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41ST Scientific Conference and General Assembly

BOOK OF ABSTRACTS

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Innovations in Biochemistry and Molecular Biology: Tools for Sustainable Development and Poverty Alleviation

6th - 10th July, 2025

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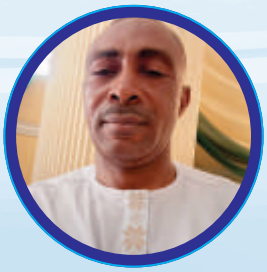

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SUB-THEME 1

A 001
STUDIES ON THE PHYTOCHEMICAL PROFILE AND ANTI-OXIDANT EFFECTS OF *Boswellia dalzielii* STEM-BARK ETHANOL EXTRACT ON CCL_4-INDUCED OXIDATIVE STRESS IN ALBINO MICE.

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ABSTRACT

Oxidative stress has a vital role in the etiology of several illnesses, including liver ailments. This research studies the phytochemical composition and antioxidant effects of *Boswellia dalzielii* stem-bark ethanol extract on carbon tetrachloride (CCl□)-induced oxidative stress in albino mice. The ethanol extract was produced using Microwave-Assisted Extraction (MAE), giving 21.92% of a brown, semi-viscous residue. Metabolite profiling by LC-MS found 23 bioactive chemicals, including flavonoids, terpenoids, phenolic acids and glycerophospholipids, which are renowned for their antioxidant and anti-inflammatory activities. The in vivo experiments demonstrated that the ethanol extract significantly mitigated CCl□-induced liver damage by reducing serum levels of aspartate aminotransferase and alanine aminotransferase, improving total protein and albumin synthesis, and enhancing body weight recovery. Histopathological examination indicated modest periportal and lobular inflammation with no signs of steatosis or necrosis in extract-treated groups, hence indicating decreased liver damage in the treated groups. Additionally, the extract exhibited robust antioxidant activity in both in vivo and in vitro models, as evidenced by increased catalase and superoxide dismutase activity, reduced malondialdehyde levels, and significant free radical scavenging capacity in assays such as DPPH, hydrogen peroxide, FRAP, and phosphomolybdenum. The extract's antioxidant activity was equivalent to that of ascorbic acid, a well-established antioxidant benchmark. These results corroborate the traditional usage of *Boswellia dalzielii* in addressing oxidative stress-related illnesses and highlight its potential as a natural hepatoprotective agent. However, additional investigations are required to explain the mechanisms of action, enhance extraction techniques, and assess its safety and effectiveness in humans by optimizing its medicinal uses.

KEYWORDS: Microwave-Assisted Extraction (MAE), Liquid Chromatography-Mass Spectrometry (LCMS), Flavonoids, IC-50, Malondialdehyde (MDA).

A 002
EVALUATION OF THE EFFECT OF *Jatropha curcas and Justicia carnea* ON HEAMATOLOGICAL AND COAGULATION PROFILE IN RATS

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ABSTRACT

This study evaluated the effects of *Jatropha curcas* and *Justicia carnea* aqueous leaves extract on haematological and coagulation profile of Rats. 30 Rats weighing between 120-130g were used and divided into six groups; 1 (control), 2 (Standard drug), 3 and 4 (low and high dose of *Jatropha curcas* respectively), 5 and 6 (low and high doses of *Justicia carnea* respectively). Administration was orally and lasted for 21 days, the rats were sacrificed and blood collected through a cardiac puncture into anticoagulant vials. Automated hematology analyzer was used for hematology, calorimetric method for coagulation profile and Dukes

method for bleeding time. The result showed an increase in WBC, RBC, PCV, HB, MCV among groups exposed to both plants. There was also an increased platelet count in group 4 while other groups showed reduced platelets counts. Group 2, 3, 5 and 6 showed reduced bleeding time while group 4 showed an increased bleeding time. The prothrombin time was increased in group 2, 3, 4, and 5 while there was a mild reduction in group 6 when compared with the negative control. The activated partial thromboplastin time was increased in group 2, 3, 4, 5 and 6. Result showed that the aqueous leaves extracts of the plants possess blood boosting properties, immune building properties andpotential to stimulate thrombopoietin production. This study scientifically confirms and supports the traditional use of the leaves of *Jatropha curcas* and *Justicia carnea* in enhancing haematological parameters.

KEYWORDS: *Jatropha curcas*, *Justicia carnea*, Hematological, Coagulation, Prothrombin

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A003
ANTIHYPERGLYCEMIC, ANTIHYPERLIPIDEMIC AND HEPATOPROTECTIVE EFFECT OF AQUEOUS, METHANOLIC AND PETROLEUM ETHER EXTRACT OF RIPE *Carica papaya* SEED IN STREPTOZOTOCIN (STZ)-INDUCED DIABETIC RATS

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ABSTRACT

Antidiabetic effect of aqueous (AQ), methanol (MET) and petroleum ether (PET)extract of ripe *Carica papaya* seed in streptozotocin-induced diabetic albino rats were investigated. The rats were randomly assigned into nine experimental groups (n=5). All the animals were exposed to the same food and water. Groups 1, 7, 8 and 9 were not induced with diabetes but groups 2 to 6 were induced with diabetes. Group 1 received 0.9% sterile saline, group 2 was left untreated, group 3 was treated with standard drug, group 4, 5 and 6 were treated with 200 mg/kg body weight (bwt) of PET, MET and AQ seed extracts of *C. papaya*respectively. Groups 7, 8 and 9 received normal saline treated with 200 mg/kg body weight (bwt) extracts of PET, MET and AQ respectively. The induction of streptozotocin caused a significant increase ($p<0.05$) in blood glucose level and decreased in body weight of rats. Also there was a significant increase ($p<0.05$) in aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline Phosphatase (ALP), gamma glutamyl transferase (GGT), total cholesterol, triacylglycerol, very low density lipoprotein cholesterol and low density lipoprotein cholesterol with decreased in high density lipoprotein cholesterol.Administration of the various extracts of *Carica papaya*seed significantly decreased ($p<0.05$) the level of blood glucose and reversed the abnormal trends observed in the dysregulated biochemical biomarkers. Conclusively this study showed that the aqueous, methanol and petroleum extract of *Carica papaya* seed exerted hypoglycemic, hypolipidemic and hepatoprotective effects and may be an alternative to the management of diabetes.

KEYWORDS: *Carica papaya*, Hypoglycemic, Hypolipidemic, Hepatoprotective, Albino rat

A 004

CHARACTERIZATION AND TOXICITY OF 3-PYRIDINE CARBOXYLIC ACID FROM THE METHANOL EXTRACT OF *Solandra longifloratus SAC* TO STEM BACK

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ABSTRACT

The methanol fraction produced a high value of crude extract in comparison to the other fractions, and the stem bark of S*olandra longiflora* showed great potential as the cytotoxicity report was unlikely to have adverse effects on humans. The conventional methanol extraction method was used to extract the stem bark of SolandraLongiflora, along with chromatographic techniques such as column chromatogram, Gas Chromatography-Mass Spectrometry (GC-MS), Nuclear Magnetic Resonance (NMR), and Fourier Transform Infra-Red spectrometry (FTIR), with a thin layer chromatography (TLC) plate serving as a medium for visual recognition and the *Artemia salina* (brine shrimp) Lethality Test. With the methanol fraction exhibiting the highest lethality (LC50 value of 574.87 µg/mL) and the hexane fraction exhibiting the lowest toxicity (LC50 value of 4577.43 µg/mL), According to the cytotoxicity investigation, the methanol fraction and the crude extract from *Solandra longiflora's* stem bark showed great promise because the methanol fraction is likely to have adverse effects on human, it yielded a significant amount of crude extract in comparison to the other fractions. The study showed the potential of medicinal plants for herbal medications with antibacterial, anticancer, and other effects.

KEYWORDS: Chemical Constituents, Characterization, Toxicity, *Solandra longiflora*, *Artemia salina*

A005

VOLATILE BIOACTIVE COMPOUNDS PROFILING OF *Chromolaena odorata* LEAF ETHANOL EXTRACT

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ABSTRACT

Chromolaena odorata is a medicinal plant widely applied in ethno-medical tinctures for treatment of wounds and pains in the tropics. The present study assessed the volatile bioactive compounds of wound healing plant *C. odorata* leaf ethanolic extract. The volatile bioactive components were determined using gas chromatography-mass spectrometry (GC-MS). The results obtained from the study showed that the extract is rich in a battery of pharmacologically beneficial bioactive compounds. GC-MS analysis identified thirty-two (32) volatile bioactive compounds in the ethanol extract of *C.odorata* leaf; these includes cis-13-Octadecenoic acid (12.34%), 1,3-Dioxolane, 4-ethyl-5-octyl-2,2-bis(trifluoromethyl)-cis-Cyclopropane carboxamide (9.32%), Butyl 9-tetradecenoate (8.63%), trans-13-Octadecenoic acid, methyl ester, 11-Octadecenoic acid, methyl ester (8.52%), 6-Octadecenoic acid, (Z)- Oleic Acid (7.17%), n-Hexadecanoic acid (6.34%), and 9-Octadecenoic acid, (E)-Octadec-9-enoic acid, 2-Trifluoroacetoxypentadecane (4.54 %)

as the major bioactive compounds. Cis-13-Octadecenoic acid (12.34%), 1,3-Dioxolane, 4-ethyl-5-octyl-2,2-bis(trifluoromethyl)-cis- Cyclopropane carboxamide (9.32%), and Butyl 9-tetradecenoate (8.63%) were the three most abundant bioactive compounds. The leastabundant volatile compounds in *C. odorata* leaf ethanol extract were Cyclopentane undecanoic acid (0.18%), 2,5-Furandione, 3-dodecyl-1H-Indene, 2-butyl-5-hexyloctahydro- Oleic Acid (0.26%), 1,2-hydrazine dicarbothioamide, N1, N2-dibutyl-Norethindrone Acetate, 2-[5-(2-Isobutoxyphenyl)-4H-1,2,4-triazol-3-ylthio] acetic acid (0.34%) and 3,7,11-Tridecatrienoic acid, 4,8,1 2-trimethyl-, methyl ester (0.37%). These compounds possess documented beneficial pharmacological properties which may be responsible for the traditionally attributed anti-inflammatory, antioxidant, antimicrobial, anti-inflammatory, and wound healing properties of the plants.

KEYWORDS: *Chromolaena odorata,* Phytochemicals, GC-MS, Bioactive compounds

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A006
BIOACTIVE PROFILE, ANTIOXIDANT POTENTIAL AND FUNCTIONAL PROPERTIES OF *Annona muricata* L (SOURSOP) LAEVES

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ABSTRACT
Bioactive profile, antioxidant potential and functional properties of *Annona muricata* L (soursop) were evaluated using the leaves. Standard methods of analysis were used. Bioactive profile evaluated was vitamins, proximate composition, fatty acid, minerals, and phytochemicals. Results of bioactive profile revealed the presence vitamins A (5.07±0.54 mg/kg), C (69.46±1.09 mg/100g) and vitamin D (14.63±0.72 mg/kg). Moisture (8.09±0.54 %), protein (17.15±0.23 %), and carbohydrate (53.26±1.90%) composition of the leaves were relatively high compared to some conventional vegetables of nutritional importance. Important fatty acids needed for optimal health such as lauric acid (0.33±0.02µg/ml), mystric acid (1.56±0.14µg/ml), linoleic acid (20.99±2.01µg/ml), linolenic acid (20.99±2.01µg/ml), and arachidonic acid (41.99±2.10µg/ml) were also found in the leaves. Potassium, calcium, and magnesium minerals were appreciably high in the studied sample. The GC-MS result of this study revealed a total of twenty phytochemicals of relative importance such as such as linamarin (0.29±0.01µg/ml), naringn (2.39±0.20µg/ml), cardiac glycoside (4.12±0.11µg/ml), Flavan3-ol (6.02±0.19ppm), and rutin (17.97±1.82µg/ml). Comparatively, the leaf extract of *A. muricata* exhibited high antioxidant potential with a lower IC_{50} values against the standard for DPPH activity, ABTS activity, superoxide anion radical scavenging ability, and nitric oxide radical scavenging activity. The functional properties of the leaf flour were swelling capacity (19.61±0.13%), water absorption capacity (54.28±2.19%), solubility index (10.71±0.17%), oil absorption capacity (36.55±1.80%), and wettability (45.00±2.40sec). Understanding the real importance of these constituents could position *A. muricata* for pharmaceutical, agricultural (food), and cosmetic importance.

KEYWORDS: Bioactive profile, Antioxidant potential, Functional properties, *Annona muricata*

A007

IMPACT OF ETHANOL EXTRACT OF *Anredera cordifolia* LEAVES IN THE TREATMENT OF TESTOSTERONE-INDUCED BENIGN PROSTATIC HYPERPLASIA (BPH) IN RATS

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ABSTRACT

The aim of this study was to investigate the impact of ethanol extract of *Anredera cordifolia* leaves in the treatment of testosterone-induced BPH in rats. Twenty-five (25) male albino rats divided into five groups of five rats each (n =5) were used for the study. Group 1 was normal control, group 2 was left untreated while groups 3 and 4-5 were treated with standard drug (finasteride) and different doses of extract respectively, after induction. Experimentally BPH model was developed in the rats (group 2 to 5) by subcutaneous injection of testosterone propionate (5 mg/kg body weight (b.w) for three (3) weeks. The treatment groups showed decrease in weight of prostate, bladder, and prostate index compared to the untreated control. The PSA level in the treatment groups showed a dose dependent decrease.Serum testosterone level was significantly ($p < 0.05$) decreased in standard control after treatment compared to the untreated group. Also, the extract treated groups showed dose dependent decrease in testosterone with the peak observed at high dose. The standard drug and extract treated groups showed significant ($p < 0.05$) increase in SOD and CAT activity compared to the untreated group. However, there was no significant ($p > 0.05$) difference observed in the activities of AST and ALT in the treatment groups when compared to the untreated group. Considering the above results, it could be concluded that *Anredera cordifolia* possesses anti-benign prostatic hyperplasia effect as observed in the reduction of prostate tissues and significant changes in other prostate indices.

KEYWORDS: Benign prostatic hyperplasia, *Anredera cordifolia*, Antioxidants, Oxidative stress, Prostate tissues.

A008

VARIATIONS IN SERUM PROGESTERONE AND ESTRADIOL LEVELS INPROESTRUS RATS ADMINISTERED EXTRACTS FROM *Alstoniaboonei* STEM BARK

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ABSTRACT

In this part of the world, traditional healers enjoy patronage for treatment of infertility and the use *Alstonia boonei* stem bark amongst others is prevalent. The effects of aqueous and ethanol extracts of *A.boonei* stem bark on serum progesterone, estradiol, uterine and ovarian weights of proestrus rats were evaluated as indices for infertility treatment. Rats with regular estrous cycle were randomly selected into eight(8) cages of five rats. Extracts of *A. boonei* stem bark were administered orally at concentrations of 250mg/kg, 150mg/kg and 75mg/kg, for fifteen (15) days. The control groups were administered normal saline. The animals were sacrificed at the proestrus phase after 15 days of extracts administration and blood samples collected for hormonal assays. The results obtained showed a concentration dependent increase in serum progesterone levels of animals administered aqueous extract of *Alstonia boonei* stem bark that was significant ($P<0.05$) in the 250mg/kg group (14.82ng/ml) when compared with the control. The ethanol extract group also revealed

concentration dependent increase in serum estradiol levels significant ($P<0.05$) in the 150mgkg^{-1} and 250mgkg^{-1} ethanol extract administered animals with 28.14pg/ml and 33.40pg/ml serum estradiol respectively. There were no significant changes in the ovary and uterine weights.The results suggest that the plant extracts increased the serum progesterone and estradiol in pro-estrus rats, thus may contain ingredients for infertility treatment.

KEYWORDS: *Alstonia boonei*, Infertility, Progesterone, Estradiol, Pro-estrus.

A009

INVITRO ANTIMICROBIAL EFFECTS OF *Azadirachta indica* SEED OIL IN MUBI

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ABSTRACT

The study was aimed to determine the antimicrobial activity of *Azadirachta indica* seed oil against some disease-causing organism such as *Staphylococcus aureus, Salmonella typhi and Pseudomonas aeruginosa.* This study of antibacterial activity against selected pathogens was done by dilution method, agar disc diffusion method and agar well diffusion method. Pathogens were taken from General Hospital Mubi. The locally extracted oil tested showed antibacterial activity against all the three (3) pathogenic bacteria even at very low concentration. In case of two (2) of the pathogens, inhibition of growth caused by *Azadirachta indica* oil was over 99%. The results showed that the oil will be an honest source of antibacterial agents. The encouraging observation also indicate that this oil should be exploited as natural antibiotic for the treatment of several infectious diseases caused by these pathogens, and could be useful in understanding the relations between traditional cures and current medicines.

KEYWORDS: *Invitro*, Antimicrobial effect, *Azadirachta indica* seed oil, Mubi, Bacterial, pathogens

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A010

FERMENTED *Parkia biglobosa*SEED MEAL MODULATES LIVER ENZYME MARKERS, SERUM ANTIOXIDANT, AND DIGESTIVE ENZYME ACTIVITIES OF ACETAMINOPHEN-EXPOSED *Clarias gariepinus*

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ABSTRACT

This research is aimed at assessing the ability of fermented condiment, *Parkia biglibosa* (*Dawadawa*) to protect *Clarias gariepinus* juveniles from Oxidative stress-related diseases that arise as a result of acetaminophen mega dose administration. *P. biglibosa* was fermented for 24 hours and seven (7) formulated diets (FD) were prepared (FD1, 2, 3, 4, 5, 6, and 7) which contained 0, 0, 15, 20, 25, 30, and 35%, respectively, of *Parkia biglobosa* seed meal inclusion. Fish fingerlings were randomly stocked into seven (7) aquarium tanks (10 L), namely, Tank1, 2, 3, 4, 5, 6, and 7 with tanks 2, 3, 4, 5, 6, and 7 topped with 300 mg of

acetaminophen, daily. Twenty (20) *C. Gariepinus* were stocked per tank and fed with each formulated diet, individually, in three replicates. The feeding was twice daily at 2% of the fish's body weight for four (8) weeks (56 days). The parameters determined include blood electrolytes, enzymatic activities of the liver, and **digestive enzyme activities.** The small intestine and liver morphology of the experimented fish would otherwise be evaluated. The results revealed reduced significance levels of the blood liver enzymes and increased serum antioxidant enzymes and digestive enzyme activities in fish fed FD1, FD3, FD4, FD5, FD6, and FD7 were observed as compared to FD2. Hepatic and intestinal tissue with normal architecture were observed in *C. gariepinus* fed FD1 (control), and FD3-FD7 (Figure 1A, C, D, E, F, G). However, in the liver and small intestine of *C. gariepinus* fed FD2 (negative control), features of acute damage were observed. All formulated meals might protect *C. gariepinus against exposure* to toxic agents. However, diets with 25, 30, and 35% inclusion of fermented *P. biglobosa* seed may look more promising against acetaminophen intoxication. Consumption of diets supplemented with fermented *P. biglobosa* seeds may serve as a protective agent against acetaminophen-induced liver damage

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A011

EFFECTS OF ETHANOL EXTRACTS OF FRUITS OF *Acacia nilotica* AND FLOWERS OF *Calotropis procera* ON LIVER FUNCTION OF ASPIRIN-INDUCED MALE ALBINO RATS

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ABSTRACT

The effects of ethanol extracts of *Calotropis procera* flowers and *Acacia nilotica* fruits on the liver function of male albino rats were investigated in this study. A total of eighty-four (84) male albino rats in good health were used for this study. Out of this, sixty (60) rats were randomly assigned into 6 groups of 10 animals each while 24 rats were used for the lethal dosage (LD50) investigation. The animals were induced with 500 mg of aspirin per kilogram of body weight 12hrs prior to the commencement of the experiment. The test animals were given ethanol extracts of *Calotropis procera* flowers and *Acacia nilotica* fruit for five and fourteen days, respectively, and were sacrificed at the conclusion of each test phase, blood was taken for biochemical analysis. At the conclusion of each stage, the liver was harvested and prepared for histological analysis. The result after 5 days of treatment showed that, ALT in group 2 increased significantly ($p<0.05$), whereas it decreased non-significantly ($p>0.05$) in groups 4, 5, and 6 and decreased significantly ($p<0.05$) in group 4, when compared with the normal control. Additionally, With the exception of group 2, aspartate transaminase (AST) values showed a general decreasing trend. Alkaline phosphatase (ALP) increased non-significantly in group 2, but decreased significantly ($p<0.05$) in all other groups. After 14 days of treatment, ALT, AST, and ALP values showed the same pattern. Both the treated animals' and normal rats' liver sections' photomicrograph revealed normal hepatocytes, sinusoids, and central veins.However, the photomicrograph of the liver slice of group 2 animals revealed a mildly dilated portal triad. In conclusion, ethanol extracts from *Calotropis procera* flowers and *Acacia nilotica* fruits may contain active compounds that can mitigate hepatotoxicity and enhance liver functions.

KEYWORDS: *Acacia nilotica, Calotropis procera, liver function, histology, acute toxicity*

A012

COMPARATIVE STUDY ON THE *INVITRO* TOXICITY OF CRUDE EXTRACTS OF NEEM (*Azadirachta indica*) AND SYNTHETIC ACARICIDES AGAINST TICKS OF THE GENUS *Boophilus*.

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ABSTRACT
Comparative study on the *invitro* toxicity of Neem plant extract, *Azadirachta indica* and pyrethroids (Deltamethrin and Lambda cyhalothrin) was evaluated in the laboratory against cattle tick, *Boophilus* using adult immersion test. Six concentrations of treatment ranging from 500ul/ml to 31.25ul/ml, including control were used for the study. The bioassays were carried out in the laboratory at room temperature. Three replicates of each concentration of respective treatments in a Completely Randomized Design (CRD) were challenged with 10 active adult ticks. Mortality resulting from the immersion of adult *Boophilus* ticks in different concentrations of the acaricides was monitored at 24 hourly intervals for a period of 24, 48, 72, and 96 hours post treatment. Data were analysed using Log-probit regression analysis and Analysis of Variance (ANOVA). Results showed that dose-related mortality responses were noted at different time intervals and these were significant ($P \leq 0.05$). Result indicated 100% and 40% mortality respectively on adult *Boophilus* ticks at the highest and lowest concentrations of *A. indica*. Exposure to deltamethrin resulted in 86.70% and 46.70% mortality respectively at the highest and lowest concentrations while Lambda-cyhalothrin caused 76.6.0% and 53.30% mortality respectively on the adult *Boophilus* ticks at the highest and lowest concentrations. LD_{50} values for adult *Boophilus* ticks were 53.56 µl/ml for *A. indica* while Lambda-cyhalothrin and Deltamethrin had 22.47µl/ml, 60.00 µl /ml respectively. The study suggests that botanical extracts offered a great potential as an alternative acaricide that is available, cheap and effective in control of ticks.

KEYWORDS: Synthetic acaricides, Plant extracts, Ticks, *Azadirachta indica, Boophilus.*

A013

IN SILICO MOLECULAR DOCKING AND PHARMACOKINETIC PROFILING OF HARMINE DERIVATIVES AS ANTI-CANCER AGENT FOR LUNG CANCER.

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ABSTRACT
This study investigates the molecular docking and pharmacokinetic profiling of harmine derivatives to evaluate their potential as therapeutic agents against lung cancer. Molecular docking simulations were

performed to assess the binding affinity of harmine derivatives to a target protein, Beta Adrenergic Receptor PDB ID 4GPO. Docking result revealed binding energies ranging from -6.5 to -8.4 kcal/mol with compound number 6 having the highest binding affinity of -8.4kcal/mol, followed by compound number 4 with the binding affinity of -8.2 kcal/mol and compound number 1 with the least binding affinity of -6.5 kcal/mol, this indicates strong and stable interactions. Pharmacokinetic analysis demonstrated that all derivatives adhered to Lipinski's Rule of Five, suggesting favorable drug-like properties, including optimal molecular weight, lipophilicity, polar surface area, hydrogen bond donors, and acceptors. The pharmacokinetic profiles of these compounds were favorable with bioavailability score of 0.55, and none of them showed any potential for toxicity. Furthermore, all the derivatives are found to be effective substrates and Inhibitors of CYT34, demonstrating their potential as promising drug molecules against lung cancer. Overall, the derivatives exhibit promising biological activity, pharmacokinetics, and stability for further development as effective therapeutic agents against lung cancer.

KEYWORDS: Harmine Derivatives, Molecular Docking, Lung Cancer, Pharmacokinetic Study

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A014

EFFECTS OF NUTRACEUTICALS OF DRIED DATE PALM (*Phoenix dactylifera*) FRUITS ON STREPTOZOTOCIN INDUCED DIABETES MELLITUS IN ALBINO RATS

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ABSTRACT

Diabetes mellitus is a metabolic disease characterized by chronic hyperglycaemia resulting from defects in insulin secretion, insulin action, or both. A nutraceutical is any substance that is a food or part of food that provides medicinal or health benefits. This research was aimed at approaching the problem of diabetes mellitus in developing countries such as Nigeria by studying the nutraceuticals of date palm fruits for their potentials in combating diabetes mellitus. The plant material was collected, identified and extracted using organic solvents (petroleum ether and methanol). Experimental animals (Albino Wister rats) were induced with diabetes mellitus using streptozotocinand treated with the crude extract and the various purified fractions. The treatment with the bioactive compounds showed a significant ($P < 0.05$) reductionin the treatment groups 3, 4 and 5(131.20± 2.49, 133.60± 6.50 and 123.40± 3.58) when compared with the control groups 1 and 2(111.00± 5.29 and 195.60± 12.38). The nutraceuticals at the dose of 400 mg/Kg body weight were able to reduce hyperglycaemia. It is therefore possible to say that the nutraceuticals present in *Phoenix dactylifera*fruit extract are anti-diabetic agents as seen by the significant changes in the experimental animals used in the study.

KEYWORDS: Nutraceuticals; Diabetes mellitus; Date palm fruit; *Phoenix dactylifera*; Hyperglycemia

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A015

QUALITATIVE PHYTOCHEMICALS AND *IN VITRO* ANTIOXIDANT ACTIVITY OF *Adansonia digitata* LEAVES METHANOL EXTRACT

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ABSTRACT

Adansonia digitata popularly called the baobab tree is widely distributed in hot savannah region of Sub-Saharan Africa. It is widely used as food and as medicinal plant for the treatment of human and poultry diseases. The aim of this study was to investigate the phytochemical constituents as well as *in vitro* antioxidant activity of *Adansonia digitata* leaves methanol extract. The qualitative phytochemicals screening was carried out according to standard methods, while antioxidant potential was evaluated by DPPH radical scavenging activity of the extract while Vitamin C was used as Standard. The phytochemical screening revealed the presence of Alkaloids, Flavonoids, Tannins, Saponin, Glycoside, Phenols and Terpenoids. The percentage radical scavenging activity (%RSA) of the extract and Vitamin C are 83.33%, 86.82%, 89.60%, 92.31%, 92.95% and 90.31%,91.27%, 93.02%,93.47%, 95.22% for *Adansonia digitata* leaves extract and Vitamin C at 12.5, 25, 50, 75 and 100µg/ml. The extract shows high antioxidant activity compared to the standard (Vitamin C) and has potential effect towards lowering oxidative stress.

KEYWORDS: *Adansonia digitata*, Leaf extract, Phytochemicals, DPPH, Vitamin C.

A 016

SUPPRESSION OF OXIDATIVE STRESS NRF2/INOS SIGNALING BY MELATONIN IN THE ENDOMETRIAL TISSUE OF BLEOMYCIN-TREATED ALBINO RAT

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ABSTRACT

Oxidative stress plays a critical role in reproductive disorders, including endometriosis, infertility and pregnancy complications. In the uterus, oxidative damage disrupts cellular processes, leading to tissue dysfunction and disease. This study investigates the protective effects of melatonin against oxidative stress and its modulation of the Nrf2/iNOS signaling pathway in the uterus of bleomycin-treated rats. Female rats (n = 5 per group) were assigned to six experimental groups: Control, Melatonin (10 mg/kg), Bleomycin (1mg/kg, 2mg/kg and 5mg/kg), and a combined treatment of Melatonin (10 mg/kg) with Bleomycin (5 mg/kg). Bleomycin was administered intraperitoneally and uterine tissues were collected at 6-, 12- and 24-hours post-treatment for biochemical analyses. Oxidative stress markers, including reactive oxygen species (ROS), malondialdehyde (MDA), superoxide dismutase (SOD) and reduced glutathione (GSH), were assessed alongside key reproductive hormones—gonadotropin-releasing hormone (GnRH), follicle-stimulating hormone (FSH) and estrogen (ESR). Bleomycin treatment significantly increased oxidative stress ($p < 0.05$), reducing antioxidant enzyme activity and disrupting hormonal balance. Melatonin co-administration restored antioxidant levels, mitigated DNA damage and normalized uterine protein concentrations. Additionally, melatonin attenuated alterations in GnRH and FSH secretion observed in bleomycin-treated rats. These findings suggest that melatonin effectively modulates oxidative stress and key signaling pathways, underscoring its potential as an adjunct therapy for oxidative stress-associated reproductive disorders, including endometriosis, polycystic ovary syndrome (PCOS) and infertility.

KEYWORDS: Infertility, Oxidative stress, NFR2 Signalling, Melatonin and reproductive system.

A017

PHYTOCHEMICAL PROFILING AND GC-MS ANALYSIS OF BIOACTIVE CHEMICAL COMPOUNDS OF METHANOL EXTRACT OF *Alstonia boonei* LEAVES

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ABSTRACT

Plants are excellent sources of functionally bioactive compounds and essential nutrient. This study was carried out to identify phytochemical components in the methanol extract of *Alstonia boonei* leaves and characterize the bioactive compounds using GC-MS. Mass spectra of the unknown compounds found were matched with standard mass spectra of known components stored in National Institute of Standards and Technology (NIST) library. The phytochemical screening revealed the presence of flavonoids (4.94±0.06), phenolics (3.95±0.07), tannins (3.00±0.28), alkaloids (2.50±0.28), glycosides (1.70±0.14), and saponins (1.15±0.17). The gas chromatography-mass spectrometry analysis of *Alstonia boonei* leaf extract revealed the presence of eight (8) bioactive compounds. These compounds were 3, 7, 11, 15–Tetramethyl–2-hexadecen-1-ol, 1-Dodecanol 3, 7, 11 – trimethyl, Cyclo propanenonanoic acid, 2-[(2-butylcyclopropyl)methyl]-, methyl ester, Phen-1,4-diol, 2,3-dimethyl-5-trifluoromethyl-, n-Hexadecanoic acid, phytol, 9,12-Octadecadienoic acid (Z,Z)-, squalene. The phytochemical and GC-MS profiling of methanol extract of *Alstonia boonei* leaves revealed the presence of bioactive compounds with important medicinal properties. Hence, the presence of these phytochemicals could be responsible for the therapeutic effects of the plant.

KEYWORDS: *Alstonia boonei*, phytochemicals, medicinal properties, GC-MS, Phytochemical analysis

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A018

IN-SILICO AND *IN-VIVO* INVESTIGATIONS OF THE ANTICONVULSANT POTENTIAL OF *Hymenocardia acida* ETHANOL LEAF AND STEM BARK EXTRACTS IN KETAMINE HYDROCHLORIDE-INDUCED NEURONAL DYSREGULATIONS IN MALE WISTAR RATS

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ABSTRACT

Ketamine hydrochloride is an N-methyl-D-aspartate receptor antagonist, is known to induce pain transmission and has been widely studied for its effects on brain damage and convulsions in animal models. However, it has several side effects, including hallucinations, impaired neuronal transmission, and inflammation. Recent HPLC analysis of *Hymenocardia acida* extracts (ethanol and stem bark) revealed the presence of bioactive compounds like Gallic acid, Syringic acid, Caffeic acid, and Resorcinol, suggesting potential therapeutic effects in mitigating ketamine-induced toxicity. In this study, fifty-four male Wistar rats were divided into nine groups, with each group receiving specific treatments for 28 days. Group 1 received normal saline, while Group 2 was administered 75 mg/kg ketamine on the 27th day. Group 3 received diazepam (50 mg/kg bw orally for 28 days). Groups 4-6 received 70 mg/kg ketamine followed by different doses (200, 400, and 600 mg/kg) of ethanol leaf extract of *H. acida*. Groups 7-9 were treated similarly but with stem bark extract. Various biochemical parameters, including plasma glucose, calcium,

neurotransmitters (Glutamate, GABA, Dopamine, Serotonin), inflammatory markers, and oxidative stress indicators (MDA, ROS, SOD, catalase), were assessed. *In silico* tools like UCSF Chimera and PyRX were used for molecular dockings. The results indicated that ketamine induced significant alterations in biochemical parameters and neurotransmitter damage. However, treatment with *H. acida* extracts notably restored these biochemical parameters, suggesting its potential therapeutic effects against ketamine-induced toxicity.The study highlights *H. acida*'s remarkable restorative potential due to its phytochemical components.

KEYWORDS: *Hymenocardia acida,* **ketamine, Diazepam,Neurotransmitters,** ***In-silico***

A019

SPOP GENE MUTATIONS, CIRCULATING PROTEIN LEVELS IN NIGERIAN PROSTATE CANCER PATIENTS AND *IN-SILICO* THERAPEUTIC TARGETING OF AR SIGNALING

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ABSTRACT

Prostate cancer (PCa) remains a leading cause of cancer-related mortality in men, with over 1.4 million new cases reported globally in 2020. The identification of effective therapeutic targets and biomarkers is crucial for improving PCa management. This study investigated Speckle Type POZ Protein (SPOP) mutations and quantified SPOP, Androgen Receptor (AR), and Steroid Receptor Coactivator 3 (SRC-3) protein levels in PCa patients and controls, while also screening for potential inhibitors targeting mutated SPOP and Androgen Receptor Variant 7 (AR-V7) computationally. A case-control study was conducted with 40 PCa patients and 40 healthy subjects. Plasma SPOP, AR, and SRC-3 levels were quantified using ELISA, and SPOP gene mutations were detected via Sanger sequencing. SPOP mutants were identified in 20% (8 out of 40) of the study cohort. Previously reported nucleotide changes (C>A, T>C, and C>A) resulted in a novel K95N (Lysine to Asparagine at position 95) SPOP mutation, which has not been previously reported. While mean protein levels did not differ significantly between PCa patients and controls ($p > 0.05$), a strong positive correlation was observed between AR and SRC-3 levels ($r = 0.9$, $p < 0.0001$). SPOP showed moderate correlations with AR ($r = 0.7$, $p < 0.0001$) and SRC-3 ($r = 0.6$, $p < 0.0001$). Computational analyses identified four promising C. bonduc compounds, with 7,4'-dihydroxy-3,11-dehydrohomo isoflavanone and Luteolin exhibiting stronger binding affinities to mutant SPOP than Enzalutamide, and other compounds showing stronger binding to AR-V7 than Apalutamide. These findings highlight a novel SPOP mutation (K95N) in this PCa cohort, suggest an interplay between SPOP, AR, and SRC-3 in PCa, and identify potential therapeutic compounds for mutant SPOP and AR-V7. Further research is needed to validate clinical relevance.

KEYWORDS: Biomarkers, Prostate cancer, Androgen receptor, SPOP, SRC-3, Therapeutics

A020

SOLVENT FRACTIONS OF *Chasmanthera dependens* (*Hochst*) ROOTS RESTORED FERTILITY PARAMETERS IN ARSENITE-INDUCED INFERTILE MALE RATS

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ABSTRACT

The ever-increasing prevalence of infertility and the lack of satisfactory management options have necessitated the need for investigation into more alternative and complementary options in plants. Therefore, this study determined the fertility restoring effects and antioxidant activity of the fractions of *Chasmanthera dependens* roots (CDR) in male rats. Sixty male rats were assigned into 6 groups such that group A (control) received distilled water, whilst arsenite (10 mg/kg body weight [b.w.]) treated-rats in groups B, C, D, E and F received distilled water, addyzoa (15.74 mg/kg b.w.), aqueous residual fraction (ARF), ethylacetate fraction (EAF), and n-butanol fraction (nBF) at 100 mg/kg b.w.each, respectively for 60 days. The arsenite-treatment related reduction ($p < 0.05$) in sperm count, motility, normal morphology, viability, fast progression, fertility index, serum testosterone, follicle stimulating hormone, luteinising hormone, testicular superoxide dismutase, catalase and glutathione peroxidase as well as the increase in sperm slow progression and testicular malondialdehyde were reversed ($p < 0.05$) by all the fractions with most pronounced outcome by the nBF and ARF. The study concluded that nBF and ARF of CDR restored fertility via modulation of the sperm profile, reproductive hormones and antioxidant enzymes.

KEYWORDS: *Chasmanthera dependens,* Male fertility, Antioxidant, *Menispermacaea*, Sodium arsenite,

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A 021

EVALUATION OF SOME NUTRITIONAL, ANTIOXIDANT, HEMATOLOGICAL, AND TOXICOLOGICAL PROFILES OF TWO LOCALLY FORMULATED APHRODISIACS, TSIMI AND GUMBA

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ABSTRACT

This study evaluates the nutritional, antioxidant, hematological, immunological, and toxicological profiles of two locally formulated aphrodisiacs, Tsimi and Gumba, to assess their safety and efficacy. Phytochemical analysis was conducted to identify bioactive compounds, while proximate composition determined carbohydrate, protein, and lipid content. Antioxidant assessments measured vitamins A, C, and E levels. Hematological and immunological parameters were analyzed, including red blood cell (RBC) count,

hemoglobin levels, and leukocyte profiles. Renal and hepatic function tests assessed urea, creatinine, and liver enzyme levels. Anti-nutritional factors such as oxalate, cyanide, and nitrate were also quantified. Phytochemical screening identified flavonoids, tannins, and alkaloids. Proximate analysis revealed significant macronutrient content. Antioxidant evaluation showed high levels of vitamins A, C, and E, suggesting potential protective effects against oxidative stress. Hematological analysis indicated normal RBC and platelet parameters, with variations in hemoglobin and hematocrit linked to iron-rich ingredients. Immunological studies suggested an age-dependent decline in leukocyte counts in Tsimi-treated subjects, while Gumba had no significant effect. Renal and hepatic function tests confirmed normal urea, creatinine, and liver enzyme levels, and anti-nutritional compounds remained within safe limits. The findings support the traditional use of Tsimi and Gumba as aphrodisiacs, highlighting their potential health benefits with no observed toxic effects. Further research is needed to optimize their formulations, establish long-term safety, and explore their efficacy in diverse populations.

KEYWORDS: Aphrodisiacs, Tsimi, Gumba, Antioxidants, Phytochemicals.

A 022

EFFECT OF FOUR MOST CONSUMED HERBAL DRINKS IN UBURU ON KIDNEY PARAMETERS IN WISTER ALBINO RATS

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ABSTRACT

High rate of bitters consumption has increased in our society due to bogus claims and peer group influence among the youths. Daily intake of alcoholic bitters by students in school and children during school hours as energy booster has resulted to chronic consumption of these herbal drinks that has caused reduced learning capacity and reasoning. Paucity of information on the active bio-components and description of these herbal drinks lead to the evaluation of the kidney profile of four different herbal bitters mostly consumed in South East Nigeria (Akpaka, Odogwu, ballamour and Confam bitters) in Wister albino rats. A total of 30 male rats were randomly divided into 5 groups labelled A, B, C, D and E. Group A served as control that were administered with distilled water. While the albino rats in the groups B, C, D and E were given 50mL/Kg body weight of Akpaka, Odogwu, Ballamour and Confam respectively once daily for 28 days via oral intubation. Animals were fasted and sacrificed after the 28th day of administration. Blood samples were collected into sample bottles for biochemical analysis using standard methods. Bitters administration significantly ($p < 0.05$) increased creatinine, (3.4 ± 0.11, 3.22 ± 0.35, 3.20 ± 0.13, 3.32 ± 0.17) urea (18.81 ± 0.43, 18.01 ± 0.15, 18.20 ± 0.33, 18.20 ± 0.13) uric acid (16.46 ± 0.4, 16.06 ± 0.13, 18.03 ± 0.26, 17.71 ± 0.32) levels in the groups that received Akpaka, Odogwu, Ballamour and Confam bitters when compared to the control (creatinine (1.05 ± 0.01), uric acid (6.56 ± 0.2), urea (12.15 ± 0.11). Our results showed that alcoholic bitters such as (Akpaka, Odogwu, Ballamour and Confam) alter kidney function parameters of rats and should not be taken on high doses on daily basis for 2 months and above because it can lead to toxicity.

KEYWORDS: Bitters, Alcohol, Herbal drinks, Bio-active, Kidney function

A023

CHEMICAL PERSPECTIVES ON HYPERTENSION: A MINI REVIEW OF THE ROLE OF OXIDATIVE STRESS, INFLAMMATION, AND BIOCHEMICAL MARKERS

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ABSTRACT
Hypertension is a multifaceted condition characterized by elevated blood pressure, significantly contributing to cardiovascular morbidity and mortality. This mini-review explores the intricate interplay between oxidative stress, inflammation, and biochemical markers in the pathophysiology of hypertension. Oxidative stress, resulting from an imbalance between reactive oxygen species (ROS) and antioxidants, plays a pivotal role in vascular dysfunction and remodeling. Elevated ROS levels lead to endothelial damage, promoting vasoconstriction and inflammation. Concurrently, inflammatory processes exacerbate hypertension through immune cell activation and cytokine release, further contributing to vascular injury. Biochemical markers, including lipid profiles and specific proteins, serve as indicators of cardiovascular risk and disease progression. Understanding these chemical perspectives is crucial for developing targeted therapeutic strategies aimed at mitigating hypertension and its associated complications. This review synthesizes current knowledge on the biochemical mechanisms underlying hypertension, emphasizing the need for integrated approaches that address oxidative stress and inflammation to improve patient outcomes.

KEYWORDS: Hypertension, Oxidative stress, Inflammation, Biochemical markers, Cytokine

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A024

PHYTOCHEMICAL COMPOSITION AND ANTIOXIDANT POTENTIAL OF *Andrographis paniculata* LEAVES

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ABSTRACT
Medicinal plants are rich source of antioxidants which are known to play significant role in preventing the generation of free radicals and reducing oxidative stress, both of which have been implicated in the aetiology of several diseases. The antioxidant activity of medicinal plants is attributed to the presence of phytochemicals which are plant secondary metabolites. This study was carried out to determine the phytochemical composition and antioxidant potential of *Andrographis paniculata* leaves. Phytochemical quantification was carried out using gravimetric method while invitro antioxidant assay was done using 2,2-diphenyl-1-picrylhydrazyl-hydrate (DPPH). The results of qualitative and quantitative phytochemical analysis indicated the following, alkaloids (17.87 ± 0.15 %), saponin (4.83 ± 0.14%), flavonoid (5.63 ± 0.21%), steroids (3.46 ± 0.21 %). Invitro antioxidant (DPPH) assay showed a concentration-dependent increase in the activity of the aqueous, flavonoid and saponin extracts of *A. paniculata* leaves as compared to the standard (ascorbic acid). IC50 were observed to be 68.75µg/mL for aqueous extract, 77.32µg/mL for saponin extract, 64.53µg/mL for flavonoids extract and 45.68 µg/mL for the standard. The result of the IC50 showed that the leaves of *Andrographis paniculata* can be used as a medicinal plant because of its rich phytochemical composition and antioxidant capacity.

KEYWORDS: *Andrographis paniculata,* Phytochemical, Antioxidant, DPPH, Extracts

A025

BIOCHEMICAL INVESTIGATION ON ANTI-HYPERLIPIDEMIC POTENTIAL OF AQUEOUS EXTRACT OF *Cissus populnae* WHOLE SEEDIN POLOXAMER 407-INDUCED RATS

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ABSTRACT

Hyperlipidemia is a major risk factor for cardiovascular diseases (CVDs) such as heart attacks, coronary heart disease, hypertension, peripheral vascular disease, and stroke. It is also linked to metabolic disorders like diabetes, among the leading global causes of death. Standard treatments like fibrates, niacin, and bile acid sequestrants target lipid metabolism but have limitations and side effects. To investigate the anti-hyperlipidemic potential of aqueous *Cissus populnea* whole seed extract in Poloxamer 407-induced rats. Experimental rats were divided into seven groups. Group 1 (normal control) received only food and water; Group 2 was treated with crude extract without induction; Group 3 (hyperlipidemic control) was untreated; Groups 3–7 were induced with Poloxamer 407 (1000 mg/kg). Group 4 was treated with atorvastatin (10 mg/kg); Groups 5 and 6 received crude extract (600 mg/kg and 400 mg/kg, respectively); Group 7 received purified extract (200 mg/kg). The study revealed that the anti-lipidemic, hepatoprotective, anti-atherosclerotic, oxidative DNA damage protective, and cardioprotective properties of *Cissus populnea*. The whole seed extract (600 mg/kg and 400 mg/kg) significantly ($p \leq 0.05$) reduced total cholesterol (64% and 60%, respectively), while the purified extract (200 mg/kg) achieved a 67% reduction. Triglycerides also significantly decreased ($p \geq 0.05$). Liver enzymes, creatinine, and urea levels significantly ($p \leq 0.05$) decrease compared to the hyperlipidemic control. The absence of mortality supports the extract's safety, reinforcing its traditional use in local diets like Okoho soup. This study supports *Cissus populnea* as a potential natural therapy for hyperlipidemia and related cardiovascular and metabolic diseases.

KEYWORDS: Hyperlipidemia, Poloxamer-407, *Cissus populnae*, Cardiovascular diseases.

A 026

BIOCHEMICAL PROFILING, ANTIOXIDANT, AND ANTIBACTERIAL POTENTIALS OF AQUEOUS TAMARIND (Tamarindus indica L.) SEED EXTRACT FOR BIOCOSMETIC AND DENTIFRICE APPLICATIONS

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ABSTRACT

Natural plant extracts are increasingly explored for bio-cosmetic and oral health care applications due to their bioactive profiles and therapeutic potentials. This study investigates the biochemical composition, antioxidant, and antibacterial properties of aqueous tamarind (*Tamarindus indica* L.) seed extract, evaluating its suitability for bio-cosmetic and dentifrice formulation. Standard analytical procedures were employed to assess the vitamin composition, elemental profile, phytochemical and anti-nutrients contents, antioxidant activity via DPPH radical scavenging assay, and antibacterial efficacy against *Escherichia coli*, *Proteus*

mirabilis, *Klebsiella pneumoniae*, and *Staphylococcus aureus*. Atomic Absorption Spectrophotometry (AAS) was used for elemental analysis, while spectrophotometric methods quantified vitamins and antioxidant activities. The extract contained substantial levels of vitamin A (4003 ± 1.53 µg/mL), vitamin B-complex, vitamin C (91.90 ± 1.13 µg/mL), and vitamin E (108.78 ± 0.60 µg/mL), supporting skin regeneration and antioxidative defenses. Phytochemical analysis revealed high concentrations of phenolics (156.91 ± 0.38 mg/g), saponins (88.65 ± 0.36 mg/g), flavonoids (28.29 ± 2.31 mg/g), and tannins (46.40 ± 0.27 mg/g), all contributing to anti-inflammatory and antioxidant effects. Elemental analysis showed significant mineral contents (K: 389 mg/L, Ca: 10.65 mg/L, Na: 15.21 mg/L) and low heavy metal contamination. DPPH assay revealed strong radical scavenging activity, with 86.29% inhibition, comparable to ascorbic acid. Antibacterial assessment showed moderate inhibitory activity against *P. mirabilis* and *K. pneumoniae* at higher concentrations but no activity against *E. coli* and *S. aureus*. Tamarind seed extract is a promising candidate for bio-cosmetic applications due to its rich antioxidant and bioactive composition. However, its modest antibacterial activity limits its standalone use in dentifrice formulations without synergistic enhancement. Further optimization and clinical validation are recommended to harness its full potential in natural product formulations.

KEYWORDS: Tamarind seed extract, Biocosmetics, Dentifrice formulation, Antioxidant activity, Natural product development.

A027

EVALUATION OF THE TOXIC EFFECTS OF AQUEOUS SEED EXTRACT OF *Hunteriaum bellata* (ABEERE) AND SACRA HERBS (BABAN AISHA) ON BIOCHEMICAL AND HEMATOLOGICAL PARAMETERS OF ALBINO RATS

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ABSTRACT

Herbal mixtures are crude, unpurified plant extract containing several constituents which work synergistically to exert a therapeutic effect. The present study investigated the *in-vivo* acute toxicity of the aqueous seed extract of *Hunteriaum bellata* (Abeere) and Sacra herbs (Baban Aisha). Albino rats (both male and female) were used for this study. The rats were divided into 3 groups of 5 rats each and group 2 and 3 were administered daily oral doses of (150 and 120) mg/kg body weight (b. wt.) of the two herbs according to their prescribed doses respectively for 2 weeks. Hematological parameters, Liver function test, and Creatinine were assayed using standard procedures. The result showed an increase in PCV, Hb, and WBC in the treatment groups, though not statistically significant ($p>0.05$) when compared with the control. Also, the ALT increased non-significantly ($p>0.05$) in group treated with Sacra herbs (23.53±4.48UI/L) and *H. umbelata* (24.03±4.17UI/L) when compared with the control (22.43±1.17UI/L). The Creatinine concentration also increased non-significantly in both treated groups *H. umbelleta* (139.67±61.85 UI/L) and Sacra herbs (131.93±43.81UI/L) when compared with the control (130.00±19.70UI/L).Findings from this study shows that the two herbs were relatively non-toxic and safe in the liver and kidney when taken at low doses. Further studies should be conducted on these herbal remedies to further investigate their safety levels especially in chronic condition and in relation to some other organs of the body.

KEYWORDS: *Hunteriaum bellata,* Sacra herbs, Herbal medicine, Biochemical, Hematological.

A028
APHRODISIAC POTENTIALS OF TWO LOCAL CONCOCTIONS ON MALE SEXUAL BEHAVIOUR AND HORMONAL PROFILE IN ALBINO RATS

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ABSTRACT
Aphrodisiacs, substances that increase libido, sexual desire, pleasure, or behavior, have been used throughout history across various cultures. This study investigates the aphrodisiac potentials of two local concoctions, Sample A and Sample B, in male albino rats. Aphrodisiac activity was evaluated by monitoring mounting frequency (MF), mounting latency (ML), intromission frequency (IF), and intromission latency (IL). Serum levels of testosterone (T), follicle-stimulating hormone (FSH), and luteinizing hormone (LH) were also measured. Results showed that both samples significantly improved sexual behavior parameters and positively modulated hormonal profiles. Mounting frequency increased, and mounting latency decreased in treatment groups, with the 200 mg/kg Sample A group exhibiting the most pronounced effect on mounting frequency. Intromission frequency was elevated, and intromission latency decreased in the 400 mg/kg Sample A group. Serum levels of testosterone, follicle stimulating hormone, and luteinizing hormone were significantlyincreased ($p < 0.05$) in the treatment groups. Sample A demonstrated greater efficacy in increasing these hormone levels than Sample B. This studysuggests that both Sample A and Sample B possess aphrodisiac properties, evidenced by improved sexual behavior and favorable hormonal modulation in male albino rats. Further research is warranted to elucidate the specific mechanisms of action and to identify the active components responsible for the observed aphrodisiac effects.

KEYWORDS: Local concoctions, Aphrodisiac activity, Male rats, Sexual behaviour, Hormone modulation.

A 029
EFFECT OF ONION ON THE OSMOTIC FRAGILITY OF RED BLOOD CELLS ON THREE GENOTYPES (AA, AS AND SS)

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ABSTRACT
Onion (*Allium cepa*) also known as the bulb onion is used as a vegetable and is the most widely cultivated species of the genus Allium. *Allium cepa* is highly appreciated for its medicinal values. Erythrocyte fragility refers to the propensity of erythrocytes (red blood cells, RBC) to haemolyse (rupture) under stress. Osmotic fragility (OF) refers to the degree or proportion of haemolysis that occurs when a sample of red blood cells are subjected to osmotic stress by being placed in a hypotonic solution. The osmotic fragility test is common in haematology and is often performed to aid with diagnosis of diseases associated with red blood cells membrane abnormalities. Effect of onion on the osmotic fragility of blood genotypes was assessed *in vitro*. The result obtained from *in vitro* osmotic fragility of test and control groups in this study indicated that *A. cepa* could alter the blood genotypes stability in isotonic solutions with sodium chloride (NaCl) content ranging from 0.2% - 0.1%. The result of statistical analysis obtained in this study showed that the control group i.e. normal saline + blood sample for the three genotypes (AA, AS and SS) indicated no level of haemolysis for HbAA (1.18 ± 1.01), for HbAS (1.27 ± 0.04) and HbSS (1.20 ± 0.11). For the Test group i.e. normal saline + blood sample + onion, the result for HbAA was (1.21 ± 0.12) which indicated that the level of

haemolysis observed was not significant. The level of hemolysis in the HbAS ($1.35 \pm 0.06^{*}$) was significant at $p < 0.05$. For HbSS, (1.35 ± 0.09), the level of haemolysis of the red blood cells was very significant at $p < 0.01$. It is then recommended that ingestion of raw *A. cepa* should be monitored in people with blood diseases.

KEYWORDS: *Allium cepa*, osmotic fragility, haemolysis, genotypes, haemoglobin.

A030

THERAPEUTIC EFFECT OF Cleistopholis patens LEAVES ON EGG ALBUMIN-INDUCED RAT PAW EDEMA

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ABSTRACT

This study was carried out to investigate the anti-inflammatory activity of the ethanol extract of *Cleistopholis patens* (C.P) leaves by evaluating its effect on egg albumin-induced rat paw edema. The phytochemical analysis of *C. patens* leaves indicated that the leaves contained Saponins (0.82 ± 0.02mg/100 g), glycosides (0.10 ± 0.01mg/100 g), alkaloids (0.28 ± 0.02mg/100 g), Flavonoids (1.12 ± 0.12mg/100 g), Tannins (0.59 ± 0.01mg/100 g), phenols (0.65 ± 0.02mg/100 g) and Terpenoids (1.04 ± 0.02mg/100 g) which were found in moderate and appreciable amounts. The ability of the *C.patens* leaves to inhibit rat paw edema was ascertained by its percentage inhibition. The percentage inhibition for the un-treated rats (toxic group) at 1hr, 2hrs, 3hrs, 4hrs, and 24hrs were 3.46%, 3.45%, 3.85%, 3.74% and 4.03% respectively. The percentage edema inhibition for rats treated with 100mg/kg of diclofenac at 1hr, 2hrs, 3hrs, 4hrs, and 24hrs were 2.29%, 1.53%, 1.23%, 0.96% and 0.48% respectively. The percentage edema inhibition for rats treated with 100mg/kg of extract after 1hr, 2hrs, 3hrs, 4hrs and 24hrs were 2.43%, 1.85%, 1.80%, 1.45% and 0.74%, respectively. The percentage edema inhibition for rats treated with 200 mg/kg of extract after 1hr, 2hrs, 3hrs, 4hrs and 24hrs were 2.86%, 2.06%, 1.74%, 1.60%, and 1.20% respectively. The percentage edema inhibition for rats treated with 300mg/kg of extract after 1hr, 2hrs, 3hrs, 4hrs and 24hrs were 2.36%, 1.85%, 1.15%, 0.69% and 0.64% respectively. The percentage edema inhibition of the group treated with 300mg/kg of extract was higher than that of diclofenac at 24 hours period. *C.patens* leaves showed higher anti-inflammatory activity than the standard drug diclofenac. The findings from this study show that *C.patens* leaves are potent in curtailing inflammatory response.

KEYWORDS: *Cleistopholis patens,* Egg Albumin, Anti-inflammatory, Diclofenac and Phytochemical analysis

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A 031

THE EFFECTS TESTOSTERONE PROPIONATE ON PROSTATE-SPECIFIC ANTIGEN LEVELS IN MALE WISTAR RATS

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ABSTRACT

Prostate-specific antigen (PSA) levels serve as a critical biomarker for assessing prostate health, with elevated levels often associated with androgen activity. This study investigates how testosterone propionate administration affects PSA levels in male Wistar rats. Six rats were divided into two groups: a negative

control group receiving only feed and water, and a positive group induced with 6 mg of testosterone propionate dissolved in olive oil. The PSA level in the control group averaged 2.79±1.19 ng/mL, while the testosterone-induced group showed a significant elevation, averaging 12.95±5.64 ng/mL. This fourfold increase suggests that testosterone propionate substantially stimulates PSA production, likely by upregulating androgen receptors within the prostate. The high standard deviation in the induced group also indicates individual variability in response to testosterone exposure. These findings underline the potent impact of exogenous testosterone on PSA levels and reinforce the androgen-PSA link in prostate function. The study demonstrates testosterone's role in modulating prostate biomarkers and emphasizes the importance of PSA monitoring in testosterone therapy to mitigate potential risks to prostate health. These results provide a model for further research on androgen-induced prostate changes, guiding clinical practice in balancing therapeutic benefits with prostate health considerations.

KEYWORDS: Prostate-Specific Antigen, Testosterone Propionate, Androgen, Receptor, Olive Oil.

A032

PHYTOCHEMICAL, ANTIBACTERIAL STUDIES AND CHARACTERIZATION OF ISOLATED COMPOUND FROM *A. macrostachya* LEAVES

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ABSTRACT

Medicinal plants have been used to treat numerous illnesses since ancient time. About 80% of the population of depends on such plant for the treatment of many diseases. One kilogram (1kg) of the powdered leave of *A. macrostachya* was successively extracted with 5 liters of methanol. The solvents were evaporated at 45°C with the aid of rotary evaporator.The extract yield was found to be 131.72g (13.17%). The phytochemical screening reveals the presence of alkaloids, glycoside, steroids, tannins, flavonoids, polyphenol, coumarinsand carbohydrate as well as saponins. The antibacterial study shows the inhibitory effect against *Salmonella typhi*, *Shigella dysentarea*, *Escherichia coli* and *Pseudomonas aeruginosa*. The extract shows minimum bactericidal concentration (MBC) at 0.2µg/ml for *S. dysentarea, E.coli, P. aeruginosa with the exception of S. typhi.* The extract was subjected to column chromatography which leads to the isolation of compound. The compound was characterized using nuclear magnetic resonance spectroscopic techniques. *A. macrostachya* leaves have antimicrobial activity hence it is good to be used as medicinal plant for the benefit of mankind.

KEYWORDS: Phytochemical, Antibacterial, *Acacia macrostachya*, Characterization.

A033

IN VITRO AND *IN VIVO* ANTIOXIDANT EFFICACY OF *Cleome gynandra* METHANOL LEAF EXTRACT AGAINST ACETAMINOPHEN-INDUCED OXIDATIVE STRESS IN RATS

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ABSTRACT

Acetaminophen-induced liver damage is driven by oxidative stress, necessitating natural antioxidants for hepatoprotection. This study evaluated the *in vitro* and *in vivo* antioxidant efficacy of *Cleome gynandra* methanol leaf extract (MCE) and its fractions against acetaminophen-induced oxidative stress in Wistar rats. *In vitro* antioxidant activity was assessed using DPPH and FRAP assays, with the n-butanol fraction (NBF) showing the highest radical scavenging ability (IC_{50}: 289.30 ± 5.20 µg/ml and 228.08 ± 3.70 µg/ml, respectively). Forty male Wistar rats (120±10g) were divided into 8 groups and pretreated orally for 8 days with MCE, ethyl acetate fraction (EAF) or NBF before acetaminophen (1.0g/kgbody weight) administration. Acetaminophen significantly ($p< 0.05$) increased serum and hepatic malondialdehyde (MDA) levels while reducing glutathione (GSH), catalase (CAT) and superoxide dismutase (SOD) activities. Pretreatment with EAF 300mg/kgbody weight and NBF 300mg/kgbody weight significantly reduced serum MDA (0.40 ± 0.014 and 0.36 ± 0.024 µM/mg protein) and increased SOD (33.98 ± 3.05 and 35.42 ± 2.57 U/mg protein) compared to the acetaminophen group (MDA: 0.94 ± 0.032, SOD: 14.44 ± 0.84). In the liver, MCE 300mg/kgbody weight, EAF 300mg/kgbody weight, and NBF 300mg/kg body weight significantly($p< 0.05$) lowered MDA (6.09 ± 1.35 to 8.58 ± 1.21 µM/mg protein) and enhanced GSH, CAT, and SOD levels. These results demonstrate the potent antioxidant and hepatoprotective properties of *C. gynandra*, suggesting its potential as a natural therapeutic agent against oxidative liver damage induced by acetaminophen.

KEYWORDS: Acetaminophen-induced liver damage, Antioxidants, *Cleome gynandra* ,Hepatic enzymes.

A034

ANTI-ANAEMIC POTENTIALS OF SOLVENT FRACTIONS OF *Theobroma cacao* STEM BARK ON HAEMATOLOGICAL AND OTHER PARAMETERS IN IRON DEFICIENT RATS

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ABSTRACT

The effect of administration of Ethanolic, Ethyl acetate and N-hexane extracts of *Theobroma cacao* stem bark on some haematological parameters, serum ferritin and gastric pH of iron deficient rats were investigated. Forty (40) albino rats (*Rattus novergicus)* with an average weight of 50.0g were used. Ten (10) of the rats were placed on iron sufficient feed, twenty-five (25) were fed iron deficient feed/diet while the remaining five (5) were given commercial (standard) feed. The body weight, PCV, RBC and haemoglobin (Hb) of the iron deficient feed fed rats reduced significantly after eight (8) weeks of induction which indicates the presence of iron deficiency. The iron deficient group was further divided into four (4) groups. Three (3) of the groups were administered with ethanolic-ethyl acetate-n-hexane fractions of *T. cacao* extracts while the fourth (4th) group was maintained on iron deficient feed. PCV, RBC and haemoglobin (Hb) levels of iron sufficient and extract groups after two weeks of extract administration significantly increased compared with iron deficient group which showed further reduction. Groups placed on ethyl acetate fraction of the extract showed the highest PCV value. The serum ferritin of groups placed on extract increased significantly with ethanolic extract group having the highest value. Serum ferritin of iron deficient rats reduced significantly. With the exception of N-hexane extract group, other extract fractions and iron deficient groups showed a significantly increased gastric pH of the stomach. Iron deficient group have reduced gastric pH. Ethanolic extract group, ethyl acetate extract and commercial feed group are not significantly different in their gastric pH levels. Phytochemical screening of the extract revealed that the three solvent fractions contains saponins and glycosides, ethanolic and ethyl acetate fractions contains tannins and phlobatannins, only ethanolic fraction contains terpenoids and only n-hexane fraction contains flavonoids. Histopathological studies show mild and moderate degeneration of the liver tissues and pit gastric erosion of the stomach tissue as a result of extract. The results revealed that the administration of ethanolic, ethyl acetate and n-hexane extracts of *T. cacao* reversed the induced anaemic condition by increasing PCV, RBC and haemoglobin (Hb), increasing serum ferritin and gastric pH of the stomach respectively.

KEYWORDS: Iron Deficiency, Anaemia, *Theobroma cacao,* Serum Ferritin, Haemoglobin.

A 035

APHRODISIAC EFFECT OF *Terminalia catappa* LEAF EXTRACTS INΔ^9 TETRAHYDROCANNABINOL INDUCED ERECTILE DYSFUNCTION IN MALE WISTAR RATS

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ABSTRACT

Erectile dysfunction (ED) is a prevalent condition characterized by the inability to achieve or sustain an erection sufficient for sexual performance. The aim of this work is to access the Aphrodisiac effect of *Terminalia catappa* leaf extracts in Δ^9 tetrahydrocannabinol (THC) induced erectile dysfunction in male Wistar rats**.** In this present work, erectile dysfunction was induced by administering 30mg/kgbwt of THC for 3 days. Treatment given was as follows: A-Normal Control, B- Std control (THC+Viagra), C-Negative control (THC only), D- THC+ 200mg/Kg bwt ethanol leaf extract of *T. catappa* (200mg/Kgbwt), E- THC + 400mg/Kg bwt ethanol leaf extract of *T. catappa* for a succession of 14 days. Sexual behaviour parameters were monitored in the male rats on day 1,7 and 14 respectively after administration by pairing with a receptive female (1:1) thereafter, rats were sacrificed and serum was collected for some biochemical parameters using standard method. Cage side observation on the animals revealed prospective behaviours by the receptive female rats and precopulatory behaviours by the ethanol extract *T. catappa* treated male rats.The extract at 200 and 400 mg/kg body weight significantly ($p<0.05$) increased the frequencies of mount and intromission.In addition, the ejaculation latency was significantly ($p< 0.05$) prolonged.The latencies of mount and intromission were reduced significantly ($p<0.05$) whereas ejaculation frequency increased. The extract also reduced the post- ejaculatory interval of the Wistar rats. Computed percentages of index of libido, mounted, intromitted, ejaculated and copulatory efficiency were significantly ($p<0.05$) higher in the extract-treated animals in a dosage dependent manner than the control whereas the inter copulatory interval decreased significantly. The extract also significantly ($p<0.05$) increased the serum testosterone, FSH and LH concentration but significantly ($p<0.05$) reduced serum oestrogen, prolactin and progesterone of the treated groups when compared with the control. The extract also significantly ($p<0.05$) increased the sperm motility, total sperm count, and sperm viability but produced a significant ($p<0.05$) decrease in serum immobility when compared with the THC control. It can be logical inferred from this present work that extract of *T. catappa* may elicit spermatogenic, androgenic and libido enhancing activities in THC induced erectile dysfunction in a dosage dependent manner.

KEYWORDS: Androgenic, androgen binding protein, *Terminalia catappa,* , spermatogenesis, THC

A 036

IN SILICO ANTI-INFLAMMATARY ACTIVITIES OF SELECTED *ABELMOSCHUS ESCULENTUS* POLYPHENOLIC

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ABSTRACT

Inflammation plays a role in several pathological conditions; diabetes mellitus and benign prostatic hyperplasia inclusive. In this study, we aim to evaluate the anti-inflammatory activities of selected

polyphenolic compounds identified through HPLC of methanol extracts of *Abelmoschus esculentus* plant, having known that inhibition of Cyclooxygenases are the principal mediators for biosynthesis of prostaglandins, inflammatory markers and thus are targets in Anti-inflammatory therapy. Nuclear factor kappa B (NF-κB) transcription factors regulate many vital physiological processes like inflammation, immune responses, cellular growth, apoptosis, and the expression of certain viral growth factor amongst others. Thus, targeting induction of NF-κB seems a viable option in the treatment of cancer and inflammatory diseases In this study, (NF-κB) and (COX-2) receptors are targets for ligands; Caffeic acid, Vanillic acid and Ferulic acid. PyRx was used for the docking using AutodockVina embedded in MGL Tools 1.5.6, while the best docking pose was visualized using Discovery Studio (Biova) software. Druglikeness test was performed using ADME tools while ProTox II was used to predict toxicity and LD_{50} of the ligands. The results for the molecular docking study of COX-II showed promising results when compared to the standard drugs, Vioxx and Ibuprofen.

KEYWORDS: *In silico*, molecular docking, Drug-likeness, inflammation, Polyphenolic.

A037

QUANTITATIVE PHYTOCHEMICAL SCREENING AND TOXICITY STUDIES OF *AQUEOUS* LEAF EXTRACT OF *Desmodium velitnum* IN WISTAR RATS

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ABSTRACT

Desmodium velitinum is a medicinal plant rich in phytochemicals that exhibit biological activities such as antioxidant antimicrobial anti-inflammatory and anticancer properties. This study investigated the quantitative composition of phytochemicals of aqueous leaf extract and toxicity studies of *D. velitinum* in wistar rats. The extract was orally administered to determine the acute toxicity followed by evaluation of its effects on some biochemical makers eg. AST, ALP, ALT. No significant difference in ALP and ALB. But there is slight alterations in AST and ALT when compared to the control all values but remained within normal limits at the end of the study, which indicate no hepatotoxic effect on the liver rather the decrease in ALP, and AST shows the hepatoprotective effects of aqueous leaf extract of *D. velitnum*. The present finding shows that the leaf extract is not likely to produce any toxicological effects suggesting safety for medicinal use.

KEYWORDS: *Desmodium velitinum,* Phytochemicals, hepatoprotective, Toxicity, Antioxidants.

A 038A

PHYTOCHEMICAL COMPOSITION AND ANTI-INFLAMMATORY PROPERTY OF ACETONE EXTRACT OF *Mangifera indica* STEM BARK IN WISTAR RATS

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ABSTRACT

This study investigates the phytochemical composition and anti-inflammatory properties of acetone extracts from *Mangifera indica* stem bark using Wistar rats. The primary aim was to identify and characterize the phytochemicals present in the stem bark extracts and evaluate their efficacy in reducing inflammation. The research involved isolating phytochemical constituents from the acetone extract of *Mangifera indica* stem bark, using various analytical reagents and solvents. Phytochemical screening revealed the presence of flavonoids, alkaloids, tannins, steroids, saponins, and terpenoids, with saponins being the most abundant. However, phenolic compounds were absent in this extract. Anti-inflammatory activity was assessed through liver function tests in Wistar rats, which were categorized into six experimental groups receiving different treatments. Results showed that the acetone extract significantly reduced levels of liver enzymes (ALT, AST, ALP) in the treated groups compared to controls, indicating a reduction in liver inflammation. Notably,

higher doses of the extract resulted in greater reductions in inflammation, although lower total protein and albumin levels in treated groups suggested possible impacts on liver protein metabolism. The findings suggest that the acetone extract of *M. indica* stem bark possesses notable anti-inflammatory properties, which may be attributed to its phytochemical composition. These results have potential implications for developing new anti-inflammatory agents from natural sources, warranting further investigation into the extract's safety, optimal dosage, and mechanisms of action.

KEYWORDS: *Mangifera indica*, Toxicity, Anti-inflammatory, Phytochemical screening, Liver Enymes

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A038 B

PHYTOCHEMICAL COMPOSITION AND ANTI-INFLAMMATORY PROPERTY OF ACETONE EXTRACT OF *Mangifera indica* STEM BARK IN WISTAR RATS

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ABSTRACT

This study investigates the phytochemical composition and anti-inflammatory properties of acetone extracts from *Mangifera indica* stem bark using Wistar rats. The primary aim was to identify and characterize the phytochemicals present in the stem bark extracts and evaluate their efficacy in reducing inflammation. The research involved isolating phytochemical constituents from the acetone extract of *Mangifera indica* stem bark, using various analytical reagents and solvents. Phytochemical screening revealed the presence of flavonoids, alkaloids, tannins, steroids, saponins, and terpenoids, with saponins being the most abundant. However, phenolic compounds were absent in this extract. Anti-inflammatory activity was assessed through liver function tests in Wistar rats, which were categorized into six experimental groups receiving different treatments. Results showed that the acetone extract significantly reduced levels of liver enzymes (ALT, AST, ALP) in the treated groups compared to controls, indicating a reduction in liver inflammation. Notably, higher doses of the extract resulted in greater reductions in inflammation, although lower total protein and albumin levels in treated groups suggested possible impacts on liver protein metabolism. The findings suggest that the acetone extract of *Mangifera indica* stem bark possesses notable anti-inflammatory properties, which may be attributed to its phytochemical composition. These results have potential implications for developing new anti-inflammatory agents from natural sources, warranting further investigation into the extract's safety, optimal dosage, and mechanisms of action.

KEYWORDS: *Mangifera indica,* Toxicity, Anti-inflammatory, Phytochemical screening, Liver Enzymes.

A039

SUB-ACUTE TOXICITY OF *Annona muricata* LEAF ETHANOL EXTRACT ON WISTAR RATS

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ABSTRACT

This present study focused on*invivo* toxicological effects of ethanol leaf extracts of *Annona muricata* on selected biochemical parameters in wistar rats. Twenty five wistar rats were divided into four experimental groups (groups 2, 3, 4 and 5) of 5 rats eachadministered 200, 400, 600 and 1800mg/kg day^{-1} of the leaf extract respectively. Group 1 served as the normal control and received normal rat pellets and water. The administration of the extracts was done for 28 days. Acute toxicity of the extract was determined by Lorke's toxicity testing method. The effects of the extracts on hematological, biochemical and the antioxidant potentials of the extracts were monitored using standard methods.The histopathological changes of the rat's organs and tissues were monitored using standard histopatological procedures. Acute toxicity studies showed that LD_{50} was >5000mg/kg. There was no significant weight gain ($p>0.05$) in the experimental groups when compared with the normal control.The extracts significantly elevated most heamatological and some kidney biochemical indices in a dose dependent manner across the groups and inversely elevated the liver biochemical indices with increase in dose. Superoxide dismutase (SOD) were significantly enhanced in a dose dependent manner while reducing the level of malondialdehyde (MDA). The Histological assessment of the liver, kidney and pancreas revealed liver, kidney and pancreatic toxicities especially at high doses. The leaf extracts is potentially harmful to vital organs and tissues with adverse effect and non reversible forms of toxicity, especially with repeated usage, necessitating the need to avoid indiscriminate use.

KEYWORDS: *Annona muricata*, Sub-acute toxicity, Histological assessment, Antioxidant enzymes, Ethanol extract.

A040

IN-VITRO AND IN-VIVO ANTIOXIDANT POTENTIALS OF METHANOL EXTRACT AND *n*-HEXANE FRACTION OF *FAIDHERBIA ALBIDA* LEAF IN ALBINO RATS

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ABSTRACT

Accumulation of the free radicals in the body can cause oxidative damage leading to many chronic diseases. Several medicinal plants possess strong antioxidant activity which may help to protect cell against oxidative damage. This study aimed to conduct phytochemical screening, *in-vitro* and *in-vivo* antioxidant potentials of methanol extract and *n*-hexane fraction of *Faidherbia albida* leaf in albino rats. Although the phytochemical screening revealed the absence of anthraquinone in both the extract and fraction, compounds such as alkaloids, glycosides, phenols, flavonoids and tannins were present in both. However, flavonoids, saponin and tannins were absent in the fraction while present in the methanol extract. The result of the *in-vitro* analysis demonstrated a dose dependent increase in ferric reducing antioxidant power (FRAP) of vitamin E while the *Faidherbia albida* leaf of*n*-hexane fraction revealed similar reducing powers at all concentration of 5, 10 and 15mg/ml. The result of *in-vivo* antioxidant potential revealed a significant decrease in biomarker enzymes in positive control and all extract treated groups compared to negative control. The result also revealed a significant increase in the activity of catalase, and superoxide dismutase in positive control and all extract and fraction treated groups compared to negative control group. A significant increase in the concentration of vitamins A, C, and E in positive control and all extract and fraction treated groups was observed compared to negative control group. Based on these findings, the methanol extract and *n*-hexane fraction of *Faidherbia albida* leaf exhibited a potent antioxidant potential. Hence, this study supports the medicinal application of *Faidherbia albida* plant in folklore.

KEYWORDS: Antioxidants, *Faidherbia albida*, Oxidative stress, Albino Rats.

A041

IN VITRO AND IN VIVO ANTIDIABETIC ACTIVITY OF AQUEOUS LEAF EXTRACT OF *Calotropis procera*IN ALLOXAN-INDUCED DIABETIC WISTAR RATS

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ABSTRACT
Diabetes mellitus, is a group of metabolic disease that are characterized by high blood glucose levels. *Calotropis procera* is a plant used traditionally to treat diabetes. This study investigated the antidiabetic potential of the aqueous leaf extract of the plant. Qualitative phytochemical screening of *Calostropis procera* leaves extract was done using standard procedures. The inhibitory potential of the extract against α – amylase was evaluated. The antihyperglycemic, nephroprotective and hepatoprotective of the extract was also evaluated using standard procedures. Thirty albino rats were grouped into six groups (Group I – VI). Group I serve as the positive control. Diabetes was induced to all rats except the positive control using 150 mg/kg b. wt. alloxan. Three days after the induction of diabetes with alloxan, their blood glucose were checked to confirm diabetes. Groups II were treated with glibenclamide while groups III – VI were treated with 100 mg/kg, 200 mg/kg and 400 mg/kg b.wt *Calotropis procera* for 21 days. Phytochemical screening revealed the presence of saponins, flavonoids, tannins, alkaloids, phenol and glycosides. The alpha amylase inhibition assay showed that the extract exhibited a dose dependent inhibition. Groups treated with *Calostropis procera* leaves extract produced a significant reduction in the level of blood glucose, ALT, AST and ALP (120 ± 0.05 mg/dl, 38.67 ± 3.06, 48.67 ± 3.21, 61.33 ± 1.53 and 42.27 ± 0.49 respectively) when compared to negative control (380 ± 0.05mg/dl, 52.33 ± 1.59; 77.00 ± 4.00; 71.33 ± 2.52 respectively)and Albumin significantly increased (24.10 ± 1.35) when compared to negative control(42.27 ± 0.79). urea and creatinine for the treatment groups (17.63 ± 1.85, 0.63 ± 0.06 respectively) significantly decreased when compared to the negative control (22.87 ± 0.71, 1.40 ± 0.20 respectively) This study showed that *Calostropis procera* leaves extract has hypoglycemic activity and can be used to manage diabetic related complications such as kidney and liver damage.

KEYWORDS: *Calotropis procera,* Diabetes, Hyperglycemia, Hepatoprotective and Alpha-amylase.

A 042

ANTIOXIDANT PROPERTIES OF *Carica papaya* SEED OIL ON ACETAMINOPHEN-INDUCED HEPATOTOXICITY IN WISTAR RATS.

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ABSTRACT
Acetaminophen (paracetamol) is a safe and effective drug at recommended doses. However, it has potential for causing hepatotoxicity and acute liver failure with misuse, overdose, and long-term usage. *Carica papaya*

seed oil (CPSO) has anti-atherogenic effects and antioxidant potential. This study investigated the antioxidant potential of CPSO on acetaminophen-induced hepatotoxicity in Wistar rats. Thirty male rats were used and grouped into six (n=5). Group 1 (Normal) and 2 (negative control) received only distilled water, group 3 (positive control) - 500 mg/kg of CPSO, and group 4-6 (pretreated group)- 250 mg/kg, 500mg/kg and 1000 mg/kg of CPSO respectively for two weeks. After day 14, groups 2-6 were induced with 600 mg/kg paracetamol intraperitoneally. Rat livers were excised for Malonaldehyde (MDA), Superoxide dismutase (SOD), Catalase (CAT), and Glutathione (GSH) activities. Data was presented as mean ± standard error of mean, and Analysis of Variance (ANOVA) ($p<0.05$) was determined using Graph pad Prism. Pretreated groups (4-6) has a decreased level of MDA (0.9 ± 0.3, 1.1 ± 0.2 and 0.8 ±0.3 respectively) compared to negative control (3.1 ± 0.5) while Group 6 showed the highest SOD, CAT, and GSH activities (52.1 ± 5.6, 7.6 ± 1.3 and 8.6 ± 0.3) respectively compared with negative control (41.8 ± 5.9, 4.9 ± 0.7 and 8.0 ± 0.2 respectively) and normal group (62.9 ±12.3, 6.2 ± 1.4, and 8.7 ± 0.2 respectively). *Carica papaya* seed oil, especially at a dose of 1000 mg/kgb.wt. may have protective benefits against liver damage caused by acetaminophen toxicity.

KEYWORDS: Antioxidant, Paracetamol, Acetaminophen, Toxicity, Carica papaya

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A 043

In Silico EVALUATION OF HEPATOPROTECTIVE EFFECT OF MORINGA SEED OIL ON ACETAMINOPHEN-INDUCED HEPATOTOXICITY IN RATS

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ABSTRACT

Acetaminophen (APAP) overdose is the primary cause of acute liver failure, mainly because it results in the formation of the toxic metabolite N-acetyl-p-benzoquinone imine (NAPQI). At therapeutic levels, APAP is broken down through glucuronidation and sulfation processes. However, in overdose situations, there is excessive NAPQI that depletes glutathione (GSH). This results in oxidative stress-induced pro-inflammatory cytokine (TNF-α) and caspase-1 release that causes hepatocyte death. N-acetylcysteine (NAC) is the usual antidote, but it has a narrow therapeutic window, which makes other treatments necessary. *Moringa oleifera* seed oil, rich in bioactive compounds like flavonoids and unsaturated fatty acids, has demonstrated antioxidant and liver-protective properties. This research applied *in silico* methods to examine the potential of Moringa-derived compounds (MS) to protect the liver against APAP-induced liver damage, targeting TNF-α and caspase-1. MS with biological activity were isolated and characterized via gas chromatography-mass spectrometry. Their 3D structures were retrieved, prepared, and tested for their ability to bind target proteins using computer simulations (AutoDock Vina and PyRx) followed by drugclike predictions. Results showed that MS4's pharmacokinetic properties conformed to Lipinski's Rule of 5 and was a substrate for P-glycoprotein (Pgp). MS3 displayed the highest level of bioavailability; in contrast, MS1 showed low gastrointestinal absorption but was toxic to the kidneys. The molecular docking results showed that Moringa compounds had a greater ability to bind than APAP, with L(+) ascorbic acid-2,6-dihexadecenoate exhibiting the strongest binding affinity for TNF-α (-5.7 kcal/mol). Protein-ligand interaction analysis showed stable interactions resulting from hydrogen bonding and hydrophobic interactions. These results indicate that Moringa seed oil has potential as a natural treatment for liver damage caused by APAP overdose. We propose that additional *in vivo* and clinical studies are required to confirm its effectiveness and guarantee its safety as steps towards drug discovery.

KEYWORDS: Toxicants, Acetaminophen, *Moringa oleifera* seed oil, *In-silico* studies, ADMET profile, Potential inhibitors

A 044

PROTECTIVE EFFECT OF *P*-COUMARIC ACID IN FRUCTOSE-FED STREPTOZOTOCIN-INDUCED DIABETIC RATS VIA MODULATION OF OXIDATIVE STRESS AND INFLAMMATION

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ABSTRACT

p-Coumaric acid found in various edible plants and fungi exhibit pharmacological properties which include antimicrobial, antioxidant, anti-inflammatory, and antidiabetic effect. This study evaluated protective potential of *p*-coumaric acid in fructose-fed streptozotocin-induced diabetic rats via modulation of oxidative stress and inflammation. The *in vitro* antioxidant and antidiabetic capacity of *p*-coumaric acid was determined at various concentration using standard procedures. Thirty-five rats were divided randomly into seven groups. Following diabetes induction and two weeks treatment with *p*-coumaric acid, the animals were euthanized and serum and liver samples were collected. The glycaemic indices, liver enzymes activity, and inflammatory markers concentration were measured in the serum. The activity of antioxidant enzymes (SOD, CAT and GPx) and their gene expression was measured in the liver. Histology of the liver was also carried out.The results revealed that *p*-coumaric acid at 25 mg/kg and 50 mg/kg significantly ($p<0.05$) improved the glycaemic indices and serum concentration of anti-inflammatory cytokine (interleukin-10). Administration of *p*-coumaric acid alleviated hepatocellular damage by reducing the serum concentration of liver enzyme markers, pro-inflammatory cytokines and hepatic oxidative stress markers. *p*-Coumaric acid also improved the activity and upregulated the expression of hepatic antioxidant enzymes (SOD, CAT and GPx) genes, showing it potency in the management of oxidative stress and inflammation..The results of this study demonstrated the protective potential of *p*-coumaric acid in the management of diabetes and its complications.The potential therapeutic benefits of *p*-coumaric acid demonstrated by this study require a long-term safety evaluation since experimental animals received *p*-coumaric acid treatment for only two weeks.

KEYWORDS: Type-2-diabetes, Liver, Glycaemic indices, Antioxidant genes, Cytokines.

A 045

GENOMIC CHARACTERIZATION OF EXTENSIVELY DRUG RESISTANT *Mycobacterium tuberculosis* ISOLATE

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ABSTRACT

Tuberculosis, attributable to *Mycobacterium tuberculosis*, constitutes a predominant infectious etiology of mortality on a global scale, notably within Nigeria. The emergence of extensively drug-resistant (XDR) tuberculosis poses a significant challenge to the control of this disease, underscoring the necessity for the

identification of the underlying genetic mutations to facilitate informed treatment decisions and mitigate transmission. A total of 199 rifampicin-resistant isolates, collected during the month of July at Zankli Tuberculosis Reference Laboratory, were cultured on Lowenstein-Jensen (LJ) media, with BACTEC-MGIT 960 system employed for both culturing and phenotypic drug susceptibility testing. The XDR isolate identified underwent long-read sequencing utilizing Oxford Nanopore technology, achieving 50x coverage. Resistance genes were discerned through the Comprehensive Antibiotic Resistance Database (CARD) resistance gene identifier, while protein structures were modeled employing Iterative-Threading Assembly Refinement (I-TASSER).The findings indicated the presence of mutations in katG (R463L), rpoB (D516G, H526T), gyrA (D94N), and embC (R738Q). The Virulence Factor Database was utilized to ascertain the virulence factors like *Mgt*C, *ctp*V, *sap*M, *nuo*G, associated with the XMTB2 binned genome, while the phylogenetic analysis revealed a close phylogenetic connection between the XMTB2 genome and the well-known Beijing lineage (L2). XMTB2 genome is an extensively drug resistant strain of Mycobacterium tuberculosis which is extremely virulent.

KEYWORDS: *Mycobacterium tuberculosis*, extensively drug resistant tuberculosis (XDR-TB), Mutation, Virulence factors, Phylogenetic analysis

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A 046

EFFECT OF VITAMIN C ON ALUMINIUM PHOSPHIDE INDUCED TOXICITY IN WISTAR RATS

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ABSTRACT

This study was designed to investigate the possible toxic effect of Aluminium phosphide (AlP) and the protective role of Vitamin Con liver, kidney and haematology biomarkers using Wistar rats. Thirty male Wistar rats were divided randomly into six groups of five animals each. Group1 served as control and was administered distilled water. Groups 2, 5 and 6 were challenged with AlP laced diet (1.2 mg/kg, 1.2 ppm) for 28 days. Groups 3 and 5 received vitamin C (50 mg/kg) while groups 4 and 6 received Vitamin C (100 mg/kg) also throughout the duration of the experiment. At the end of the 28 days duration of the study, all the animals were sacrificed and blood samples were collected. Serum biomarkers and haematology markers were assayed. Results were analyzed using student t-test and ANOVA. Oral administration of AlP brought about a significant ($P<0.05$) increases in Alanine aminotransferase, Aspartate aminotransferase, Total bilirubin, Direct bilirubin, Creatinine, Urea, Sodium, Potassium and Chloride, with subsequent reduction in Albumin and Total protein concentrations. White blood cells, Lymphocyte, Monocytes, Neutrophils, Red blood cells, Hemoglobin, Hematocrit, Platelet, Red cell distribution width-standard deviation, Red cell distribution width-coefficient of variation, Platelet distribution width, Mean platelet volume, Platelet-large cell ratio, Mean corpuscular volume, Mean corpuscular hemoglobin and Mean corpuscular hemoglobin concentrations were either significantly ($p<0.05$) depleted or elevated. However, administration of vitamin C was able to ameliorate the various alterations induced by AlP.

KEYWORDS: Aluminium phosphide, Vitamin C, liver injury, kidney injury, blood poisoning.

A047

Citrus sinensis EXTRACTS AMELIORATED HEPATOCELLULAR DAMAGE IN FRUCTOSE-FED STREPTOZOTOCIN-INDUCED TYPE 2 DIABETES IN MALE WISTAR RATS

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ABSTRACT

Citrus sinensis possess secondary metabolites with several pharmacological activities. This study evaluated the hepatoprotective potential of polyphenol-rich extracts from *C. sinensis* in streptozotocin-induced diabetic rats.The extraction of crude, free, and bound phenol extract were done using standard procedures. The streptozotocin (STZ)-induced diabetic rats were pre-fed with 20% (w/v) fructose water for one week and injected with 40 mg/kg STZ intraperitoneally. Fifty-four wistar rats were divided into nine groups with six rats per group: control, diabetic control (STZ), diabetic rats treated with 100 mg/kg *C. sinensis* crude extract (STZ + CSC), 100 mg/kg *C. sinensis* free phenol extract (STZ + CSFP), 100 mg/kg *C. sinensis* bound phenol extract (STZ + CSBP), and corresponding groups of normal rats treated with each extract (CSC, CSFP, and CSBP alone). The positive control group received 200 mg/kg metformin (STZ + MET). After two weeks of treatment, the animals were euthanized, blood and liver tissue were collected for biochemical analysis. The effect on glycemic indices, liver biomarkers, and inflammatory markers were evaluated. The HPLC characterization revealed the presence of several secondary metabolites in *C. sinensis* extracts with kaempferol, being the most abundant. All the extracts showed significant antioxidant potentials and antidiabetic activity. Induction of STZ raised the blood glucose level, liver markers, and other key indicators of diabetes. Administration of the extracts significantly improved glycemic indices, reduced liver damage, and downregulated pro-inflammation (TNF-α, NF-kB) gene expression, while upregulating anti-inflammation (IL-10) gene expression. Histological analysis confirmed the protective effects of *C. sinensis* on the liver. The extracts hold promise as a potential therapeutic agent for managing diabetes.

KEYWORDS: Medicinal plant; polyphenolic compound; oxidative stress; glycemic indices; inflammatory genes,

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A048

ANTIOBESITY ACTIVITY OF BIOACTIVE AQUEOUS FRACTION OF *Vigna subterranean* IN PRECLINICAL MODELS

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ABSTRACT

Obesity remains one of the world's major growing metabolic disorder raising public health concerns, necessitating the search for safe and effective natural therapeutics. This study investigated the anti-obesity properties of aqueous fraction of *Vigna subterranean (VS)*. Ethanolic extract of *VS* was fractionated using n-hexane, ethyl acetate, chloroform, and water. The aqueous fraction was analyzed via GC-MS analysis.*In vivo* evaluation of VS employed by dividing thirty-five male Wistar rats into: (1) normal control (NPD), (2) HFD control, (3) HFD + orlistat (100 mg/kg), (4) HFD + aqueous fraction (200 mg/kg), and (5) HFD + aqueous fraction (400 mg/kg). After 12 weeks of obesity induction in groups 2-5, treatments commenced for 4 weeks and body weight was measured weekly. Biochemical and histopathology examinations were performed on

serum and tissues respectively. GC-MS identified Ethyl .alpha.-d-glucopyranoside (12.60%), 1,3-Propanediol, 2-(hydroxymethyl)-2-nitro-(11.22%), 9,12-Octadecadienoic acid (Z,Z)- (11.15%), Dihydroxyacetone (6.28%), Maltol (6.06%), Methyl 4,8-dimethylnonanoate (5.88%), and Diglycerol (5.77%), were predominant flavonoid and phenolic acid derivatives. There was dose dependent significant decrease ($p<0.05$)in body weight (136.33 ± 2.19,156.00 ±1.15 g), liver weight (5.83 ± 0.36, 5.77± 0.59 g), kidney weight (1.57 ± 0.04, 1.40 ± 0.10 g) and fat weights (2.33 ± 0.12, 1.50 ± 0.20 g), LDL(0.42 ± 0.15,0.24 ± 0.02), VLDL (0.49 ± 0.00,0.40 ± 0.01), triglycerides (0.97 ± 0.00,0.81 ± 0.04), total cholesterol (1.16 ± 0.02, 1.08 ± 0.01) mmol/l and MDA in treatment in 200 and 400 mg/kg aqueous fraction of *VS* respectively, but significant increase in HDL (0.55 ± 0.16, 1.68 ± 0.02) mmol/, SOD, CAT and GSH. The liver revealed the absence of fat deposits with no renal toxicity when compared to HFD control group. The aqueous fraction of *VS* exhibits anti-obesity activity by reducing body weight, fat mass, triglycerides, and total cholesterol in obese rats. These findings provide insight into developing natural anti-obesity therapeutics and warrant further clinical investigation.

KEYWORDS: *Vigna subterranea*, Anti-obesity, Antioxidant, Flavonoid, high-fat diets

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A049

EVALUATION OF THE ANTIBACTERIAL, ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF *Waltara indica* ROOT EXTRACTS IN FORMALIN-INDUCED INFLAMMATION IN RATS

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ABSTRACT

The work investigated the antibacterial, antioxidant and anti-inflammatory activities of *W. indica*root extracts in formalin-induced inflammation in rats using different solvent extracts in order of increasing polarity (n-hexane, chloroform, ethyl acetate and methanol). The antibacterial activitywas determined using micro well diffusion method against three selected pathogenic bacteria, *Escherichia coli, Staphylococcus aureus,* and *Salmonella typhi*. The antioxidant activity was determined by 2-2 diphenylpicrylhydrazyl (DPPH) and Ferric Reducing Antioxidant power (FRAP) assays while the anti-inflammatory activity was determined by erythrocyte sedimentation rate (ESR). The resultsof the antibacterial studyrevealed significant activity in n-hexane extract against *E. coli* and *S.typhi* at 100mg/Ml while *S. aureus* at 50 mg/mL, the MIC was observed at 100mg/mLfor all the organisms and the zone of inhibition for*E.coli*was 11.26 ± 0.28 mg/mL, *S aureus*was 13.30 ± 0.5 mg/mL and *S. typhi*was 16.23 ± 0.58 mg/mL respectively. The Antioxidant activity results showed that the n-hexane extract has the highest activity in both assays with an $1C_{50}$ values of 61.27 % in DPPH and 54.62 % in FRAP, respectively. The anti-inflammatory activity result showed that the n-hexane extract reduced the ESR value to 4.97 ± 0.58 mg/mL at 400mg/mL which is even lowerat $p<0.05$ when compared to the control group level. This study revealed that *W. indica*root extract possesses significant (at $p<0.05$)antibacterial, antioxidant and anti-inflammatory activitieswhich might be attributed to the phenolic esters and amino acids as revealed by the GC-MS analysis, and can be effective in management and treatment of inflammatory infarctions.

KEYWORDS: Anti-inflammation, Erythrocyte Sedimentation Rate (ESR), Antibacterial, pathogenic, *W. indica.*

A 050

BIO ASSAY-GUIDED ANTICANCER EFFECT OF *Brachystagia eurycoma* SEED N-HEXANE FRACTION ON COLON CANCER CELL LINE

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ABSTRACT

To determine the anticancer effect of *Brachystegia eurycoma* seed n-hexane fraction on colon cancer cell line. *B.eurycoma* seed, human colon cancer cell line (HT 29), Dulbecco's Modified Eagle Medium (DMEM), 10% fetal bovine serum (FBS) and 1% penicillin. 1,1-diphenyl-2-picrylhydrazyl (DPPH), Ferric reducing antioxidant power (FRAP), and egg albumin denaturation assays were used on different fractions which include; n-hexane, chloroform, n-butanol, ethyl acetate, water and crude, to determine which fraction of the seed exact has the highest activity. Cell Cytotoxicity Assay (MTT), $IC_{50,}$ and Phase contrast microscopy were then used to determine the effect of *B. eurycoma*n-hexane fraction on human colon cancer cell line (HT29). The DPPH assay of the fractions showed that n-hexane and water had the highest value of 74.3% and 63% respectively. The FRAP assay indicated that n-hexane and ethyl acetate had the highest antioxidant activity at a value of 49.3% and 31.3% respectively. The egg albumin denaturation assay showed that n-hexane fraction depicted the highest egg albumin denaturation antioxidant activity at different concentrations of 2.5mg/ml and 5mg/ml at a value of 76% and 85%. Cell Cytotoxicity Assay (MTT) indicates that the n-hexane fraction caused better cell growth inhibition when compared to standard cancer drug (cyclophosphamide). IC_{50} indicates that the n-hexane fraction was significantly more potent than the standard drug. The Phase contrast microscopy of colon cancer revealed notable changes in cell morphology induced by the fraction. N-hexane fraction possesses anticancer activities by inhibiting human colon cancer cell line (HT29).

KEYWORDS: Bio assay-guided; *Brachystegia eurycoma* seed; Colon cancer cell line, Anticancer; N-hexane fraction

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A 051

SYNERGISTIC EFFECTS OF METHANOL EXTRACTS OF *Ocimum gratissimum* and *Vernonia amygdalina* on SOME LIVER MARKERS AND ANTIOXIDANT STATUS OF CCL_4-INDUCED TOXICITY IN RATS

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ABSTRACT

The present study assessed the synergistic effects of methanolic extracts of *Ocimum gratissimum* and *Vernonia amygdalina* leaves on some liver markers and antioxidant status of CCl_4-induced-toxicity in experimental rats. Thirty rats grouped into six of five rats each were used for the study. Group 1 served as normal control while group 2 was induced with CCL4 without treatment (positive control). Groups 3, 4, 5 and 6 were pretreated with 100 mg/kg b.w. of silymarin (standard drug), 400 mg/kg b.w. of *V.amygdalina* leaf extract, 400 mg/kg b.w. of *O. gratissimum* leaf extractand400 mg/kg b.w. of mixtures of *V.amygdalina* and *Ocimum gratissimum* extracts respectively for 14 days prior to CCL4-induction to cause toxicity. Results: The result revealed that both *O. gratissimum* and *V.amygdalina* extracts were rich in phytochemicals. Pretreatment with *V. amygdalina* and *O. gratissimum* extracts significantly ($p < 0.05$) reduced the activities of liver enzyme markers (ALT and AST) compared to group 2. Pretreatment of the animals with the extracts significantly ($p<0.05$) reduced the malondialdehyde concentrations with a corresponding increase in superoxide dismutase, catalase and glutathione peroxidase activities of groups 4-6 compared to group 2. The present study revealed that both *V. amygdalina* and *O. gratissimum* extracts when used together possess synergistic effect against CCL4-induced toxicity in rats which could be attributed to their rich bioactive components. Isolation and characterization of the bioactive components responsible for the synergistic activities of the extracts are recommended.

A052

BIOPROSPECTION OF *Piliostigma thonningii* LEAVE EXTRACT FOR PUTATIVE LEADS AGAINST UTERINE FIBROIDS USING GCMS PROFILING, MOLECULAR DOCKING AND *IN VIVO* HORMONAL EVALUATION IN *WISTAR* RATS

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ABSTRACT

Uterine fibroids (UF) affect up to 80% of women of reproductive age, yet existing treatments are often invasive, expensive, or have adverse effects. There is limited research on the anti-fibroid potential of Nigerian medicinal plants. This study evaluated the effect of *Piliostigma thonningii* leaf extract on hormone levels (FSH, LH, progesterone, and estrogen) in female Wistar rats and the *in silico* inhibitory potential of its secondary metabolites against progesterone and estrogen receptors. The plant was extracted with 96% ethanol, and acute toxicity of its crude extract was assessed at doses of 500, 1000, and 2000 mg/kg body weight. The result showed that the extract did not significantly alter hormone levels, even at high doses. Molecular docking of 31 GC-MS-identified metabolites revealed 10 compounds with favorable binding energies (-8.8 to -6.4 kcal/mol) comparable to those of the reference compounds: ulipristal acetate (-10.6 kcal/mol) and estradiol (-10.8 kcal/mol). Three of these compounds strongly interacted with key catalytic residues (THR^{894}, CYS^{891} for progesterone and HIS^{524} for estrogen receptors). Drug-likeness predictions confirmed that these three met Lipinski's criteria for oral bioavailability, with one showing strong potential as an estrogen receptor antagonist. These findings suggest that *P. thonningii* contains bioactive compounds with potential anti-UF activity. Further studies are needed to develop these compounds into natural therapeutic agents for UF management.

KEYWORDS: Uterine fibroids, Drugs, medicinal plants, *Piliostigma thonningii,* therapeutics

A053

Curculigo pilosa rhizomes POSSESS ANTIOXIDANT AND NEPHROPROTECTIVE EFFECTS AGAINST CARBON TETRACHLORIDE (CCL_4)-INDUCED TOXICITY IN ALBINO RATS

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ABSTRACT

*Curculigo pilosa*is a perennial traditional plant used to treat various diseases. Objective: The study investigate the effect of ethanol extract of *C. pilosa* rhizomes (EECPR) on some renal and antioxidant parameters of carbon tetrachloride (CCl_4)-induced toxicity in albino rats. Thirty male albino rats were divided into six groups of five rats. Group 1 was the normal control. Groups 2-6 were administered 2.5 ml/kgb.w of CCl_4intraperitoneally once and left for one hour before treatment by oral intubation for 14 days. Groups 2 was left untreated, group 3 was treated with 20 mg/kg b.w of vitamin C, while groups 4–6 were treated with 250, 450 and 650 mg/kg b.w of EECPR respectively. The concentrations of urea, creatinine, bicarbonate, uric acid and MDA significantly ($p<0.05$) increased, including the activity of glutathione peroxidase (GPx), whereas the activities of superoxide dismutase (SOD) and catalase (CAT) decreased significantly ($p<0.05$) in a dose-dependent manner in the untreated group compared to the normal control group. However, treatment of groups 4-6 with different doses of EECPR caused significant ($p<0.05$) reductions in the concentrations of urea, creatinine, bicarbonate, uric acid and MDA, including the activity of GPx, with significant ($p<0.05$) increases in the activities of SOD and CAT in a dose-dependent manner when compared tothe untreated group. The finding of this study showed that *C.pilosa* rhizomes have antioxidant effect and could prevent kidney toxicity. Thus, the plant extract could be used in ameliorating kidney and oxidative stress-mediated diseases.

KEYWORDS: *Curculigo pilosa,* Albino rats, Carbon tetrachloride, Antioxidant parameters, Kidney parameters.

A 054

THE ROLE OF NANOTECHNOLOGY IN MEDICINE: INNOVATIONS AND CHALLENGES

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ABSTRACT

Nanotechnology, operating at the atomic and molecular scale (1-100 nanometers), holds transformative potential, particularly in medicine. Nanodevices play a crucial role in diagnosing, treating, and delivering targeted therapies for diseases such as cancer. Key nanodevices, including cantilevers, carbon nanotubes,

quantum dots, and dendrimers, are essential for detecting cancer cells, locating them, and providing precise therapies. Nanomedicine, the use of engineered nanoscale structures for diagnostic and therapeutic purposes, is gaining attention for its ability to revolutionize cancer treatment by targeting malignant cells with accuracy. Another promising field is nanonephrology, focusing on kidney diseases. Nanonephrology explores nanomaterials and devices to enhance precision in diagnosing and treating renal conditions, potentially leading to nano-scale artificial kidneys and targeted therapies at the cellular level.Despite its potential, integrating nanotechnology in medicine presents significant challenges. Designing functional nanodevices that can efficiently deliver drugs, navigate biological systems, and target specific organs is complex. Furthermore, issues like the biodistribution of nanoparticles and nanotoxicity pose critical concerns. Delivering drugs to precise locations while minimizing adverse effects on healthy tissues remains a major hurdle. Looking ahead, futuristic concepts such as nanorobots for cellular repairs and neuro-electronic interfaces hold remarkable potential. These innovations could transform disease treatment, enabling direct intervention at the molecular and cellular levels, and ultimately improving patient outcomes through more personalized, efficient, and precise medical care.

KEYWORDS: Nanotechnology, Nanomedicine, Cancer Treatment, Nanonephrology, and Nanorobots.

A 055

HEPATOPROTECTIVE, HEMATOLOGICAL, AND PHYTOCHEMICAL EVALUATION OF *Azadirachta indica* LEAF EXTRACT IN SULPHONAMIDE-TREATED BROILER CHICKENS

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ABSTRACT

This study investigated the phytochemical profile and the protective effects of *Azadirachta indica* leaf extract on liver, kidney, and hematological parameters in broiler chickens exposed to sulphonamide-induced toxicity. Phytochemical analysis of the extract revealed a rich composition of bioactive constituents, with saponins (677.95 ± 4.84 g/mg), flavonoids (199.46 ± 1.01 g/mg), and terpenoids (161.75 ± 1.54 g/mg) occurring in highest concentrations. Cardiac glycosides, phenols, alkaloids, tannins, and steroids were also present, while glycosides were absent. Liver function markers, total bilirubin, direct bilirubin, ALT, AST, and ALP were significantly elevated ($P<0.05$) in sulphonamide-treated chickens, indicating hepatic impairment. In contrast, birds treated with *A. indica* exhibited values similar to controls, suggesting hepatoprotective effects. The extract also enhanced serum protein and albumin levels significantly ($P<0.05$) compared to both control and sulphonamide groups. Although urea and creatinine levels remained stable, *A. indica* caused a significant decrease ($P<0.05$) in sodium and bicarbonate, indicating potential effects on electrolyte balance without nephrotoxicity. Hematological analysis revealed that *A. indica* significantly increased WBC, RBC, hemoglobin, PCV, MCV, MCH, neutrophils, and platelets ($P<0.05$), suggesting immune stimulatory and erythropoietic properties. These results highlight the therapeutic potential of *A. indica* as a natural hepatoprotective and hematological enhancer in poultry. The findings support its use in managing drug-induced toxicity and promoting general health in broiler chickens, possibly reducing reliance on synthetic drugs in poultry production systems.

KEYWORDS: *Azadirachta indica*, phytochemicals, hepatoprotective, hematology, broiler chickens.

A-056A

EVALUATION OF THE *IN VITRO* ANTIOXIDANT AND ANTIDIABETIC POTENTIALS OF LEAF AND STEM BARK METHANOLIC EXTRACTS OF *Borassus aethiopum*

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ABSTRACT

Borassus aethiopum locally known as Giginya is a palm tree of Araceceae family. It is not cultivated like other known crops but grow in the wild, mostly in the Northern part of Nigeria. The fruit was previously identified as a potent hypolipedemic, antidiabetic, and antioxidant. However, the antidiabetic and antioxidant activities of the leaf and stem bark have not been scientifically validated and authenticated. The present study aimed to investigate the *in vitro* anti-diabetic and antioxidant potential of leaf and stem bark crude extracts and solvent fractions. The total phenol content (TPC), total flavonoid content (TFC) and total tannins were investigated. The antioxidant activity of the of leaf and stem bark was assessed employing three assays (2-diphenyl-1-picrylhydrazil (DPPH) free radical scavenging assay, reducing power assay and metal chelating assay). Antidiabetic activity was investigated by*in vitro* α-amylase and α-glucosidase inhibitory activityassay.The chemical compositions of most active antidiabetic subfraction were determined by Liquid Chromatography-Mass Spectrometry (LC-MS). Methanol stem bark fraction (MSTF) exhibited higher scavenging activity (IC_{50} 2.20 µg/mL) than methanol crude stem bark (MCSB), methanol crude leaf extract (MCLF), N-hexane leaf fraction (HXLF), methanol leaf fraction (MELF), ethylacetate leaf fraction (EALF) and ethylacetate stem bark fraction (EASF) where the IC_{50} values ranged from 3.66 to 39.87 µg/mL. The metal chelating capacity was found to be higher for EALF and MSTF showed the highest degree of electron donation (reducing power). EASF exhibited effective inhibition of α-amylase and α-glucosidase with an IC_{50} value of 77.63 and 253.25 µg/mL, respectively. Fractionation and purification of the ethyl acetate fraction using column chromatography and thin layer chromatography gave six ethyl acetate subfractions. SF2 had the lowest IC_{50} for α-glucosidase activity (246.63 ± 2.29 µg/mL), there was significant difference almost amongst all subfractions in the enzyme activity. SF2 was selected and profiled by LC/MS, as it had the best DPPH and α-glucosidase inhibitory activity. The compounds identified among others are vanillic acid, 2-furoic acid and citreoisocoumarin. Potential antidiabetic activity of methanol extracts could be from the identified compounds.

KEYWORDS: *Borassus aethiopum,* Antidiabetic, Antioxidant, α-amylase, α-glucosidase, LC-MS.

A 056B

IN VITRO INHIBITORY POTENTIALS OF METHANOLIC EXTRACTS OF *Borassus aethiopum* LEAVES AGAINST ENZYMES ACTIVITIES LINKED TO DIABETES

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ABSTRACT

One of the most common chronic diseases in the world and a major burden on society is diabetes mellitus. Worldwide enthusiasm is inspired by the thought that medicinal plants could help with managing blood sugar levels. The current study sought to investigate phytochemicals, antioxidant potentials, α-amylase and α-glucosidase inhibitory activities of Methanolic Extract of *Borassus aethiopum* leaves *in vitro*. Antioxidant properties of the extract were appraised by assessing its inhibition against 1,1-diphenyl-2-picrylhydrazyl (DPPH), metal chelating assay, as well as ferric reducing antioxidant power (FRAP), the anti-diabetic activity was evaluated by α-amylase and α-glucosidase inhibition. A significant ($p<0.05$) high levels of flavonoids, phenolics and tannins were observed in the crude extract, ethylacetate leaf fraction (EALF) and hexane leaf fraction (HXLF). The methanol leaf fraction (MELF) demonstrated a significant ($P < 0.05$) inhibition against DPPH free radical (6.63 ± 0.93 µg /mL) while the metal chelating capacity of ethylacetate leaf fraction (EALF) showed the highest reducing power activity (0.008 ± 0.004 µg /mL) and had the best inhibitory activity on α-amylase. MELF (IC_{50} 265.90 ± 1.83 µg/mL) showed a better inhibition on α-glucosidase when compared to HXLF. Methanolic extract of *Borassus aethiopum* leaves could be useful as an alternative phytotherapy in the management of DM, having shown a promising antioxidative capacity and substantial *in vitro* inhibition against the activities of key enzymes involved in carbohydrate hydrolysis.

A 057

PLANT-BASED APPROACHES TO MANAGE FILARIAL LYMPHOEDEMA AND ASSOCIATED SKIN MANIFESTATIONS

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ABSTRACT

Lymphoedema, an incapacitating manifestation of lymphatic filariasis, is characterized by chronic swelling, thickening of the skin, and recurrent inflammatory episodes. Although conventional treatment addresses the active filarial infection, management for established lymphoedema or elephantiasis (a more advanced stage) and its dermatological complications are lacking effectivity, leaving patients with *body deformities, social stigma and sub-optimal mental health.* This review critically analyzes plant-derived extracts with therapeutic potential addressing inflammatory cascade and oxidative stress present in lymphatic dysfunction. Recent studies point to phytochemicals that exhibit antifilarial activity while simultaneously presenting significant lymphoprotective, anti-inflammatory, and antioxidant properties relevant to lymphoedema management. This narrative further examines the possibilities of recent innovative formulation strategies aiming at improving the bioavailability of these compounds – systems including nanoemulsions, nanoemulgels, and lipid-based carriers that potentially possess efficacy in treating skin manifestations like lymphoedema, with clinical observations of improved integrity, reduced hyperkeratosis, and enhanced barrier function. Furthermore, biofilms and nanoemulsions from plant sources used as topicals on lymphoedema-related wounds are shown to improve antimicrobial protection against secondary infections while triggering tissue regeneration and lymphangiogenesis. This strategy promises for an all-around management approach to filarial lymphoedema, which could potentially lead patients to functional and aesthetic benefits hardly achieved through conventional therapies.

KEYWORDS: Lymphoedema, Nanoemulsion, Phytochemicals, Dermal Regeneration, Lymphangiogenesis

A-058A

BIOCHEMICAL AND *IN VIVO* ANTIOXIDANT ACTIVITY OF N-HEXANE FRACTION OF *Pterocarpus mildbraedii* Harms IN HIGH CALORIE FED WISTAR RATS

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ABSTRACT

The use of natural products as alternatives for the treatment and management of diseases associated with oxidative stress and metabolic regulation is on the increase. In this study, *Pterocarpus mildbraedii* Harms was investigated for its biochemical and *in vivo* antioxidant properties in rats fed with high calorie diet. Thirty-five healthy wistar rats were randomly divided into five groups with each group having 7 animals. Group I served as the baseline, with rats being fed normal pelleted diet (NPD) and water, groups II to V were provided high-calorie diet (HCD) and water, all for a period of 12 weeks. Treatment followed immediately for 4 weeks. Group II served as negative control while Groups III, IV and V served as treatment groups. Changes in body weight were monitored; biochemical parameters (liver function tests, kidney function tests and blood lipid profile) and *in vivo* antioxidant parameters (catalase, superoxide dismutase and glutathione reductase) were evaluated following standard procedures. Results showed significant reduction ($p < 0.05$) in body weight, alanine aminotransferase, creatinine, urea, aspartate aminotransferase albumin, and malonaldehyde concentrations in the serum of treated rats, in contrast with a significant increase ($p < 0.05$) in the activities of antioxidant enzymes. Notably, there were improvement ($p < 0.05$) in blood lipid profile of treated groups, which was characterized by decreased levels of triglycerides, total cholesterol, and low-density lipoprotein cholesterol, coupled with increased level of high-density lipoprotein cholesterol. Conclusively, n-hexane fraction of *P. mildbraedii* possesses biochemical and anti-oxidative properties which can be utilized in disease management.

KEYWORDS: *Pterocarpus mildbraedii,* Antioxidant, Disease management, High-calorie diet, liver function

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A058 B

PHYTOCHEMICAL CHARACTERIZATION AND *IN SILICO* ANTITRYPANOSOMAL SCREENING OF *Rogeria adenophylla* N-BUTANOL FRACTION.

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ABSTRACT

Recent advancements in molecular modeling and *in silico* screening have revolutionized the identification of bioactive compounds for drug discovery. This study investigated the phytochemical profile of *Rogeria adenophylla*'s n-butanol fraction (RABF) and its potential antitrypanosomal activity. One (1) µL of RABF was analyzed via GC-MS and FTIR spectroscopy. Antitrypanosomal potential of its phytoconstituents was evaluated through molecular docking, with drug-likeness properties and LD_{50} of top-binding compounds predicted using computational methods. GC-MS and FTIR analyses identified 21 phytoconstituents and 13 functional groups within RABF, highlighting its diverse chemical composition. Molecular docking simulations against key *Trypanosoma brucei enzymes* revealed 11 compounds with strong binding affinities, suggesting inhibitory potential against *Trypanosoma brucei* (nucleoside hydrolase, dihydrofolate reductase or adenosine kinase) (TbNH), (TbDHFR), (TbAK). Among these, 1-β-d-ribofuranosyl-1H-imidazole-4-carboxamide exhibited the highest binding energy (−7.8 kcal/mol) into TbNH, positioning it as a lead candidate while squalene and benzyl oleate actively docked into TbAK (−7.7 kcal/mol) and TbDHFR (−7.4 kcal/mol) respectively. Additionally, acute toxicity assessments demonstrated an exceptional safety profile for most RABF constituents, with an LD_{50} exceeding 5000 mg/kg, underscoring their suitability for further development as plant-derived antitrypanosomal agents. These findings emphasize the therapeutic promise of *R. adenophylla* in combating African trypanosomiasis, warranting subsequent isolation and *in vitro/in vivo* validation of the identified phytocompounds to elucidate their mechanisms of action. This study bridges traditional phytochemical analysis with computational drug discovery, offering a robust framework for accelerating the development of novel antitrypanosomal therapies.

KEYWORDS: Antitrypanosomal, Molecular docking, *Rogeria adenophylla, Trypanosoma brucei* enzymes, Phytoconstituents.

A 059

IN VIVO ANTI-TYPHOID EVALUATION OF AQUEOUS LEAF-EXTRACT OF *Olax subscorpioidea* ON HEMATOLOGICAL AND BIOCHEMICAL PARAMETERS IN *Salmonella typhi*-INFECTED RATS.

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ABSTRACT

Typhoid fever remains a major global health concern, particularly in Africa. This study investigated the effects of the aqueous leaf extract of *Olax subscorpioidea* on selected biochemical and hematological indices in *Salmonella typhi*-infected albino rats. A total of 92 rats were used for the *In-vivo* studies. The rats were divided into seven groups (A to G), with groups A and B consisting of 16 rats each, and groups C to F consisting of 12 rats each. Groups B to F were infected with *Salmonella typhi* by oral administration of 0.5 ml of *Salmonella typhi* at a dose of 1 $x10^6$ CFU/ml. Group A served as the normal control, group B received no treatment, group C was treated with 10 mg/kg ciprofloxacin, and groups D, E, F, and G were treated with 125, 250, 500, and 1000 mg/kg body weight of the aqueous leaf extract of *O. subscorpioidea*, respectively, via oral intubation for 15 days. Widal agglutination test was used to confirm the presence of typhoid antibody in the induced rats, 48 hours post-infection. On days 5, 10, and 15 of treatment, 4 rats from each group were sacrificed for *In-vivo* analysis. In the infected rats, the extract significantly reversed biochemical and hematological abnormalities caused by *S. typhi*, suggesting its potential as a therapeutic agent for typhoid fever.

KEYWORDS: Typhoid fever, *Olax subscorpioidea, Salmonella typhi,* Rats, typhoid fever, biochemical, hematological.

A 060

ETHANOL STEM BARK EXTRACT OF *Adenium obesum(Forssk.)* Roem. AND Schult. AMELIORATES HYPERTENSION IN L-NAME-INDUCED RAT MODEL

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ABSTRACT

Hypertension is a major health problem worldwide due to its high prevalence and its association with an increased risk of cardiovascular disease. Therefore, the present study aimed to investigate the folkloric claim regarding the potential of *Adenium obesum* stem bark extracts and fractions at reducing hypertension in rats. Secondary metabolites were screened using standard methods, while the antihypertensive activity was assessed using the L-NAME-induced hypertensive rat model. Additionally, the extract was assayed for DPPH radical scavenging activities and characterized using HPLC. The quantitative phytochemical analysis demonstrated that the ethyl acetate fraction had the highest flavonoid content (108 ± 2.5 mg of QE/g). The LD_{50} of the ethanol extract was found to be >5000 mg/kg, indicating low toxicity. The DPPH radical scavenging assay revealed that the ethyl acetate and aqueous fractions exhibited the highest antioxidant activity, with IC_{50} values of 94.6 ± 20.7 µg/ml and 96.9 ± 19.8 µg/ml, respectively. HPLC analysis revealed the presence of several compounds with potential antihypertensive activity, including gallic acid, protocatechuic acid, gallocatechin, epigallocatechin, chlorogenic acid, catechin, 4-hydroxybenzoic acid, caffeic acid, valeric acid, and p-coumaric acid, among others which might be responsible for the observed antihypertensive property of the plant, at different doses, in this study. These findings suggest that *A. obesum* stem bark extract contains compounds which may be effective in reducing hypertension and the associated oxidative stress.

KEYWORDS: Cardiovascular disease, herbal medicine, secondary metabolites, antioxidants, animal model of hypertension.

A 061

BIOCHEMICAL ALTERATIONS IN LIVER AND KIDNEY FUNCTION MARKERS INDUCED BY ETHANOLSEED EXTRACT OF *Trigonella foenum-graceumlinn* IN WISTAR RATS

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ABSTRACT

Trigonella foenum-graceumlinn,is a medicinal plant known for its hepatotoxic and nephroprotective effects, following oral administration. This study was aimed at determining the biochemical alterations in liver and kidney function markers induced by ethanol seed extract of *Trigonella foenum-graceumlinn* in wistar rats. Fifty-three (53) Male and female wistar rats were used for the study. Thirteen were employed for acute toxicity test (LD_{50}) while forty were divided into eight groups of five rats per group (M1-M4 for males) and (F1-F4 for females). M1 and F1 received normal rat chaw, M2 and F2 received 100mg/kg b.w, M3 and F3 received 200mg/kg, M4 and F4 received 400mg/kg of the extract. The rats were sacrificed after 28 days of feeding and blood samples collected by cardiac puncture. Biochemical parameters: Serum Alanine aminotransferase (ALT), Aspartate aminotransferase (AST), alkaline phosphates (ALP), total bilirubin, creatinine and urea levels were assayed using Randox kit. Acute toxicity testshowed that mortality was recorded at 500 mg/kg b.w. ALP level of the treated groups increased with increase in concentration of the

extracts while the ALT and AST levels remained the same when compared to control group. Urea and creatinine levels significantly decreased with increased concentration when compared to control. The effect of the ethanol seed extract of *T. foenum-graceum* on the organ markers was concentration- dependent, suggestive of both protective and adverse effects.The administration of *T. foenum-graceum* seed extract should be dose regulated to achieve a better efficacy.

KEYWORDS: Biochemical alteration, *Trigonella foenum-graceumlinn,* Kidney, Liver, Nephroprotective.

A 062

EFFECTS OF ETHANOLIC EXTRACTS OF FRUITS OF *Acacia nilotica* AND FLOWERS OF *Calotropis procera* ON LIVER FUNCTION OF ASPIRIN-INDUCED MALE ALBINO RATS

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ABSTRACT

The effects of ethanolic extracts of *Calotropis procera* flowers and *Acacia nilotica* fruits on the liver function of male albino rats were investigated in this study. A total of eighty-four (84) male albino rats in good health were used for this study. Out of this, sixty (60) rats were randomly assigned into 6 groups of 10 animals each while 24 rats were used for the lethal dosage (LD50) investigation. The animals were induced with 500 mg of aspirin per kilogram of body weight 12hrs prior to the commencement of the experiment. The test animals were given ethanol extracts of *Calotropis procera* flowers and *Acacia nilotica* fruit for five and fourteen days, respectively, and were sacrificed at the conclusion of each test phase, blood was taken for biochemical analysis. At the conclusion of each stage, the liver was harvested and prepared for histological analysis. The result after 5 days of treatment showed that, ALT in group 2 increased significantly ($p<0.05$), whereas it decreased non-significantly ($p>0.05$) in groups 4, 5, and 6 and decreased significantly ($p<0.05$) in group 4, when compared with the normal control. Additionally, With the exception of group 2, aspartate transaminase (AST) values showed a general decreasing trend. Alkaline phosphatase (ALP) increased non-significantly in group 2, but decreased significantly ($p<0.05$) in all other groups. After 14 days of treatment, ALT, AST, and ALP values showed the same pattern. Both the treated animals' and normal rats' liver sections' photomicrograph revealed normal hepatocytes, sinusoids, and central veins. However, the photomicrograph of the liver slice of group 2 animals revealed a mildly dilated portal triad. In conclusion, ethanol extracts from *Calotropis procera* flowers and *Acacia nilotica* fruits may contain active compounds that can mitigate hepatotoxicity and enhance liver functions.

KEYWORDS: *Acacia nilotica, Calotropis procera, liver function, histology, acute toxicity*

A 063

ANTI-PROLIFERATIVE EFFECT OF *Senna alata* AND *Spondiasmombin* LEAVES EXTRACTS AND FRACTIONS ON BREAST AND RHABDOMYO SARCOMA CANCER CELL LINES

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ABSTRACT

Herbal medicine has a crucial role in healthcare for centuries, particularly in developing nations, where it serves as the primary treatment for numerous illnesses, including cancer. This research explored the potential of medicinal plants, specifically *Senna alata* and *Spondiasmombin*, as alternative sources of bioactive compounds with anticancer properties. The research aimed to isolate and characterize phytochemicals from these plants and evaluate their in-vitro anti-proliferative effects on breast and rhabdomyosarcoma cancer cell lines.The cytotoxic activity of the extractand fractions against breast cancer (MCF-7) and Rhabdomyosarcoma (RMS) cells were determined based on the colorimetric assay using 3-(4,5-dimethylthiazol-2-yl)- 2,5-diphenyltetrazolium bromide (MTT). Results of phytochemical screening confirmed the presence of flavonoids, phenols, alkaloids, saponins, and tannins, with*Spondiasmombin*exhibiting a higher concentration of phenolic compounds (540.44±0.42) and flavonoids (156.31±1.17) compared to *Senna alata*with 337.60±0.36 phenolic and 121.93±0.88 flavonoid concentrations. The results indicated appreciable cytotoxic activity, with the chloroform fraction exhibiting the highest potency (0.44 µg/mL), particularly against MCF-7 (breast cancer). n-haxane fraction of *Spondiasmombin* showed better effect (1.243 µg/mL) on RD (rhabdomyosarcoma) cells. Notably, the extracts selectively targeted cancer cells while displaying minimal toxicity toward normal VERO cells, underscoring their potential as chemotherapeutic agents.

KEYWORDS: Phytochemicals, Rhabdomyosarcoma cells, *Senna alata, Spondiasmombin,* Cytotoxicity.

A-064A

PHYTOCHEMICAL ANALYSIS AND ANTIMICROBIAL EFFICACY OF Gongronema latifolium OIL AGAINST Staphylococcus aureus

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ABSTRACT

Natural plant extracts have been widely studied for their medicinal properties, particularly their antibacterial potential. This study evaluates the phytochemical composition and antimicrobial activity of Amaranth globe (Gongronema latifolium) oil against Staphylococcus aureus. The oil was extracted using Soxhlet extraction with n-hexane. The phytochemical screening revealed the presence of tannins (4.15 mg/g) and triterpenoids (5.80 mg/g), while alkaloids, flavonoids, glycoside, saponins, and anthraquinones were absent. Antibacterial activity was assessed using the agar well diffusion method.Values of results are triplicate and were expressed in mean ± standard deviation with inhibition zones of 12.3 ± 0.58 mm, 10 ± 1.00 mm, and 7.7± 1.16 mm at 4000 µg/ml, 2000 µg/ml, and 1000 µg/ml, respectively, while 500 µg/ml showed no inhibition. In comparison, Ampiclox (125 mg/ml) produced a 31 mm inhibition zone. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were 250µg/ml and 500 µg/ml, respectively, yielding an MIC/MBC ratio of 1:2, indicating a bactericidal effect. The extract was green, gummy, and pungent in nature. These findings suggest that *Gongronema latifolium* oil possesses moderate antibacterial activity and could serve as a potential natural antimicrobial agent against Staphylococcus aureus.

KEYWORDS: Amaranth globe, Staphylococcus aureus, antimicrobial, phytochemical, Inhibition zone

A 064B

PHYTOCHEMICAL ANALYSIS AND ANTIMICROBIAL EFFICACY OF CARROT (*Daucus carota*) OIL AGAINST Staphylococcus aureus

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ABSTRACT

Carrot (*Daucus carota*) oil has gained attention for its potential antimicrobial properties. This study evaluated the antimicrobial efficacy and phytochemical composition of carrot oil against *Staphylococcus aureus*, a pathogenic bacterium responsible for various infections. The phytochemical analysis was conducted to identify bioactive compounds using qualitative and quantitative methods. Antimicrobial activity was assessed at concentrations of 2000 mg/mL, 1000 mg/mL, 500 mg/mL, and 250 mg/mL, with ciprofloxacin as the standard antibiotic for comparison. The results revealed the presence of key bioactive compounds, including flavonoids, tannins, alkaloids, and saponins, which may contribute to the antimicrobial effects. The antimicrobial assay demonstrated a dose-dependent inhibition of *S. aureus*, with higher concentrations of carrot oil exhibiting greater efficacy. Statistical analysis confirmed the significance of the observed antimicrobial activity. These findings suggest that carrot oil possesses promising antimicrobial potential, supporting its traditional use in herbal medicine. However, further studies, including in vivo evaluations and mechanistic investigations, are recommended to explore its full therapeutic potential, toxicity profile, and possible pharmaceutical applications

KEYWORDS: Carrot, Staphylococcus Aureus, Antimicrobial, Phytochemical, Ciproflaxacin

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A065

IN SILICO ADME, DRUG-LIKENESS AND TOXICOLOGICAL EVALUATION OF PHYTOCHEMICALS FROM THE HYDRO-ETHANOL LEAVES EXTRACT OF *Calotropis procera* PLANT.

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Calotropis procera from Apocynaceae family is a medicinal plant species with reported wide medicinal effect such as antidiabetic potential, cardiotoxic, Antiviral effect, treatment and cure of leprosy, elephantiasis, Jundice etc. The present predictive study aimed to investigate the pharmacokinetics and drug likeness and toxicity profile of identified phytochemicals present in *Calotropis procera* crude hydroethanol extract using online tools.For this purpose, the air-dried leaves were pulverized and subjected to maceration to obtained crude extract of *Calotropis procera* using hydroethanol solvent and it phytoconstitunent was identified using LCMS. Basic phytochemical screening and functional group identification was carried-out using standard methods. The clinical potential of these drug candidates was assessed by applying a Swiss ADME and ADEMTLAB 3 screening profile and their toxicity using PROTOX 3 webserver. Findings of Swiss ADME and ADEMTLAB 3 indicators (Absorption, Distribution, Metabolism, and Excretion) for the compounds presented a mildly toxic phytoconstituents with varying drug-likeness potentials. The compounds were predicted to be in Class 4, 5 and 6 which is harmful if swallowed, maybe harmful if swallowed and non- toxic respectively. Quercetin-3-O-vicianoside and [1-[2-(Difluoromethoxy) benzoyl] pyrrolidin-2-yl]-[4-[(3-methyl-1, 2-oxazol-5-yl) methyl] piperazin-1-yl]methanoneare predicted to have LD 50 of 5000mg/kg and

325 mg/kg respectively. This maybe classified into class 5 and 4 respectively i.e non-toxic and slightly toxic. The Protox III database also predicted these compounds not to be Carcinogenic, Mutagenic, and Cytotoxic. This is an indication that although these compounds may possess therapeutic potential, their toxicity profile may serve as a drawback in being good candidates for bioactivity in biological system and based on calculated ADME parameters they are anticipated to serve as cytotoxic lead compounds. It is advocated that current predictive results should be authenticated by in vitro and in vivo toxicological and pharmacological assay.

KEYWORDS: ADME, Drug-likeness, Toxicological Evaluation, Phytochemical, *Calotropis procera*

A-066

IRON ATTENUATES CADMIUM-INDUCED TESTICULAR TOXICITY IN RATS VIA ACTIVATION OF THE *Nrf2*/*HO-1* SIGNALING PATHWAY

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ABSTRACT

Nuclear factor erythroid 2–related factor 2 (*Nrf2*) plays a key role in regulating antioxidant defenses. Cadmium (Cd), even at sub-toxic levels, induces oxidative stress and impairs testicular function. This study investigated the modulatory role of iron (Fe) on Cd-induced testicular toxicity in adult male rats, focusing on oxidative stress biomarkers, reproductive hormones, and gene expression in the *Nrf2*/*HO-1* signaling pathway. Twenty adult male albino rats were divided into four groups (n = 5): control (metal-free), Cd-only (0.229 mg/L), Fe-only (1.900 mg/L), and Cd+Fe. After four weeks of feeding with catfish-derived protein diets, serum and testicular samples were analyzed. Cd exposure disrupted antioxidant enzyme activities, elevated testicular glutathione (GSH), and increased lipid peroxidation (MDA). Co-treatment with Fe normalized MDA but reduced GSH levels. Hormonal profiling revealed elevated luteinizing hormone (LH), follicle-stimulating hormone (FSH), and testosterone in the Cd and Cd+Fe groups, although LH and FSH were lower in Cd+Fe compared to Cd alone. Estradiol levels rose with Cd but declined with Fe. *Nrf2* expression was suppressed by Cd but restored upon Fe co-administration. *HO-1* was upregulated in Fe and Cd+Fe groups. Histological analysis showed Cd-induced degeneration of seminiferous tubules and Leydig cell reduction, which improved only marginally with Fe co-treatment. In conclusion, Fe exhibits partial protection against Cd-induced testicular toxicity by modulating oxidative stress, hormonal disruption, and upregulating the *Nrf2*/*HO-1* pathway. Overall, this study highlights the antagonistic effect of Fe against Cd toxicity and suggests its potential protective role via enhancement of antioxidant signaling.

KEYWORDS: Cadmium toxicity, Iron supplementation, Testicular function, Oxidative stress, Gene expression.

A 067

PHYTOCHEMICAL SCREENING, GC-MS ANALYSIS AND *IN VITRO* ANTIOXIDANT STUDIES OF ETHANOLIC EXTRACT OF *Icicinia mani* (EARTH BALLS) TUBERS

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ABSTRACT

Icicinia mani also known as *Efik-isong* in Ibibio is a potential feed material for animals including humans. There are reports that commercial producers of *garri,* a major staple food in Southern Nigeria combine large quantities of *Icicinia mani* tubers with cassava to increase their production. In this study, we conducted the phytochemical screening, GC-MS analysis and *in vitro* antioxidant activity of *Icicinia mani* (Earth balls) tubers using standard methods to ascertain the safety or otherwise of this plant material. Finely ground *Icicinia mani* tubers (1000 g) was extracted with 80% ethanol and the filtrate was concentrated using a rotary evaporator (LabTech EV400H).The dried extract was refrigerated at 4°C until required for use. Qualitative and quantitative phytochemical screening was conducted using standard protocols. The extract was further analyzed by gas chromatography-mass spectrometry (GC-MS) to identify the important functional groups and phytochemical constituents. *In vitro* antioxidant activity of the extract was evaluated using ferric-reducing antioxidant power (FRAP), 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, and nitric oxide (NO) scavenging assays. The results of phytochemical screening indicate the presence (g/100g) of alkaloids (29.703), flavonoids (8.911), tannin (5.455), steroids (0.007), saponin (13.269), cardiac glycosides (18.889), cyanogenic glycosides (0.002), oxalate (0.0004) and anthocyanin (10.00). GC-MS analysis revealed the presence of one hundred and five (105) compounds of which 1,2-Benzisothiazole, 3-(hexahydro-1H-azepin-1-yl)-, 1,1-dioxide had the highest retention time (23.712), Ethyl 2-(2-chloroacetamido)-3,3,3-trifluoro-2-(4-fluoroanilino) propionate had the highest molecular weight (356.70), while n-Hexadecanoic acid the highest peak area (4.92). The FRAP, DPPH, and NO scavenging assays indicated that the extract was capable of neutralizing free radicals. Ethanol extracts of *Icicinia mani* tubers contains useful phytochemicals which synergistically confers strong antioxidant potentials on it, hence, the extract may be considered a potential natural source for developing additives in the food and pharmaceutical industries, offering an alternative to synthetic compounds for enhancing health benefits and mitigating oxidative stress.Further investigations on the minerals and proximate analysis as well as the effects of the extracts on biochemical parameters are on-going in our laboratory.

KEYWORDS: *Icicinia mani*, phytochemicals, antioxidants, Gas chromatography-mass spectrometry

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A 068

COMPARATIVE STUDY ONTHE PHENOLIC CONTENT, ANTIOXIDANT PROPERTIES AND GC-MS FINGERPRINTING OF EXTRACTS OF *Cocos nucifera L.*

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ABSTRACT

Plants are rich sources of phytocompounds, *Cocos nucifera* is one of the most important economic and nutritional plants found mostly in the tropics. This present study was aimed at investigating the phenolic contents and antioxidant properties of the various husk extracts of *Cocus nucifera*. Extraction was carried out using solvents of varying polarities: methanol (MECN), hydroethanol (HECN), and ethyl acetate (EACN). Total phenolic content was assayed using the *Folin- ciocalteu* method, *invitro* scavenging activities of the extracts were determined using the 1,1-diphenyl-2 picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP) methods. Furthermore, GC-MS analysis was carried out to determine the various bioactive compounds present in the extracts. Result of the total phenolic content showed that MECN > EACN > HECN, results also showed that MECN had the highest DPPH radical scavenging activity (IC_{50}= 11.32 ± 2. 09 µg/mL) and reducing power (0.622 ± 0.007 µg/mL). The GC-MS results revealed the presence of caffeic acid, gallic acid, catechin, quercetin, luteolin, apigenin, rutin, quercitrin, kaempferol as its major bioactive compounds. The significant difference ($p < 0.05$) noticed in the scavenging potential of the extracts may be due to variation in the phytoconstituents extracted using various solvents. The result suggests that the husk of *C. nucifera* could serve as a potential source of antioxidants and can be explored as a therapeutic agent.

A 069

AN ASSESSMENT OF LEVELS OF INFLAMMATORY MARKERS IN WISTAR RAT TREATED WITH SAMPEA 20-TCOWPEA CULTIVARS

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ABSTRACT

This study investigates the impact of SAMPEA 20-T cowpea cultivar on inflammatory markers in Wistar rats. Rats weighing 200–250g were assigned into four groups: a control group fed a normal diet and water, and three treatment groups fed 25%, 50%, and 100% SAMPEA 20T (w/w) of SAMPEA 20-T diets, respectively, for 14 days. C-reactive protein (CRP), packed cell volume (PCV), and colon histopathology, were assessed to determine the effects of SAMPEA 20-T consumption. The results showed a non-significant increase in CRP levels across treatment groups, with mean CRP values rising from 1.23 mg/L in the 25% group to 1.42 mg/L in the 100% group, compared to 1.10 mg/L in the control group. Similarly, PCV levels exhibited a non-significant decreasing trend from 45.00% in the control group to 36.50% in the 100% treatment group. Histopathological examination revealed no signs of inflammation or tissue damage in the colons of treated rats, with intact mucosal architecture and normal glandular arrangement across all groups. The findings suggest that SAMPEA 20-T consumption do not induce significant inflammatory responses or histopathological changes in Wister rats after 14 days.

KEYWORDS: SAMPEA 20-T, C-reactive protein, packed cell volume, inflammatory markers, Wistar rats

A 070

IN-VIVO ANTIVENOM ACTIVITIES OF METHANOL LEAF EXTRACT OF *Solanum dasyphyllum* AGAINST *Naja nigricollis* VENOM-INDUCED ENVENOMATION IN MICE

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ABSTRACT

The high mortality due to snakebite envenomation as a result of shortage or high cost of antivenom has necessitated the exploration of the plant kingdom for alternative therapeutic agents. *Solanum dasyphyllum* is a plant often employed in ethnomedicine especially in the southwestern part of Nigeria for the treatment of tooth pain, poisons and snakebites. This study aims to evaluate the venom neutralization capacity and detoxifying effects of *S. dasyphyllum* extract against the toxic effects of *N. nigricollis* venom.Methanol leaf extract of *S. dasyphyllum* (100-400 mg/kg) was evaluated for their neutralization and detoxifying effects on lethality induced by *N. nigricollis* in-vivo and activity on liver enzymes. The results indicated that the LD_{99} of the venom was estimated at 7.57 mg/kg, while the co-administration of venom and the extract shows maximum neutralization (16.6% mortality), compared to treating the mice 5 minutes post-envenomation (33.3% mortality).The extract does notexhibit significant protective effect against *N. nigricollis* venom (83% mortality) and the extract was able to restore the biochemical functions (ALT, AST) of the liver. These findings suggest that the plant possess potent snake venom neutralizing capacity.

KEYWORDS: Snakebite, Envenomation, *Naja nigricollis*, detoxification, toxicity.

A 071

PHYTOCHEMISTRY, INVITRO ANTIOXIDANT ACTIVITY AND IDENTIFICATION OF BIOACTIVE COMPOUNDS OF THE AQUEOUS/ETHANOL LEAF AND SEED, ESSENTIAL OIL EXTRACTS OF PARSLEY (Petroselinum crispum(Mill.) Nym.ex A.W Hill, Apiaceae); USING GAS CHROMATOGRAPHY-MASS SPECTROSCOPY

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ABSTRACT

Parsley, *Petroselinum crispum* is a vegetable, medicinal herb and spice belonging to the carrot family, Apaiceae; with history of ethno medicinal properties from parts of the plant. This study investigated the phytochemistry and identification of bioactive compounds present in two solvent extracts of the seeds and

leaves of parsley; as well as the essential oils, using Gas chromatography-Mass Spectrometry (GC-MS) technique. The preliminary phytochemical evaluations were carried out using standard methods. The invitro-antioxidant activity (IC50) was evaluated by the DPPH (1,1 -diphenyl-2-picrylhydrazyl) reduction test. The solvent extracts of the seed and leave, tested positive for flavonoids, alkaloids, volatile oil, glycosides, terpenoids and phenols in various concentrations but anthraquinone was absent in all extracts. The essential oils also revealed the presence of some phytochemicals. The quantitative phytochemical analysis of the extracts revealed terpenoid, as the major constituent present in high concentrations in all the extracts; with the highest concentration of terpenoids in the essential oil extracts (8.994 ± 0.35) mg/g. The aqueous parsley seed extract exhibited the highest invitro-antioxidant activity with an IC_{50}= 6.7µg/mL and this was a function of the presence of the phenols (Apiol), terpenoid and flavonoid content of the extract. While all the other extracts showed antioxidant activities less than the standard ascorbic acid exhibited (IC_{50}=7.1µg/mL). The chromatograms of the aqueous and ethanol seed extracts identified 18 and 26 bioactive compounds, with the highest percentage abundances of 81.04% and 81.54% for the compound Apiol respectively; while the chromatograms for the aqueous and ethanol leave extracts revealed the presence of 38 and 40 bioactive compounds, with the highest percentage abundances identified to be 13.00% for Mono-Palmitin and 17.58% for Palmitic acid, respectively. The chromatograms for the essential oils of the seed and leave extracts identified 30 and 52 bioactive compounds with the highest percentage abundances identified to be 88.93% for Apiol and 17.67% for Oleic acid respectively. Apiol was identified to be the predominant chemical constituent in the essential oil extract of the seed as well as the aqueous and ethanol seed extracts; this accounts for the distinctive aromatic scent. The GC-MS analysis of parsley seed, leave and essential oils, highlights their importance in traditional medicine as well as in culinary applications. From this investigation, the diverse array of phytochemicals and bioactive constituents identified in the extracts, suggests potential health advantages, reinforcing parsley's historical and contemporary uses for nutritional, pharmaceutical and therapeutic purposes.

KEYWORDS: Apiol, Bioactive, Gas Chromatography-Mass Spectroscopy, Parsely, Phytochemical Constituent,

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A 072

DETERMINATION OF ANTI-DIABETIC ACTIVITIES OF AQUEOUS AND METHANOLIC EXTRACTS OF *Buchholzia coriacea* (WONDERFUL KOLA) SEEDS IN STREPTOZOTOCIN-INDUCED DIABETIC RATS

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ABSTRACT

The seeds of *Buchholzia coriacea* have medicinal value which gave the plant its common name 'wonderful kola nut' because of its usage in traditional medicine to treat a variety of illnesses. This study seeks to evaluate the anti-diabetic effect of *B. coriacea* on STZ-induced diabetic rats. Preliminary hypoglycaemic study revealed that the methanol extract showed better hypoglycemic potential *($p<0.05$)* when compared with the aqueous extract, therefore the extract was partitioned using the following solvents: n-hexane, ethyl acetate, butanol and distilled water after which the fractions obtained were tested for anti-diabetic activity in streptozotocin induced diabetic rats. Acute toxicity (LD_{50}) was found to be greater than 5000mg/kg an indication of a high safety profile of the methanol seed extracts of *B. coriacea*. The methanol extract 600 mg/kg per oral dose achieved the best hypoglycemic activity on oral glucose-induced hyperglycemia ($p<$ 0.05) while the hexane (nHex) fraction exhibited the best hypoglycemic effect ($p<0.05$). The hexane fraction

was subjected to GC-MS analysis, from which 17 compounds were identified. The inhibition of porcine α-amylase and α-glucosidase activities was determined to be competitive inhibition. The results of this study have provided evidence-based insights into the ability and reliability of *B. coriacea* seeds extracts as a cheaper, affordable and an acceptable alternative or complementary therapy for the management of Diabetes. Further studies can be embarked upon to determine the mechanism by which *B. coriacea* seeds exert its antidiabetic effect.

KEYWORDS: Diabetes Mellitus, *Buchholzia coriacea*, hypoglycaemia, α-amylase and α-glucosidase, GC-MS

A-073

IN SILICO ALCOHOL DEHYDROGENASE INHIBITION AND HEPATORENAL PROTECTION BY *Cnidoscolusaconitifolius*LEAF AQUEOUS EXTRACT IN ETHYLENE GLYCOL-INDUCED UROLITHIASIS

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ABSTRACT

Urolithiasis, characterized by urinary stone formation, is a global health issue with limited safe therapeutic options. This study investigated the antiurolithiatic potential of *Cnidoscolus aconitifolius* leaf aqueous extract (CAE) using molecular docking, ADMET analysis, and *in vivo* assessments. GC-MS analysis identified 57 bioactive compounds, including benzenemethanamine and octatriacontylpentafluoropropionate, which showed strong binding affinities to alcohol dehydrogenase (ADH), a key enzyme in oxalate production (-4.92 and -4.23 kcal/mol, respectively, in standard precision docking). Benzenemethanamine emerged as the top candidate in extra precision docking (-3.04 kcal/mol) with favorable pharmacokinetics, including high gastrointestinal absorption and no neurotoxicity or carcinogenicity risks. *In vivo*, ethylene glycol-induced urolithiatic Wistar rats treated with CAE (200, 300, and 400 mg/kg) exhibited significant reductions in serum creatinine, urea, and uric acid levels, indicating nephroprotective effects. Hepatoprotective benefits were observed through reduced alanine aminotransferase, aspartate aminotransferase, and total bilirubin levels, with the 400 mg/kg dose showing the most pronounced improvements. This study therefore, highlights the therapeutic promise of *C. aconitifolius*as a natural remedy for urolithiasis, integrating computational biology and experimental approaches to establish its efficacy and safety. These findings provide a foundation for future clinical evaluations for translation of its benefits to human health.

KEYWORDS: Urolithiasis; *Cnidoscolus aconitifolius*; Molecular docking; Nephroprotective; Hepatoprotective

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A-074

ANTIMALARIAL ACTIVITIES OF METHANOL LEAF EXTRACTS OF *Dialium guineense* AND *Morinda lucida* IN *Plasmodium berghei*– INFECTED MICE

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ABSTRACT

Malaria is one of the most serious health problems worldwide and treatment has been compromised by drug resistance. Consequently, efforts are directed towards discovery of novel agents including those from medicinal plants. Malaria pathogenesis is based mainly on extensive changes of haematological and biochemical parameters. This study evaluates comparatively, the antimalarial property of methanol leaf extracts of *Dialium guineense* and *Morinda lucida* in *Plasmodium berghei*-infected mice. The extracts were subjected to Gas Chromatography and Mass Spectrometry (GC-MS). Different doses (200, 400 and 600 mg/kg body weight) of the extracts and Artesunate (20 mg/kg) were administered orally to the infected mice for five days, thereafter parasitaemia and haematological indices were monitored. The liver, spleen and whole blood samples were collected for biochemical evaluations. GC-MS results indicated the presence of large quantities of alpha tocopherol, squalene, linolenic acid and other highly pharmacologically active compounds. There was significant ($p< 0.05$) suppression of parasitaemia in mice infected and treated with rated doses of the extracts and Artesunate respectively. Significant hepatosplenomegaly was observed but was significantly ameliorated in the groups of infected mice treated with the extracts and Artesunate. The extracts were effective in ameliorating the adverse changes that occurred in haemetological indices in the infected and treated groups as compared with the untreated mice. They also exhibited protective effect on the liver and spleen. These results validate the experiential use of *D.guineense* and *Morinda lucida* as remedies for malaria.

KEYWORDS: Malaria, Drug Resistance, *D.guineense, M. lucida,* Ameliorate

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A-075

STRUCTURE-BASED PHARMACOPHORE MODELLING, VIRTUALSCREENING, AND MOLECULAR DYNAMICS SIMULATIONS FOR THE IDENTIFICATION OF C-MET RECEPTOR TYROSINE KINASE INHIBITORS

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ABSTRACT

The cell-surface receptor tyrosine kinase c-MET is often overexpressed in solid tumours, making it a key target for cancer therapy. While many c-MET-targeted treatments have shown limited clinical success, Savolitinib—an oral small-molecule inhibitor—has demonstrated a manageable safety profile and antitumor activity in MET-driven advanced tumours. Despite showing promise in clinical trials, Savolitinib's limited bioavailability and potential for resistance have driven the search for alternative c-MET inhibitors. In this computational biology research, a pharmacophore model was derived from Savolitinib and validated using Receiver Operating Characteristic (ROC) curves and Enrichment Factor (EF). Virtual screening of compound libraries identified two promising candidates, ligand-154859854 and ligand-9038296 based on superior docking scores. Subsequent molecular dynamics simulations confirmed the stability of the ligand-enzyme complexes, while binding free energy calculations revealed strong binding affinities for ligand-154859854 and ligand-9038296. Per-residue decomposition pointed to critical interactions with active site residues, including ILE 1084, VAL 1092, and MET 1211, contributing to the compounds' stability and activity. These findings suggest that ligand-154859854 and ligand-9038296 are potential inhibitors of c-MET, with promising efficacy, drug-likeness and appreciable safety profile. However, further experimental studies are essential to confirm the therapeutic potential of these compounds for the treatment of c-MET driven cancers.

KEYWORDS: c-MET driven cancers, Savolitinib, Structure-based pharmacophore model, c-MET receptor tyrosine kinase inhibitors

A-076

ALPHA AMYLASE INHIBITION STUDIES USING AQUEOUS AND ETHANOL EXTRACTS OF SOME MEDICINAL PLANTS REPORTED TO POSSESS ANTIDIABETIC ACTIVITY

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ABSTRACT
A significant characteristic of individuals with Type 2 Diabetes Mellitus (T2DM) is elevated post-meal blood sugar levels, closely linked to the breakdown of starch. Slowing the digestion of carbohydrates can reduce the amount of glucose entering the bloodstream, thereby lowering post-meal glucose concentrations. This approach of moderating glucose absorption to maintain normal blood sugar levels has emerged as an encouraging strategy in managing T2DM.This study investigated the α-amylase inhibitory potential of aqueous and ethanolic leaf extracts of five medicinal plants: *Mangifera indica, Senna italica, Vernonia amygdalina, Parkia biglobosa,* and *Carica papaya.* Phytochemical analysis and alpha-amylase inhibition were conducted according to standard methods. Phytochemical analysis revealed the presence of phenols, flavonoids, alkaloids, tannins, terpenoids, and saponins. Alpha-amylase inhibition assays yielded key findings: aqueous extracts demonstrated more consistent inhibitions, particularly in *V. amygdalina* (83–89%), *P. biglobosa* (>99%), and *C. papaya* (78–92%), suggesting potential anti-diabetic activity. Ethanolic extracts showed strong inhibition in *M. indica* (98–99%) but exhibited low inhibitions in others, including lack of inhibition in *S. italica, P. biglobosa,* and *C. papaya*, possibly due to solvent interference or compound instability. The presence of flavonoids, alkaloids, and phenols correlates with inhibitory activity, supporting their role in carbohydrate metabolism modulation. The results highlight that aqueous extraction generally provides more reliable alpha-amylase inhibition, though ethanolic extracts may be effective for specific plants.

KEYWORDS: Alpha-amylase inhibition, antidiabetic, medicinal plants, phytochemicals, enzyme inhibition.

A-077

EFFECT OF EXTRACTS OF *Abrus precatorius* STEM IN STREPTOZOTOCIN-INDUCED DIABETIC WISTAR RATS

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ABSTRACT
Diabetes mellitus (DM) remains a pervasive metabolic disorder globally, particularly in developing regions, where access to effective and affordable treatment is limited. This study investigated the Normal Glycemic Effect of Extracts of *Abrus precatorius s*tem in Streptozotocin-induced Diabetic Wistar Rats. The research aimed to evaluate the antidiabetic efficacy, toxicity, antioxidant capacity, and hematological effects of these plant stem extracts. Phytochemical screening revealed the presence of bioactive compounds such as flavonoids, alkaloids, saponins, tannins, and glycosides. Acute toxicity tests confirmed a high safety margin of the extracts. Diabetic rats treated with 100, 200 and 400 mg/kg of both extracts for 28 days showed

significant reductions in fasting blood glucose levels compared to untreated diabetic controls. Improvements in lipid profiles, liver enzyme activities, and antioxidant markers were also observed. Hematological parameters were also normalized in extract-treated groups. These findings demonstrate that *Abrus precatorius* stem bark possesses potent anti-hyperglycemic and protective properties, indicating its potential use as a natural, accessible therapeutic alternative in diabetes management.

KEYWORDS: Diabetes mellitus, *Abrus precatorius*, Streptozotocin, Phytochemicals, Aqueous and methanolic extracts

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A 079

INVESTIGATING ALPHA AMYLASE INHIBITION USING AQUEOUS AND ETHANOL EXTRACTS OF SOME MEDICINAL PLANTS WITH ANTIDIABETIC PROPERTIES

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ABSTRACT
Type 2 diabetes is linked to post-meal blood sugar spikes from starch breakdown. Slowing carbohydrate digestion reduces glucose absorption, helping maintain stable blood sugar levels and manage the condition effectively. This study evaluated the *in vitro* alpha-amylase inhibitory potential of aqueous and ethanolic extracts from five medicinal plants, namely *Eucalyptus globules* (leaves), *Vitellaria paradoxa* (leaves), *Ziziphus mauritiana* (leaves), *Syzygium cumini* (seeds), and *Anacardium occidentale* (stem bark) by monitoring the amount of glucose produced using glucose oxidase after incubating α-amylase along with the extract for 1 hour.The phytochemical constituents of the plant extracts were also determined. The results revealed that *Syzygium cumini* extracts exhibited excellent inhibition (aqueous: 93–98%; ethanolic: 77–100%). Varying inhibitions were observed with *Z. mauritiana, A. occidentale,* and *V. paradoxa* ethanolic extracts. The phytochemicals detected in the extracts include phenols, flavonoids, alkaloids, terpenoids and saponins. The study highlights the potential of the extracts to manage diabetes mellitus through inhibition of alpha amylase.

KEYWORDS: Alpha-amylase inhibition, Antidiabetic plants, Aqueous and ethanol extracts, Phenolic compounds

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A 080

COMPARATIVE STUDIES AND BIOACTIVE COMPOUNDS ANALYSIS ON TEA LEAVES SAMPLE (*Camellia sinensis*) AND JACKFRUIT (*Artocapus heterophyllus*)

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ABSTRACT
Camellia Sinensis generally known as green tea leaves found majorly in Taraba north east part of Nigeria is the second most consumed drink after water worldwide due to its promising benefit and Artocarpus

Heteropyllus known as Jackfruit leaves found most in southeast part of Nigerian believed to have similar good bioactive compounds and benefit as tea was proving by this research work. Both Qualitative and Quantitative Phytochemicals were analyzed after aqueous extraction method at 65^{0}C in water bath using color, appearance, presence and intensity for qualitative and spectrophotometer for quantitative analysis at various wavelength say, 445nm, 500nm and 620nm respectively at various concentration 0.01mg/ml to 2.5mg/ml with Phenols, Tannins, Flavonoids and Saponins positive on both leaves, Cardial glycoside positive to jackfruit only while steroids and glycosides are positive to C. sinensis only. The quantitative phytochemical showed significant value above 10mg/ml in flavonoid, phenols and steroids respectively while tannins, saponins and Glycosides were below which suggest they can be use as pain killers, antioxidant relief stress, DPPH and hydroxyl Radical Scavenging activities were determined using ascorbic acid as standard, significant amount was seen above 16.6mg/ml for the jackfruit below the c.sinensis having respect to HRSA and above 6.0mg/ml for DPPH. Amino acid profiling was significant in all sample having 19 out of 20 with both essential having higher value and non-essential less, cystien has 0.48g/100mg the lowest and aspartic acid has 16.7g/100g the highest amount. Its concluded that jackfruit is quiet a good source of antioxidant and bioactive compound use as stated above.

KEYWORDS: Jackfruit, Phytochemicals, Antioxidant, DPPH, *C.sinensis*

A081

THERAPEUTIC POTENTIAL OF *Hyphaene thebaica* METHANOL FRUIT EXTRACT IN MITIGATING GENTAMICIN-INDUCED HEPATO-RENAL TOXICITY IN WISTAR RATS

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ABSTRACT

Liver and kidney dysfunctions are closely interconnected pathologies caused by oxidative stress and inflammation, often exacerbating disease progression. The present study investigates the therapeutic potential of *Hyphaene thebaica* methanol fruit extract in mitigating gentamicin-induced hepato-renal toxicity in Wistar rats. Liver and kidney function markers were significantly ($P<0.05$) elevated in the hepato-renal toxic control group (HRTC), confirming severe liver and kidney damage after intraperitoneal administration of gentamicin injection for 14 days. Treatment with *H. thebaica* at 250 mg/kg (HT250) and 500 mg/kg (HT500) significantly ($P<0.05$) ameliorated these biochemical alterations. The extract's hepatoprotective and nephroprotective effect might be attributed to its rich polyphenolic composition. Notably, the lower dose (HT250) exhibited greater therapeutic benefits, suggesting a non-linear dose-responserelationship. The results highlight *H. thebaica* as a promising natural candidate for managing hepato-renal toxicity, emphasizing its potential integration into therapeutic strategies for liver and kidney disorders.

KEYWORDS: H. thebaica, Hepatotoxicity, Kidney, Liver, Nephrotoxicity.

A-082

APHRODISIAC POTENTIAL OF *Securidaca longipedunculata* STEMBARK METHANOL EXTRACT ON MALE ALBINO RATS

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ABSTRACT

Sexual dysfunction, encompassing erectile dysfunction, ejaculatory disorders, and hypogonadism, constitutes a significant global public health concern, affecting over 20% of males across age groups. While synthetic therapies exist, their adverse effects have spurred interest in plant-based alternatives. *Securidaca longipedunculata* is traditionally utilized for enhancing sexual function, yet scientific validation of its efficacy remains limited. This study aimed to evaluate the aphrodisiac potential of a methanol stembark extract of *S. longipedunculata* in male albino rats. This study aimed to evaluate the aphrodisiac potential of methanol stembark extract of *S. longipedunculata* in male albino rats. Phytochemical screening was performed using standard protocols. For aphrodisiac assessment, 15 rats were divided into five groups (n=3): Group 1 (control, 5 mL/kg distilled water), Group 2 (standard, 5 mg/kg sildenafil citrate), and Groups 3–5 (100, 200, and 400 mg/kg extract, respectively). Treatments were administered orally for 14 days. Mating behaviors—mount latency (ML), intromission latency (IL), mount frequency (MF), intromission frequency (IF), ejaculation latency (EL), and post-ejaculation interval (PEI)—were recorded at baseline (week 0), week 1, and week 2. Post-treatment mating performance was additionally assessed. Phytochemical analysis identified tannins, flavonoids, steroids, and alkaloids. At baseline, no significant differences ($P > 0.05$) in behavioral parameters were observed among groups. Post-treatment, extract- and sildenafil-treated groups exhibited significant reductions ($p< 0.05$) in ML, IL, and PEI compared to controls. EL increased significantly ($p < 0.05$) in all treated groups, while IF showed non-significant elevation ($p> 0.05$). Dose-dependent improvements in mating performance were evident across extract groups. *S. longipedunculata* stem bark methanol extract demonstrated aphrodisiac activity, likely attributable to its bioactive constituents. These findings validate its traditional use as a sexual enhancer and warrant further investigation into its mechanistic pathways.

KEYWORDS: Aphrodisiac, Mating behavior, *Securidaca longipedunculata*, Stem bark, Phytochemicals

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A 083

IN VIVO ANTITRYPANOSOMAL AND ANTIOXIDANT POTENTIAL OF *Rogeria adenophylla J. Gay. Ex Delile* and *Bauhinia rufescens* (Lam.) METHANOL LEAVES EXTRACTS

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ABSTRACT

Trypanosomiasis, a parasitic disease caused by *Trypanosoma species,* remains a substantial health and economic burden in Sub-Saharan Africa, due to limited treatment options and the growing concerns of resistance and toxicity. This study evaluates the antitrypanosomal and antioxidant potentials of *Rogeria adenophylla* J. Gay. Ex Delile and *Bauhinia rufescens* (Lam.) methanol leave extracts (RAME and BRME).Acute oral toxicity (LD_{50}) assessment was carried out using Lorke's method, followed by *in vivo* evaluation of antitrypanosomal activity in *Trypanosoma*-infected rats. Extracts were administered orally for seven days post-infection (DPI), when the peak trypanosomal load was $\approx 10^6$ trypanosomes/mL. Antioxidant activity was analyzed via standardized assays. The LD_{50} for RAME and BRME was estimated as >5000mg/kg and 3807.89 mg/kg respectively. Antitrypanosomal activity of both extracts demonstrated a dose-dependent ($p<0.05$) decline in mean trypanosomes load count across all the treatments, although total trypanosomes clearance was observed only on RAME treatments (100 to 400 mg/kg). The mean packed cell volume (PCV) has significantly ($p<0.05$) improved across RAME at 200 - 400mg/kg (4% and 8% LD_{50}) and

BRME at 152.32 and 304.63 mg/kg (4% and 8%LD_{50}) treatments, whereas both extracts displayed a dose-reliant antioxidant activity when compared with the controls. RAME demonstrated a promising trypanocidal and antioxidant activity in comparison to BRME with potential trypano-suppressive to trypanostatic effects. This necessitates the need for subsequent separation of bioactive compounds responsible for the antitrypanosomal and antioxidant action.

KEYWORDS: Trypanosomiasis, *Rogeria adenophylla, Bauhinia rufescens,* Antitrypanosomal and Antioxidant activity.

A-084

ELEVATED ALKALINE PHOSPHATASE: A POTENTIAL MARKER OF BONE METABOLISM IN METABOLIC SYNDROME

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ABSTRACT
Metabolic syndrome (MetS) is a systemic disorder characterized by metabolic dysregulation, chronic inflammation, and increased cardiovascular risk. Emerging evidence suggests these disturbances may also impair bone remodelling. Alkaline phosphatase (ALP), a biomarker of bone turnover, has been implicated in potential skeletal alterations. This study examines the prevalence of elevated ALP in MetS patients and its implications for bone health.A cross-sectional study was conducted at Igbinedion University Teaching Hospital, Edo State, Nigeria, involving 75 MetS patients diagnosed using the Joint Interim Statement (JIS) criteria. Serum ALP levels were measured using a standard enzymatic assay, and patients were categorised based on ALP status. Descriptive and inferential statistical analyses were performed, with $p < 0.05$ considered significant. Orthopaedic insights were incorporated to assess the potential impact on bone quality and fracture risk. Elevated ALP was observed in 34.7% of MetS patients, a significant finding that suggests nearly one in three individuals with MetS from this cohort may have underlying alterations in bone turnover. Among these, 21.3% were females, indicating a possible gender-specific susceptibility ($p > 0.05$). These findings suggest that insulin resistance and chronic inflammation in MetS may contribute to skeletal remodelling changes, independent of bone mineral density. A significant subset of MetS patients' exhibit elevated ALP, raising concerns about overlooked bone health risks. Integrating metabolic and orthopaedic assessments could enhance early detection of skeletal complications. Future longitudinal studies are needed to establish causal links and inform multidisciplinary clinical strategies for fracture prevention in MetS patients.

KEYWORDS: Metabolic syndrome, Alkaline phosphatase, Bone turnover, Orthopaedic assessment, Fracture.

A 085

PHYTOCHEMICAL AND TOXICITY EVALUATION OF *Monodora myristica* SEEDS IN WISTAR RATS

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ABSTRACT

This study was aimed at the determination of the phytochemical content and toxicity evaluation of the methanol extract of *Monodora myristica*s eeds in Wistar rats. Qualitative and quantitative analyses confirmed the presence of bioactive compounds like flavonoids (23.62 ± 0.27 mg/g), saponins (22.31 ± 0.22 mg/g), alkaloids (24.60 ± 0.26 mg/g), and steroids (28.55 ± 0.09 µmol/L), suggestive of high therapeutic value. Acute toxicity studies revealed no cases of mortality and signs of toxicity at doses up to 5000 mg/kg, suggestive of a very high level of safety. Sub-chronic administration (250–1000 mg/kg body weight) for 28 days did not produce any negative effect on body weight, hematological parameters, or renal function. Biochemical assays of liver function showed dose-dependent decrease in AST, ALT, and ALP levels and increased levels of total protein and albumin, suggesting potential hepatoprotective effect. Histopathological study of liver and kidney tissues showed normal architecture in all the treated groups, and there was no evidence of tissue damage. The findings showed that *M. myristica* seed methanol extract is not toxic at the dose levels administered and may potentially exhibit health benefits, thus justifying its use in ethnomedicine.

KEYWORDS: *Monodora myristica* seeds, Toxicity, Phytochemical, Extract

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A-087

PHYTOCHEMICAL SCREENING AND THERAPEUTIC EFFECT OF *Manihot esculenta* IN BENZENE-INDUCED LEUKEMIC ALBINO RATS

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ABSTRACT

Leukemia has remained a major threat to life. Treatment by chemotherapy and synthetic drugs have imposed countless drawbacks, hence the need to explore natural products such as plants that are non-synthetic. This study investigated the phytochemical composition of *Manihot esculenta* extract and its therapeutic effects in Benzene-induced leukemic Albino rats. Benzene (0.2 mL of a 1:10 benzene/solvent solution) was administered intravenously at two days interval for 21 days to induce leukemia in the rats. The leukemic rats were treated for two weeks with standard chemotherapy (doxorubicin plus cytarabine), 0.1 ml and 0.5 ml *M. esculenta* (M.E.) respectively. Phytochemical screening showed high concentrations of phenolic compounds, tannins, flavonoids, and quinines in the extract. The un-induced group (negative control) had normal hematological parameters, C-reactive protein (CRP) levels, and lactate dehydrogenase (LDH) biomarkers after treatment. The induced untreated group (positive control) showed high level of compromise in the different parameters determined, indicating leukemia. Treatment with standard chemotherapy (doxorubicin plus cytarabine) was shown to improve WBC, but decreased PCV, hemoglobin and platelet count exacerbating anemia. The group treated with (M.E) extract showed better effect returning significantly ($p < 0.05$) in blood indices (WBC, hemoglobin, PCV and platelet count) to normal or near normal as compared with I/U group and the chemo treated group. The same trend was observed for the oxidative stress levels as anti-oxidant enzyme activity increased significantly ($p < 0.05$) in (SOD, GSH, CAT and GPx) in the group treated (M.E). These findings indicate that *M.esculeta* might be relevant in the treatment and management of leukemia.

KEYWORDS: Leukemia, *Manihot esculenta*, Doxorubicin, Cytarabine, Benzene

A 089

APHRODISIAC POTENTIAL OF *Securidaca longipedunculata* STEM BARK METHANOL EXTRACT ON MALE ALBINO RATS

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ABSTRACT

Male sexual dysfunction (erectile dysfunction, ejaculatory disorders, hypogonadism) is a significant global public health issue, affecting over 20% of males. While synthetic therapies exist, their adverse effects drive interest in plant-based alternatives. *Securidaca longipedunculata* is traditionally used for enhancing sexual function, but scientific validation is limited. This study evaluated the aphrodisiac potential of a methanol stembark extract of S. longipedunculata in male albino rats. Phytochemical screening using standard protocols revealed tannins, flavonoids, steroids, and alkaloids. Fifteen rats were divided into five groups (n=3): Group 1 (control, distilled water 5 mL/kg), Group 2 (standard, sildenafil citrate 5 mg/kg), and Groups 3–5 (extract at 100, 200, 400 mg/kg, respectively). Treatments were administered orally for 14 days. Mating behaviors—mount latency (ML), intromission latency (IL), mount frequency (MF), intromission frequency (IF), ejaculation latency (EL), and post-ejaculation interval (PEI)—were recorded at baseline (week 0), week 1, and week 2. Post-treatment mating performance was also assessed. Baseline parameters showed no significant differences ($P > 0.05$). Post-treatment, extract- and sildenafil-treated groups exhibited significant ($P < 0.05$) reductions in ML, IL, and PEI compared to controls. EL increased significantly ($P < 0.05$) in all treated groups, while IF showed non-significant elevation ($P > 0.05$). Dose-dependent improvements in mating performance were observed in extract groups. The *S. longipedunculata* stem bark methanol extract demonstrated significant aphrodisiac activity, likely mediated by its bioactive constituents. These findings validate its traditional use as a sexual enhancer and warrant further investigation into its mechanisms of action.

KEYWORDS: Aphrodisiac, mating behavior, *Securidaca longipedunculata*, stembark, Phytochemicals

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A 090

ANTIDIABETIC ACTIVITY OF GREEN-SYNTHESIZED SILVER NANOPARTICLES FROM *Ziziphus mucronata* LEAVES.

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ABSTRACT

Green-synthesized silver nanoparticles (AgNPs) offer sustainable, cost-effective therapeutic potential in nanomedicine due to their unique physicochemical properties.
This study explores *Ziziphus mucronata* leaf extract-synthesized AgNPs (ZM-AgNPs) for in vitro antidiabetic activity via in vitro assay. ZM-AgNPs were synthesized using methanol extract, characterized

via UV-Vis spectroscopy, FT-IR, SEM, and XRD. Phytochemical composition was analyzed using GC-MS. Antidiabetic activity was assessed through α-glucosidase and α-amylase inhibition assays at varying concentrations (20 – 100 µg/mL). UV-Vis spectra showed a surface plasmon resonance peak at 412 nm, confirming AgNP formation. FT-IR identified bioactive compounds (phenolics, flavonoids) involved in reduction and stabilization. XRD and SEM revealed crystalline, spherical nanoparticles (20 – 50 nm). ZM-AgNPs exhibited dose-dependent inhibition, with maximal α-glucosidase (88.05%, IC_{50}: 1.56mg/mL) and α-amylase (68.09%, IC_{50}: 61.31mg/mL) activity, surpassing both crude extract (80.59%, 44.34%) and Acarbose (83.32%, 52.24%) respectively. ZM-AgNPs demonstrate superior antidiabetic potential, attributed to enhanced bioavailability and synergistic phytochemical interactions. This underscores their promise as a natural alternative for diabetes management.

KEYWORDS: AgNPs, α-amylase, α-glucosidase, *Ziziphus mucronata*, green-synthesis

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A-091

PHYSICOCHEMICAL PROPERTIES AND PROXIMATE COMPOSITIONS OF THE BLOSSOMS OF THREE *Musa*SPECIES OBTAINED FROM LAPAI NIGER STATE

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ABSTRACT

Banana and plantain are unique perennial single plant which produce banana blossoms as wastes product after harvesting the fruits which rots away in the banana plantations. The blossoms of these plants are vital in human nutrition due its high nutritive values. In this study, the blossoms of three Musa species, namely; *Musa acuminata*, *Musa sapientum* and *Musa paradisiaca*, were evaluated for their nutrient potential. Physicochemical properties, including total soluble solids (TSS), pH, titrable acidity, total sugar, reducing sugar were analyzed alongside proximate compositions (moisture,ash, protein, fat, fiber, and carbohydrates). The results revealedno significant ($p < 0.05$) difference amongst all the species for physicochemical parameters. TSS ranged from 9.00 to 11.58 ^{0}Bix, with *M. paradisiaca*exhibiting the highest value correlating with its elevated Total Sugar (10.38 %). *M. acuminate* showed the highest titrable acidity (1.00 %) and lowest pH of 6.34, indicating more acidic profile. Reducing sugars (5.85 to 8.99 %) and Non-reducing sugars (0.48 to 1.39 %) varied significantly, reflecting differences in sucrose and polysaccharides composition. In case of proximate composition,*M. sapientum* contained the highest Fiber (52.27 %) while *M. paradisiaca*had the highest Protein (10.79 %). *M. acuminate* showed thehighest Ash (6.59 %), Fat (3.22 %) Carbohydrate (28.66 %) and Moisture (6.80 %) with softer texture.The study suggests that the blossoms of the different Musa species contain appreciable amount of nutrients that can be used for animal feed formulation.

KEYWORDS: Banana blossoms, *Musa* species, Physicochemical properties, Proximate composition, Titrable acidity

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A 092

INVITRO DETERMINATION OF ANTIOXIDANT ACTIVITY OF METHANOL EXTRACT AND FRACTIONS OF *Philanthus niruri* LEAF

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ABSTRACT

Phyllanthus niruri has been reported to possess antidiabetic and kidney protective effects. During excess oxidative stress, the body's endogenous system fails to maintain the normal physiology, hence antioxidant supplementation is necessary. This study evaluated phytochemicals, *invitro* antioxidant activities of methanolic extract and fractions of *P. niruri* leaf. The fractionation of the extract was carried out successively using solvent-solvent partitioning in a separating funnel.The*invitro* antioxidant activities of methanolic extract and fractions of *P. niruri* leaf were determined using DPPH and FRAP methods respectively. Methanolic extract gave a yield of 19.82g. The quantitative phytochemical content of total phenol and flavonoids in the methanolic extract were 24.05mg/100g and 13.81mg/100g respectively. Aqueous fractions gave the lowest yield of total phenol of 2.03mg/100g and flavonoids 1.04mg/100g content as compared with other fractions. Qualitative phytochemical content of *P. niruri* shows that Alkanoids, Anthraquinones, flavonoids, glycosides, saponins, steroids and Tannins were all present in the extract and fractions of the leaf. Antioxidant activities of the leaf show that n-hexane fraction had the highest IC_{50} value of 51.77mg/ml and aqueous fraction had the lowest IC_{50} value of 48.92mg/ml. FRAP assay shows that n-hexane fraction had the highest IC_{50} value of 63.98mg/ml and aqueous fraction had the lowest IC_{50} value of 22.26mg/ml.This study shows that methanol extract and fractions of *P. niruri* leaf shows high antioxidant potentials that can be of benefit in the treatment of severaldisease.

KEYWORDS: *Phyllanthus niruri,* phytochemicals, DPPH, FRAP, Antioxidants

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A-093

ANTISNAKE VENOM POTENTIALS OF CRUDE AND FRACTIONATED EXTRACTS OF *Sclerocarya birrea* ROOT-BARK

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ABSTRACT

Snake venom is a complex mixture that induces toxic effect such as edema,hemorrhage, paralysis and death. The clinical management of snake envenomation is by parenteral administration of serum based antivenins, which causes adverse reactions. Hence, this research is aimed at evaluating the antisnake venom potential of *Sclerocarya birrea* rootbark extracts on *Naja nigricollis*venom. Information on the medicinal plants used for the treatment of snake bite envenomation in Gummi Local Government Area was obtained through Ethnobotanical survey. One (1) of the most cited plants; *Sclerocarya birrea* was selected. The root-bark of *S. birrea* was collected, authenticated and extracted using methanol followed by solvent fractionation using n-hexane, ethylacatate and n-butanol. The LD_{50} and LD_{100} of the venom was determined using Probit analysis. Theantivenom activity of the crude extract was evaluated by grouping experimental animals (albino rate) into six groups; normal control, venom control, venom and conventional antivenin, venom and extracts (300mg/kg b.vwt), venom and extracts (500mg/kg b.wt) and extracts only (500mg/kg b.wt). For the fractionated extracts animals were grouped into seven; normal control, venom control, venom and antivenin, Venom and n-hexane fraction, venom and n-butanol fraction, venom and aqueous fraction. The lethal doses, 50% (LD_{50}) and 100% (LD_{100}) of the venom were determined to be 0.389 and 3.891 mg/kg b. wt respectively. The phytochemicals composition of *S.birrea* root-bark revealed the presence of saponin, flavonoid, tannins, phenol, alkaloids and steroids. The plant extracts exhibited anti-venom activitieswith different degrees of efficacy. The antivenom activities of the extracts is a dose dependent. At higher dose of the extract; 500mg/kg b.wt., the crude extract has no significant difference($p>0.05$) with the standard antivenin. Among the fractions, the ethyl acatate fraction exhibited the highest antivenom activitywith mean survival time of 22.75±1.25h and 75% survival rate when compared with other fractions. These findings suggested that, the *Sclerocarya birrea* root-bark extracts have potential anti-venom activities on the selected venom and can serve as an alternative for the development of safe, readily available and affordable plant-based antivenom that can substitute the use of serum-based antivenins.

KEYWORDS: Snake venom, Antivenom, Crude extract, Fractionated extracts, *Sclerocarya birrea.*

A-094

LAXATIVE EFFECT OF AQUEOUS LEAF EXTRACT OF *Euphorbia heterophylla* ON ENERGY METABOLISM

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ABSTRACT

Euphorbia heterophylla Linn is a medicinal plant used by traditional herbal practitioners in Nigeria for purgative purposes. This study was designed to investigate the laxative effect of aqueous leaf extract of *Euphorbia heterophylla* (ALEEH) on energy metabolism in Wistar rats. A total of thirty-six (36) ratswere grouped into six (6). Group 1 rats (control) received normal saline,while group 2 rats received standard laxative (5mg bisacodyl). The remaining four groups received ALEEH at graded doses (10- 250mg/kg b.wt) for 30minutes before they were sacrificed. Blood samples were collected in heparinized bottles, while muscle, small intestine and liver were quickly excised, and weighed portions were used in preparation of tissue homogenate for biochemical assays. The extract affected energy metabolism through changes inkey glycolytic enzymes (LDH, PFK and PK) and related parameters (CK and Glycogen). The result showed a significant decrease in LDH, PFK, PK and glycogen level with an increase in CK.ALEEH exerted a stronger laxative effect than bisacodyl (standard laxative). These findings provide a scientific justification for body weakness by traditional folks on use of ALEEH for laxative purposes. There is therefore need for caution in the use of this extract due to adverse effects which can result to death.

KEYWORDS: *Euphorbia heterophylla,* Energy Metabolism, Laxative, Bisacodyl, Glycolytic enzymes.

A-095

CYTOTOXIC ACTIVITIES OF SOME PLANTS USED IN NIGERIAN ETHNOMEDICINE FOR THE TREATMENT OF CANCER

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ABSTRACT

Cancer remains a leading cause of death globally, with Africa recording approximately 573,653 cancer-related deaths in 2022 and a projected rise to one million by 2030. In Nigeria, many cancer patients turn to

medicinal plants for treatment, though the therapeutic efficacies of most remain scientifically unverified. This study investigated the cytotoxic activities of 14 medicinal plants traditionally used in Nigerian ethnomedicine for the treatment of cancer. The leaves of *Acacia senegal, Ageratum conyzoides, Albizia chevalieri, Annona muricata, Borreria stachydea, Cassia singueana*, *Dicoma tomentosa,Guiera senegalensis, Heliotropium indicum, Peristrophe bicalyculata*, *Physalis angulata*, *Senegalia ataxacantha, Xeromphis nilotica,* and the stem bark of *Euphorbia hirta* were screened for cytotoxicity against the human cervical cancer (HeLa), breast cancer (MCF-7) and lung cancer (A549) cell lines, using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay. The most potent activity was observed against HeLa cells. Bioactivity-guided fractionation of the most active extracts led to the identification of three subfractions: AMHE-S-1, AMHE-S-2, and AMHE-S-3 from the ethyl acetate fraction of *A. muricata* (AMHE2), with AMHE-S-1 being most active (IC = 8.56 ± 1.36µg/ml). AMHE-S-1 induced lactate dehydrogenase (LDH) and caspase activity, disrupted mitochondrial membrane integrity, caused DNA damage, and inhibited cell migration. It also modulated gene expression by upregulating BAX and caspase-3 while downregulating BCL2, suggesting apoptosis induction. Liquid chromatography-mass spectrometry (LC-MS) analysis of AMHE-S-1 revealed the presence of bromosuccinic acid, 3-hydroxy-beta-ionone, and 2-arylbenzofuran flavonoid. These findings provide scientific validation for the use of *A. muricata* and support its therapeutic potential in the treatment of cervical cancer.

KEYWORDS: Cytotoxicity, *Annona muricata*, HeLa cells, Apoptosis, Medicinal plants.

A-096

ANTIDIABETIC EFFECT OF BIOACTIVE COMPOUNDS FROM *Phaseolus vulgaris* SEED: AN*IN SILICO* AND *IN VITRO* APPROACH

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ABSTRACT

Alpha amylase and glucosidase inhibitors are beneficial in the treatment of diabetes by inhibiting the absorption of carbohydrates from the small intestine while the peroxisome proliferator-activated receptor gamma (PPAR-γ) agonists increase the tissues sensitivity to insulin action. Thus, the current study aimed to investigate the inhibitory activity on α- amylase and α -glucosidase, and PPAR-γ agonist property of phasvulic acid and dihydrophaseic acid isolated from *Phaseolus vulgaris* using an *insilico* approach.*In vitro* model was used to assess the inhibitory effect of β-sitosterol glucoside and stigmasterol glucoside against human α- glucosidase, and α- amylase. Compounds from *P. vulgaris* were docked against human α -glucosidase, α- amylase and PPAR-γ using AutoDock Vina and their ADMET profiles were evaluated *in silico*.The docking studies showed that phasvulic acid, dihydrophaseic acid and acarbose exhibited binding energies of −7.0, −6.2 and -5.7 kcal/mol, against α-glucosidase: -7.8, -6.8 and -6.8 kcal/mol against α-amylase respectively. The docking results with PPARγ showed they had binding energies of -7.7 and -3.67 kcal/mol respectively. The IC50 values were 3.03 ±1.2 and 11.54 ±2.00 µM for acarbose while the pure compounds had values of 548.75 ± 2.79 and 18.9 ± 4.00 µM for α-amylase and α-glucosidase respectively. The ADMET prediction indicates favorable properties and has potential pharmacological actions.Conclusively, bioactive compounds obtained from *P. vulgaris* seed extract displayed significant antidiabetic activity. Hence, they could serve as a potential antidiabetic compound as well as add to the library of α-glucosidase inhibitory agentsactivity.

KEYWORDS: Diabetes mellitus, *Phaseolus vulgaris*, phasvulic acid, peroxisome proliferator-activated receptor gamma (PPAR-γ), alpha glucosidase

A-097

THERAPEUTIC EFFECTS OF *Cucurbita pepo* LEAF AND SEED EXTRACTS ON INDUCED INFERTILITY IN FEMALE ALBINO RATS

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ABSTRACT

Infertility is now one of the major health challenges among all ages especially in female. Excessive production of reactive oxygen species (ROS) and inflammation is seen as one of the main etiologies. This study is aimed to determine the therapeutic effects of *Cucurbita pepo* leaf and seed extracts on induced infertility in female albino rats. Thirty albino rats (24 females and 6 males) were grouped into six groups of five rats each. Group 1(Nc) and 2 (I) were controls, while group 3 (S&L), 4 (L), 5(S) and 6 (VE) were administered 20mg/kg of $AlCl_3$ and treated with extracts and standard drugs for 8weeks. The phytochemical Biochemical evaluation was carried out using spectrophotometric methods. The serum concentration of reproductive hormones was determined using ELISA techniques. The results of phytochemical screening revealed the presence of alkaloids, steroids, flavonoids, terpenoids, phenols, saponins, to be 37.15 ± 0.30, 28.42 ± 1.17, 23.62 ± 0.57, 25.79 ± 0.62, 17.99 ± 1.47, 17.77 ± 0.12 respectively. Both extracts of *Cucurbita pepo*(seed and leaf) showed noticeable effect on antioxidant activity and inflammatory cytokines. This significantly ($p<0.05$) increase the serum concentration of superoxide dismutase (SOD) and Glutathione peroxidase (GPx) with significant decrease in the serum level of Malondialdehyde (MDA) in all the treatment when compared to group I (induced). The result of the extracts also exhibited an excellent potency against inflammation due to the significant decrease($p<0.05$) in the serum level of interleukin (IL-6) cytokines in all the treatment group when compared to the $AlCl_3$ induced group with the concentration of 226.89 ± 3.45. This clearly showed that the extracts have protective effect on the damage caused by $AlCl_3$ and therefore can ameliorates female infertility resulting from oxidative stress and inflammation.

KEYWORDS: Infertility, Oxidative stress, *Cucurbita pepo,* Antioxidants, Pro-inflammatory cytokines.

A-098

COMPARATIVE ANALYSIS OF THE CHEMICAL PROFILES OF THREE VALIDATED ANTIDIABETIC MEDICINAL PLANTS; *Gongronema latifolia, Heinsia crinita* AND *Peristrophe bicalyculata:* MARKERS FOR IDENTIFICATION AND STANDARDIZATION.

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ABSTRACT

Medicinal plants constitute a source of raw materials for both traditional and modern systems of medicine, but the problem of mis-identification and standardization of these plant crude extracts exists. The main aim of this study was to compare the chemical profiles of three validated anti-diabetic plants namely, *Gongronema latifolia (utazi), Heinsia crinita, (atama), Peristrophe bicalyculata (vinegar);* to establish if there are some common phytochemicals with antidiabetic activities, that could be used as active biomarkers

for antidiabetic plants and subsequently for identification and standardization of the plant preparations. The dried pulverized leaves were macerated in 80% ethanol and subjected to Gas Chromatography-Mass Spectrometry (GC-MS) analysis. Chromatograms of extracts showed 40 peaks each of the identified phytochemical compounds for *G.latifolia, H.crinita, P.bicalyculata* respectively. However, only eleven (11) phytoconstituents namely geraniol, linalool, beta-caryophyllene, alpha-pinene, bisabolene, terpinen-4-ol, alpha terpineol, borneol, neral, alloocimene and benzyl alcohol were common to all three plants. All except one of these common phytoconstituents (Mycrene) have been shown to possessantidiabetic activity. It is proposed that anyone or a synergy of these ten common phytochemicals might be used as active therapeutic markers for identification and standardization of the three plants and by extension other anti-diabetic plants if the same similarities can be established for the plants.Based on the narrow percentage range of peaks in the three plants, Bisabolene (2.57- 3.52%), Neral (1.16-1.60%) and Terpinen-4-ol (4.38- 5.33%) could be better active diabetic marker candidates for standardization of the three plants.

KEYWORDS: Antidiabetic plants, Chemical markers, *Gongronema latifolia, Heinsia crinita, Peristrophe bicalyculata*

A-099

DYSGLYCAEMIA, DYSLIPIDAEMIA AND CARDIOVASCULAR RISK AMONGST HYPERTENSIVES ATTENDING THE UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL, RIVERS STATE, NIGERIA.

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ABSTRACT

This study investigated the dysglycaemia, dyslipidaemia and cardiovascular risk amongst hypertensives attending the University of Port Harcourt Teaching Hospital, Rivers State, Nigeria. The study adopted a cross-sectional study design. Data were collected using structured self-administered questionnaire, clinical records, basic haematological investigation and anthropometry. A total of 38 hypertensive patients were enrolled. The result indicated that cardiovascular risk was more in females (65.79%) than males (34.21%). The marital status distribution presented married (86.84%) as the majority at risk. The mean BMI presented 35.81 kg/m^2 (SD = ±6.5) indicating that most of the participants fell within the obese category, whereas the LDL (mg/dL) Mean was 3.23 mg/dL (SD = ±0.53) and Triglycerides (mg/dL) Mean was 1.45 mg/dL (SD = ±0.23). Fasting Blood Glucose (FBG): Mean = 12.99 mg/dL (SD = ±8.01). HbA1c (%) Mean was 8.41% (SD = ±1.97) indicating poor glycaemic control and the Cardiovascular Risk Score mean was 3.74 (SD = ±1.48). The lifestyle of the study participants showed: (15.62%) smokers, (84.38%) non-smokers, (81.58%) consumed alcohol while (18.42%) do not take alcohol. However, sex and medical history were strongly significant ($p < 0.001$), indicating their vital role in the prevalence of medical conditions such as hypertension and diabetes. Therefore, in view of the importance of genetic counselling to hypertensives, enforcement of health education is advocated. This study provided valuable insights into the relationship between biochemical parameters and cardiovascular risk factors in hypertensives.

KEYWORDS: Dysglycaemia, Dyslipidaemia, Cardiovascular, Hypertensives, Haematology.

A-100

COMPUTATIONAL DISCOVERY OF NATURAL PFM1 AMINOPEPTIDASE INHIBITORS AS NOVEL ANTIMALARIAL AGENTS: AZULENE SN AND GARDENIN A OUTPERFORM BESTATIN

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ABSTRACT

Malaria is still a major worldwide health concern, and in order to tackle treatment resistance, new antimalarial drugs must be developed. Potential inhibitors of *Plasmodium falciparum* M1 aminopeptidase (PfM1 AP), a validated therapeutic target essential for parasite proteostasis, are sought after in this study using *in silico* techniques. The 3D crystal structure of PfM1 AP (PDB ID: 8SLO) was optimized and verified through the use of Ramachandran analysis and energy minimization. Pre-filtered using Lipinski's and Veber's rules, a library of 1,040 natural compounds, and the reference inhibitor Bestatin were subjected to molecular docking, ADMET profiling, and binding site analysis. Virtual screening identified two lead compounds, Azulene Sn and Gardenin A, with higher binding affinities (−8.3 kcal/mol) than Bestatin (−7.6 kcal/mol). Pharmacokinetic predictions showed favorable absorption, distribution, and safety profiles for both leads, with Gardenin A showing less hepatotoxicity than Bestatin. Binding interaction analyses revealed different mechanisms: Bestatin formed complexes rich in hydrogen bonds, whereas Azulene Sn relied on hydrophobic interactions, and Gardenin A engaged in π-stacking.These results highlight the possibility of Gardenin A and Azulene Sn as multi-target antimalarial options with improved efficacy and decreased toxicity, deserving of additional *in vitro* and *in vivo* testing.

KEYWORDS: *Plasmodium falciparum*; Malaria; M1 aminopeptidase; Azulene Sn; Gardenin A

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IN SILICO DISCOVERY OF TANGERETIN AS A POTENT PF DHFR-TS INHIBITOR WITH ANTIMALARIAL POTENTIAL: A COMPUTATIONAL AND PHARMACOKINETIC PROFILING STUDY

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ABSTRACT

Plasmodium falciparum dihydrofolate reductase-thymidylate synthase (Pf DHFR-TS), an enzyme mainly involved in folate and thymidylate production for DNA synthesis, is a crucial target for development of novel antimalarial therapeutics. Here, we employed *in silico* strategies to identify natural compounds with inhibitory activity against Pf DHFR-TS. A library of 1040 natural compounds derived from indigenous plants and pre-screened for drug-likeness were docked against the 3D crystal structure of Pf DHFR-TS (PDB ID: 1J3I) using Auto Dock Vina. Tangeretin, a flavonoid, had a greater binding affinity (-7.6 kcal/mol) compared to the reference drug Pyrimethamine (-7.3 kcal/mol). Analysis of the pharmacokinetic properties via Swiss ADME and pkCSM revealed Tangeretin's favourable bioavailability, though its potential hERG II inhibition warrants caution. Binding site analysis highlighted Tangeretin's diverse interactions including hydrogen bonds and π-stacking with residues ILE899, PHE1016, and ASN1017 which suggests robust target engagement. While Pyrimethamine demonstrated broader tissue distribution, Tangeretin's efficient clearance

and minimal toxicity risks position it as a promising antimalarial drug candidate. This study underscores the utility of computational approaches in accelerating drug discovery while emphasizing the need for further experimental validation to address safety concerns.

KEYWORDS: Malaria; *Plasmodium falciparum*; dihydrofolate reductase-thymidylate synthase, in silico,

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A-102

SEROPREVALENCE OF HBV INFECTION AMONG STUDENTS AT SA'ADU ZUNGUR UNIVERSITY, BAUCHI STATE NIGERIA.

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ABSTRACT

Hepatitis B virus infection is hyper-endemic in Nigeria, with a prevalence rate of 9.9% in Nigeria and 10.7% in Bauchi state though works of literature on HBV are scanty. Several studies have reported various prevalence rates among undergraduate students.This cross-sectional descriptive study was carried out on both male and female undergraduate students from different faculties of Sa'adu Zungur University Bauchi State with the aim of assessing the prevalence of HBV.About 3ml of venous blood sample was withdrawn from consecutive consenting students who agreed to take part in the study; the blood was then screened for HBV using a combo rapid kit. Ethical clearance was sought in addition to participants' consent forms before conducting the study. Out of 213 students who participated in this study, the prevalence rate was 8% which is (17/213), this indicates a high prevalence. Out of the seventeen positive samples, 11.7% (2) were positive for HBsAb and 5.9% (1) students was positive for HBeAg. The highest prevalence was recorded among students aged 21 to 25 (72.3%). Married students recorded a prevalence rate of 11.7% (2). The females recorded the highest prevalence of 58.8% (10) while the males had 41.2% (7). By WHO recommendation the sero prevalence of HBV infection in this study is hyper-endemic among the students. Therefore screening for HBsAg is very important, especially in university settings;the priority of every university should be safeguarding the well-being of its students against infectious diseases through regular screening, creating awareness, and vaccination.

KEYWORDS: HBV, Hepatitis B virus,HBsAg, Hepatitis, HBsAb,HBeAb, WHO.

A103

UNVEILING *MKPURUMIRI*: GCMS AND FTIR PROFILING OF ILLICIT METHAMPHETAMINE FROM OWERRI, SOUTH EAST NIGERIA

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ABSTRACT

Illicit methamphetamine is the second most abused substance globally and ranks next to cannabis in Nigeria. Locally known as *crystal ice*, *ice*, or *mkpurummiri* in South East (SE) Nigeria, its dynamic synthesis, widespread use, and rising abuse have become a serious public health concern, contributing to psychosocial dysfunction and multidimensional disabilities among users, families, and communities. Gas Chromatography-Mass Spectrometry (GC-MS) and Fourier-Transform Infrared Spectroscopy (FTIR) were used to identify the organic constituents and functional groups in samples of *mkpurummiri* from the streets of Owerri, SE Nigeria. The results revealed a toxic mixture of compounds with characteristics consistent with methamphetamine. Notably, high concentrations of 2,4-di-tert-butylphenol (2,4-DTBP), 1,3-dichlorobenzene, potential acyl donors, and hydroxylamine O-decyl were detected, suggesting their possible roles in the synthesis. These findings point to the likely use of the phenyl-2-propanone (P2P) pathway, involving oxidation, Friedel–Crafts acylation, and reduction reactions catalyzed by organic reagents and Lewis acids. Although inorganic compounds are not detected by GC-MS, their involvement cannot be excluded. The suspected sourcing of precursors from the ubiquitous polymer industry highlights an alarming trend that facilitates the spread of *mkpurummiri* and worsens its psychosocial and toxicological impacts. The continued circulation of this potent cocktail further strains Nigeria's already fragile social, economic, and healthcare systems.

KEYWORDS: Illicit methamphetamine, *mkpurummiri*, GC-MS, FTIR, P2P pathway

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A-104

ASSOCIATION OF HEMOGLOBIN VARIANTS AND UNCOMPLICATED *PLASMODIUM FALCIPARUM* MALARIA AMONG FEBRILE PATIENTS ATTENDING AHMADU BELLO UNIVERSITY HEALTH SERVICES

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ABSTRACT

Researchers have reported that genetic factors such as hemoglobin (Hb) influence the susceptibility of the human host to malaria infection. This study investigated the association between hemoglobin variants and *P. falciparum* malaria among febrile patients attending Ahmadu Bello University Health Services. A cross-sectional study design was employed, involving 50 participants aged 2 to over 40 years who had given their consent. A semi-structured questionnaire was developed and administered. Blood samples from the patients were collected and microscopically screened for *P. falciparum* and genotypes. It was found that the majority of the febrile patientswere females aged 26 to 29 years (72%), undergoing university education, residing in ABU hostels (62%), and possessing prior knowledge of malaria and their genotype. Most febrile patients examined belonged to the HbAA type (69%), while AS and AC patients comprised 22% and 9%, respectively. High *P. falciparum* parasitemia was observed in the AA genotype at 68%, while AS had 24%, and AC had 8%. The percentage of low haematocrit among the patients relative to their genotypes was 75%, 20%, and 5% for AA, AS, and AC genotypes, respectively. The average parasitemia level and percentage hematocrit of the AA genotype patients (2%) were statistically higher ($p < 0.05$) than those of the AS (0.1%) and AC (0.01%) patients, respectively. It was concluded that most of the febrile patients examined had the HbAA genotype, high *P. falciparum* parasitemia, and low hematocrit values. A negative association exists between HbSC/HbAC genotypes and *P. falciparum* density, which is suggestive of protection.

KEYWORDS: Hemoglobin, *P. falciparum*, genotypes, hematocrit, Malaria.

A-105

PARTIAL PURIFICATION, CHARACTERIZATION AND ANTIMICROBIAL PROPERTIES OF *Mangifera indica* SEED LECTINS

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ABSTRACT

Lectins are group of proteins that play a crucial role in plant defense against various invading pathogens. With the increasing global threat of antimicrobial resistant pathogens, lectins are currently exploited for their potential antimicrobial effects against varieties of multidrug resistant bacteria. In this study, lectins extracted from *Mangifera indica* seed was partially purified on size exclusion chromatography and characterizedbased on its hemagglutination activity. Thereafter, its antimicrobial activity was evaluated against multi drug resistance *Escherichia coli*, *Klebsiella pneumoniae* and *Staphylococcus aureus* using agar well diffusion method.The milled *M. indica* seed fine-powder was defatted using n-Hexane, and its lectins was extracted in aqueous phosphate buffer saline pH 7.2. The crude lectin extract was partially purified on a Sephadex G-50 resin and the absorbance was monitored at 280 nm. Protein peaks were assayed for hemagglutination activity using rabbit and human ABO erythrocytes. The fraction peaks that visibly agglutinated the erythrocytes were pooled and called partially purified *M. indica* seed lectins (ppMISL). The hemagglutination activity was optimal at pH values between 7.0 and 8.0, and the lectin remained active until 40°C. Although the ppMISL did not show antibacterial activity against thetested bacteria isolates, the crude extract showed visible zones of inhibitions on all the tested MDR bacterial isolates at different concentrations suggesting that *M. indica* seed lectins has the potential to be exploited against MDR pathogens.

KEYWORDS: Lectins, *M. indica*, Partial purification, Multidrug resistant bacteria

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QUANTITATIVE EVALUATION OF NUTRACEUTICALS IN DICHLOROMETHANE EXTRACTS OF *Piper guineense* AND *Xylopia aethiopica* SEEDS

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ABSTRACT

Nutraceuticals in plants has been the underlying principle behind their medicinal relevance and pharmaceutical applications. Fresh and matured seeds of *P. guineense* and *X. aethiopica* purchased from Choba market were separately pulverized after 14 days of drying at room temperature. Twenty grams of each sample was staple-sealed in separate Whatman no. 4 filter paper and extracted in a Soxhlet extractor using dichloromethane as solvent. The extracts obtained were concentrated and their nutraceuticals determined using GC-MS. Amongst the 79 nutraceuticals observed in *P. guineense* seed, 4,5-dimethoxy-6-(2-propenyl)-1,3-Benzodioxole ($C_{12}H_{14}O_4$),4-methoxy-6-(2-propenyl)-1,3-Benzodioxole ($C_{11}H_{12}O_3$),(2E,4Z)-N-Isobutyldeca-2,4-dienamide ($C_{14}H_{25}NO$) and β-Bisabolene ($C_{15}H_{24}$) were the most predominant with percentage concentration of 34.986, 15.388, 9.238 and 7.357 respectively. The most predominant amongst the 100nutraceuticals observed in*X. aethiopica* seed are 1a,2,3,4,4a,5,6,7b-octahydro-1,1,4,7-tetramethyl-,[1aR-(1a.alpha.,4.alpha.,4a.beta.,7b.alpha.)]-1H-Cycloprop[e]azulene ($C_{15}H_{24}$), 4-methyl-1-(1-methylethyl)-3-Cyclohexen-1-ol ($C_{10}H_{18}O$), 2-Pinene ($C_{10}H_{16}$) and (-)-Germacrene D ($C_{15}H_{24}$) with percentage concentrations of 10.819, 8.316, 7.006 and 3.436 respectively. This present study reveals the potentials of these plant seeds as nutraceutical hives of compounds with promising pharmaceutical values.

KEYWORDS: Nutraceuticals, Plant seeds, Medicinal relevance, Pharmaceutical applications.

A-108

BEHAVIORAL AND NEUROCHEMICAL EVALUATION OF *Portulaca oleracea* AS A POTENTIAL ANTIDEPRESSANT AGENT IN A RAT MODEL

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ABSTRACT

Depression is a debilitating mental disorder associated with increased risk of criminal behaviour, substance abuse, and suicide. This study evaluated the antidepressant potential of hydro-ethanolic extract of *Portulaca oleracea* (HEPO) in wistar rat model.

Thirty male wistar rats weighing 180±20 grams were divided into five groups. The animals were subjected to stress by preventing them from sleeping for 24 hours after which they were treated. Group 1 (control) received no treatment, group 2 was treated with fluoxetin (5mg/kg b.w.) while groups 3, 4 and 5 were treated with HEPO (200, 400 and 600 mg/kg b.w. respectively) for 14 days. The forced swim test (FST) and tail suspension test (TST) were used to investigate the antidepressive effect of HEPO in the rat model. Cerebral cortex, cerebullum, medulla oblongata, midbrain and basal ganglia were isolated to elucidate HEPO's impact on monoaminergic neurotransmission, acetyl cholinesterase activity, and calcium homeostasis across the brain region. There were significant reduction of the immobility times in the FST and TST following oral administration of HEPO 2 hours prior to testing when compared to the control group and no significant difference in dose variation when compared to FXT group. After treatment with HEPO, dopamine, norepinephrine and serotonin were significantly increased in the studied brain region, acetyl cholinesterase was increased in all brain regions except in the cerebellum while there was a decrease in calcium concentration of the brain cortex. The results suggest that HEPO exhibit antidepressant-like effect and the ability to modulate key neurochemical pathways implicated in depression.

KEYWORDS: Antidepressant, *Portulaca oleracea,* neurochemical pathways, brain, depression.

A109

PREVALENCE AND SOCIO-CLINICAL CORRELATES OF TYPHOID FEVER AND MULTIDRUG-RESISTANT SALMONELLA ENTERICA TYPHI IN NIGERIA'S FEDERAL CAPITAL TERRITORY

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ABSTRACT

Typhoid fever remains a major public health challenge in Nigeria, exacerbated by the rise of multidrug-resistant (MDR) *Salmonella enteric*serovar Typhi. This study investigated the prevalence of typhoid fever in the Federal Capital Territory (FCT) and examined its socio-clinical determinants and MDR patterns. A cross-

sectional study was conducted among 628 participants, assessing demographic, environmental, and clinical factors, alongside antibiotic sensitivity profiles of isolated *S.* Typhi strains. The prevalence of typhoid fever was 27.4%, with the highest burden among young adults (18–27 years). MDR strains exhibited alarming resistance to first-line antibiotics, including 100% resistance to tetracycline and 97.7% resistance to co-trimoxazole and amoxicillin-clavulanate. Key risk factors included self-medication with antibiotics, reliance on untreated boreholes and sachet water, and inadequate sanitation. Notably, levofloxacin remained the most effective antibiotic, with 76.7% susceptibility. These results reflect the critical need for focused public health measures, enhanced water and sanitation infrastructure, and antibiotic monitoring initiatives to reduce the spread of typhoid and antibiotic resistance.

KEYWORDS: Typhoid fever, multidrug resistance, socio-clinical factors, *Salmonella*Typhi, public health

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SAFETY ASSESSMENT OF POLYPHENOLIC EXTRACTS OF *Paullinia pinnata* LEAVES IN ALLOXAN-INDUCED DIABETIC RATS

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ABSTRACT

Polyphenolic extracts of *Paullinia pinnata* leaves (PPPL) have been shown to possess antidiabetic, antihyperlipidemic, and antioxidant properties. The safety of PPPL was evaluated in the present study on Alloxan-induced diabetic rats. Male albino rats with a body weight of 150 ± 1.14 g were rendered diabetic by intraperitoneal administration of Alloxan monohydrate (120 mg/kg b.w) and subsequently treated with PPPL (25 or 50 mg/kg b.w) for 14 days. Body weight, biochemical parameters (AST, ALT, ALP), liver and kidney function tests, hematological parameters, and tissue histology were evaluated. Both doses of PPPL treatment preserved hepatic and serum total protein content and maintained hematological parameters comparable to non-diabetic controls ($p > 0.05$). PPPL treatment brought urea, creatinine, and serum creatine kinase levels back to near normal levels, in contrast to untreated diabetic rats. While ALT levels remained high, AST and ALP serum, liver, and kidney levels were normalized in the 25 mg/kg PPPL group ($p > 0.05$). Histopathologically, there were no hepatic lesions in PPPL-treated rats. Mild to moderate pancreatic degeneration was manifested, though with fewer architectural distortions than in untreated diabetic controls. These findings indicate that PPPL (25–50 mg/kg b.w) administration via oral route is not causative of discernible adverse effects in diabetic rats. The extract has a good safety profile, heralding its potential therapeutic use in the management of diabetes. Further studies are warranted to elucidate long-term effects and mechanisms.

KEYWORDS: Alloxan, diabetes, *Paullinia pinnata*, hepatic, creatinine

A-111

IN SILICO EVALUATION OF BITTER KOLA (*Garcinia kola*) PHYTOCHEMICALS AS POTENTIAL INHIBITORS OF KEY SARS-COV-2 REPLICATIVE ENZYMES

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ABSTRACT

Despite the availability of vaccines and antivirals, the global health threat posed by SARS-CoV-2 remains, especially with emerging variants that demonstrate immune evasion. There is growing interest in phytochemicals from traditional medicinal plants as alternative therapeutic agents. Garcinia kola (bitter kola), widely used in African ethnomedicine, contains bioactive compounds with known antiviral and anti-inflammatory properties. This study aimed to assess the potential of ten phytochemicals derived from Garcinia kola to inhibit three key SARS-CoV-2 replicative enzymes: helicase, main protease (Mpro), and 3-chymotrypsin-like protease (3CLpro), using *in silico* molecular docking and ADMET profiling. Phytochemicals including kolaviron, garcinoic acid, garcinia biflavonoids (GB-1, GB-2), apigenin, and quercetin were retrieved from PubChem and assessed for drug-likeness, bioactivity, and pharmacokinetics. Protein targets (PDB IDs: 6ZSL, 7SET, 7LMD) were prepared for docking using AutoDock Vina. Docking scores and binding interactions were analyzed alongside *in silico* ADMET predictions and drug-likeness rules. Garcinoic acid showed the strongest interaction with SARS-CoV-2 helicase (-7.1 kcal/mol), while kolaviron had the highest affinity for Mpro (-6.1 kcal/mol), surpassing the control drug nelfinavir. GB-2 also demonstrated strong binding to 3CLpro (-6.1 kcal/mol). Most compounds showed favourable ADMET profiles with high gastrointestinal absorption, moderate clearance, non-carcinogenicity, and compliance with multiple drug-likeness rules. Notably, no prior study has reported helicase-targeted phytochemical docking, highlighting this as a novel contribution. Garcinia kola-derived phytochemicals, particularly kolaviron and garcinoic acid, exhibit promising inhibitory activity against SARS-CoV-2 replicative enzymes and demonstrate favourable drug-likeness and safety profiles. These findings support their further investigation as candidates for anti-COVID-19 therapeutic development.

KEYWORDS: SARS-CoV-2, Garcinia kola, *in silico* docking, kolaviron, ADMET

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MOLECULAR DOCKING STUDY OF THE ANTIDIABETIC POTENTIAL OF COMPOUNDS FROM *Tapinanthus bangwensis*.

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ABSTRACT

Recently, research effort shifts from synthetic drugs to plant-based drugs in diabetic treatment due to toxicity. Thus, molecular docking tool was used to investigate the anti-diabetic potential of compounds from *Tapinanthus bangwensis* using two target proteins (α-amylase and α-glucosidase). The extracts (HECF1 and HECF2) were obtained by column chromatography. Analysis of the antioxidant and anti-diabetic activities were determined by DPPH and ABTS, and α-amylase and α-glucosidase assays. Molecular docking was done using MOE, 2015 software. The in vitro results showed that the mean inhibition concentration (IC_{50}) of HECF1 was lower than the HECF2. The LC-MS result (HECF1) revealed eighteen compounds (ligands) which were docked withα-amylase and α-glucosidase proteins. For α-amylase, the control's docked score (-9.085kcal/mol) was higher compared to those of the compounds that were between -3.506 – (-6.355kcal/mol). The interaction between the four top-ranked compounds with the enzyme are as follows:1-(-4-chloro-3-trifluoromethyl) phenyl)-3-(-4-hydroxyphenyl) urea (Arg 195, Asp 300), diiodotyrosylglycine (Asp 197, Asp 300), Methimazole (His 299, Arg 195, Asp 197) and neophytadiene (Trp 59). For α-glucosidase, the control's docked score was -8.311kcal/mol compared to the ligands (– 3.636 - (- 6.416 kcal/mol]. The result showed that the four top-ranked ligands interacted with the enzyme's binding sites as follows: 1-(-4-chloro-3-trifluoromethyl) phenyl)-3-(-4-hydroxyphenyl) urea (Asp 327, Met 444, Asp 203), diiodotyrosylglycine (Asn 449, Arg 526, Asp 542, Met 444), Bromomesaconic acid (His 600, Asp 542, Met 444) and ethanone, 1-(2- amino phenyl) (Asp 327, His 600, Tyr 299).In conclusion, 1-(-4-chloro-3-trifluoromethyl) phenyl)-3-(-4-hydroxyphenyl) urea and diiodotyrosylglycine may be a therapeutic option for DM treatment.

KEYWORDS: *Tapinanthus bangwensis*, Anti-diabetic, Molecular docking, Molecular operating environment (MOE), liquid Chromatography-Mass spectroscopy.

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IN VITRO AND *IN SILICO* APPROACHES TO DECIPHER THE INHIBITORY ACTION OF KOLAVIRON AGAINST PHOSPHOLIPASE A_2 ISOLATED FROM *Naja nigricollis*

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ABSTRACT

Snake venom phospholipase A_2 ($svPLA_2$) enzymes induce toxicity via oxidative stress, and Kolaviron, a biflavonoid known for its antioxidant properties, appears to be a potential inhibitor. This study investigates the inhibitory potential of Kolaviron against $svPLA_2$ using *in vitro* and *in silico* approaches. Extraction and kinetic studies were employed to purify $svPLA_2$ enzyme and evaluate the inhibitory effect of Kolaviron. Additionally, molecular docking was used to reveal details of the possible interactions between kolaviron and $svPLA_2$. Prior to inhibition studies, the test compound, Kolaviron,was authenticated using Liquid chromatography-mass spectrometry (LC-MS). $svPLA_2$ was isolated and partially purified from the crude venom of *Naja nigricollis* by a two-step purification process on DEAE sephadex and sephadex G-50column chromatography. The enzyme was purified 14.6 folds with recovery of 80.55 % and migrated homogenously on polyacrylamide gel as a monomer of 14 kDa molecular weight. Studies on the inhibition kinetics revealed

that Kolaviron exhibited a non-competitive type of inhibition. Molecular docking simulations further revealed specific interactions between PLA_2 and Kolaviron at a site distal to the active site. The data suggest that inhibition occurs through binding to an allosteric site, potentially disrupting the alignment of the catalytic site and thereby impairing PLA_2's toxic effects.

KEYWORDS: Phospholipase A_2, Oxidative stress, Kolaviron, Antioxidant properties, Molecular docking, Inhibition pattern

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EFFECT OF ETHANOL LEAF EXTRACT OF *Aspilia africana* ON ACTIVITIES OF SOME SERUM ENZYMES OF MALE RATS

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ABSTRACT

Man has been widely depending on medicinal plants for health care right from the beginning of age.The effect of ethanol leaf extracts of *Aspilia africana* (hemorrhage plant) on some serum enzyme activities on male albino Wistar rats were determined.A total of 48 male Wistar albino rats were used in this research, these were shared into 4 groups of 12 each. Group 1 was placed as the control, group 2 were given 500mg/kgBW of the extract, group 3 were given l000mg/kgBW of the extract and group 4 were given 2000mg/kgBW of the extract. The administration of the extract was done in batches (14 and 28days). Following the administration for the 14 days, batch 1(which was gotten by selecting 6 rats randomly from each group) were sacrificed and the administration were continued with the remaining rats at the same doses for 28 days. Statistical analysis of serum enzyme activities for 14days showed that there was no significant difference in activities of ALT, AST and ALP of the treatment groups compared to the control. In 28 days, there were no significant difference in the activities of both alanine amino transferase and alkaline phosphatase among the groups, Aspartate aminotransferase concentration in the different experimental groups of the 28 days differed significantly from the control at $p<0.05$, showing potential toxicity to the heart tissue. Conclusively, that the ethanol leaf extract of *A.africana* is safe and can be useful in the management hepatic conditions and other ailments due to it low toxicity.

KEYWORDS: Ethanol Leaf Extract, *Aspilia africana*, Serum Enzymes, hepatic conditions and Male Rats.

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In Silico DRUG REPURPOSING OF ANTIBACTERIAL COMPOUNDS AGAINST *Schistosoma mansoni* CERCARIAL ELASTASE: TOWARDS BLOCKING SCHISTOSOMIASIS TRANSMISSION

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ABSTRACT

Schistosomiasis is a debilitating neglected tropical disease caused by the parasitic blood fluke of the genus *Schistosoma*. Three species; *S. mansoni, S. haematobium*, and *S. japonicum* are the most transmitted in humans. Currently, transmission in 78 countries have been reported with Nigeria having the highest burden. There is no vaccine and treatment relies upon chemotherapy using praziquantel, which is in use for over 40 years. Because of the risk of drug resistance, there is a need to emphasize searching for novel anti-schistosomal chemotherapy. *S mansoni* cercarial elastase (SmCE) is the major invasive larval protease secreted by the cercariae to aid mammalian host skin invasion by breaking various skin barriers. Cercarial elastase is a promising drug target, and inhibiting it could block infection and reduce transmission, representing an innovative approach to combating schistosomiasis. This study utilized molecular docking, an *in-silico* method widely applied in drug discovery, to identify potential inhibitors of SmCE. The amino acid sequence of SmCE was retrieved from the National Center for Biotechnology Information and the three-dimensional structure was generated using SWISS-Model and saved in Protein Data Bank format. After that, antibacterial compounds were searched and downloaded in Structure Data File format from PubChem. The compounds and the SmCE were imported into the PyRx virtual screening tool for molecular docking. BIOVIA Discovery Studio was used for post-docking interaction analysis. ADMETlab3.0 was employed for pharmacokinetics and toxicity prediction analysis. The computational analysis identified methacycline, tetracycline, doxycycline, levofloxacin N-oxide, and cefamandole nafate among the top candidates, with binding affinities of -8.5, -8.3, -8.1, -7.8 and -7.7kcal/mol respectively, and the compounds were predicted to possess good pharmacokinetics parameters and passed Lipinski's rule, indicating favorable drug-like properties. This study provides valuable insights for further experimental validation and serves as a foundation for designing potent SmCE inhibitors.

KEYWORDS: Schistosomiasis, Drug Repurposing, Antibacterial compounds, Molecular Docking, *Schistosoma mansoni* cercarial elastase

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ACUTE AND SUBACUTE TOXICOLOGICAL EVALUATION OF JINJA™: A LOCAL HERBAL MIXTURE (LHM)

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ABSTRACT

The Local Herbal Mixture (LHM), a polyherbal formulation comprising *Carpolobia alba*, *Cnestis ferruginea*, and *Heliotropium indicum*, is traditionally employed in Nigeria for the management of piles, infections, and detoxification. Despite widespread use, scientific evidence supporting its safety remains limited. This study assessed the acute and subacute toxicity of LHM in Wistar rats to determine its safety profile. Acute toxicity testing revealed no mortality or behavioral abnormalities at doses up to 5000 mg/kg body weight, indicating an LD greater than this threshold. In the sub-acute study, rats were administered 50-200 mg/kg of LHM daily for 28 days. No adverse effects were observed on body weight gain or general health status. Biochemical analyses revealed no significant ($p > 0.05$) alterations in liver enzymes, renal function markers, lipid profile, or antioxidant parameters. However, at higher doses, significant changes ($p < 0.05$) were noted in levels of creatinine, sodium, and glutathione, suggesting possible dose-dependent physiological responses. Histopathological evaluations of liver and kidney tissues confirmed preserved organ architecture, supporting the absence of toxicological damage. These results indicate that LHM is safe for short-term use within the tested dosage range and lend scientific credence to its traditional applications. Nevertheless, the observed biochemical variations at higher doses underscore the need for further research, particularly on long-term toxicity, potential cumulative effects, and interactions with conventional medications. This study provides a foundational toxicological profile that supports the regulatory assessment and informed clinical use of LHM.

KEYWORDS: Herbal Mixture, Toxicity, $LD_{50,}$ Liver, Kidneys

A 117

PATERNAL IRON DEFICIENCY PROGRAMS INSULIN RESISTANCE AND TYPE 2 DIABETES-LIKE PHENOTYPES IN Drosophila melanogaster OFFSPRING

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ABSTRACT

Evidence suggests that paternal nutritional status alters offspring metabolic health and predisposes to diseases. This study explored the generational effects of paternal iron deficiency (ID) and role of high fat diet (HFD) on insulin resistance and type 2 diabetes (T2D) in *Drosophila melanogaster* (*D. melanogaster*) offspring. ID was induced in F0 male flies (Bathophenanthroline disulphonate exposure at 200 µmol/10ml diet for 2 weeks) and mated with control females to produce F1 and F2 generations on normal food diet (NFD) and HFD. The levels of iron, glucose, lipid, oxidative stress markers and epigenetic changes were assessed. Significant increases($p< 0.05$) in iron, superoxide dismutase (SOD), glucose and triglyceride were observed in F1 and F2 male offspring raised on both NFD and HFD compared to controls. Hemolymph glycogen decreased significantly($p< 0.05$) in F1 and F2 male offspring raised on HFD. qRT-PCR showed significant increases ($p< 0.05$) in malvolio, SOD, glutathione peroxidase, drosophila insulin-like peptide 2 and drosophila histone lysine demethylase mRNA with decreased ferritin, drosophila glucose transporter 1, drosophila insulin receptor substrate and drosophila ten eleven translocase mRNA levels in F1 and F2 male offspring raised on HFD compared with controls. Our study demonstrated the transgenerational effect of paternal ID on altered iron homeostasis and antioxidant defense system. Furthermore, paternal ID induced fetal programming of insulin resistance and T2D-like phenotypes which mediated via altered epigenetic genes regulating DNA and histone demethylation. HFD as a secondary stressor exacerbated the effects in F2 offspringThis study thus highlighted the potential implications for understanding and addressing the developmental origins of metabolic diseases.

KEYWORDS: Iron deficiency; Insulin resistance; Transgenerational inheritance; Fetal programming; *Drosophila melanogaster*

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ANTIOBESITY ACTIVITIES OF N-HEXANE FRACTION OF *Mucuna flagellipes* HOOK. F IN 3T3-L1 CELLS AND *IN SILICO* MODELS

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ABSTRACT

Obesity is a medical condition in which excess fat has accumulated in the body with possible adverse health consequences such as diabetes mellitus, cardiovascular diseases, stroke and osteoarthritis. This study seeks to determine the antiobesity effects of *Mucuna flagellipes* (seed) on the expression of obesity related genes in 3T3-L1 cells. The hexane fraction of *M. flagellipes* was obtained from the fractionation of its ethanol extract via solvent-solvent partitioning and compounds in the fraction were identified by GCMS analysis. The hexane fractions of *M. flagellipes* showed an antiadipogenic effect in the clearance of adipocytes and reduction of lipid content in 3T3-L1 adipocytes. The hexane fractions downregulated the gene expression of peroxisome proliferator-activated receptor-gamma (PPAR-γ), fatty acid synthase (FAS) and acetyl-CoA carboxylase (ACACA) while upregulating adiponectin (ADIPO1) and SLC2A4, indicating they possess antiobesity effect. The hexane fraction of *M. flagellipes* contained 20 compounds revealed via GC-MS analysis. The three abundant compounds in the hexane fraction of *M. flagellipes* are: 9,12-Octadecadienoic acid (69.84%), 9-Oxabicyclo[6.1.0]nonane, cis- (8.70%), and Linoleic acid ethyl ester (6.05%). Amongst them, Linoleic acid ethyl ester consistently ranked as top binder across multiple targets, with binding energies of 5.7, 5.2 and 5.7 kcal/mol to SLC2A4, FAS and ADIPO1. This implies a potential role of *M. flagellipes* in regulating glucose uptake and fat accumulation, which could be relevant for diabetes and obesity management.

KEYWORDS: Obesity, 3T3-L1 cells, fatty acid synthase, acetyl-CoA carboxylase, antiadipogenic

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A-119

IN-VITRO ANTI-SICKLING ACTIVITY OF METHANOL STEM BARK EXTRACT OF *Acacia polyacantha*

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ABSTRACT

Sickle cell disease (SCD) is a genetic disorder caused by hemoglobin polymerization, leading to erythrocyte sickling and vaso-occlusive crises. *Acacia polyacantha*, a medicinal plant used in Northern Nigeria to alleviate SCD symptoms, was evaluated for its anti-sickling properties. A methanol stem bark extract was tested *in-vitro* using sodium metabisulfite (2%) induced sickling of healthy RBCs, with hydroxyurea as the standard control.The extract exhibited dose- and time-dependent anti-sickling activity. At 24 hours, 10

mg/mL extract reduced sickling to 0.3%, outperforming hydroxyurea (0% at 6–10 mg/mL but rising to 4–5.9% by 48 hours). Crucially, the extract maintained near-complete inhibition (0.1–0.2%) at 48 hours, demonstrating superior stability compared to the standard. Dose-response trends were clear: 6 mg/mL extract achieved 0.5% sickling (24 hrs) and 0.2% (48 hrs), while hydroxyurea's efficacy declined over time. These results suggest that *A.polyacantha* not only matches but sustains anti-sickling effects longer than hydroxyurea, potentially due to stable bioactive compounds. Its traditional use aligns with observed efficacy, warranting further *in-vivo* studies and phytochemical characterization to identify active principles. This extract represents a promising, culturally relevant candidate for SCD management.

KEYWORDS: *Acacia polyacantha*, *In-vitro* Anti-sickling activity, Sickle cell disease, Percentage sickling, Natural therapeutics.

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TOXICOLOGICAL EFFECT OF WATER PIPE TOBACCO ON RENAL AND HEPATIC BIOMARKERS IN BLOOD OF FEMALE ALBINO RATS.

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ABSTRACT

This study assessed the effect of water pipe tobacco on renal and hepatic biomarkers in blood serum of female albino rats. Fifteen female albino rats were divided into three groups. Group 1 represents the control (animals not exposed to water pipe tobacco), Group 2 (exposed to water pipe tobacco for 30second per cycle) and Group 3 (50 seconds exposure). Exposures were done for a period of 15 minutes daily for 13days using an improvised inhalation chamber. Biochemical analysis revealed the following concentrations across groups 1, 2 and 3 respectively for the hepatic and renal biomarkers; urea (3.20±0.1, 3.85±1.0 and 2.93±0.1 mmol/l). Creatinine (63.50±1.5, 78.50±18.5 and 62.33±2.5 mmol/l). Potassium (3.10±0.1, 3.20±0.1 and 3.33±0.1 mmol/l). Sodium (116.50±3.5, 121.0±4.0 and 125.67±3.2 mmol/l). Chloride (67.50± 2.5, 66.50±4.5 and 70.67± 14.1 mmol/l). Bicarbonate (22.0± 1.0, 26.0± 1.0 and 23.67± 1.53mmol/l). The hepatic and oxidative markers had varying concentrations of (38.00± 1.0, 33.00± 9.0 and 47.0± 1.00 µ/l) across groups for AST, while ALT (22.0±1.0, 20.0±1.0, 31.70±6.5 µ/l) and ALP (41.50±1.50, 47.00± 1.00, 45.00±1.00 µ/l). Total Protein (61.00± 1.0, 63.00± 2.0 and 61.70± 4.04mmol/l), albumin (40.0± 1.0, 41.0 1.0, and 39.0 ± 4.0mmol/l), total billirubin (7.75 ± 0.3, 7.25± 1.3, 7.63± 0.2mmol/l). More so, for the SOD (0.40± 0.1, 0.24± 0.1 and 0.15± 0.02 µ/l) and MDA (0.38± 10, 0.50± 0.1 and 0.56± 0.1 µ/l). These changes observed in the biomarkers are suggestive of toxic impact of the water pipe tobacco on both kidney and liver integrity posing a major health concern for the smokers.

KEYWORDS: Water pipe tobacco, renal, hepatic function, Albino rats, oxidative stress.

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ANTIOXIDANT PROPERTIES AND REPRODUCTIVE HEALTH BENEFITS OF *OPA EYIN* HERBAL CONCOCTION: *IN VITRO* AND *IN VIVO* EVALUATION

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ABSTRACT

There is an increased demand and consumption of aphrodisiac and reproductive-beneficial herbal mixtures in Nigeria. The empirical data to validate the perceived therapeutic properties of herbal concoctions like *Opa eyin* remains undocumented. Therefore, this study investigated the phytochemical composition and antioxidant properties of *Opa eyin*, a traditional herbal concoction used in South Western Nigeria. A total of 20 healthy male *Wistar* rats wereassigned to 4 groups (n=5). The animals received graded doses of *Opa eyin* (0.20, 0.40, and 0.80 ml/kg body weight respectively) for 28 days. The animals were then sacrificed and the antioxidant evaluation of *Opa eyin* was carried out on the liver, kidney, and testes according to standard protocols. The data generated was subjected to statistical analysis in R statistical programming version 4.3.0. Phytochemical analysis revealed high levels of anthocyanins (109.91 mg/100 g), flavonoids (98.82 mg/100 g), steroids (58.39 mg/100 g), and alkaloids (56.55 mg/100 g), which are associated with antioxidant, anti-inflammatory, and antimicrobial effects. The concoction demonstrated significant ($p < 0.05$) *in vitro* antioxidant activity through DPPH radical scavenging, reducing power, and nitric oxide scavenging assays, exhibiting a dose-dependent response. *In vivo* experiments on *Wistar* rats revealed dose-dependent antioxidant effects in the liver, kidney, and testes. *Opa eyin* improved the reproductive health of the exposed animals, evidenced by reduced oxidative stress in the testes, suggesting potential benefits for fertility. These findings underscore its therapeutic potential and validate its traditional use, although further studies are needed to elucidate its long-term safety and efficacy.

KEYWORDS: *Opa eyin,* Oxidative stress, Antioxidants, Reproductive health, Wistar rats

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EFFECT OF *Costus afer* LEAF JUICE ON SOME HAEMATOLOGICAL INDICES OF TESTOSTERONE-INDUCED BENIGN PROSTATIC HYPERPLASIA IN WISTAR RATS

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ABSTRACT

Benign Prostatic Hyperplasia (BPH) is the most common urological condition among elderly men, beginning around the age of 40 and reaching a prevalence of up to 90% of men in their 80s. It is a non-cancerous enlargement of the prostate which may develop gradually over several years. The study involved a total of 32 wistar rats, weighing 120g-150g. Group 1(Positive control), was served rat chow + water, Group 2 (Negative control), 3, and 4 were given rat chow + water + 5mg/kg body weight Testosterone propionate, intraperitoneally for BPH induction for 4 weeks, rat chow + water + Testosterone for BPH induction + Finasteride,rat chow + water + Testosterone for BPH induction + 0.45ml/kg leaf juice respectively. All the hematological indices were determined using the Sysmex Automated Haematological Analyzer (BC-2600 RX ZIN).*Costus afer* leaf juice produced a significant ($P<0.05$) reversal in the levels of most of the BPH induced derangements in the hematological indices. The positive effect expressed by the *Costus afer* leaf juice may be used in the treatment of these complications in BPH.The findings of the study showed that *Costus afer* leaf juice possess ameliorative potentials against the negative of testosterone induced BPH rats in the hematological indices.

KEYWORDS: *Costus afer,* BPH, Finasteride, Haematology and Wistar rats.

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ASSESSMENT OF ANTIOXIDANT ACTIVITY OF *Conoclinium coelestinum* LEAF EXTRACT ON INDOMENTACIN INDUCED ULCER IN WISTAR RATS

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ABSTRACT

This study investigates the antioxidant properties of *Conoclinium coelestinum* leaf extract by assessing its impact on catalase (CAT), superoxide dismutase (SOD), and malondialdehyde (MDA) levels in indomethacin induced rats. Indomethacin, a nonsteroidal anti-inflammatory drug (NSAID), is known to induce oxidative stress and gastrointestinal toxicity, serving as a model for studying oxidative damage. *C. coelestinum,* a medicinal plant, is reputed for its potential antioxidant properties, which may mitigate oxidative stress. In this experiment, rats were divided into four groups: Positive control, Negative control, standard control, indomethacin induced, indomethacin+ omeprazol induced, indomethacin induced treated with *C. coelestinum* extract. Biochemical assays were conducted to measure the activity of CAT, SOD and MDA, a marker of lipid peroxidation. Results demonstrated a significant reduction in CAT and SOD activities in the indomethacin induced group, accompanied by elevated MDA levels, indicating enhanced oxidative stress. Treatment with *C. coelestinum* extract significantly restored CAT and SOD activities and enhanced MDA levels, suggesting its potent antioxidant effect. This study concludes that *C. coelestinum* leaf extract exhibits significant antioxidant properties, potentially offering a protective effect against indomethacin induced oxidative damage in rats. These findings support the therapeutic potential of *C. coelestinum* as a natural antioxidant source for mitigating oxidative stress related conditions.

KEYWORDS: *Conoclinium coelestinum*, Antioxidant, Ulcer, Indomethacine

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METHANOLIC EXTRACT OF *Detarium microcarpum* (G. & P.) AND ITS FRACTIONS INHIBITS FREE RADICALS AND LIPID PEROXIDATION DAMAGE IN RAT BRAIN – *IN VITRO*

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ABSTRACT

Detarium microcarpum (G. & P.) Fabaceae, is one of the Northern Nigeria medicinal plants, useful in folklore medicine in the management of oxidative stress related diseases. The purpose of this study is to comparatively evaluate the ability (*in vitro*) of its methanolic extract and two fractions ability to inhibit free radicals and lipid peroxidative damage in the rat brain, liver. The Fractionation of *D. microcarpum* methanolic extract was carried out using n-Butanol (BfDML) and Ethyl-acetate solvent (EfDML) using the solvent partitioning method. Some free radical scavenging assays and inhibition of lipid peroxidative activities were carried out. Judging by its IC_{50} values, EfDML was significantly ($p<0.05$) the highest in scavenging DPPH*, OH*, Nitric oxide free radicals and also the highest in scavenging OH* radical. EfDML also had the highest significant ($p<0.05$) ability to inhibit lipid peroxidation in the rats brain. Ethyl-acetate fraction of *D. microcarpum* had the highest free radical scavenging and inhibition of lipid peroxidation activity, which may justify its use in the folklore management of diseases caused by oxidative stress.

KEYWORDS: *In vitro* antioxidant assays, *Detarium microcarpum*, lipid peroxidation, Fractions.

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THE EFFECTS OF *Eucalyptus camaldulensis* EXTRACT ON LIVER ENZYMES AND HEMATOLOGICAL PARAMETERS IN ALLOXAN-INDUCED DIABETIC WISTAR RATS.

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ABSTRACT

Eucalyptus camaldulensis, a plant renowned in traditional Nigerian medicine for its diverse therapeutic properties including antiseptic, antioxidant, antibacterial, anti-inflammatory, and antipyretic effects. To investigated the potential ameliorative effects of *Eucalyptus camaldulensis* extract on liver enzymes and hematological parameters in alloxan-induced diabetic Wistar rats. Forty-two male rats (160–250g) were randomly assigned to six groups (n=7): normal control, diabetic control (negative), insulin-treated (0.2 ml, intraperitoneally), and three groups administered *E. camaldulens*is leaf extract orally at doses of 250, 350, and 450 mg/kg body weight, respectively. Treatments lasted for 21 days. Biochemical analyses revealed that extract-treated groups exhibited a dose-dependent hepatoprotective effect, with significant reductions in AST and ALP levels approaching those of the normal and insulin-treated controls. Notably, AST levels decreased from 46.52 ± 2.43 U/L in the diabetic control to 3.26 ± 0.20 U/L at 450 mg/kg, while ALP decreased from 445.80 ± 15.35 U/L in the diabetic group to 150.92 ± 10.22 U/L in 450 mg/kg body weight group. However, significant reduction in ALT was observed only in the insulin-treated group. Hematological evaluation showed that diabetes induced alterations in RBC, Hb, PCV, WBC, and platelet counts. The extract, particularly at 350 and 450 mg/kg, significantly improved several hematological parameters. The 350 mg/kg dose notably elevated platelet counts (753.67 ± 30.90), while the 450 mg/kg dose increased Hb (14.50 ± 0.39), WBC (12.66 ± 0.79), and MCHC (29.98 ± 0.24). Furthermore, neutrophil levels improved significantly (27.20 ± 4.18) in the 450mg/kg extract-treated group compared to diabetic and insulin-treated controls, suggesting enhanced immune response and erythropoiesis. These findings suggest that *Eucalyptus camaldulensis* leaf extract exerts both hepatoprotective and hematological restorative effects in diabetic conditions, highlighting its potential as a complementary therapeutic agent in managing diabetes-related hepatic and hematological complications.

KEYWORDS: Diabetic,Hematological, Liver enzyme, Alloxan, *Eucalyptus camaldulensis*

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GC-MS ANALYSIS AND MOLECULAR DOCKING STUDY OF PHYTOCHEMICALS FROM *Morinda citrifolia* SEED EXTRACT ON ANTI-INFLAMMATORY BIOMARKERS

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ABSTRACT

Molecular docking is a vital tool in drug discovery, enabling simulation of interactions between bioactive plant compounds and disease-associated proteins. Many plants have traditionally been used to ease inflammation due to their natural compounds that modulate immune responses. This study aimed to identify the phytochemical constituents of *Morinda citrifolia* seed extract and evaluate the binding affinities and molecular interactions of these compounds with key anti-inflammatory biomarkers. Seeds of *M. citrifolia* were extracted using aqueous methanol, and phytochemical profiling was performed via Gas

Chromatography-Mass Spectrometry (GC-MS). Identified compounds were subjected to molecular docking analysis against two inflammation-related proteins: cyclooxygenase-2 (COX-2) and tumor necrosis factor-alpha (TNF-α). A total of 35 bioactive compounds were identified, including dodecanoic acid, 9-Octadecenoic acid (Z)-, 2,3-dihydroxypropyl ester, 9-Octadecenoic acid (Z)-, 2-hydroxy-1-(hydroxymethyl)ethyl ester, and ferulic acid. Ferulic acid showed notable binding affinities with COX-2 (−6.3 kcal/mol) and TNF-α (−6.6 kcal/mol), slightly lower than standard drugs indomethacin (−8.2 kcal/mol) and diclofenac (−7.5 kcal/mol), respectively. 9-Octadecenoic acid (Z)-, 2,3-dihydroxypropyl ester, and other unsaturated fatty acids also exhibited promising docking scores. Binding site analysis revealed stable hydrogen bonding interactions, although minor steric clashes were observed, indicating potential for structural optimization. The seed extract of *M. citrifolia* contains multiple anti-inflammatory agents, with ferulic acid standing out as a potential lead compound for further drug development. Further *in vitro* and *in vivo* investigations are necessary to validate these *in silico* results and to explore synergistic effects among the identified compounds.

KEYWORDS: *Morindacitrifolia*, molecular docking,anti-inflammatory, phytochemicals, COX-2/ TNF-α inhibition

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TOXICITY PROFILE OF METHANOL LEAF EXTRACT OF *Morinda citrifolia* ON THE LIVER OF WISTAR RATS

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ABSTRACT

The toxicological evaluation of *Morinda citrifolia* methanol leaf extract was conducted to assess its safety profile. The study involved acute and sub-acute toxicity assessments, qualitative phytochemical analysis, and quantitative estimation of selected phytochemicals. Acute toxicity testing, following OECD guidelines, revealed no mortality or signs of toxicity up to an oral dose of 2000mg/kg. Sub-acute toxicity studies involved different doses administered over three weeks, with no significant changes in liver enzyme levels or organ weights observed across groups. Qualitative phytochemical analysis indicated the presence of various bioactive compounds, including alkaloids, flavonoids, saponins, and terpenoids. Quantitative analysis revealed high concentrations of alkaloids, saponins, and reducing sugars in the leaves. However, tannins were not detected in the qualitative analysis. Liver function assays showed non-significant changes in alanine aminotransferase (ALT), aspartate aminotransferase (AST), and alkaline phosphatase (ALP) levels across groups, although an increasing trend was noted. Liver histopathology exhibited mild congestion and inflammatory cell infiltration in some groups, suggesting potential mild hepatotoxic effects with prolonged exposure. In conclusion, *Morinda citrifolia* methanol leaf extract demonstrated low acute toxicity, but prolonged exposure may lead to mild hepatotoxic effects. Further research is recommended to explore chronic toxicity and better understand the safety profile of this plant extract.

KEYWORDS: *Moringa citrifolia*, Methanol, Phytochemical, Bioactive, Liver.

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PHYTOCHEMICAL PROFILING(GC-MS) AND HEMATOLOGICAL MODULATING EFFECTS OF ETHANOL LEAVE EXTRACT OF *Eucalyptus camaldulensis IN* WISTAR RATS.

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ABSTRACT

The extract of the leaves of *Eucalyptus camaldulensis* has been used for centuries in traditional medicine, its leaves and essential oils have found various applications in everyday life due to their antiseptic, anti-inflammatory and antipyretic properties. This study evaluates phytochemical profiling(GC-MS) and the effect of ethanol leaf extract of *E. camaldulensis* on some haematology parameters (white blood cell, red blood cell,MCV, haemoglobin, PCV , mean cell hemoglobin concentration, mean corpuscular hemoglobin, red blood cell distribution, platelets) of wistar rats. Forty-two (42) wistar rats weighing 100g-280g were randomly divided into six groups, with seven rats per group. Normal control was administered (orally) distilled water, DMSO and feed, group A to F was administered (orally) 150mg/kg body weight, 250mg/kg body weight, 350mg/kg body weight, 450mg/kg body weight and 550mg/kg body weight. Extraction of the plant was done using 90% ethanol and soxhlet apparatus. All biochemical analysis were carried out using standard laboratory techniques. This experiment lasted for 21 days. The findings demonstrated that the *E. camaldulensis* extract significantly altered the packed cell volume (PCV) of the administered groups in comparison to the normal control group at a significance level of ($p< 0.05$). In contrast to the control group, the administered group's white blood cell count (WBC) did not significantly rise ($p< 0.05$). Phytochemical screening revealed the presence of alkaloids, saponins, terpenoids, catecholic tannins, carbohydrates, glycosides, fats and oils in *E. camaldulensis* leaf extract. The plant extract's GC-MS examination revealed that it contains compounds like 1H-Cycloprop[e]azulene, decahydro, 1,2-Benzenedicarboxylic acid, mono, 9-Octadecenoicacid, methylester, 7-Hexadecenal, (Z)-, 1,2-Benzenedicarboxylicacid,2-eth etc. *E. camaldulensis* includes phytochemicals that may be utilised as pharmacological probes, and it also increases blood volume and may be used to treat anaemia in patients.

KEYWORDS: White Blood Cells, Haematology, Phytochemicals, Packed Cell Volume, Red Blood Cell

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A 129

EFFECT OF THERAPEUTIC AND OVERDOSE OF CAMEL URINE IN MALE WISTAR RATS

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ABSTRACT

Camel urine is used in northern Nigeria as a therapeutic option for treatment of various human illnesses. Local traditional medical practitioners prescribe therapeutic dosages for the use of camel urine; however, such dosages are often abused and not based on research findings. A sub-acute oral toxicity study of camel urine was conducted in male Wistar rats. Thirty (30) healthy male Wistar rats were grouped into three (10 rats/group) and administered camel urine orally for two weeks. Group 1 (control) was administered distilled water orally at 2ml/kg body weight. Group 2 and 3 were administered camel urine at Human Therapeutic Dose Equivalent (TD) and Twice the Human Therapeutic Dose Equivalent (2TD), respectively. Food and water intake, body weight, serum biochemical indices, serum electrolytes, haematological parameters, and organ histological changes were determined. The results showed significant ($p < 0.05$) decrease in leucocytes count, platelet count, serum total bilirubin, direct bilirubin, glucose, urea, sodium and chloride concentrations($p < 0.05$) in the 2TD group. Both the TD and 2TD groups exhibited a decrease in food

consumption and blood total bilirubin concentrations compared to the control group. However, no histopathological changes were observed in any of the organs (liver, kidney, heart, lungs, spleen, intestine, stomach and testis) been examined. Thus, oral administration of camel urine at twice the therapeutic dose (2TD) decreased food consumption and may suppress the immune system by decreasing the WBC count in rats.

A 131

EFFECT OF QUAIL EGG CONSUMPTION ON HAEMATOLOGICAL PARAMETERS OF PHENYLHYDRAZINE ANAEMIA INDUCED WISTAR ALBINO RATS,

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ABSTRACT

Anaemia is a common blood disorder characterized by reduced red blood cells or haemoglobin, leading to impaired oxygen transport. It can result from various causes, including nutritional deficiencies, infections, genetic disorders, and toxic substances like phenylhydrazine (PHZ), which induces haemolytic anaemia by damaging red blood cells. PHZ-induced anaemia is widely used as a model for studying anaemia and its treatments. Quail eggs known for their rich nutritional and medicinal properties have been traditionally consumed for their health benefits, including claims of anti-anaemic effects. This study investigated the impact of quail egg consumption on haematological parameters in PHZ-induced anaemia in Wistar albino rats. Thirty male rats were divided into six groups, with anaemia induced by PHZ administration. The rats were then treated with varying doses of quail egg, standard anaemia drug, or water for 14 days. Results showed that PHZ significantly reduced haematological parameters, confirming anaemia induction. However, quail egg treatment significantlyimproved these parameters, with the highest dose yielding effects comparable to the standard drug. These findings suggest that quail eggs may serve as a natural alternative therapy for anaemia due to their nutritional and antioxidant properties. Further research is needed to determine their mechanism of action and optimal dosage.

KEYWORDS: Phenylhydrazine, Anaemia, Quail eggs, Hematologic

A 132

ASSESSMENT OF POTENTIAL ANTI-INFLAMMATORY ACTIVITY OF *Afzelia xylocarpa* IN THE LIVER OF INDOMETHACIN-INDUCED INFLAMMATION ON ADULT SWISS ALBINO MICE

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ABSTRACT

Inflammation of the liver connotes the liver's response to injury and toxicity. Symptoms culminate into fever, abdominal discomfort, nausea and in later stages yellowing of the eyes. This study aimed to evaluate the

potential anti-inflammatory activity of *Afzelia Xylocarpa* in the liver of indomethacin induced inflammation on adult Swiss albino mice. Thirty (30) mice weighing (9.5g – 14.4g) were sourced from the Animal House of the Faculty of Basic Medical Sciences, Delta State University, Abraka and were randomly assigned into 6 Groups of which three groups were administered *Afzelia Xylocarpa* extract (AZE) at varying doses orally (100mg/kg -300mg/kg). One of the groups was induced with indomethacin without treatment (negative control), while another was induced with indomethacin and treated with Omeprazole (positive control). One of the groups was given food and water only (neutral control). *Afzelia* X*ylocarpa* exhibited antioxidant and anti-inflammatory properties in the indomethacin induced models. The treatment effectively reduced oxidative stress markers such as MDA, while improving antioxidant enzymes such as GPx, GSH, CAT. Additionally, the reduction in nitrates indicates an anti-inflammatory effect. The immunohistochemical and biochemical analysis of this study offers a wide range of evidence of *Afzelia Xylocarpa*'s efficacy in treating indomethacin induced liver inflammation.

KEYWORDS: *Afzelia Xylocarpa, Indomethacin, Inflammation, antioxidant enzymes.*

A 133

IS MONOSODIUM GLUTAMATE A CLASSIC INDUCER OF UTERINE FIBROID?

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ABSTRACT

Previous preclinical research used monosodium glutamate (MSG) to induce uterine fibroid growth in experimental rat models, using elevations in estrogen, progesterone, total protein and total cholesterol as yardstick. This, however, remains inconsistent and largely hypothetical with inconclusive uterine histopathological and radiological evidence. This study was aimed at assessing the clinical, biochemical, histological and radiological changes in the uterus of female Wistar rats after the administration of MSG. Twenty five Virgin female Wistar (142.50 ± 3.01 g; n = 5/group) rats in Groups 1, 2, 3, 4 and 5 were orally administered 1 ml of distilled water, same volume corresponding to 50, 100, 200 and 400 mg/kg body weight of MSG, respectively, once daily for 30 days. Comprehensive clinical, biochemical, histological and radiological imaging was determined. All the doses of MSG significantly ($p < 0.05$) increased body weight, uterine weight, uterine coefficient, prolactin, LH, FSH, aromatase, 17-β hydroxysteroid dehydrogenase, nitric oxide synthase, nitric oxide, alkaline phosphatase, alanine aminotransferase, vitamin C, creatinine, urea, alkaline phosphatase, 8-hydroxy, 2'deoxyguanosine and advanced oxidation protein product whereas it decreased ($p < 0.05$) estradiol, testosterone, gonadotropin releasing hormone, progesterone and aspartate aminotransferase. The total cholesterol, high density lipoprotein-cholesterol, low density lipoprotein-cholesterol, total protein and calcium increased only at 100, 200 and 400 mg/kg body weight whereas triglycerides only decreased at 100, 200 and 400 mg/kg body weight. The MSG did not significantly ($p > 0.05$) alter the levels of phospholipids and transforming growth factor-beta. The MSG at 50 and 100 produced uteri with well-defined outline, increase in uterine size, anterior-posterior diameter and uterine compartment diameter whilst the 200 and 400 mg/kg body weight induced uterine horn hyperplasia, loss of anatomical definition, unclear outlines, irregular mixed echo with increase in uterine volume. Histologically, the 50 and 100 mg/kg body weight of MSG increased cellularity with glandular degeneration of the uteri whilst the 200 and 400 mg/kg body weight produced stroma densely packed with diffused smooth muscle cells proliferation and absence of growth/mass/tumour. Although, changes in clinical, biochemical, histological and uterine ultrasound were induced by the MSG, the absence of growth or mass in the uterus of the animals is insufficient to drive induction of fibroid.

KEYWORDS: Monosodium glutamate; uterine fibroids; estradiol; progesterone; fibroid induction.

A 134

Azadirachta indica FRUIT JUICE RESTORES DYSREGULATED KIDNEY FUNCTION AND DYSLIPIDEMIA IN MALARIA INFECTED MICE.

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ABSTRACT

There is currently an overwhelming scientific evidence on the potentials of various parts of *Azadirachta indica* as natural sources of bioactive compounds useful for the development of human and animal health products. The effect of *Azadirachta indica* fruit juice on lipid profile and kidney functions in *Plasmodium berghei* infected mice was investigated. Thirty-six mice were distributed in six groups (n=6). Group I served as normal control with free access to feed and water. Malaria parasitemia was induced in groups II to VI through intraperitoneal injection of *Plasmodium berghei*. Group II was untreated and served as positive control while group III was treated with artesunate (5 mg/Kg body weight). The test groups were confirmed of parasitemia and further treated with 4.3, 8.6 and 12.9 ml/Kg body weight of *Azadirachta indica* fruit juice respectively. Determinations of creatinine, urea and lipid profile were carried out using Auto-analyzer. The effect of the fruit juice on serum creatinine levels showed a significant increase ($p<0.05$) in the standard and in test groups in a dose-dependent pattern. The result also revealed a significant decrease ($p<0.05$) in the level of low-density lipoprotein in the standard and test groups. Additionally, there was a significant increase ($p<0.05$) in the level of high-density lipoprotein in the standard and test groups. Fruit juice of *Azadirachta indica* may have potentials of enhancing clearance function of the kidney in addition to modulating lipid profile in malaria-infected patients.

KEYWORDS: Malaria, Parasitemia, *Plasmodium berghei,* Clearance, lipid profile.

A 136

EFFECTS OF MAIZE AND AFRICAN PEAR CONSUMED AS SNACKS IN NIGERIA ON *IN VITRO* ACTIVITIES OF CYCLOOXYGENASE, LIPOXYGENASE AND CHOLINESTERASE AND CARBOHYDRATE METABOLIZING ENZYMES REVEALS STRONG ANTIINFLAMMATORY AND ANTIDIABETIC POTENTIALS.

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ABSTRACT

Maize (*Zea mays*) and African pear (*Dacryodes edulis*) are widely consumed in tropical regions and recognized for their nutritional and therapeutic properties. This study evaluated the *in vitro* anti-inflammatory and antidiabetic activities of boiled *Zea mays* (maize) and *Dacryodes edulis* (African pear). Aqueous extracts of both plants were tested for their inhibitory effects on key inflammatory biomarkers such as cyclooxygenase (COX), lipoxygenase (LOX), and butyrylcholinesterase (BChE) and carbohydrate-metabolizing enzymes (α-amylase and α-glucosidase) at concentrations ranging from 0.2 to 1.0 mg/mL. Standard biochemical methods were employed in this study. Enzyme inhibition assays revealed significant dose-dependent suppression of key inflammatory and diabetic targets across concentrations of 0.2–1.0 mg/mL. For COX inhibition, *Z. mays* showed a maximum inhibition of 72.69% at 1.0 mg/mL, while *D. edulis* exhibited 71.70%. LOX inhibition peaked at 69.55% for *Z. mays* and 65.45% for *D. edulis*. In antidiabetic assays, *Z. mays* displayed higher inhibition of α-amylase (58.11%) and α-glucosidase (54.90%) compared to *D. edulis* 53.25% and 51.83%, respectively. For BChE inhibition, *Z. mays* again recorded a higher inhibitory effect (70.97%) than *D. edulis* (69.10%) at the highest concentration. These results highlight the significant role of these foods in modulating inflammation and carbohydrate-metabolizing enzymes, validating their traditional use as functional complementary foods with therapeutic relevance to inflammatory disorders and management of diabetes.

KEYWORDS: Anti-inflammation, Anti-diabetic, Maize (*Zea mays*), African pear (*Dacryodes edulis*), α-amylase, α-glucosidase.

A137

EFFECT OF EXTRACT OF *FICUS CAPENSIS* ON ANTIOXIDANT AND ANTI-INFLAMMATORY MARKERS IN CARAGEENAN INDUCED INFLAMMATION IN WISTER ALBINO RATS

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ABSTRACT

This study investigates the antioxidant and anti-inflammatory effects of aqueous extract of ripe *Ficus capensis* fruits in rats subjected to Carrageenan-induced inflammation. The research evaluated a comprehensive set of biochemical parameters to elucidate the therapeutic potential of the extract. Phytochemical compositions of the extract were analyzed to determine its nutritional and bioactive profile using standard methods. The anti-inflammatory activity was assessed by measuring key inflammatory markers such as C-reactive protein (CRP), interleukin-6 (IL-6), interleukin 1β and tumor necrosis factor-alpha (TNF-α). Oxidative stress markers such as malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) and glutathione (GSH) were also quantified to determine the antioxidant potential of the extract. Results from the induced group showed significant increase in the levels of AST, ALT, ALP, MDA, TNF- α, IL-1β, IL-6, CRP and significant decrease in the levels of SOD, GSH, GPx and catalase. Results revealed that the aqueous extract of *Ficus capensis* fruits contained significant levels of beneficial phytochemicals including flavonoids and phenols and tannins. Administration of the extract led to a significant reduction in inflammatory markers and oxidative stress markers. These findings suggest that *Ficus capensis* fruit extract possesses potent antioxidant and anti-inflammatory properties, supporting its potential use in managing inflammation and oxidative stress-related conditions.

KEYWORDS: Carrageenan, inflammation, *Ficus capensis,* oxidative stress, interleukins.

A138

STUDIES OF *Achyranthes aspera* L. (AMARANTHACEAE) DERIVED CHIKUTSESUSAPONIN IVA AND GYPSOGENIN-3-O-GLUCORONIDES ON *PLASMODIUM FALCIPARUM* DIHYDROFOLATE REDUCTASE, A TARGET ENZYME IN ANTIMALARIAL DRUG DESIGN

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ABSTRACT

The continuous decline in the effectiveness of existing antimalarials coupled with the rising parasite resistance, presents a major challenge in malaria treatment. Historically, antifolates like sulphadoxine-pyrimethamine and cycloguanil have been used for malaria treatment, but the search for new therapies has increasingly shifted toward phytochemicals from medicinal plants. One of such plants is *Achyranthes aspera* L. (Amaranthaceae) also called Kiban Katangare in Hausa and Ndufwet in Mwaghavul language and is widely distributed across Africa and Nigeria. This study explored the antimalarial potential of two phytocompounds: Chikutsesaponin Iva and Gypsogenin-3-O-glucuronides, targeting the *Plasmodium falciparum* dihydrofolate reductase (*PfDHFR*). Shoots of *A. aspera* were collected, air-dried, pulverised, and extracted separately with distilled water and methanol. The extracts underwent acute toxicity testing indicating both were safe up to 5000 mg/kg in experimental rats. Rane's test guided the antiplasmodial evaluation. Fractions of the more potent methanol extract presenting significant reduction in parasitemia ($P<0.05$) were evaluated for active phytoconstituents. LC-MS analysis of the chloroform fraction which showed the highest antiplasmodial activity at 200 mg/kg revealed 37 compounds. Molecular docking, using Auto Dock Vina 4.2, screened these compounds for their interaction with *PfDHFR*. Chikutsesaponin Iva and Gypsogenin-3-O-glucuronides generated superior binding affinities, -9.4 kcal/mol and -9.0 kcal/mol respectively, than the standard inhibitors -pyrimethamine (-5.6 kcal/mol) and cycloguanil (-5.8 kcal/mol). *Achyranthes aspera* derived Chikutsesaponin Iva and Gypsogenin-3-O-glucuronides present promising drug able potential and so could serve as lead candidates for novel antimalarial drug development.

KEYWORDS: *Plasmodium falciparum*, Dihydrofolate Reductase, Chikutsesusaponin Iva, Gypsogenin-3-O-glucoronides

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A-139

STUDIES ON PHYTOCHEMICAL AND ANTIOXIDANT EFFECT OF *Securudata longepedunculata* ROOTS ON CARBON TETRACHLORIDE INDUCED OXIDATIVE STRESS IN MICE.

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ABSTRACT

Diseases linked to oxidative stress, such as cancers, are critical conditions that necessitate efficient and cost-effective therapies. *Securidata longepedunculata*, a therapeutic plant belonging to the polygalaceae family, is traditionally utilized in Africa for treating different health issues. This research examined the hepatoprotective and antioxidant properties of *S. longepedunculata* root extract in relation to carbon tetrachloride (CCl)-induced oxidative stress in albino mice and identified its bioactive components.

Phytochemical evaluation via LC-MS/MS revealed 23 bioactive compounds, comprising 3 flavonoids, 2 alkaloids, 2 sterol lipids, 5 organic acids, along with additional metabolites. In the hepatoprotective study, 30 mice were separated into 6 groups: normal control (NC), CCl -induced toxic control, two extract-treated groups SL1 and SL2 (200 mg/kg and 400 mg/kg), a silymarin-treated group (100 mg/kg), and an extract-only group SL3 (400 mg/kg). Oxidative stress was triggered using CCl (3 ml/kg), while liver injury was evaluated through serum biomarkers (ALT, AST, total protein, albumin) and analysis of liver tissue (MDA, catalase, SOD). Exposure to CCl notably ($p < 0.05$) raised liver enzyme levels (ALT, AST), decreased antioxidant activity (catalase by approximately 40%, SOD by around 35%), and heightened lipid peroxidation (MDA by roughly 50%). Nevertheless, administration of *S. longepedunculata* extract (200 mg/kg and 400 mg/kg) and silymarin (100 mg/kg) improved liver function, decreasing ALT and AST levels by approximately 30% and 45%, respectively, and enhancing catalase and SOD activity. Histopathological examination verified diminished liver injury in the treated groups. In vitro antioxidant tests showed significant radical scavenging properties, with DPPH inhibition reaching 86% at 500µg/ml, FRAP activity rising in a dose-dependent manner, and H O scavenging surpassing 70% at elevated concentrations. The research finds that *S. longepedunculata* root extract effectively mitigates CCl -induced liver injury by boosting antioxidant levels and lowering oxidative stress, indicating its promise as a natural treatment option.

KEYWORDS: Oxidative stress, *Securidata longepedunculata*, carbon tetrachloride, antioxidant, hepatoprotective

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Pp A002

SYNTHESIS, CHARACTERIZATION AND ANTIHYPERLIPIDEMIC PROPERTY OF GREEN SILVER NANOPARTICLES DERIVED FROM *Borassus aethiopum* HYPOCOTYL EXTRACTIN POLOXAMER-407 INDUCED HYPERLIPIDEMIC PRE-CLINICAL MODELS

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ABSTRACT

The synthesis of nanoparticles, characterization of synthesized nanoparticles and use of synthesized nanoparticles for hyperlipidemia is improving nanocardiology research owing to its nano size, targeted therapy and easy drug delivery. This study synthesized, characterized and assessed the antihyperlipidemic potential of silver nanoparticles (AgNPs) derived from *Borassus aethiopum*hypocotyl aqueous extract (BAHAE) in poloxamer-407 induced hyperlipidemic rats.

Materials and Methods: Thirty-five male rats were divided into seven groups (n=5). The control group (A) received distilled water (DW). Groups B-G which were induced into hyperlipidemia with poloxamer-407 (300 mg/kg BW) received DW, fenofibrate (250 mg/kg BW, 10 mg/kg BW nano-sized particles (NSP), 20 mg/kg BW NSP, 200 mg/kg BW of BAHAE, 400 mg/kg BW of BAHAE respectively. Treatment occurred for 14 days after which related biomarkers and characterization were conducted using standard protocols. Poloxamer-407 which substantively ($p<0.05$) lowered HDLC, CAT, SOD, GPx, notably elevated serum levels of CK-MB, cTnI, LDH, MDA, TC, TAG and LDLC when compared with the sham control. BAHAE and AgNPsrestored the studied biomarkers, with profound effect by AgNPs, when liken with fenofibrate. UV-VIS confirmed AgNPs with a size (200–800 nm) and a peak absorbance (4.521). While XRD showed a crystalline structure, FTIR peaked at this transmittance intensity (79.44726). SEM-EDX and EDXRF showed elemental constituents peaking at (C, 80.53) and (Pb, 0.333 %) respectively. AgNPs normalized the poloxamer-407 induced hyperlipidemic alterations in the rats and it could be explored in the management of hyperlipidemia. Toxicological and histological examination of the AgNPs is encouraged.

KEYWORDS: *Borassus aethiopum*, Hyperlipidemia, Silver nanoparticles, Poloxamer-407, EDXRF.

Pp A 009

ANTIBACTERIAL AND ANTIOXIDANT ACTIVITIES OF GREEN SYNTHESIZED SILVER-MANGANESE(AG-MN) BIMETALLIC NANOPARTICLES USING MANGO (*Mangiferaindica* L.) LEAF EXTRACT

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ABSTRACT

This study investigated the green synthesis, characterization, and biological (antibacterial and antioxidant) activities of silver–iron (Ag–Mn) bimetallic nanoparticles using *Mangifera indica* leaves extract. Ag–Mn nanoparticles were synthesized via a one-pot green synthesis approach and characterized using UV–Vis spectroscopy, FTIR, SEM, and EDX analyses. The antibacterial activities were accessed using the agar well diffusion method and antioxidant activities by DPPH and ABTS assays. The UV–Vis spectra exhibited a distinct surface plasmon resonance peak at 445 nm, confirming the presence of Ag nanoparticles, along with minor peaks attributable to Mn interactions. FTIR analysis revealed functional groups such as hydroxyl, carboxylic, and carbonyl bands that acted as reducing and stabilizing agents. SEM images displayed irregular, non-spherical nanoparticles with moderate aggregation, while EDX confirmed the elemental composition of Ag and Mn. The antibacterial evaluation demonstrated that the Ag–Mn nanoparticles exhibited broad-spectrum activity, with the highest inhibition against *Klebsiella pneumonia* (19.98 ± 1.03mm), followed by *Pseudomonas aeruginosa*, *Salmonella typhi*, and *E. coli*. Antioxidant assays showed that the Ag–Mn NPs exhibited dose-dependent radical scavenging activity. In the ABTS assay, it outperformed ascorbic acid at concentrations ≤40 µg/mL, with an IC of 31.25 µg/mL. The DPPH IC was 23.74 µg/mL, slightly lower than that of ascorbic acid. The synthesized Ag–Mn bimetallic nanoparticles showed strong antibacterial and antioxidant potential, due to the synergistic effects of silver and manganese, and the capping influence of phytochemicals in *M. indica* leaf extract. These findings suggest their application in biomedical and pharmaceutical as eco-friendly therapeutic agents.

KEYWORDS: Green Synthesis, Ag-Mn, *Mangifera indica*, Antibacterial and Antioxidants

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Pp A010

INTEGRATIVE TRANSCRIPTOMIC ANALYSIS IDENTIFIES MIR-548C-3P AS A POTENTIAL REGULATORY HUB IN BREAST CANCER PATHOGENESIS

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ABSTRACT

Early detection remains critical in reducing breast cancer (BC)-related mortality. While circulating microRNAs (miRNAs) are increasingly recognized as promising noninvasive biomarkers, however, the functional relevance of many individual miRNAs in breast cancer pathogenesis remains poorly understood. This study aimed to identify key miRNAs and their target genes involved in BC progression through integrative bioinformatics analysis. Three BC-related gene expression datasets (GSE216528, GSE248670, and GSE225762) were obtained from the NCBI Gene Expression Omnibus (GEO). Differentially expressed genes (DEGs) were identified using GEO2R, and the intersecting genes were determined through Venn

diagram analysis. The genes were compared with the predicted miRNA target genes obtained from miRDB to identify the miR-target differentially expressed gene (miR-DEGs). Functional enrichment and pathway analyses were performed using DAVID and KEGG online tools. Among the miRNAs identified, miR-548c-3p emerged as the most prominent, targeting 809 genes. Gene ontology and pathway enrichment analyses revealed that miR-548c-3p is involved in key biological processes and pathways relevant to BC, including apoptosis, ubiquitin-like (Ubl) conjugation, angiogenesis, translational regulation, cell adhesion, and neurogenesis. Its downregulation may facilitate tumor growth, metastasis, and resistance to apoptosis. Additionally, significant enrichment was observed in cancer-associated pathways such as Wnt signaling, oxytocin signaling, and adherens junctions. These findings highlight miR-548c-3p as a potential regulatory hub in breast cancer progression and underscore the utility of integrative transcriptomic analysis for uncovering novel biomarkers and therapeutic targets.

KEYWORDS: Breast cancer, miR-548c-3p, Genes, Functional Enrichment

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Pp A 011

ADMINISTRATION OF *Phyllanthus amarus* MITIGATES COGNITIVE DEFICITS AND NEUROPATHOLOGY IN AN ALZHEIMER'S RATS MODEL

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ABSTRACT

Alzheimer's disease (AD) is the leading cause of dementia and a progressive neurodegenerative disorder characterized by cognitive decline and neuronal degeneration. This study investigated the therapeutic potential of *Phyllanthus amarus* aqueous extract on AlCl -induced rat model of Alzheimer-like disease. A total of 28 Wistar rats were randomly divided into four groups: positive and negative control groups, Donezepil treated group, and *P. amarus* extract treated group. Alzheimer-like symptoms were induced using AlCl (100 mg/kg), followed by oral administration of the extract for 21 days. Cognitive performance was assessed using the novel object recognition test. Brain tissues were analyzed for oxidative stress markers, acetylcholinesterase (AChE) activity, and histopathological changes. The results demonstrated that *P. amarus* significantly improved cognitive function, as shown by an increased recognition index. The AD untreated group exhibited elevated levels of GSH and Vitamin E, which were significantly reduced upon treatment with the extract. Moreover, *P. amarus* significantly inhibited AChE activity, indicating a restoration of cholinergic function. Histopathological evaluation revealed reduced neuroinflammation and neuronal damage in the hippocampus and cortex of the treated animals. GC-MS analysis of the aqueous extract identified 13 bioactive compounds. Molecular docking revealed that cyclobutane-1,1-dicarboxamide, N,N'-di-benzoyloxy- exhibited the strongest binding affinity (-10.8 kcal/mol) to acetylcholinesterase, suggesting its potential as a therapeutic lead compound. These findings suggest that *Phyllanthus amarus* aqueous extract exhibits significant neuroprotective activities through its antioxidant, anti-inflammatory, and inhibitory effect against cholinesterase activities, highlighting its potential as a candidate for AD management.

KEYWORDS: Alzheimer's disease, neurodegeneration, acetylcholinesterase, oxidative stress.

Pp A 016

AN ASSESSMENT OF AWARENESS OF FORENSIC SCIENCE ACROSS KEY SECTORS OF SOCIETY IN ZARIA METROPOLIS, KADUNA STATE, NIGERIA TITLE

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ABSTRACT

This study assessed the level of awareness of forensic science across key sectors of society in Zaria Metropolis, Kaduna State, Nigeria with the aim of identifying knowledge gaps and developing recommendations for enhancing forensic capabilities within the criminal justice system. The research employed a mixed-methods approach, utilising a convergent parallel design that combined quantitative surveys and qualitative interviews to examine eight stakeholder groups: law enforcement officers, judicial officials, medical professionals, academics, researchers, traditional leaders, religious authorities, and students. A total of 587 participants completed the Forensic Science Awareness Assessment Questionnaire, representing a 94.7% response rate, while 24 key informant interviews provided qualitative insights into contextual factors affecting forensic science implementation. The study was grounded in Knowledge Gap Theory and Technology Acceptance Model frameworks to analyse disparities in forensic knowledge and factors influencing adoption of forensic methodologies. Results revealed significant variations in awareness levels across stakeholder groups, with academics recording the highest awareness scores (4.12) and traditional leaders the lowest (2.78). Statistical analysis confirmed significant differences between groups and identified ten major barriers to forensic science implementation, with inadequate funding, insufficient training, and poor infrastructure emerging as primary obstacles. Multiple regression analysis demonstrated that professional training and educational background significantly predicted forensic science awareness, explaining 45.4% of variance in awareness scores. Cultural, religious, and traditional factors showed moderate influence on forensic science acceptance, accounting for 27.3% of variance, with cultural sensitivity emerging as the strongest predictor of acceptance. The study concluded that while moderate forensic science awareness exists among certain stakeholder groups, systematic gaps in knowledge, training, and resources significantly impede effective implementation. Recommendations include establishing comprehensive training programs, prioritising infrastructure development, developing culturally sensitive implementation strategies, strengthening legal frameworks, implementing targeted awareness campaigns for traditional and religious leaders, and establishing inter-sectoral collaboration mechanisms to enhance forensic science capabilities within Zaria Metropolis and similar contexts.

KEYWORDS: Forensic Science, Awareness, Stakeholders, Forensic Evidence.

Pp A 017

AFRICAN EBONY *(D. mespiliformis)* ETHANOLIC LEAVES EXTRACT DOWNREGULATES HER1 AND HER4 THROUGH INHIBITION OF NRF2 SIGNALLING PATHWAY LEADING TO REDUCED OVARIAN CANCER PROLIFERATION

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ABSTRACT

African Ebony (*D. mespiliformis)* is a natural product that has many health benefits. It has been shown to inhibit cancer cell migration and invasion in in vitro cancer cells and in vivo animal models. NRF2 and HER family regulate the normal cellular and are determinants of cancer initiation and progression. Both NRF2 and HER family are implicated in resistance of numerous cancers to chemotherapeutic agents and use of natural product could overcome the resistance. Human ovarian cancer cell lines, OVCAR3 and OVCAR4 were maintained in RPMI 1640 media supplemented with 10% foetal bovine serum (FBS) and 1% pen/strep in 5% CO_2 and incubated at 37°C. Before experimental treatments, cells were grown for 24 h in RPMI 1640 media and then treated with either tert-Butylhydroquinone (tBHQ; Sigma) or African Ebony *(D. mespiliformis)* ethanolic leaves extract to a final concentration as required with media. Following this, Dual luciferase assay, cytotoxicity assay, ROS detection, Glutathione assay and immunoblotting were performed in this study. It demonstrated that African Ebony *(D. mespiliformis)* ethanolic leaves extract inhibited the NRF2 activity,

which led to downregulation of HER1 and HER4 protein expression and decreased cell growth of OVCAR3 and OVCAR4 cells. Furthermore, inhibition of NRF2 led to increase in ROS level and depletion of total glutathione in all the cell lines. Taken together, these data suggest that African Ebony (D. mespiliformis) ethanolic leaves extract may inhibit the cell growth of ovarian cancer cells through NRF2-mediated downregulation of HER 1 and HER4 expression

KEYWORDS: African Ebony *(D. mespiliformis),* ethanolic leaves extract NRF2, HER1 and HER4, Glutathione, ROS, Cytotoxicity

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Pp A 018

NEUROPROTECTIVE POTENTIAL OF *Phyllanthus amarus AND SORGHUM BICOLOR ON ARSENITE – INDUCED ALZHEIMER'S DISEASE (AD) IN MALE RATS*

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ABSTRACT

Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by cognitive decline and neuronal damage, with oxidative stress and inflammation playing a major role in its pathogenesis. The search for natural bioactive compounds with therapeutic potential against Alzheimer's disease has led to the exploration of potential medicinal plants. This study aimed to comparatively evaluate the phytochemical composition of Phyllanthus amarus, and Sorghum bicolor, and their potential therapeutic effects of Arsenite-induced Alzheimer's disease through biochemical assessments of the brain, kidney, and liver in an experimental rat model. The study assessed hematology, the antioxidant assays and enzyme Assays on the hepatic and renal biomarkers and DNA fragmentation. Statistical analysis was conducted using one-way ANOVA, with significant differences set at $P<0.05$ and $P<0.001$. Results showed the level of Antioxidant assays of Arsenite intoxication in the brain was reduced by the medicinal plants as compared to their level in the Liver and Kidney which shows similar results. However, the level of DNA fragmentation was highly expressed in Arsenite induced group as compared to the treatment group and control group. Also, the enzyme assay biomarker SOD shows that there is highly level of oxidative stress in the arsenite induced group as compared to treatment group. However, the level of oxidative stress in sorghum bicolor treated group is lower in comparative to Phyllanthus amarus. These findings suggest that Phyllanthus amarus, and Sorghum bicolor contain bioactive compounds with potential neuroprotective and antioxidative effects, which may contribute to therapeutic strategies for the maintenance of Arsenate induced-Alzheimer's disease.

KEYWORDS: Phyllanthus amarus, Sorghum bicolor, Arsenite-induced, neuroprotection, oxidative stress.

Pp A 019

A MACHINE LEARNING-DRIVEN BIOPROSPECTING OF NIGERIAN MEDICINAL PLANTS FOR PUTATIVE LEADS AGAINST BUTYRYLCHOLINESTERASE TOWARD ALZHEIMER'S CARE

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ABSTRACT

Butyrylcholinesterase (BChE) preserves appropriate cholinergic neurotransmission implicated in advanced Alzheimer's disease (AD), hence a therapeutic target. This study employed machine learning (ML) based cheminformatics pipeline to explore a compiled library of 2,179 secondary metabolites (SMs) from 50 Nigerian plants with reported cholinergic activity was investigated using the ML model. Molecular modelling was used to further screen the active SMs (827). The final predicted models demonstrated significant robustness, with a correlation coefficient of 0.8981. Molecular docking investigation of the 827 SMs identified the top five candidates based on their scores. These leads exhibited favourable ADMET properties and promising safety profiles. Among these five, lupenone (-48.78 kcal/mol), β-amyrin (-49.19 kcal/mol), and adipedatol (-48.87 kcal/mol), from *Peltophorum pterocarpum, Bryophyllum pinnatum* and *Alcyone laxiflora* respectively, were the most promising leads with significant binding free energy compared to decamethonium (-17.64 kcal/mol) and more favourable van der Waals, electrostatics and non-polar solvation energetics. Furthermore, the binding of these leads resulted in optimised interaction profiles that preserved the structural integrity of the BChE and aligned well with desirable drug-like characteristics. These findings position the leads as promising candidates for therapeutic applications targeting BChE for Alzheimer's disease management, subject to further in vitro and in vivo validation investigations.

KEYWORDS: Machine learning; Butyryl cholinesterase; Alzheimer's diseases; Molecular docking; Molecular dynamics simulation; Medicinal plants.

Pp A022

Khaya grandifoliola EXTRACT: A PROMISING NATURAL SOLUTION FOR CYCLOPHOSPHAMIDE-INDUCED TOXICITY IN RATS

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ABSTRACT

Cyclophosphamide (CP), a widely used chemotherapeutic agent, is associated with hematological disturbances, immune suppression, and organ-specific damage. This study investigated the potential therapeutic benefits of *Khaya grandifoliola* extract fractions in mitigating CP-induced toxicity: Experimental models were administered CP for 3 months to induce toxicity, followed by treatment with *Khaya grandifoliola* extract fractions for 1 month. Our findings showed that prolonged CP administration resulted in significant adverse alterations in hepatic and cardiac biomarkers, hematological indices, and immunosuppression, as evidenced by increased hepatic and cardiac biomarkers and decreased Interleukin-2 (IL-2) serum levels. In contrast, treatment with *Khaya grandifoliola* extract fractions effectively restored these biomarkers and hematological parameters, potentially through immunomodulatory and antioxidative mechanisms). In contrast, treatment with *Khaya grandifoliola* extract fractions effectively restored these biomarkers and hematological parameters, potentially through immunomodulatory and antioxidative mechanisms. Histopathological examination of liver and heart tissues revealed marked tissue damage in CP-exposed groups, which was attenuated in *Khaya grandifoliola*-treated groups. Our findings suggest that *Khaya grandifoliola* may be a promising therapeutic agent for mitigating CP-induced tissue toxicity, warranting further studies to elucidate the underlying molecular mechanisms and explore potential therapeutic applications.

KEYWORDS: Cyclophosphamide, *Khaya grandifoliola*, Toxicity, Immunosuppression; Antioxidative mechanisms, Hematological indices, Hepatic and cardiac biomarkers

Pp A 023

IN VITRO ANTIOXIDANT ACTIVITY OF *Cassia sieberiana* ETHANOL ROOT EXTRACT

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ABSTRACT

This study evaluated the antioxidant activity of *Cassia sieberiana* ethanol root extract. Antioxidant activity of the root extract was estimated by different *in vitro* antioxidant assay procedures such as 1, 1-diphenyl-2-picrylhydrazyl radical (DPPH),2,2-azinobis-3-ethylbenzothiozoline-6-sulfonic acid (ABTS) assay, ferric reducing antioxidant power (FRAP) assay and hydrogen peroxide scavenging assay, The extract was used at 10, 20, 50, 100 and 150 µg/ml concentrations. The results showed that *C. sieberiana* root possess antioxidant activity in the various radical systems and was comparable to the standard, ascorbic acid. The results of this study suggest that the high antioxidant activity of *C. sieberiana* may be responsible for the wide use of the plants in traditional system of medicine.

KEYWORDS: Antioxidant, *Cassia sieberiana*, DPPH, ABTS, FRAP

Pp A 026

COMPARATIVE ANALYSIS OF PHYTOCHEMICALS AND ANTIOXIDANT POTENTIALS OF SOME CONSUMED HERBAL TEAS (GINGER, GARLIC, AND CINNAMON) AMONG UNIVERSITY STUDENTS WITHIN KADUNA STATE

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ABSTRACT

A comparative evaluation of the phytochemical composition and antioxidant potential of Ginger, Garlic, and Cinnamon teas, with the objective of identifying and quantifying the phytochemicals and some in-vitro antioxidant properties was investigated. The consumption pattern, perception and knowledge of the health benefits of these teas among 300 university students in Ahmadu Bello University were assessed. The socio demographic data indicated majority of respondents 21-25yrs (57%) and predominantly male (60.8%). The Consumption Patterns, indicated Ginger to be the most consumed herb (95%), garlic (82.5%) and cinnamon (59.3%). About 25.3% of the respondents consumed these teas weekly while 38.7% rarely consume these teas. Medicinal purposes (38.1%) were largely found to be the primary reason for their consumption. Qualitative analysis using both ethanol and water as solvents detected the presence of several phytochemicals, notably cardiac glycosides, saponins, tannins, phenols and steroids. The quantitative analysis of the extracts showed most significant amount of saponin (29.87Ug/ml) at $P<0.05$ for aqueous extracts of ginger, while most significant steroids (19.27Ug/ml) was found in ethanolic extracts of garlic. The antioxidant potential assessed using two established assays: 2,2-diphenyl-1-picrylhydrazyl (DPPH) and Ferric Reducing Antioxidant Power (FRAP) showed ethanolic extracts of cinnamon had the most potent antioxidant activity with a DPPH percentage inhibition of (69.71%) and FRAP (687.9Ug/ml). In conclusion, this study substantiates the traditional medicinal use of Ginger, Garlic, and cinnamon by highlighting their significant antioxidant properties. Ethanol proved to be an effective solvent for extracting these beneficial compounds, paving the way for potential applications in natural health therapies.

KEYWORDS: Ginger, Garlic, Cinnamon, phytochemicals, antioxidants

Pp A027

PARTIAL CHARACTERIZATION OF *Trypanosoma congolense* LYSOSOMAL A-D-MANNOSIDASE (TCLDM) AND DRUG EFFICACY ASSESSMENT THROUGH INFECTIVITY ASSAY

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ABSTRACT
Animal African trypanosomiasis (AAT) remains a major constraint to livestock productivity across sub-Saharan Africa, with Trypanosoma congolense being the most prevalent pathogenic species. This study explored the lysosomal α-D-mannosidase of *T. congolense* (TcLDM) a key glycoprotein-degrading enzyme involved in the parasite's antigenic variation machinery as a potential drug target. This study reports the first partial purification of TcLDM from *T. congolense* lysate using DEAE ion exchange and Sephadex gel filtration chromatography yielded a final purification fold of 1.62 and an overall yield of 38.70%. SDS-PAGE analysis estimated its molecular weight at approximately 70 kDa. The purified TcLDM showed optimal activity at pH 5.0, aligning with its lysosomal role. Lineweaver-Burk analysis yielded V_{max} = 1.136 mM/min, K_m = 0.503 mM, and k_a = 229 s^{-1}, indicating strong catalytic efficiency. Kifunensine exhibited mixed-type inhibition (K_i = 9.07 µM) with an IC_{50} of 52.97 µM. Drug incubation infectivity tests (DIIT) at five concentrations (¼× to 4× IC_{50}) revealed dose- and time-dependent suppression of parasite motility. While untreated controls maintained full motility over 6 hours, near-complete immobilization was observed at 4× IC_{50} by hour 6. Parasitemia monitored over 19 days showed delayed onset and gradual decline in treated groups, with the 2× and 4× IC_{50} doses showing the greatest reductions compared to controls. Although less rapid than Diminazene Aceturate (DA), which achieved complete immobilization within 1 hour, Kifunensine demonstrated significant anti-trypanosomal potential. These findings validate TcLDM as a viable drug target and justify the c0ontinued investigation of kifunensine as scaffold for anti-trypanosomal drug development.

KEYWORDS: Kifunensine, Mannosidase, Anti-Trypanosoma, Drug-Target, Trypanosomiasis

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Pp A 028

COMPARATIVE EVALUATION OF PHYTOCHEMICAL CONSTITUENTS, *IN VITRO* ANTIOXIDANT AND MOLLUSCICIDAL ACTIVITY OF *Ficus exasperata* STEM BARK EXTRACTS

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ABSTRACT
Schistosomiasis is a Snail-borne parasitic disease transmitted through water contact activities in endemic areas. It is associated with serious morbidities including anaemia, bladder cancer and infertility. Vector control efforts rely on the use of synthetic molluscicide (Niclosamide) which has been attributed to environmental toxicity. The present study investigates the potential of *Ficus exasperata* stem bark extracts as Molluscicidal agent targeting Bulinus, the intermediate host of *Schistosoma haematobium*. *F. exasperata* stem bark was obtained from natural habitat in Zaria, authenticated, dried under shade, ground into powder

and subjected to extraction with distilled water, ethanol and methanol. The extracts were evaluated for phytochemical constituents, DPPH and FRAP radical scavenging activities and Molluscicidal efficacy. Higher percentage yield (8.62%) was obtained in Methanolic extract. Phytochemical analysis revealed the presence of compounds such as alkaloids, flavonoids, saponins, cardiac glycosides and steroids. Tannins and Phenolics have higher concentration compared to other phytochemicals detected in all the extracts. *In vitro* antioxidant analysis demonstrated moderate activity, with DPPH radical scavenging activity of 62%, 60% and 47% for methanolic, aqueous and ethanolic extracts, respectively. Molluscicidal screening of the extracts revealed dose dependent toxicity against Bulinus snails, with LC50 value of 23.59ppm, 28.96ppm, 31.51ppm for ethanolic, methanolic and aqueous extracts, respectively. These findings suggest that *F. exasperata* stem bark extracts could be exploited for development of eco-friendly botanical molluscicide. Further research is needed to identify the bioactive compounds responsible for Molluscicidal efficacy, elucidate the possible mechanisms of action, evaluate the efficacy in field trials and environmental impact.

KEYWORDS: Schistosomiasis, Bulinus Snails, Vector control, *Ficus exasperata,* Bioactivity

SUB-THEME 2

B001

CHEMICAL AND NUTRITIONAL PROFILE OF WEEVIL INFESTED MAIZE

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ABSTRACT

This study investigates the chemical and nutritional profile of maize subjected to weevil (*Sitophilus zeamais*) infestation. Maize samples weredivided into two groups: weevil-infested maize (A) and non-infested maize (B) and stored in containers for 40 days. The treatments (A and B) were subjected to nutritional content assay (moisture, ash, protein, crude fiber, fat, carbohydrate, essential vitamins A, C, E) and chemical profiling by GC-MS. The results showed a significant change ($P<0.05$) in nutritional values. Moisture content, carbohydrate levels, ash, and fibre were notably lower in A, while protein and fat contents increasedsignificantly ($P<0.05$) in A as compared to B. There was a significant decrease ($P<0.05$) in levels of vitamin C and Efor the weevil-infested sample. The chemical profile revealed the introduction of some compounds in sample A. Compounds that are toxicologically potent as determined by *in silico* ADME studies were: N-(2-Chloroethyl) diacetamide, N-(7,7-Dimethyl-4-oxo-5,6,7,8-tetrahydro-4H-thiazolo[5,4-c] azepin-2yl)-acetamide, 2,6-Dimethylbicyclo [3.2.1] octane, 2-Methyltridecane, 1-Hexadecyne, Quinoline, and Triethylenemelamine. The following properties were determined for the compounds and reported: Caco-2 Permeability, protein binding (PPB), Blood brain barrier (BBB) Penetration, CYP1A2, CYP2D6, clearance (CL), half-life ($T_{1/2}$), AMES Toxicity, Rat Oral Acute Toxicity, Carcinogenicity and Respiratory Toxicity. The findings underscore the effects of weevil infestation on maize quality, emphasizing the need for improved storage and pest control methods to preserve maize's nutritional integrity during storage. These results provide valuable insights for agricultural practices aimed at reducing post-harvest losses in maize.

KEYWORDS: Maize, Weevil-Infestation, Nutrients, Chemical profile, Toxicology

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B002

NUTRITIONAL QUALITY ASSESSMENT AND FUNCTIONAL PROPERTIES OF TEXTURED VEGETABLE PROTEIN

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ABSTRACT

Textured Vegetable Protein (TVP) is a fabricated food product made from plant-based ingredients such as soybeans and kenaf seeds, serves as a meat substitute in various culinary applications. Both kenaf seeds and soybeans are rich in essential nutrients and offer numerous health benefits. This study aimed to assess the nutritional and functional properties of TVP made from these two sources. TVP was produced from soybean and kenaf seed extracts, and the sensory quality, nutritional composition, phytochemicals, and functional

properties were evaluated. The findings revealed that the TVP from kenaf seeds had a high protein content (8.85%), lipids (6.45%), and carbohydrates (76.98), as along with lower moisture (5.13%), compared to soybean TVP, which had protein, lipid, and carbohydrate contents of 6.61%, 2.19%, and 71.80%, respectively. Additionally, kenaf seed TVP contained greater amounts of vitamins A (244.92 mg/dL), C (194.73 mg/dL), and E (559.09 mg/dL), but lower levels of phytochemicals compared to soybean TVP. Kenaf seed TVP also exhibited superior functional properties, specifically higher water and oil holding capacities. Sensory evaluation indicated no significant differences ($p>0.05$) between the two TVPs regarding appearance, aroma, taste, texture, and overall acceptability. Overall, both kenaf seed and soybean TVP are nutritious options suitable for incorporation into a variety of food products, particularly as meat alternatives in soups and stews.

KEYWORDS: Textured vegetable protein, Soybean, Sensory quality, Kenaf seed, Functional properties.

B003

EFFECTS OF CASSAVA ROOT PROCESSING INTO FLOUR ON SELECTED ANTI-NUTRIENTS IN TME 419, IBA980581 AND CR36-5 CASSAVA VARIETIES.

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ABSTRACT

This study examined the effects of processing cassava (Manihot esculenta) roots into flour on the antinutrient content of three varieties: TME 419, IBA980581, and CR36-5. The research focused on four processing methods: fermented air-drying, fermented sun-drying, non-fermented air-drying, and non-fermented sun-drying, and their impact on cyanide, phytate, and oxalate levels. Cassava is a vital staple crop, but it contains antinutrients like cyanide, tannins, phytates, and oxalates, which can harm human health and hinder nutrient absorption. The findings revealed that fermentation significantly reduced cyanide levels across all varieties, with TME 419 showing the most notable decrease. Non-fermented samples retained higher cyanide levels, especially in IBA980581 and CR36-5. Both air-drying and sun-drying reduced cyanide levels similarly. Unprocessed cassava had higher phytate concentrations, but non-fermented/air-dried flour had lower phytate levels compared to non-fermented/sun-dried flour. This difference may be due to sun-drying's higher temperatures, which can inactivate enzymes like phytase that break down phytate. Fermentation also effectively reduced other antinutrients more than non-fermentation, regardless of drying methods. Oxalate levels in TME 419 followed a similar trend to phytate. Overall, the study demonstrates that fermentation and air-drying are effective in reducing cyanide and other antinutrients in cassava flour. These findings are crucial for improving the safety and nutritional quality of cassava products, benefiting both consumer health and agricultural practices.

KEYWORDS: Anti nutrients, TME419, IBA980581, CR36-5, Cassava

B004

OPTIMIZATION OF ASSAYING METHOD FOR LIPASE FROM SPROUTED TIGER NUT USING COMBINNED METHODS OF BOX-BEHNKEN METHODOLOGY AND DESIRABILITY FUNCTION

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ABSTRACT
Lipases abound in nature and are sourced from several plants, microorganisms and animals. Standard methods were used to optimize tiger nut lipase assaying conditions needed for lipase assaying in industrial applications. The assaying conditions optimized were; Incubation time (16 - 24 min), Temperature (33 – 37 ^{o}C) and pH (5 - 8), using; Box Behnken Design (BBD) of response surface methodology and Desirability Function Methodology (DFM). Results showed that, lipase activity was highest (22. 45 U) on the third day of sprouting. BBD model indicated lipase activity of 50.25 U at 95 % confidence level and experimented lipase activity of 52.14 U. While DFM predicted lipase activity of 50.77 U and 52. 39 U using optimum assay conditions. The quadratic equation of the model generated lipase activity = - 537.33802 +13. 21219Time + 25.38794 Temperature – 1.46808 pH – 0,001562 Time Temperature - 1.15967E – 18Time pH + 0,007500 Temperature pH – 0.334406 Time^2 – 0.344094 Temperature^2 – 0.024620 pH^2. A point prediction assaying conditions of; incubation time: 20 min, Temperature 37°C and Ph 5, gave lipase activity of 53.42 U. The process of using statistical optimization package yielded over 2 - fold increase in lipase activity over unoptimized process. Thus, result has proven lipase from sprouted tiger nut will be best assayed at; incubation time: 20 min, Temperature 37°C and pH 5, for laboratory and industrial use.

KEYWORDS: Box-Behnken Design (BBD), Desirability Function Methodology (DFM), Lipase assay, Response Surface Methodology, Tiger nut.

B 005

EVALUATION OF BIOACTIVE COMPONENTS, ALCOHOL AND MINERAL CONTENTS IN WINE PRODUCED FROM *Vitex doniana* (BLACK PLUM)

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ABSTRACT
Grape fruits have been exploited for decades in wine production though with limited functional characteristics. The searches for alternatives with reasonable functional characteristics form parts of this study. The present study evaluates the bioactive components, alcohol and mineral contents in wine produced from *Vitex doniana* (Black plum) fruit. Freshly harvested ripe *Vitex doniana* (purple black in colour) (6000 fruits) were purchased from a local producer in Jalingo, Taraba State, Nigeria and identified by a Botanist in the Department of Biological Sciences ofTaraba State University Jalingo, Nigeria and were thereafter transported to the laboratory in a polypropylene box and stored (25 °C, 85% Relative Humidity). Bioactive components and alcohol contents were determined using HPLC while mineral contents were carried out

using AAS (Agilent 240 FS AA model) for Fe and Zn and Jenway ME 882 Flame photometer for Na. The results for the bioactive compound indicated the presence of lutein, ellagic acid, fucoxanthin, and zeaxanthin. Alcohol contents revealed (209.935 µg/mL) acetic acid, (2.483µg/mL) ethanol. The wine sample showed the presence of (0.200 ± 0.057 ppm) iron (Fe), (0.094 ± 0.001ppm) Magnesium (Mg),(0.940 ± 0.000 ppm) Potassium(K), (3.390 ± 0.000 ppm) Sodium (Na) concentrations. These findings unveiled that *Vitex doniana* wine has important diverse antioxidants, bioactive and alcohol components, appreciable mineral contents in good proportion which rival grapes wine and therefore, it is an indispensible nutrients with health benefits.

KEYWORDS: Bioactive, *Vitexdoniana*, Alcohol, Minerals, HPLC.

B 006

BIOCHEMICALS CHARACTARIZATION OF MECHANICALLY EXTRACTED OIL FROM *Anacardium occidentale* NUT SHELL FOR POSSIBLE INDUSTRIAL USES

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ABSTRACT

The search for novel sources of oil has made man to be creative and innovative because oil is needed for food and industrial uses. Among many other raw materials available in Nigeria is *Anacardium occidentale* nut shell from which cashew shell oil can be extracted. This study therefore, was carried out to extract and determine the biochemical compounds present in the oil from cashew nut*(A. occidentale)* shell purchased from Ayingba, Kogi state and ascertains its suitability for consumption and industrial uses. The cashew nut shell oil (CNSO) was assessed for geochemical compounds using standard analytical methods (GC-MS). In the physicochemical properties, the appearance and the nature of oil extracted was dark brown in colour with a pungent odour. It has a pH of 6.30 and a percentage yield of 29.20%.Other properties detected were refractive index of 1.513 ± 0,002, specific gravity of 0.991 ± 0.0001kg/dm,$^{-3}$ kinematic viscosity (75.17±0.35/m^2/sec) and smoke point of 50°C. The biochemical compound present include 3-pentadec-8-en-1-yl phenol (cardanol) [27.61%], -3-(heptadec-10-en-1-yl) phenol (20.64%), -6(6-methyl-2-pyra-2-pyrazinyl)-3-methyl[30.91%], 1,5-bi(-4-nitrophyl) carbazide [8.88%], 3-Tridecyl phenol(4.26%) and 5-tridecyl benzene-1, 3-diol [1.09%] among others. These compounds are sources of raw materials for various industries like Paints and Enamels industries, electrical insulating and varnishes industries, polymer and ruber industries, Agro-allied industries, oil and gas industries and pharmaceutical industries etc. Cashew nut shell oil (CNSO) produced therefore might be a raw material for industries thereby converting waste to wealth, and boosting a cleaner environment.

KEYWORDS: *Anacardium occidentale,* Nut Shell, Oil, Physicochemical Properties, Cashew

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B 007

ALLELOPATHIC ACTIVITIES OF N-HEXANE AND ETHYL ACETATE EXTRACT OF *Azadirachta indica* ON THE GERMINATION OF MAIZE SEEDS.

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ABSTRACT

The rate of residual toxicities from insecticides use in agricultural produce is alarming. *Azadirachta indica* leaf is one of the natural insecticides used on crops at different stages which either act positively or negatively on their growth. This study determined qualitative phytochemical constituents, allelopathic effects of *Azadirachta indica* leaf extract on Maize seed germination and seedling growth using standard methods. Allelopathic effects of N-hexane extracts of A. indica leaf was determined on maize seed using concentration of 2.5%, 5.0% and 10% for 12 days. On days 3, 6, 9 and 12, the root and shoot development, germination percentage, and seedling vigour of maize seeds were determined. Both N-hexane and ethyl acetate extracts contained B-Caryophyllene, Trans-B-Farnes, Alpha lonone, Phytol, Myricetin, Quarcetin, Azadirachtol, Azadirachnol, Azadirachta A, Phyllene and Ascaridol. The inhibitions of plumule and radicle growth were observed to be concentration-dependent with the highest percentage of inhibition in 10% of n-hexane extract of *Azadirachta indica*. Germination percentage also decreased with higher concentration, with a maximum of 100% germination in the control group, and only 10% and 30% at 10% and 5% concentrations respectively. Similarly, Seedling vigour index was drastically reduced at higher concentrations, with a value of 3.6 and 37.8 at 10% and 5% respectively, as compared to 423 in the control group. These findings suggest that high concentration of A. indica (10% and 5%) extract inhibit maize germination and seedling growth. Therefore, high concentrations should be avoided when using A. indica leaf extract as insecticide during germination stage of maize.

KEYWORDS: Allelopathic, *Azadirachta Indica,* Germination, Maize, Seeds.

B 008

EFFECT OF SINGLE NUCLEOTIDE POLYMORPHISMS (SNPS) ON SMOOTH CAYENNE FRUIT BROMELAIN PROTEIN SOLUBILITY SCORE.

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ABSTRACT

Bromelain is a major protease-containing enzyme extracted from the pineapple (*Ananas comosus*) plant. Single nucleotide polymorphism is a genomic variant at a single base in the deoxyribonucleic acid (DNA).Protein solubility score predicts a protein reaction in solution, which is crucial for its biotechnological application. The physicochemical features of sequenced smooth cayenne fruit bromelain (SCFBRM) and its monophyletic MN299329.1 reference gene were determined using the ProtParam tool. Their protein solubility scores were predicted via the Protein-Sol solubility prediction server. SCFBRM showed 98.8% similarity with MN299329.1, 9single nucleotide polymorphisms (SNPs) that translated into 13 amino acid variations. Higher physicochemical parameters (theoretical pI of 5.81, Grand Average of Hydropathy of – 0.447) and protein solubility score of 0.43 were recorded in SCFBRM compared to theoretical pI of 5.21, Grand Average of Hydropathy of –0.399 and protein solubility score of 0.47 in MN299329.1. This study shows that single nucleotide polymorphisms reduced the solubility score of SCFBRM and presents possible positions in SCFBRM that can be targeted for effective modifications required of optimized protein expression, isolation and purifications.

KEYWORDS: Bromelain, Genomic, Polymorphism, Solubility, Variant.

B010

THE EFFECT OF PROCESSING METHODS ON THE NUTRITIONAL COMPOSITION OF TIGER-NUT MILK

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ABSTRACT

Tiger-nut (*Cyperus esculentus*) is a tuber widely consumed for its nutritional benefits, particularly when processed into milk, which serves as a plant-based alternative to dairy milk. This study investigates the effect of various processing methods on the nutritional composition of tiger-nut milk. The Tiger-nut samples were processed using three different techniques: boiling required heating the nuts before blending; toasting involved dry-heating the tiger-nuts prior to blending and soaking (fermenting) in water for 20-24 hours before blending. After blending, the milk from the blended tiger nut was extracted using a sieve. The extracted milk was analyzed using standard biochemical techniques to quantify its nutritional contents. The proximate analysis revealed that all tiger nut milk samples had high moisture content (93–97%), with soaked tiger nut milk (STM) having the highest (96.27%) percentage. Toasted tiger nut milk (TTM) exhibited the highest protein content (2.12%), while boiled tiger nut milk (BTM) had the highest crude fiber content. The energy values of the samples varied, with TTM showing the highest (27.23 Kcal/100ml), though not significantly different from the others. Mineral composition analysis indicated significant variations in calcium, magnesium, potassium, sodium, and phosphorus levels across methods. STM demonstrated the highest calcium (596.66 mg/L) and magnesium (313.34 mg/L) contents; whereas TTM exhibited the highest phosphorus content (78.16 mg/L).Sensory evaluation indicated that STM and TTM were the most preferred samples in terms of color, flavor, taste, aroma, and overall acceptability. These findings can guide consumers and manufacturers in selecting appropriate processing techniques based on desired nutritional outcomes.

KEYWORDS: Tiger-nut milk, Nutritional content, Toasting, Fermentation, Plant-based protein

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B013

EFFECT OF SPROUTING ON PROTEIN QUALITY OF THREE LANDRACES OF BAMBARANUT (*Vigna Subterranea* [l] verdc.) GROWN IN KANO, NIGERIA

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ABSTRACT

Agricultural products processing is an important aspect of food security. Foods are processed to improve the nutritional quality thereby improving consumer acceptability. This research determined the effect of sprouting on amino acid profiles of sprouted Bambara nut. Cream, black and zebra landraces of Bambara nut obtained from four areas of Kano were used for the research. The landraces were soaked separately overnight for 15 hours (cream and zebra landraces) and 24 hours (black landrace) and were allowed for five days for

sprouting to occur. The sprouted and non-sprouted landraces were milled separately to obtain powdered samples. Amino acids were analyzed using Technicon Sequential Multi sample Amino acid analyzer. The result showed significant $P<0.05$ increase in essential and nonessential amino acids following sprouting in all the landraces. The total essential amino acids of non-sprouted and sprouted Bambara nut were 37.92, 39.58g/100g protein, 36.94, 40.76g/100g protein and 37.79, 41.53g/100g protein for black, cream and zebra landraces respectively. Similarly, the total nonessential amino acids were 40.06, 41.97g/100g protein, 38.98, 42.92g/100g protein and 42.27, 44.40g/100g protein for black, cream and zebra landraces respectively. This indicates an increase in both essential and nonessential amino acids in sprouted Bambara nut. Our finding concludes that sprouting increases the protein quality of Bambara nut irrespective of the landrace. Therefore, sprouted Bambara nut could be used to treat under-nutrition related disorders such as kwashiorkor and could therefore be used in therapeutic formulations.

KEY WORDS: Sprouting, Protein, Bambara nut, Landrace, Sprouting

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B 014

A GONADOSOMATIC INDEX STUDY ON THE CAMEL BULLS (*Camelus dromedarius*) IN ZURU, NIGERIA

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ABSTRACT

Camels are known for their capacity to endure long periods without water and are easily identified by the humps on their backs. It is an animal species that is seldom studied. The study assessed the gonadosomatic index (GSI) of camel testis of the dromedary species as a measure of the reproductive status of herds in Zuru, Kebbi state in Northwestern Nigeria. The data set consisted of twenty (20) testes from camel bulls ages 7 and 12 years. The data included body weight (BW), weight of the right testis (WRT), weight of the left testis (WLT), and the weight of both testes (WBT). The colour and shape of the testes were white to grayish in color and oval, respectively. The descriptive analysis showed that the body weight ranged from 362 to 562 kg, with a mean of 460.9 kilograms. The WBT ranged from 133 g to 151 g, with a mean of 141.5 g. The GSI was calculated using the formula; weight of both testis/total body weight. The index obtained for both age groups was 0.31. The two age groups having the same index are indicative of similar reproductive output regardless of the age of the bull. A regression model used identified BW coefficient 0.0538 ($p=0.007$), as a significant predictor of the weight of both testis. This implies that for every 1 kg increase in body weight, the weight of both testis increased 0.054 this suggests that other factors might also contribute to testicular weight variability.

KEYWORDS: Camel, Dromedary, Gonadosomatic index, Zuru

B 015

BIODEGRADATION OF GLUFOSINATE AMMONIUM IN AGRICULTURAL SOIL: A REVIEW OF MICROBIAL STRATEGIES FOR SUSTAINABLE HERBICIDE REMEDIATION

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ABSTRACT

The widespread application of glufosinate ammonium herbicides in modern agriculture has raised significant concerns regarding soil fertility, environmental sustainability, and aquatic ecosystem health. Its extensive use led to persistent hazardous residues in soils and water sources, which necessitates effective remediation strategies to mitigate environmental risks. Biodegradation has emerged as a sustainable approach to detoxify agricultural soils, relying on microbial metabolism to break down the residues. This review examines recent advancements in the isolation, identification of bacterial strains capable of degrading glufosinate ammonium. Bacterial strains such as *Pseudomonas spp* have demonstrated significant potential in degrading this herbicide. This review will provide a comprehensive understanding of microbial degradation mechanisms, identify bacterial strains with high biodegradation efficiency, and, propose strategies for optimizing bioremediation in agricultural settings. By analyzing studies conducted between 2010 and 2025, the findings will serve as a resource for researchers, environmental biotechnologists and policymakers, offering an innovative Sapproaches for herbicide management, soil health, and Aquatic ecosystems protection.

KEYWORDS: Biodegradation, Glufosinate ammonium, Strains, *Pseudomonas,* Bioremediation.

B 016

EVALUATING DROUGHT TOLERANCE IN SORGHUM SEEDLINGS: A VALUABLE INSIGHT INTO PHOTOSYNTHETIC EFFICIENCY AND STRESS RESISTANCE

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ABSTRACT

Sorghum has become increasingly important to agriculture, providing the world's food needs in the face of climate change. Despite its potential, drought remains a major limiting factor in sorghum production. Screening sorghum seedlings for drought tolerance provides a valuable foundation for understanding how drought stress affects photosynthesis at the physiological, biochemical, and molecular levels. In this study, ten sorghum varieties were evaluated for drought tolerance at seedling stage using 20% polyethylene glycol (PEG) 6000.The data from various seedling parameters, such as germination percentage, root length, root length stress tolerant index (RLSTI), shoot length, shoot length stress tolerant index (SLSTI), and seed vigor (SV), were recorded. The results indicated that increase in osmotic stress caused a significant decrease in germination percentage in all genotypes under study. The highest germination rate (90%), root length (9.2

cm), RLSTI (72.33 %) and seed vigour (1166.6) were observed in genotype Samsorg-53 while the highest shoot length (4.5cm) and SLSTI (40.17 %) were recorded in Samsorg-52 genotypes. The overall results showed thatSamsorg-52, Samsorg-53andSRN39-2 exhibited a comparatively better performance than other genotypes. In contrast, Samsorg-45and Samsorg-46were more adversely affected than other genotypes at high PEG concentration. These findings imply that Samsorg-52, Samsorg-53, and SRN39-2 showed remarkable promise as drought-tolerant varieties. This varying degrees of drought tolerance observed among the varieties suggest differences in their photosynthetic efficiency. Thus, early screening for drought resilience ensures selection of most drought-resilient genotypes for further enzymatic and molecular studies on photosynthetic efficiency improvement.

KEYWORDS: Sorghum, Drought Tolerance, PEG, Photosynthetic efficiency, Climate change.

B 017

STUDIES ON FACTORS RESPONSIBLE FOR EARLY RIPENING OF TOMATOES: TOWARDS DEVELOPMENT OF STRATEGIES FOR MITIGATION OF POST HARVEST LOSSES

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ABSTRACT

The aim of this study was to isolate and characterize the genes responsible for early ripening in tomatoes so as to establish future strategies on how this could be stemmed biotechnologically. About 30 tomato cultivars were collected as seedlings from the Nigerian - Green Agro-Allied Industrial Zone (GAAIZ), Kaduna and cultivated in a nursery bed for four weeks before transferring to a greenhouse. Fruit ripening stages were divided into five stages and total genomic DNA was extracted from these different growth stages using a DNA Plant extraction Kit (Qiagen). Fourteen SSR primers designed for tomato DNA fingerprinting and further molecular analysis were then carried out. For salt stress treatment, the roots of tomato seedlings were submerged in a solution containing 250 Mm NaCl for 0, 1, 2, 4, 8, 12 and 24 hours. These were done to know the type of volatile oils expressed from the plant due to environmental factors. Based on the data obtained after the molecular analysis, nine MTases were identified in tomato through Blastp alignment. The open reading frame (ORF) length of these genes varied from 1.1 kb to 4.6 kb and their protein length ranged from 381 to 1559 amino acids. All the deduced polypeptides are hydrophilic. Salt tolerant stress test gave 5 different types of volatile oil. This study shows that series of modifications that transform a mature green fruit into a ripe fruit occur during the ripening stages and involve many different metabolic pathways. Therefore, these ethylene-independent factors that control the transition of a fruit from the end of growth to the onset of ripening are of primary importance. Based on findings from this work, studies to determine the roles of target genes in tomato physiology and development should further be performed by gene knockout or over expression experiments using techniques such as CRISPR-Cas9 gene editing. Then assess the phenotypic effects of gene manipulation on traits of interest, such as fruit ripening behavior or disease resistance.

KEYWORDS: Tomato, Molecular characterization, Volatile oils, BlastP, Salt Tolerance

B 018

EVALUATION OF NUTRITIONAL AND THERAPEUTIC EFFECTS OF DEFATTED *Moringa oleifera* SEEDS IN PROTEIN ENERGY MALNOURISHED RATS

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ABSTRACT

Protein Energy Malnutrition (PEM) is a significant global health problem, particularly in developing countries. This study investigated the nutritional potential of defatted *Moringa oleifera* seeds in ameliorating PEM in albino rats. *M. oleifera* seeds were defatted to enhance protein concentration. The seeds' proximate composition, mineral elements, amino acid profile, and *in-vitro* protein digestibility were analyzed. Additionally, the effects of *Moringa oleifera* seeds based-diet on liver function indices of PEM rats were assessed. Results indicated that defatting significantly increased crude protein content and reduced crude fat level. Mineral analysis revealed high sodium and calcium concentrations, essential for electrolyte balance and bone health. Amino acid profiling showed a significant ($p < 0.05$) increase in essential amino acids, particularly arginine, leucine, and valine, which are crucial for tissue repair and muscle growth. *In-vitro* protein digestibility improved significantly after defatting, with the highest digestibility observed in seeds defatted with the solvent mixture. PEM rats exhibited significantly ($p<0.05$) elevated serum level of alanine amino transferase, aspartate aminotransferase, alkaline phosphatase, conjugated and total bilirubin with significantly ($p <0.05$) reduced plasma protein levels (total protein, globulin and albumin), indicative of liver dysfunction. Treatment with the *Moringa oleifera* seed-based diet resulted in significant reduction on these liver enzymes and significant increase in the serum protein compare to the malnourished control group. The diet normalized enzyme activities and increased plasma protein levels, suggesting liver recovery. The study concludes that defatted *Moringa oleifera* seeds are a viable, cost-effective alternative protein source for managing PEM, exhibiting promising nutritional and functional properties.

KEYWORDS: Malnutrition, *Moringa oleifera*, proximate, amino acids profile, Protein Digestibility

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B-019

PHYTOCHEMICAL AND SELECTED NUTRIENT PROFILING OF MANGO PEEL: A COMPARATIVE STUDY OF TWO VARIETIES

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ABSTRACT

Mangoes are one of the most widely consumed fruits globally, generating substantial amounts of peel waste that could serve as a valuable resource for food and pharmaceutical industries.This study compared the proximate content, phytochemical composition, mineral levels and antioxidant vitamins in the peels of two mango varieties: Sherri and Peter. Standard analytical procedures were employed to determine the levels of proximate components, antioxidant vitamins, minerals, and phytochemicals.The results showed that the Peter variety had significantly ($P<0.05$) higher levels of fibre, ash, and lipid content compared to the Sherri variety, but the increase in crude protein was not statistically significant ($P>0.5$). conversely, the Sherri variety had significantly higher ($P<0.05$) carbohydrate and moisture content. Potassium and Iron concentrations were significantly higher ($P<0.05$) in the Peter variety, while differences in Copper, Magnesium and Manganese were not significant ($P>0.05$). The Sherri variety contained significantly higher ($P<0.05$) levels of vitamin A and significantly lower vitamin E levels compared to the Peter variety, while the difference in vitamin C content was not significant ($P>0.05$). Additionally, Sherri mango peels had

significantly (P<0.05) higher concentrations of flavonoids, saponins, and alkaloids. These findings provide valuable insights into the phytochemical and nutritional differences between these varieties, supporting informed decision-making by consumers, nutritionists, and stakeholders in the food and pharmaceutical industries, while also contributing to effective waste utilization and thereby reduce environmental pollution.

KEYWORDS: Mango peel, Antioxidant vitamins, Proximate analysis, Phytochemicals, Food waste management

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B 020

EFFECT OF CHEMICAL AND ORGANIC FERTILIZER ON THE ANTIOXIDANT CONSTITUENT IN THE LEAF OF *OCIMUM GRATISSIMUM*

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ABSTRACT

Ocimum gratissimum popularly known as scent leaf, is one of the discovered medicinal plants with the potential to serve as an alternative therapy for the treatment of various ailments or as a source of a new drug. It is a widespread and commercially viable perennial herbaceous plant with a very strong aromatic smell. They are rich sources of essential nutrients such as carbohydrates, carotene, protein, vitamins, calcium, iron, ascorbic acid, trace minerals antioxidants. The concentration of antioxidants depends largely on soil nutrient and composition; it was on this note that a nutrient application trials was conducted to investigate the effect of chemical and organic fertilizer on the antioxidant constituent in the leaf of *O.gratissimum*. Ten seeds of *O.gratissimum* were sown in a polythene bag filled with 10.00 kg of top soil and after emergence the seedlings were thinned to two plants per pot. Complete randomized design (CRD) was adopted, using three treatments namely, Control (No application of fertilizer), application of *C. thonglongyai* dropping and Chemical fertilizer. Each treatment had 10 pots. The vegetable leaves were harvested at market maturity and was subjected to chemical analysis using spectrophotometric method to evaluate the concentrations of β-carotenoid, tocopherol, lycopene, chlorophyll, total carotenoid, phenol, steroids, alkaloid, and flavonoid. The results showed that the application of chemical fertilizer and *C. thonglongyai* droppings significantly increased ($p < 0.05$) the concentration of β-carotene in *O. gratissimum*, however; the concentration of this parameter was significantly higher ($p < 0.05$) in the vegetable treated with the organic fertilizer when compared with the one fertilized with chemical fertilizer. While the concentration of vitamin C in *O. gratissimum* fertilized with *C. thonglongyai* droppings and chemical fertilizer did not differ significantly from each other. Similarly, application of chemical fertilizer has no significant effect on the concentrations of lycopene, chlorophyll, vitamin E, carotenoid, flavonoid and phenol in *O. gratissimum,* the concentrations of these antioxidants increased significantly with the application of *C. thonglongyai* droppings. The research concludes that the vegetable grown with *C. thonglongyai* dropping significantly contain higher antioxidant substance which can play a vital role in disease prevention and therapeutic applications.

KEYWORDS: *Ocimum gratissimum*, antioxidant, *Craseonycteric thonglongyai* droppings;

B-021

PURIFICATION AND CHARACTERIZATION OF TANNASE PRODUCED VIA SOLID-STATE FERMENTATION OF COCOA POD BY *Aspergillus flavus*

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ABSTRACT

This study was aimed at purification and characterization of tannase, produced via solid-state fermentation of cocoa pod using *Aspergillus flavus*. Tannase produced was purified via precipitation by ammonium sulphate and gel filtration using sephadex-100 packed column**.** The activity profile of tannase was determined after precipitation with different concentrations of ammonium sulphate (20-80%). Characterization of purified tannase was by carried out using standard methods. The yield, specific activity, and purification fold of purified tannase were determined using spectrophotometry method. Kinetic properties of purified tannase were determined using Michaelis-Menten method. Km, Vmax, Kcat and Kcat/Km values of purified tannase obtained from solid-state fermentation of cocoa pod using *A. flavus* were 1.01x 10^{-3} mM, 68.54 µmol mg^{-1} min^{-1}, 0.70 s^{-1} and 688.23 $s^{-1}mM^{-1}$ respectively. The yield, specific activity and purification fold of purified tannase produced via solid-state fermentation of cocoa pod was 34.04%, 11.99 U/mg and 34.04 respectively; purified tannase was observed to be activated by Mg^{2+} and Ca^{2+} while Cu^{2+}, Zn^{2+}, K^{+}, Fe^{2+}, Co^{2+}, EDTA and SDS inhibited it; optimal pH and temperature of purified tannase was 6.0 and 80°C respectively. Characterization of purified tannase from this study revealed the enhancement of tannase activity for industrial application. Characterizing tannase from *Aspergillus flavus* through a multidimensional approach - covering biochemical, molecular, kinetics, and applicationsis essential for determining its industrial potential and optimizing it for commercial-scale production

KEYWORDS: *Aspergillus flavus,* Solid-state fermentation, Tannase, Characterization, Kinetics

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B 022

INVESTIGATION OF THE PHYSICOCHEMICAL AND BIOLOGICAL PROPERTIES OF *Carica papaya* HEXANE SEED EXTRACT UNVEILS POTENTIAL ANTI-DENGUE TYPE 2 COMPOUNDS

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ABSTRACT

Carica papaya Linn. belongs to the family *Caricaceae* and is well known for its therapeutic and nutritional properties. The study evaluated the hexane seed extract phytocompounds for their potential antiviral properties using integrated computational analysis. Phytocompounds were analyzed using GC-MS analysis. Compounds were classified and annotated using the ClassyFire methodology. Physicochemical characteristics were predicted via the Swiss ADME web service. Antiviral properties were predicted using Passonline. Natural product-likeness was assessed using the NP-Scout system. Kinase targets prediction was determined using the KinScreen application. Gene expression profiles were extrapolated using the DIGEP Pred web service. The compounds belonged to the organic compound kingdoms. ClassyFire hierarchical revealed compound 1, 4, and 5 as fatty acid methyl esters, compound 2, 6, and 7 as long-chain fatty acids, and compound 3, 8, 9, and 10 as linoleic acids and derivatives, very long-chain fatty acids, phosphatidylethanolamines, and fatty aldehydes. Compounds 1 and 2 showed potential drug properties using ADME analysis and natural product likeness. Compound 2 exhibits the best target in the kinase members. The compounds were active against the dengue virus type 2 genome polyprotein. Compounds 2 and 7 were the most active and had the highest confidence level of 0.6981. Gene expression profiling analysis revealed overlapping genes. IL23A was significantly upregulated while MT1H, ELAVL1, and SMARCC1 were significantly downregulated. The phytocompounds could exhibit antiviral properties against dengue virus type 2 by interfering with mRNA expression of key genes and mediating signaling in coordinating immune defenses against DENV infection.

KEYWORDS: *Carica Papaya,* Extract, GC-MS Analysis, Antiviral Properties, Dengue Virus Type 2

B-023

EVALUATION OF THE NUTRITIONAL AND PHYTOCHEMICAL PROFILE OF *Hibiscus sabdariffa* (RED) AND *Hibiscus asper (BLACK)*

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ABSTRACT

In an era where commercial soft drinks are both costly and linked to adverse health effects, the search for affordable, health-promoting, and culturally relevant alternative beverages/drinks is essential. This study explores the nutritional and medicinal potential of two locally sourced hibiscus varieties; *Hibiscus sabdariffa* (red) and *Hibiscus asper (*black), commonly used as traditional beverages. Proximate composition, phytochemical profile, and antioxidant vitamin contents were analyzed using standard methods while the mineral content was analyzed using atomic absorption spectroscopy. Proximate analysis revealed low moisture content and high levels of crude fibre, carbohydrates and protein in both varieties. *H. sabdariffa* (red) and *H. asper (*black) showed crude fiber contents of 16.0 ± 0.50% and 15.5 ± 0.40%, and carbohydrate levels of 54.6 ± 1.20% and 56.1 ± 1.10%, respectively. Phytochemical screening confirmed the presence of bioactive compounds including alkaloids (1.10 ± 0.07 mg/g and 0.95 ± 0.08 mg/g), flavonoids, phenolics, tannins, and saponins. Mineral analysis showed notable levels of essential elements such as iron, calcium, and magnesium. These results highlight the rich nutritional and bioactive chemicals contents of red and black hibiscus, supporting their potential as sustainable, health-enhancing alternatives to synthetic soft drinks. Therefore, their incorporation into diets may not only offer refreshments but also contribute to improved public health outcomes.

KEYWORDS: *Hibiscus sabdariffa*, *Hibiscus asper*, Proximate composition, Phytochemicals, Beverages.

B 025

A REVIEW OF THE ROLES OF PLANT HORMONES AND GROWTH REGULATORS IN PLANT GROWTH AND DEVELOPMENT

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ABSTRACT

Growth and development are modified by environmental factors, phytohormones and growth regulators. Phytohormones are organic molecules manufactured in the plant in only very low amount that regulate or affect developmental methods whereas growth regulators or bioregulators, are synthetically formed chemical compounds which can be applied to plants to control the action of the phytohormones. Growth regulators or bioregulators include the synthetic chlorine chloride, chloro choline chloride, ethepon and mepiquat chloride. Auxins which are produced in meristematic tissues are essential for growth stimulating extension of both shoot and roots. A principal function of gibberellins is the initiation of cell enlargement and stem extension involved in the transcriptional regulation of gene expression. Abscisic acids strengthen membrane permeability for water therefore allowing the passage of water across membranes and the uptake of water from the soil. Brassinosteroids are concerned with monitoring of cell division, elongation, and differentiation of many types of cells throughout the plant life cycle. Ethylenes are regarded as multipurpose

plant hormones that regulate both growth and senescence. Jasmonic acids promote the synthesis of proteins which may assist as transitory storage proteins which are complicated in the protection of plant cells against biotic and abiotic stresses. Oligosaccharins are observed to function as elicitors in pathogen defense mechanisms and are active biomolecules which stimulate defense responses and resistance in numerous plants. Salicylic acids are critical signal molecules that play fundamental role in plant growth by affecting cell growth and expansion, and boost immunity. Similarly, strigolactones are complicated in plant defense responses in addition to their ability to increase root hairs, plant height, senescence, and secondary growth. On the other hand, growth regulators control vegetative growth and therefore adjusting culm length or shoot/root ration. However, they may equally concentrate on flower and fruit development. Continual research on the effects of growth regulators is likely to reveal more effects of these growth regulating substances. The more we know about these effects the more enlighten we are on sustainable food production which will consequently affect agriculture.

KEYWORDS: Hormones, Growth, Regulators, Influence, Development.

B-026

EFFECTS OF PROCESSING METHODS ON THE VITAMIN AND MINERAL CONTENT OF COMMONLY CONSUMED VEGETABLES IN NIGERIA

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ABSTRACT

Vegetables are essential components of human diets, supporting health and nutrition. This study evaluated the effects of boiling, steaming, and storage (room temperature vs. refrigeration) over 7 days on vitamins A, C, K and minerals calcium and potassium in spinach, carrots, and cabbage obtained from Yankaba market, Kano, Nigeria. Vitamin concentrations were measured by UV–Vis spectrophotometry and mineral concentrations by atomic absorption spectrophotometry. Significant main effects of vegetable type, treatment, and nutrient type on both vitamin and mineral contents were observed ($p < 0.001$). Vitamin content varied substantially across vegetables and treatments, with steaming and refrigerated storage best preserving vitamin levels. Two way and three way interactions for vitamins were not significant, suggesting that the effects of each factor on vitamin content are largely independent. Mineral analysis revealed significant main effects of vegetable, mineral, and treatment ($p \leq 0.002$) and a significant vegetable and mineral interaction, indicating that calcium and potassium retention depended on vegetable type. Other two way and three way interactions for minerals were not significant. These findings highlight the critical role of vegetable selection and processing in nutrient retention. Steaming combined with refrigeration is recommended to maximize vitamin and mineral intake from commonly consumed vegetables. This work underscores the importance of selecting appropriate processing and storage methods to preserve essential nutrients in vegetables.

KEYWORDS: Vegetables, vitamins, minerals, processing, storage

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B-027A

ANTIBIOTIC RESIDUAL CONCENTRATIONS AND THEIR EFFECTS IN BROILER CHICKS

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ABSTRACT

Antibiotics are commonly used as growth promoters and for therapeutic purposes. A survey of 80 questionnaires was carried out to identify the most commonly used antibiotics in poultry farms. This was done to recreate how antibiotic administration is carried out in poultry farms which would indicate if these drugs are being abused by poultry farmers. Seven antibiotics were selected and administered based on the average body weight of 40 broiler chickens. These included Oxytetracycline (400mg/kg), Tylosin (500mg/kg), Gentamycin (330mg/kg), Penicillin (500mg/kg), Neomycin (220mg/kg), Sulfonamide (200mg/kg), and Fluroquinolone (300mg/kg) administered for four weeks and compared with a normal control group. Additionally, 15 chickens were purchased from local markets in Keffi, Nasarawa State, for comparison. Samples from the breast, liver, gizzard and crop were analyzed to determine antibiotic residual concentrations and their effects on liver and kidney function. The results showed significant difference ($p<0.05$) in kidney and liver parameters in the local market group when compared to the poultry farm group, indicating kidney and liver function impairment. Both groups exceeded recommended maximum residue limits and pathogenic bacteria like Salmonella spp. and E. coli were found in the local market group. This indicated the misuse of antibiotics in the market group during administration, rendering the meat unsafe for human consumption.

KEYWORDS: Antibiotics, Broiler-chicks, Antibiotic-resistance, Antibiotic-residual-concentration, Resistant-bacteria.

B 027B

HARNESSING WASTE FOR CLEAN ENERGY: SUSTAINABLE CELLULASE PRODUCTION FROM AGROWASTES BY *Aspergillus flavus*

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ABSTRACT

The importance of cellulase in energy production, especially biofuels and biopower, cannot be overemphasized. It is primarily involved in the production of glucose which is ultimately fermented to produce bioethanol. This study investigates the cellulase production potential of Aspergillus flavus isolated from sewage sludge and refuse dumpsites, utilizing selected agro wastes as carbon sources. Agro wastes including rice bran, groundnut pod and maize stalk were subjected to submerged fermentation for enzyme production. Cellulase activity was determined using the DNS method, reaction temperature and pH were optimized, and enzyme kinetics was calculated. Results revealed that *A. flavus* from refuse dumpsites produced cellulase with the highest activity compared to that from sewage sludge. Among the agro wastes tested, rice bran and groundnut pod showed the highest enzyme activity, with maximum production observed on the sixth day of fermentation. The optimal temperature for activity of cellulase produced with the three agro wastes was 50°C, while optimal pH values varied, with rice bran peaking at pH 7.0, groundnut pod at pH 5.0. The kinetics of cellulose produced showed high Vmax and low Km, indicating high affinity for substrates and efficient hydrolysis. This study highlights the potential of agro wastes as alternative carbon sources for cellulase production and underscores its valorization, promoting cleaner environments and supporting industrial applications in biofuel and energy industries. Future studies should explore the thermal and storage stability of this enzyme to enhance its industrial viability.

Keywords: *Aspergillus flavus*, Cellulase activity, Refuse dumpsite, Sewage sludge, Agrowastes

B-028

INFLUENCE OF AGEING ON THE PHYTOCHEMICAL CONTENT OF AGED *Ficus capensis* WINE

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ABSTRACT

Phytochemicals contribute to red wine's health benefits. Numerous chemical reactions occur during ageing process, alternating phytochemical compositions of wine. Therefore, this paper focused on the influence of ageing on the phytochemical content of the wine. Wine produced from *Ficus capensis* leaves using *Sacharomycea cerevisae* was analyzed using High Performance Liquid Chromatography after twelve (12) months of ageing. The result showed the presence of quercitin, kaempferol, geranyl acetone, alpha caryophyll, kaempferol, orientin, linalool, scytalone, myricetin, catechin, luteolin, isoquinoline, liquiritic acid, epigallocatechin and lupeol. Quercitin had the highest concentration (10.2300 mg/g) while lupeol had the lowest concentration (0.0002mg/g). The research showed that ageing had a positive influence on the phytochemical composition and would enhance the nutritional benefits of the wine.

KEYWORDS: Nutrition, Wine, Phytochemicals, *Ficus capensis*, Aging.

B 029

COMPARATIVE ANALYSIS OF ASCORBIC ACID CONTENT IN SPINACH, MORINGA AND LETTUCE AND BITTER LEAF

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ABSTRACT

Ascorbic acid, or Vitamin C, is a water-soluble vitamin crucial for numerous biological functions, including the protection of cells from destruction inflicted by free radicals. It is found in many fruits and vegetables. This study investigated the ascorbic acid (vitamin C) content in four leafy vegetables: Spinach (*Spinacia oleracea*), Moringa (*Moringa oleifera*), Lettuce (*Lactuca sativa*), and Bitter Leaf (*Vernonia amygdalina*) to compare their nutritional potential. Fresh samples were collected, washed, and analyzed using the 2,6-dichlorophenol-indophenol (DCPIP) titrimetric method for ascorbic acid quantification. Samples were homogenized, filtered, and titrated with a standard DCPIP solution to ascertain the ascorbic acid concentration in mg per 100g of each vegetable. The results revealed significant variation in ascorbic acid levels among the vegetables: Moringa having the highest concentration at (160.30±1.90) mg/100g, Bitter Leaf (102.57±0.86) mg/100g, Spinach: (79.60±0.86) mg/100g and lettuce having the lowest concentration at (43.83±0.65) mg/100g. These findings highlight the exceptional nutritional benefits of Moringa and Bitter Leaf as prospective sources of dietary vitamin C. Incorporating these vegetables into daily diets can help meet the recommended ascorbic acid intake and contribute to improved health outcomes. Further studies are recommended to evaluate the impact of different processing methods on vitamin C retention in these vegetables.

KEYWORDS: Ascorbic acid, Vegetables, Free radicals, *Moringa oleifera, Vernonia amygdalina*

B-030

ASSESSMENT OF MICROBIAL LOAD AND ANTIBIOTIC SUSCEPTIBILITY OF GRAM-NEGATIVE BACTERIA FROM FRESH VEGETABLES IN GUSAU METROPOLIS

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ABSTRACT

The increasing prevalence of antibiotic-resistant bacteria in food sources poses a significant public health concern, particularly in developing regions. This study aimed to assess the microbial load and determine the antibiotic susceptibility patterns of Gram-negative bacteria isolated from selected vegetables sold in Gusau Metropolis, Zamfara State, Nigeria. A total of 50 vegetable samples, including tomatoes and lettuce were randomly collected from local markets. Standard microbiological techniques were employed for bacterial isolation and identification. Isolates were subjected to antibiotic susceptibility testing using the Paper disk diffusion method, following Clinical and Laboratory Standards Institute (CLSI) guidelines. The isolates obtained after sub culturing were characterized based on their cultural, morphological and biochemical characteristics. The total bacterial count ranged from 1.25×10^{-2} to 8.06×10^{-8}cfu/ml. The results revealed the presence of various Gram-negative bacteria including *Escherichia coli*, *Klebsiella spp*. and *Proteus spp*., with *E. coli* being the most prevalent. The isolates exhibited varying degrees of resistance to commonly used antibiotics such as tarivid, reflacine, ciproflox, gentamycin, ampicillin, streptomycin, ceporex, nalidixic acid, augmentin and septrin.A significant proportion (60%) of the isolates were multidrug-resistant, highlighting the potential risk of consuming raw or poorly washed vegetables. Furthermore, molecular characterization of the antibiotic resistance genes is ongoing to validate the susceptibility and MIC screening. However, these findings underscore the need for improved hygiene practices in vegetable handling and stronger surveillance of antibiotic resistance in foodborne pathogens. Public awareness and policy interventions are recommended to mitigate health risks associated with contaminated produce.

KEYWORDS: Foodborne, Vegetables, Bacteria, Gram-negative, Antibiotic.

B 031

COMPARATIVE ANALYSIS OF FATTY ACID PROFILES AND OIL QUALITY IN RAW AND FERMENTED CASTOR SEEDS OIL

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ABSTRACT

Castor seed, *Ricinus communis*, is one of the well-known oil seeds in Africa containing between 40% to 60% oil. The oil is unique among vegetable oils being the only commercial source of hydroxylated fatty acid. This study investigated the impact of fermentation on the fatty acid profile and overall oil quality of castor seeds. Castor seeds were subjected to an uncontrolled solid state fermentation process, and the resulting oil was extracted and analyzed. Gas chromatography was used to determine fatty acid composition, while standard methods were used to assess oil quality parameters, including oil content, the pH, iodine value, acid value, refractive index, specific gravity and saponification value. The results were compared with those obtained from raw castor seed oil. The fatty acids present are linoleic acid, arachidonic acid, oleic acid, ricinoleic acid, palmitic acid, stearic acid and linolenic acid. CasOgbo-20AC variety yielded a significantly ($p>0.05$) higher amount of Ricinoleic acid in both raw and fermented castor seed oil (45.46±0.75 and 78.45±0.90 ug/g respectively). Palmitic acid was significantly ($p > 0.05$) lower in amount among the fatty acids present in the

castor seeds analyzed. NCRICAS1 produced a significantly ($p>0.05$) lower concentration of palmitic acid ($0.12^{e}\pm0.01$ and $0.24^{d}\pm0.01$ug/g respectively) as compared to other samples analyzed. The results showed that the oil content in raw and fermented Casogbo-20AC, Caspampo1 and NCRICAS1 are $46.33^{a}\pm 0.05$: $28.46^{d}\pm 0.05$; $35.41^{c}\pm 0.05$:$23.36^{e}\pm 0.05$; and $36.82^{b}\pm 0.11$:$21.45^{f}\pm 0.03$ respectively. The findings in this study provide insights into the potential of fermentation as a pre-treatment method in enhancing the nutritional and industrial value of castor seed oil.

B-032

STUDY ON THE UTILIZATION OF MACRONUTRIENTS AS DEPENDENT ON THE FLUX OF MICRONUTRIENTS DURING THE PATHOGENESIS OF *Plasmodium falciparum* INDUCED MALARIA

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ABSTRACT

Malaria caused by *Plasmodium falciparum* continues to pose a significant health burden worldwide, with severe cases often associated with nutritional deficiencies. This studyinvestigates the influence of micronutrients flux on macronutrients utilization during the pathogenesis of *P. falciparum* induced malaria. A hospital-based cross-sectional study was used to examine the zinc and iron concentrations from patients diagnosed with malaria and estimate the influence of these micronutrients on the serum levels of carbohydrate and protein in malaria patients with varying parasite densities to determine their role in disease progression.Results revealed that dietary habits significantly ($p<0.05$) influenced malaria severity. Carbohydrate, protein and zinc concentrations were markedly reduced in patients with high parasite density, while a decrease in carbohydrate and iron levels were significant ($p< 0.05$) in patients with low parasite density. On the other hand, the concentrations of protein and iron significantly ($p < 0.05$) decreased across the various parasite densities during the infection. Dietary habit singularly connotes this observation among the study groups (Chi-square 0.04). Additionally, a significant positive correlation between carbohydrate and zinc levels was observed in patients with low parasite density, whereas a non-significant correlation was noted in patients with high parasite density. In a contrary fashion, the decrease in iron level had no effect on the uptake of protein suggesting a negative correlation. These findings suggest that zinc plays a crucial role in carbohydrate metabolism during malaria infection, potentially affecting disease severity as well as the intricate interplay between protein utilization and iron fluxin *P. falciparum* induced malaria. Nutritional interventions that address micronutrients and macronutrients deficiencies could therefore contribute to better disease outcomes.

KEYWORDS: Malaria, Micronutrients, Macronutrients, *Plasmodium falciparum*, Pathogenesis.

B 033

PRODUCTION OF KERATINASE ENZYME USING ACTINOBACTERIA FOR ITS POTENTIAL APPLICATIONS IN POULTRY WASTE MANAGEMENT, LAUNDRY AND DEHAIRING

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ABSTRACT

Poultry feather waste poses a significant environmental challenge due to its high keratin content and resistance to degradation. This study explored the potential industrial and environmental applications of keratinolytic enzymes produced by Actinobacteria isolated from a poultry feather waste dumping site at Birnin Kebbi Central Market, Kebbi State, Nigeria. Soil samples were serially diluted and the suspensions were cultured on Starch Casein Digest Agar. Keratinolytic bacteria were screened based on their feather meal utilization capabilities. The most efficient feather meal utilizing isolate was subjected to keratinase enzyme production by submerged fermentation. After fermentation, the crude enzyme was partially purified using ammonium sulphate precipitation and evaluated for its industrial applicability. Detergent compatibility studies revealed that the keratinase enzyme exhibited stability with a test detergent (So Klin), which is a widely used commercial detergent. Additionally, the destaining performance of the keratinase enzyme demonstrated promising destaining activity against proteinaceous stains. Further to this, the keratinase produced, exhibited effective dehairing performance on animal hides. These findings underscore the enzyme's viability as a sustainable biocatalyst for the valorization of feather waste into value-added products, contributing to waste minimization and circular bioeconomy.

KEYWORDS: Keratinase, Actinobacteria, Feather Waste, Bioconversion, Submerged fermentation.

B 034

EVALUATION OF PATHOGENIC BACTERIA'S DYNAMISM IN AGRICULTURAL RUNOFF USING QUANTITATIVE PCR (QPCR)

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ABSTRACT

Agricultural runoff serves as the primary cause of pathogenic bacterial contamination in surface waters, which raises issues for the environment and human health. The dynamics of harmful bacteria in runoff from farmlands in Wudil LGA, Kano State, Nigeria, are examined in this study using qPCR. In both the wet and dry seasons, samples were taken from the main agricultural runoff sites, and qPCR was used to check for *Salmonella spp., Shigella spp*., and *Escherichia coli* using species-specific primers. High rain was found to increase bacterial loads in samples, particularly at locations where manure was applied as fertilizer. According to the study, qPCR is a quick and accurate way to find and assess the amount of pathogens present in environmental water samples. These results highlight the necessity of improved agricultural management techniques, including vegetative buffer zones, which can lessen bacterial contamination in the water bodies in the area. To guarantee public health safety and sustainable agriculture in Wudil LGA, this study offers the framework for real-time water quality monitoring systems.

KEYWORDS; Quantitative PCR (qPCR), Pathogenic bacteria, Agricultural runoff, Water quality, Wudil

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Pp B 003

EFFECTS OF SPROUTING AND ALCOHOL-ALKALINE TREATMENT ON COLD WATER SOLUBILITY OF FINGER MILLET (*Eleusine coracana*) STARCH

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ABSTRACT

Finger millet (*Elusine coracana* (L) Gaertn.) popularly known as 'Ragi' or 'Mandua", belongs to family Poaceae'. The research was aimed at improving the cold water solubility of finger millet starch by sprouting and pretreatment with alcohol-alkaline treatment. The finger millet was steap in water for 6hours at room temperature. It was sprouted for 72 hours. The sprouted finger millet starch was homogenized and starch extracted following standard procedures and dried in a hot air oven at 40^0C until a constant weight was achieved. Cold-water-soluble sprouted finger millet starch was prepared by an alcoholic-alkaline treatment. The method was carried out by treating the finger millet starch with mixtures of ethanol and NaOH solution to swell starch granules. The treated starches were then neutralized with HCl, washed, and dried at 80°C for 3 hr. The sprouted and alcohol- alkaline treated finger millet starch shows 17% cold water solubility compared with the control with a cold water solubility of 7%. The X-ray diffraction, SEM (Scanning electron microscope), FTIR Spectroscopy and microscopy results show that the sprouted and treated finger millet has transformed from crystalline to amorphous after treatment, the sprouted and treated finger millet starch granules swell and burst after treatment. The study concluded that sprouted and treatment of finger millet starch with alcohol-alkaline could increase cold water solubility for better application in food industry.

KEYWORDS: Finger millet, sprouting, Solubility, Starch, Food industry

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Pp B 004

EFFECT OF SOIL ZINC CONCENTRATION ON PLANTS GROWTH: MOLECULAR MODELLING AND DOCKING OF INTERACTIONS BETWEEN PLANT PROTEINS AND ZINC IONS

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ABSTRACT

This study explored dual aspects of plant-soil interactions involving zinc (Zn) and molecular dynamics between plant proteins and metal ions. About 2kg of soil mixed with a small amount of gravel (1.5v/v) were placed in experimental pots. The seeds of Sunflower, Amaranthus, Cowpea, and Groundnut were planted in the pots and irrigated for two weeks. The seedlings used were treated with 500ppm zinc sulphate. The shoot, leaves and root were separated, and their length and weight measured. The concentrations of zinc In the digests were analysed using AAS. The modeling and docking were conducted using online chemical compound databases such as PubChem, chimera 1.10.2, Phyre2 and PyMOL software were engaged for preparation of the 3D structure for Bb ZIP protein. Its active binding sites prediction was achieved with COACH-D algorithm while the quantum tunnel prediction was done with CAVER Web 1.0 tools. Results revealed the presence of flavonoids, tannins, flavonoids, steroids, and saponins in plant samples. The plants' growth was low compared to the controls while the zinc concentrations were higher in treated soils, shoots and roots of the plants grown on the treated soils with highest concentrations (315ppm) found in the root of peanut plant. The prediction of binding sites and tunnels disclosed active site with five poses comprising the

predicted catalytic amino acids (Met 91, Leu 92, Phe 94, Ala 95, Ala 96, Pro210, Glu 211, Ala 214 and Gly 93, Ala 178, Leu179, Glu 181, Ser 236, Leu 238, Met 239, Glu 240, Pro 241, Gly 182, and Gly 237). The molecular docking revealed binding affinity of – 3.8 kcal/mol with inhibition constant of 247.81 mM. The BbZIP-Zn complex was stabilized by four hydrogen bonds (Ala 96, Ala 290, Ser 236 and Leu 294). The study establishes a broad disposition of the dual role of zinc in stress response mechanisms and even plant development.

KEYWORDS: Soil, Zinc, Plant, Modelling, Molecular docking.

Pp B 015

PREVALENCE AND CHARACTERIZATION OF ANIMAL TRYPANOSOMES IN SLAUGHTERED CAMELS AND CATTLE IN CENTRAL ABATTOIR, KANO STATE, NIGERIA

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ABSTRACT

Animal trypanosomiasis remains a major constraint to livestock productivity across sub-Saharan Africa. The disease, primarily caused by species of the genus *Trypanosoma*, leads to anemia, weight loss, and death in infected animals. This study investigated the prevalence, molecular characterization, and virulence potential of trypanosome infections in slaughtered camels and cattle at the Kano Central Abattoir, Kano State, Nigeria. A total of 2,013 blood samples (167 from camels and 1,846 from cattle) were screened, with an overall trypanosome prevalence of 0.35%. Camels exhibited a higher infection rate (1.20%) compared to cattle (0.27%). Molecular identification using nested PCR targeting the ITS1 region revealed three positive isolates. Sequencing and BLAST analysis identified two as *Trypanosoma evansi* and one as *T. brucei gambiense*, with phylogenetic analysis showing distinct clustering patterns. Experimental infection in rats demonstrated varying degrees of virulence: isolate 1223 showed the most aggressive parasitemia, fastest mortality, and severe anemia, while 792 and 1127 presented slower disease progression. Biochemical analysis revealed elevated liver (AST, ALT) and kidney (urea, creatinine) markers in all infected groups, indicating organ damage. Histopathological evaluations supported these findings, with severe hepatic necrosis, renal tubular injury, and splenic hyperplasia observed. The presence of T. brucei gambiense, a human-infective species, underscores the potential public health risk. This study highlights the need for enhanced surveillance, vector control, and further molecular research to understand the evolving epidemiology and pathogenicity of animal trypanosomes in Nigeria.

KEYWORDS: Trypanosomiasis, Trypanosoma Brucei gambiense, Prevalence, Virulence, Abattoir.

Pp B 021

AN OPTIMISED WARMSTART COLORIMETRIC LOOP-MEDIATED ISOTHERMAL AMPLIFICATION FOR THE SPECIFIC DETECTION OF MYCOBACTERIUM LEPRAE

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ABSTRACT

Leprosy remains a major public health issue in many developing countries, including Nigeria, where early diagnosis is limited by the lack of sensitive and specific diagnostic tools. This study addresses the urgent need for improved diagnostics by optimizing and validating a WarmStart Colorimetric LAMP assay targeting the 16S rRNA gene of Mycobacterium leprae for early, cost-effective detection. A synthetic gene construct (pUC57-Mleprae-16S-rRNA) was engineered by cloning the M. leprae 16S rRNA gene into the pUC57-Bsal-free plasmid using the EcoRV restriction enzyme. This construct served as the template for assay optimization, specificity testing, and sensitivity analysis. Clinical validation involved 27 blood samples (8 from untreated leprosy patients and 19 from untreated tuberculosis patients with PCR as the reference method. The optimal assay conditions were established at 65°C for 60 minutes, with a detection limit of 2 pg/µL. Specificity tests showed no cross-reactivity with DNA from Mycobacterium tuberculosis, Escherichia coli, Pseudomonas spp., Salmonella spp., or Staphylococcus aureus. The WarmStart Colorimetric LAMP assay, including its direct version which bypasses nucleic acid extraction, demonstrated 100% sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy. The Cohen's kappa value of 1 indicates perfect agreement with PCR. This assay offers a reliable, rapid, and low-cost point-of-care diagnostic tool, suitable for use in resource-limited settings and overcoming the limitations of traditional diagnostic methods such as slit-skin smear microscopy and histopathology.

KEYWORDS: Leprosy, Mycobacterium leprae, WarmStart colorimetric LAMP assay, Early diagnosis, Resource-limited settings.

SUB-THEME 3

C001A

INTERVAL ANALYSIS OF VOLATILE SOLIDS (VS) AND BIOCHEMICAL OXYGEN DEMAND (BOD) IN BATCH ANAEROBIC FERMENTATION OF SELECTED AGRO-WASTES.

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ABSTRACT
This study investigated the degradation of Volatile Solids (VS) and Biochemical Oxygen Demand (BOD) during the anaerobic digestion of selected agro-waste, specifically cassava peels, maize husks, pig slurry, and the composite. The objective was to evaluate the biodegradability of these feedstocks, in line with their potential for biogas production. Batch reactors were used for the digestion experiments for over a period of 45 days. The digesters were operated under controlled conditions, and samples were analyzed at three (3) different points viz:24 hours, peak of gas production, and at the end of the digestion. The results demonstrated that all the substrates exhibited a reduction in VS and BOD in the course of digestion. However, the most significant reduction in VS and BOD occurred around the peak of gas production. This entails that this period is critical for microbial activity and biogas yield. Maize husks had high initial VS and BOD values of 4.73±0.22 and 92.80±3.26 respectively. However, that did not translate to higher biogas production compared with the composite that had initial values of 4.34±0.19 and 88.00±5.50 respectively. By the end of digestion, an average VS reduction of 65% and a BOD reduction of 70% were observed across all substrates, indicating a substantial degradation of organic material. Biogas production was better in the composite (72.58±4.53), an indication that higher VS and BOD do not automatically translate to higher gas yield. Thus, factors like multiple substrate interaction affect gas yield and process efficiency.

KEYWORDS: Volatile Solid (VS), Biochemical Oxygen Demand (BOD), Anaerobic Digestion, Batch Fermentation, Agro-waste.

C 001B

DIFFERENTIAL BIOACCUMULATION OF HEAVY METALS IN TISSUES OF *Tilapia zilli*EXPOSED TO LIQUID HABITAT FROM RIVER CHALLAWA IN KANO, NIGERIA

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ABSTRACT
Increased water body contamination by heavy metals (HMs) is a serious health hazard to both aquatic biota and their predators. The degree of contamination is a function of bioavailability and bioaffinity to an organism. Metallothioneins (MTs) –a protein with high metal binding ability was used to assess the differential bioaccumulation of HMs in liver and skeletal muscles of *Tilapia Zilli.* HM concentration in all the liquid habitats was above the permissible limits of Federal Ministry of Environment with Zinc having the highest concentration ranging from 6.791-11.825 ppm. Exposure of *T. Zilli*to the three liquid habitats for 72 hours showed significant ($p \geq 0.05$) induction of MTs. Fishes showed higher induction in the downstream liquid habitat, where accumulation of HMs was higher in liver than muscle tissues. Fishes exposed to that habitat recorded MT concentrations of 102.859µg/g WWt and 83.947µg/g WWt after 72 hours of exposure

for liver and skeletal muscle respectively. The liver demonstrated higher bioaccumulation potential than muscle tissues and the highest bioaccumulation factor for most of the HM was associated with the downstream habitat. *T. Zilli*from this study bioaccumulated HM and MTs played a vital role in bioaccumulation assessment of HM. Though HM in skeletal muscles were relatively low, it still poses health threat through bioaccumulation. Thus, consumption of fish from polluted bodies needs to be avoided.

KEYWORDS: Metallothioneins, bioaccumulation, aquatic habitats, heavy metals, bioavailability.

C002

ANALYSIS OF MUTATIONS IN THE RECEPTOR BINDING DOMAIN OF SPIKE PROTEIN OF SARS-COV 2 IN BORNO STATE, NIGERIA, AND ITS EFFECT ON ANTIGENIC PROPERTIES

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ABSTRACT

The high mutation rate and RNA nature of SARS-CoV-2 drive rapid evolution, emphasizing the pivotal role of inhibiting viral interaction with host cells for pharmaceutical intervention. The study was aimed to assess the influence of mutation on the receptor binding domain (RBD) of the Spike glycoprotein gene, with a particular emphasis on changes in antigenicity. To achieve this, a combination of experimental (wet lab) and computational (in silico) techniques was utilized. The mutations and their impact on antigenicity of the receptor binding domain (RBD) of the Spike glycoprotein were assessed by comparing the antigenic epitope of Spike glycoprotein from the initial reported sequence of the Wuhan wet seafood market virus to those of SARS-CoV-2 isolated in Borno state. Twenty mutations in the Spike glycoprotein among SARS-CoV-2 isolates were identified. Notably, we identified 291 B cell epitopes, 307 MHC I, and 435 MHC II. Among them, 79 MHC I and 20 MHC II are potential antigenic sites for multiple subunit vaccine production. This comprehensive analysis elucidates the impact of mutations on antigenic properties, providing valuable insights for vaccine development strategies against SARS-CoV-2.

KEYWORDS: SAR-COV2, Spike glycoprotein, Mutation, Antigenicity, Vaccine.

C003

DNA FINGERPRINTING AND MOLECULAR MARKER DEVELOPMENT FOR *Baliospermum montanum* (Wïld.) Muell. Arg.

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ABSTRACT

Baliospermum montanum is one of the medicinal plants, commonly known as 'Denti', it belongs to the family *Euphorbiaceae* found in India, Nepal, Burma and Malaya. It has many medicinal values as the pharmaceutical compounds isolated from its secondary metabolites are used for the treatment of various diseases. The plant was collected from Western Ghats of Tamil Nadu, in the year June 2013 and preserved in the green house of parental institution. Therefore, 3g of the leave were used for the extraction and Isolation of genomic DNA which is followed by RAPD analysis using 20 random primers which were arbitrarily selected (MAP-1, MAP-2……MAP-20) (MAP=Medicinal and Aromatic plant/primer) for random amplification of DNA sequences. In the present study, the result shows that the *B. montanum* genomic DNA extract, which were randomly amplified using 20 set of primers by arbitrary PCR-based DNA fingerprinting (RAPD) for screening, whereby only 16 primers were able to produce bands at a different score while the remaining three primers remain unamplified. However, out of reproducible primers (MAP-1-16), three primers (MAP-1, 12 and 14) were found to produce more specific bands, which were selected for specific amplification analysis. Prior to the sequence analysis of specific amplicons (BM MAP-1, BM MAP-13, and BM MAP-14), the following sequences was retrieved at different size per band, i.e BM MAP-1 (604bp), BM MAP-13 (493bp) and BM MAP-14 (506bp) respectively. However the origin of replication fragments (ORFs) shows BM MAP 01- 604bp has 7 ORFs, BM MAP 13-494bp with 3 ORFs, and BM MAP-506bp has 10 ORFs. In addition, these sequences were submitted to the NCBI website after been analyzed (BLAST) (GenBank accession numbers KX139410.1, KX139411.1 and KX139412.1) that they have no any similarities by the available literature. Thus, could be specifically applicable as a molecular marker of *B. montanum* DNA fingerprint for identification of medicinal plant adulteration or other molecular analysis.

KEYWORDS: *Baliospermum montanum*, RAPD, DNA sequencing, Molecular marker development.

C 004

DETERMINATION OF HEAVY METALS AND MICROBIAL CONTAMINATION OF SOME SELECTED GREEN TEA SOLD IN GUSAU METROPOLIS OF ZAMFARA STATE, NIGERIA

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ABSTRACT

Heavy metals and microbial contaminants in tea pose significant health risks. This study aimed to evaluate the concentrations of heavy metals and microbial contamination in three green tea samples (Flecha, SenaMakki, and Mint & Lemongrass) sold in Gusau, Zamfara State, Nigeria. The tea samples were obtained from the local market and analyzed using standard laboratory procedures. Elemental analysis was conducted through acid digestion followed by quantitative elemental analysis to determine concentrations of cadmium (Cd), chromium (Cr), copper (Cu), nickel (Ni), and lead (Pb). Microbial analysis involved serial dilution, culture, subculture, gram staining, microscopy, and biochemical tests to identify bacterial and fungal contamination. Results showed that while most heavy metals were within WHO permissible limits, Mint & Lemongrass tea exhibited elevated nickel levels, and both Flecha and Mint & Lemongrass exceeded the safe limit for lead. Microbial analysis revealed bacterial contamination across all samples, with Sana Makki having the highest colony count. Fungal analysis identified species such as *Aspergillusniger, Aspergillusflavus*, and *Rhizopusarrhizus*, some of which are potential mycotoxin producers. These findings emphasize the need for continuous monitoring and strict quality control measures in green tea production to ensure consumer safety.

KEYWORDS: Green Tea, Heavy Metals, Microbial Contamination, Fungal Contamination, Toxicity.

C005

EFFECT OF ANGIOTENSIN CONVERTING ENZYME (ACE) INHIBITOR (CAPTOPRIL) ON THE LEVELS OF ACE IN *Plamodiumberghei*-INDUCED MICE

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ABSTRACT

Malaria is caused by parasites that are transmitted to people through the bites of infected female mosquitoes. *P. falcifrum* is the most deadly malaria parasites and the most prevalent in Africa, where malaria cases and death due to malaria are heavily concentrated. This study is aimed to determine the effect of Lonart (anti-malarial drug) and captopril (ACE inhibitor) on the level of parasitemia and ACE in the serum and kidney of plasmodium infected mice. Forty (40) mice were randomly divided into five groups: group 1 were given normal rat feed without any treatment, group 2 were infected with *Plasmodium berghei* without any treatment, group 3 were infected with *Plasmodium berghei* and treated with Lonart, group 4 and 5 were infected with *Plasmodium berghei* and treated with captopril at low and high doses respectively. The parasite used was *plasmodium berghei* ANKA, inoculated into mice and drugs administration follows. The percentage of the parasitemia is in the range of 4-5% after the infection and % parasitemia was observed for fourteen days. Serum and kidney homogenates was obtained after the mice were sacrificed and the ACE level was determined using ELISA-KIT. The result shows that the parasitemia level in group 1 (0.00±0.000) differ significantly *($p<0.05$)* from group 2 (4.26±0.11). There is also a significant difference ($p<0.05$) between group 2 and groups 3, 4 and 5 but there is no significant difference between groups 3 and 5. ACE level of group 1 differ significantly ($p< 0.05$) from groups 2, 3 and 5 but there is no significant difference ($p<0.05$) between group 1 and group 3. There is a significant difference ($p<0.05$) between groups 2, 3 and 4. Also there is a significant difference ($p<0.05$) between groups 4 and 5. Hence elevated levels of Angiotensin I due to the inhibition of the ACE have a beneficial effect in malaria-induced pathology in mice models.

KEYWORDS: Malaria, ACE, *Plasmodium berghei* ANKA, Mosquito

C006 A

ANALYSIS OF HEAVY METALS AND HEALTH RISK ASSESSMENT OF EDIBLE VEGETABLES AT OBAJANA COMMUNITY

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ABSTRACT

Environmental factors such as soil pH, organic matter content, and the proximity of farmlands to industrial activities have been identified as key contributors to metal bioavailability and uptake by plants. This study investigates the levels of heavy metals in leafy vegetables collected from the Obajana community and

evaluates the associated health risks for local consumers. Using atomic absorption spectroscopy (AAS), leaf samples were analyzed for the concentrations of common heavy metals such as lead (Pb), cadmium (Cd), arsenic (As), Chromium (Cr), and mercury (Hg) in various vegetables consumed in Obajana. Health risk assessments were conducted based on the estimated daily intake (EDI) of these metals and the target hazard quotient (THQ) for both adults and children in the community. The results revealed that several vegetables exceeded the acceptable limits of heavy metals set by the World Health Organization/Food and Agriculture Organization (WHO/FAO). Particularly, Hg, Pb and Cd concentrations were found to be higher than recommended levels, posing significant potential risks to human health. This study underscores the need for effective monitoring and regulation of food safety, as well as raising public awareness in Obajana regarding the health implications of consuming contaminated vegetables.

KEYWORDS: Heavy metals, bioavailability, leafy vegetables, health risks, contamination.

C006 B

HEMATOLOGICAL AND SERUM BIOCHEMICAL PARAMETERS OF CATTLE SLAUGHTERED FOR HUMAN CONSUMPTION AT BUKURU SLAUGHTER HOUSE, PLATEAU STATE

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ABSTRACT

Beef constitutes a significant source of meat and protein consumed in Nigeria. Although veterinary inspection is carried out before slaughter authorization, there are concerns about pathologies that may not be easily observed during routine inspection. Even in disease-free cattle, stress from transportation, environmental conditions, and pre-slaughter handling can affect meat tenderness, shelf-life and overall quality. Hematological indices and serum biochemical parameters could provide information on the health status or otherwise of animals. This study examined the hematological and biochemical profile of cattle brought to the slaughter house in Bukuru, Plateau State, Nigeria. Fifty (50) cattle were randomly selected for the study. Ten (10) milliliter of blood was collected from the study cattle into labelled EDTA-containing and plain tubes for hematological and biochemical analysis respectively. The results showed packed cell volume (PCV) levels of 37.04 ± 3.34%, hemoglobin levels of 9.43 ± 2.64 g/dl, alanine aminotransferase (ALT) levels of 20.40 ± 4.25 IU/l, aspartate aminotransferase (AST) levels of 40.37 ± 5.08 IU/l and albumin (ALB) levels of 3.46 ± 2.29 g/dl. The values obtained are within internationally acceptable levels for healthy cattle. However, routine monitoring of these parameters is necessary to assist in ensuring healthy and less stressed cattle at the point of slaughter and consequently healthier and safer meat available in markets for human consumption.

KEYWORDS: Beef, Bukuru, aspartate aminotransferase, alanine aminotransferase, albumin

C006 C

LARVICIDAL POTENTIALS OF *LEAF EXTRACTS OF Cnidoscolusaconitifolius* AGAINST MOSQUITO LARVAE AND ASSESSMENTS OF ITS INHIBITION OF ADULT MOSQUITO EMERGENCE

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ABSTRACT

The study evaluated the *larvicidal* activity of aqueous and methanol leaf extracts *of Cnidoscolusaconitifolius* (*Euphorbiaceous*) against mosquito larvae from Kuchingoro Internally Displaced Person (IDP) *Camp, Abuja, Nigeria.* Larvae and *pupae* were collected from Kuchingoro, IDP Camp, and introduced into 100, 200, and 400 µg/mL *aqueous and methanol leaf extracts of C. aconitifolius. A*zadirachtin at 100 µg/mL, 1% DMSO and 1% Triton X100 were used as controls. Mortality was monitored at 24, 48 and 72 hours. Data were presented as percentage mean and subjected to probit analysis. Aqueous and methanol leaf extracts of *C. aconitifolius* resulted in no significant ($p>0.05$) larvicidal activities after 24 hours of treatment, while triton X100 exalted a 100% mortality. However, significant ($p<0.05$) larvicidal activities of 53.13±2.57%, 35.00±2.50%, and 67.50±8.00% were observed at 72-hour treatment with methanol and aqueous *C. aconitifolius* extracts, and azadirachtin treatments respectively compared with DMSO control. Probit LC_{50} and LC_{90} lethal concentrations after treatment with aqueous and methanol leaf extracts were 423.36 and 2447.27 µg/mL ($p = 0.011$, Chi-Square = 6.391) for methanol extract and 793.79 and 13863.96 µg/mL ($p = 0.115$, Chi-Square = 2.486) for aqueous extract respectively. Mosquito emergence rate from the pupae stage after 72 hours was significantly higher ($p<0.05$) with methanol extract of *C. aconitifolius* (36.67%) compared with aqueous extract of *C. aconitifolius* treatment (10.00%). *C. aconitifolius* extracts possess significant larvicidal activity. The aqueous extract may be stage-specific, as it inhibited more pupae conversion to adult mosquitoes.

KEYWORDS: *Internal Displaced Person; Cnidoscolusaconitifolius;* Larvicidal activities; Lethal concentration; Pupae

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C007

LARVICIDAL POTENTIALS OF *LEAF EXTRACTS OF Cnidoscolus aconitifolius* AGAINST MOSQUITO LARVAE AND ASSESSMENTS OF ITS INHIBITION OF ADULT MOSQUITO EMERGENCE

Salima Adamu Sada[1], Habibu Tijjani[1]*,Bartholomew Odaudu[2], Oluremi *Aduke* Saliu[1], Suwaiba Nasir[1], Ayodeji Oluwafemi Idowu[1], Blessing Edogbo[1], Uzaifa Mustapha Adam[3] and Shehu Usman Adamu[2]
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ABSTRACT

The study evaluated the *larvicidal* activity of aqueous and methanol leaf extracts *of Cnidoscolus aconitifolius* (*Euphorbiaceous*) against mosquito larvae from Kuchingoro Internally Displaced Person (IDP) *Camp, Abuja, Nigeria.* Larvae and *pupae* were collected from Kuchingoro, IDP Camp, and introduced into 100, 200, and 400 µg/mL *aqueous and methanol leaf extracts of C. aconitifolius. A*zadirachtin at 100 µg/mL, 1% DMSO and 1% Triton X100 were used as controls. Mortality was monitored at 24, 48 and 72 hours. Data were presented as percentage mean and subjected to probit analysis. Aqueous and methanol leaf extracts of *C. aconitifolius* resulted in no significant ($p>0.05$) larvicidal activities after 24 hours of treatment, while triton X100 exalted a 100% mortality. However, significant ($p<0.05$) larvicidal activities of 53.13±2.57%, 35.00±2.50%, and 67.50±8.00% were observed at 72-hour treatment with methanol and aqueous *C. aconitifolius* extracts, and azadirachtin treatments respectively compared with DMSO control. Probit LC_{50} and LC_{90} lethal concentrations after treatment with aqueous and methanol leaf extracts were 423.36 and 2447.27 µg/mL ($p = 0.011$, Chi-Square = 6.391) for methanol extract and 793.79 and 13863.96 µg/mL ($p = 0.115$, Chi-Square = 2.486) for aqueous extract respectively. Mosquito emergence rate from the pupae stage after 72 hours was significantly higher ($p<0.05$) with methanol extract of *C. aconitifolius* (36.67%) compared with aqueous extract of *C. aconitifolius* treatment (10.00%). *C. aconitifolius* extracts possess significant larvicidal activity. The aqueous extract may be stage-specific, as it inhibited more pupae conversion to adult mosquitoes.

KEYWORDS: *Internal Displaced Person; Cnidoscolus aconitifolius;* Larvicidal activities; Lethal concentration; Pupae

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C008

ASSESSMENT OF HEAVY METALS AND PHYSICO-CHEMICAL PROPERTIES OF WATER SOURCES AROUND WUDIL LOCAL GOVERNMENT AREA, KANO STATE

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ABSTRACT

Heavy metals are generally defined as metals with relatively high densities, atomic weight, or atomic number. They are either essential nutrients or relatively harmless but can be toxic in larger amounts. The physical and chemical qualities of water, such as its temperature, pH and electrical conductivity referred to as its physicochemical properties. These attributes can have an effect on both the environment and human health. Water is an essential component of lives. Good quality water is colorless, odorless, and tasteless.This study assesses the water quality by evaluating the heavy metals concentrationand physicochemical properties in various water sources (tap water, borehole water, and sachet water) in Wudil Local Government Area, Kano State, and compliance with WHO standards, highlighting the potential health risks when consumed excessively.Water samples were collected from various locations (Unguwar Danya, Gavan Komi, Kofar Yamma, and Dorawar Yan Nana) and analyzed using atomic absorption spectrophotometry (AAS) for heavy metal analysis, while standard methods were employed for the physicochemical analysis.The results indicated all physico-chemical properties and heavy metals analyzed complied with WHO standard limits, with the exception of lead (Pb), which was above WHO limits of 0.01 mg/L with nosignificant difference at $P>0.05$. Conclusively, all water sources around Wudil local government are considered fit for consumption, except for the elevated levels of lead, which have to be reduced for healthy human consumption.

KEYWORDS: Heavy metals, Physicochemical properties, Tap water, Borehole water, Sachet water

C009

EXPLORING THE REPELLENCY ACTIVITY AND THE EFFECTIVENESS OF LOWER CONCENTRATIONS OF CERTAIN BOTANICAL INSECTICIDES FOR THE CONTROL OF *CALLOSOBRUCHUS MACULATUS* FAB.

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ABSTRACT

The quest to replace the deleterious synthetic insecticides with their relatively safe plant derived counterpart may be a mirage if the concentration of the substance dispensed to achieve control is high and or in much contact with the product targeted for protection. Therefore, the aim of this study was to explore the repellency activity and the effectiveness of lower concentrations of azadirachtin, myristicin and α-humulene to control *Callosobruchus maculatus*. At the 6th hour of insects' exposure to 100µg/mL of the test insecticides, the optimal repellency activity of the botanical insecticides was attained. While a 100.00±00% insect mortality was recorded at the 96th hour of insects' exposure to 0.0015, 0.0122 and 0.0061 µg/mL of azadirachtin, alpha humulene and myristicin based insecticides respectively. LC_{50} analysis performed on the test insecticides established LC_{50} of 0.1, 2.8 and 4.4 µg/mL for azadirachitin, αhumulene and myristicin-based insecticides respectively. The outcome of this study unveils the effectiveness of lower concentrations azadirachitin, myristicin and αhumulene-based insecticides against *C. maculatus*, however at an elongated period of time with azadirachtin based insecticide being the most potent of the test insecticides

KEYWORDS: Azadirachtin, Myristicin, α-Humulene, Repellency, *Callosobruchus maculatus*, Insecticide

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C010

MOLECULAR DETECTION OF MRSA IN COMPUTER COMPONENTS IN HEALTHCARE ADMINISTRATIVE OFFICES, A CROSS-SECTIONAL STUDY IN BICHI EMIRATE SPECIALIST HOSPITAL

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ABSTRACT

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a major cause of nosocomial infections, posing significant health risks due to its antibiotic resistance. Contamination of administrative offices in healthcare settings plays an important role in the spread of infection among patients, visitors, and healthcare workers as a result of a deficiency of cleaning and disinfection practices. This study aims to assess MRSA contamination on these surfaces and confirm its presence through molecular detection at Bichi Emirate Specialist Hospital. A cross-sectional study was conducted in 21 administrative offices at Bichi Emirate Specialist Hospital from September to November 2024. Swabs were collected from computer components and cultured on Mannitol Salt Agar (MSA). Presumptive Staphylococcus aureus isolates were subjected to Gram staining, biochemical

tests, and Cefoxitin disc diffusion to confirm MRSA. Molecular detection was performed using PCR amplification of the mecA gene, a genetic marker for ethicillin resistance and all the data was analyzed by SPSS software. The highest contamination rate was observed on keyboards (69.2%), followed by the mice (66.7%). Desks showed a lower contamination rate, suggesting that handheld devices may act as primary reservoirs for microbial transmission. The most commonly isolated microorganism was *Staphylococcus aureus* (40%), a coagulase-negative Staphylococcus species known for its role as an opportunistic pathogen, particularly in immunocompromised individuals. On the other hand, it indicated that 76% of workers said they use alcohol to disinfect their computers, and 52% of them stated they clean their computers in the morning. The high contamination levels suggest that disinfection protocols may be inadequate or inconsistently applied. No significant associations were found between microbial contamination and workers' age, qualification level, or gender. The findings highlight a concerning level of microbial contamination in the administrative offices of the hospital, underscoring the urgent need to apply essential precautionary measures to reduce the spread of the infection.

KEYWORDS: Administrative offices, Computers, Infection, Hospital, Microbial Contamination,

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C 011

EVALUATING THE PRESENCE OF HEAVY METALS IN FISH PONDS AND FISH FEEDS IN KARU LOCAL GOVERNMENT AREA, NASARAWA STATE

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ABSTRACT

The presence of heavy metals has been implicated in the contamination of fish pond water and feeds and this has been a concern all over the world. This research is aimed at assessing the level ofsomeheavymetals such as lead [Pb] , Mercury [Hg] ,Cadmium [Cd], Arsenic [As], Zinc [Zn] ,iron [Fe] ,Chromium [Cr] ,Nickel [Ni]. Fish pond water and fish feeds were Obtained from eight different locations within Karu local government area of Nasarawa State. The levels of heavy metals were determined using Atomic Absorption Spectroscopy (AAS). The result for the heavy metal concentration in the different fish water samples analyzed shows that in twelve 12 water fish samples analyzed, they tend to show the highest concentration as observed in sample F for Zn(915.0 ± 1.0) x10-^{5}mg/L and Cr (921.0 ± 1.0) x10-^{5}mg/L, sample B recorded highest for Fe (941.0 ± 1.0) x10-^{5}mg/L and Pb(981.0 ± 1.0) x 10-^{5}mg/L, sample H for Cu (701.3 ± 1.5) x10- 5mg/Land As (947.0 ± 1.0) x 10-^{5}mg/L, sample I for Cd (316.3 ± 1.5) x10-5mg/L, and finally, sample G for Ni (194.3 ± 1.5) x10-^{5}mg/L. Furthermore, the results also showed that feed from samples 1 & 4 had the highest concentration of As (884.0 ±1.0 and 826.0 ±1.0) x10-5mg/L, feed 2, 5 and 6 recorded highest for Pb (932.0±1.0, 759.7±1.5 and 744.3±1.5) x10-^{5}mg/L, feed 3 and feed 7 recorded highest concentration for Zn (823.3±1.5)x10-^{5}mg/L and Cr (958.0±1.0) x10-^{5} mg/L respectively. The results indicate that significant differences in heavy metal concentrations exist across different fish feeds and water samples, with some feeds and water samples having potentially harmful levels of arsenic, lead, and chromium. The presence of high concentrations of these metals is alarming due to their toxicity, which can affect fish health and safety for human consumption. Regular monitoring and stricter regulations are needed to control heavy metal contamination in aquaculture systems, ensuring both environmental sustainability and consumer safety.

KEYWORDS: Heavymetals, feeds, Spectroscopy, fish, concentration

C012

REAL-TIME PCR AS A DIAGNOSTIC TOOL FOR EARLY DETECTION OF BACTEREMIA IN IMMUNOCOMPROMISED PATIENTS

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ABSTRACT

Bacteremia are potentially fatal illnesses that need to be diagnosed quickly and accurately, especially in individuals with weakened immune systems who are more likely to experience serious side effects. This study examines the use of real-time polymerase chain reaction (qPCR) for bacteremia early identification and resistance gene profiling at Wudil General Hospital in Kano State, Nigeria. Blood samples were collected from an immunocompromised individuals suspected of having bacteremia and subjected to real time PCR assays that target common bacterial pathogens including*Streptococcusspp*., *Escherichia coli*, and *Staphylococcus spp*. Furthermore, mecA (methicillin resistance) and blaKPC (carbapenem resistance) were identified using qPCR-based assays. In comparative with the conventional blood cultures, the qPCR approach showed higher sensitivity and quicker detection times, allowing for the early identification of resistance indicators as well as infections. These results highlight the potential of qPCR to lower mortality rates among immunocompromised patients at Wudil General Hospital, guide antibiotic therapy, and improve diagnostic efficiency.

KEYWORDS: Bacteremia, Real-time PCR, Immunocompromised patients, Resistance gene, Wudil.

C013

HEMATOLOGICAL AND SERUM BIOCHEMICAL PARAMETERS OF CATTLE SLAUGHTERED FOR HUMAN CONSUMPTION AT BUKURU SLAUGHTER HOUSE, PLATEAU STATE

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ABSTRACT

Beef constitutes a significant source of meat and protein consumed in Nigeria. Although veterinary inspection is carried out before slaughter authorization, there are concerns about pathologies that may not be easily observed during routine inspection. Even in disease-free cattle, stress from transportation, environmental conditions, and pre-slaughter handling can affect overall meat quality.To determine hematological indices and serum biochemical parameters in cattle slaughtered in Bukuru abattoir, as an indication of the health status or otherwise of animals sold in the market for human consumption.Fifty (50) cattle were randomly selected for the study. Ten (10) milliliter of blood was collected from the study cattle

into labelled EDTA-containing and plain tubes for hematological and biochemical analysis respectively. The results showed packed cell volume (PCV) levels of 37.04 ± 3.34%, hemoglobin levels of 9.43 ± 2.64 g/dl, alanine aminotransferase (ALT) levels of 20.40 ± 4.25 IU/l, aspartate aminotransferase (AST) levels of 40.37 ± 5.08 IU/l and albumin (ALB) levels of 3.46 ± 2.29 g/dl. The values obtained are within internationally acceptable levels for healthy cattle. Routine monitoring of hematological and biochemical parameters is necessary to assist in ensuring healthy and less stressed cattle at the point of slaughter in order to ensure healthier and safer meat sold in markets for human consumption.

KEYWORDS: Cattle, Hematological Indices, Serum Biochemistry, Disease, Slaughter House.

C014

VIRTUAL SCREENING OF MICROALGAL COMPOUNDS AS POTENTIAL INHIBITORS OF TYPE 2 HUMAN TRANSMEMBRANE SERINE PROTEASE (TMPRSS2)

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ABSTRACT

More than 198 million cases of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been reported that result in no fewer than 4.2 million deaths globally. The rapid spread of the disease coupled with lack of specific registered drugs for its treatment pose a great challenge. I In-silico method was employed to screen and identify potential natural compounds that can inhibit human transmembrane protease serine type 2 (TMPRSS2). 3D model of TMPRSS2 was constructed using I-TASSER. The model was refined by GalaxyRefine, validated by Ramachandran plot server and overall model quality was checked by ProSA. 95 natural compounds from microalgae were virtually screened against modeled protein.A total of 17 best leads capable of binding to TMPRSS2 with good binding score comparable to, greater or a bit lower than that of the standard inhibitor (Camostat) were identified. Physicochemical properties, ADME (absorption, distribution, metabolism, excretion) and toxicity analysis revealed top 4 compoundswith good pharmacokinetic and pharmacodynamic profiles. These compounds bind to the same pocket of the protein with binding energy of -7.8 kcal/mol, -7.6 kcal/mol, -7.4 kcal/mol and -7.4 kcal/mol each for Camostat, apigenin, catechin and epicatechin respectively. MMPBSA energy analysis using Gromacs indicated a total binding energy of -200.807 kjmol^{-1}, -202.309 kjmol-^{1}and -225.072 kjmol^{-1}for Camostat, Catechin and Epicatechin respectively. This study shed light on the inhibition potential of microalgal compounds against SARS-CoV-2. Experimental study is required to develop SARS-CoV-2 drugs based on the structures of the compounds identified in this study.

KEYWORDS: Binding energy, Coronavirus 2, Drugs, Inhibitors, Protein

C 015

ANTIMALARIAL ACTIVITIES AND LIPID PROFILE OF ETHANOLIC EXTRACT OF *Ficus sur* IN *Plasmodium berghei* INFECTED ALBINO RATS

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ABSTRACT

Drug-resistant malaria is a significant issue in sub-Saharan Africa due to the limited availability of healthcare. This study evaluated the antimalarial properties of *Ficus sur* leaf extract using albino rats. Thirty male albino rats (150–200 g) were divided into five groups (n=6). Group 1 served as the control, while Groups 2–5 were infected with *Plasmodium berghei* (NK 65 strain). Group 2 (parasite control) received no treatment, whereas Groups 3 and 4 were administered *Ficus sur* extract at 400 mg/kg and 200 mg/kg, respectively, and Group 5 received 10 mg/kg of chloroquine from day 4 to 8. Blood samples were collected on days 0, 4, and 8 to assess parasitemia and lipid profiles. By day 4, all treated groups exhibited similar parasitemia levels to group 2, with a significant increase ($p < 0.001$). By day 8, parasitemia peaked in the group 2 (48.74±0.42%), while Groups 3, 4, and 5 significantly reduced parasitemia ($p < 0.001$). Group 5 showed the highest inhibition (83.17±0.65%). While in lipid profile result, groups 3 and 4 effectively restored LDL and total cholesterol levels, with group 3 being more effective, while group 5 maintained near-normal values. HDL levels were significantly improved by groups 3 and 4, though not reaching group 1 values, while group 5 showed near-normal levels. Triglyceride levels remained consistent across all groups with no significant differences. These findings suggest that *Ficus sur* possesses promising antimalarial activity and lipid-regulating properties, indicating potential as an alternative therapy for malaria treatment.

KEYWORDS: Antimalarial, *Ficus sur,* Parasitemia, Lipid, *Plasmodium berghei,* Healthcare

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C016

TRANSGENERATIONAL EFFECTS OF MATERNAL LEAD (PB) EXPOSURE IN *Drosophila melanogaster* MODEL

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ABSTRACT

Lead (Pb) is amongst the ubiquitous and persistent toxic heavy metal on the earth crust. It is a critical epigenetic modifier that threatens human health. Despite its oxidative properties that modify

epigenetic marks, yet studies on transgenerational effects of Pb are rare. This study was aimed at evaluating the transgenerational effects of chronic maternal Pb exposure on oxidative stress using *D. melanogaster*. Female fruit flies were exposed to Pb for 20 days using lead acetate in their normal diet. To obtain F1 offspring, virgin female exposed flies were mated with un-exposed male flies. Then, F1 were allowed to produce F2 and later F3 generation. The offsprings (F1-F3) of the exposed female flies were maintained on the normal diet devoid of any means of Pb exposure. Body weight and negative geotaxis were evaluated across the generations. Antioxidant vitamins (A, C & E), reduced glutathione (GSH), catalase, superoxide dismutase (SOD), malondialdehyde (MDA), and metabolic biomarker (triglyceride) were also estimated. This finding revealed significant increase ($p < 0.0001$) in the body weight, triglyceride level, and MDA across the generations (F0-F3). Significantly lower levels of antioxidant vitamins, and GSH were also observed in the F1-F3 generations due to the maternal exposure in F0. Additionally, significant decreases in the negative geotaxis and activities of the antioxidant enzymes (catalase and SOD) were also observed. This study observed that the effects of Pb in the 3 generations are transgenerationally inherited from their exposed female grandmothers (F0) and hence it demonstrated the transgenerational potential of maternal Pb exposure.

KEYWORDS: Lead, Maternal, Transgenerational, *D. melanogaster*, Antioxidants.

C017

IN SITU MONITORING AND MITIGATION OF HARMFUL ALGAL BLOOMS (HABS) IN MARINE HABITATS USING A SUSTAINABLE MODULAR ALGASOME-'SECRETING' REMEDIATIVE TOOLBOX (SMARTBOX)

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ABSTRACT

Harmful algal blooms continue to pose increasing global concerns, and the use of algicides in water bodies compounds toxicological concerns. Some diatoms secrete domoic acid (DA), a neurotoxin that affects aquatic life and humans, causing amnesic shellfish poisoning.We aim to concurrently shut down DA synthesis and transport at the genomic and metabolic levels, and to disrupt bloom-supporting phycobiome via 'nanoalgasomes', alga-derived extracellular vesicles (EV). Thus, we are developing SMARTbox, a delivery platform for re-engineered algasomes – loaded with RNA-interfering oligonucleotides targeted against the DA synthesis complex – mimicking asecretory gland. The abundance of algae-derived EVs adsorbed onto a poly-L-lysine-coated surface was determined using an EV-specific fluorescence-based assay [FluoroCet]. Their protein cargo was quantified on a NanoQuant plate, stained with ExoGlow™-Protein EV Labeling Kit and visualized using a Confocal Microscope. Preliminary investigations demonstrated the adsorption of algae-derived vesicles onto the PLL-coated surface and was corroborated by confocal microscopy, which showed the green fluorescence of labeled internal proteins. The marine water sampleshowed significantly less vesicles than the enrichedfractions. However, this confirms the possibility to harness algasomes directly from marine water without the need for pre-processing steps. The outcomes from this Tier 1 laboratory phase have provided proof of concept for the SMARTbox, offering a safe and sustainable bioremediation option. Future works will focus on validating the feasibility, reproducibility, utility, versatility, viability, selectivity, and scalability of this dual-purpose HAB monitoring and mitigation floating device, laying the groundwork for translation and commercialization.

KEYWORDS: Algal bloom, algasomes, domoic acid, nanotechnology, neurotoxin

C018

MAPPING OF CHLOROQUINE RESISTANCE GENE (PFCRT) IN *Plasmodium falciparum* ISOLATES FROM MALARIA INFECTED PATIENTS ATTENDING MURTALA HOSPITAL AND HASIYA BAYERO HOSPITAL, KANO, NIGERIA

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ABSTRACT

Plasmodium falciparum chloroquine resistance transporter (*pfcrt*) is a genetic locus found in the genome of the malaria parasite *Plasmodium falciparum* and associated with chloroquine resistance in the parasite. This study aimed to map chloroquine resistance gene (*pfcrt*) in *Plasmodium falciparum* isolates from malaria-infected patients attending public hospitals (Murtala Hospital and Hasiya Bayero Hospital), Kano, Nigeria. Samples from 100 children aged 0 – 17 years with malaria were examined to confirm the malaria parasite density and further genotyped via BigDye (v3.1) terminator cycle sequencing for the presence of SNPs in *pfcrt* gene samples at codons 74, 75, 76 and 80. The results revealed 10.1% and 16.7% prevalence of malaria infection in patients that visited Murtala Muhammad Specialist Hospital (MMSH) and Hasiya Bayero Pediatrics Hospital (HBPH) respectively between the months of March and May 2021. Of those that had malaria in MMSH, 88.5% had low (+), 10.3% had moderate (++) and 1.2% of patients had severe (+++) malaria while in HBPH, 87.1%, 10% and 2.9% of patients had low, moderate and severe malaria respectively. Twenty-four of the samples were successfully amplified and analyzed for the *pfcrt* gene located at codons 74 to 80 (74, 75, 76, 80) with amplicon size of 267bp. The results revealed that 22 (91.7%) of the 24 amplified isolates possessed mutant *pfcrt* gene at the selected codons. The results also showed that sex had no significant association ($p= 0.3173$) with *pfcrt* SNP mutation. However, significant associations were observed between the age groups (0-17years) ($p = 0.0002$), locality (rural and urban) ($P<0.001$), season (wet, cold and dry) ($p<0.001$) and dose compliance ($p<0.001$) represented in the study and *pfcrt* mutation. The high prevalence (91.7%) of SNPs in *pfcrt* gene highlights the limited presence of chloroquine-sensitive parasites in the studied population.

KEYWORDS: Malaria, *Plasmodium falciparum,* Patients, Resistance

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C 019

PRODUCTION OF THE ECO-ENZYME, CELLULASE FROM NATIVE FUNGAL ISOLATES USING ORANGE WASTE PEEL AS THE SOLE ENERGY SOURCE

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ABSTRACT

Eco-enzymes are a conglomerate of enzymes that include cellulases and other inducible hydrolytic enzymes. They represent a class of versatile proteins obtained when microbes ferment organic compounds. Cellulases are modular enzymes utilized by microbes to degrade lignocellulosic biomass and they find application in a variety of industry. Agricultural biomass, such as wastes from fruits like orange, papaya, banana present a valuable reservoir for the potential production of eco-enzymes. Harnessing this potential of agricultural wastes for the purpose of producing useful products such as eco-enzymes promote a circular economy where wastes is converted to wealth. *Aspergillus niger* and *Rhizopus species* were isolated from sewage sediment byculturing and sub-culturing techniques. The fungi were grown on Sabouraud dextrose agar (SDA) medium and cultured on cellulose medium, and finally, on orange waste peel medium. Thus, orange waste peel was

utilized as the sole carbon source for the production of the eco-enzyme, cellulase. The extracellular eco-enzyme (cellulase) produced by *A. niger* and *R. species* was partially purified by ammonium sulphate precipitation in a single step and dialyzed. Cellulase activity of partially purified eco-enzymes from *A. niger*and *R. species* was determined. Cellulase from both fungi had optimum temperature of 45°C but differ in their optimum pH. While cellulase from *A. niger* was optimized at pH 7, celluase from *R. species* was optimized at 6.5. Thermo-stability study of the partially purified eco-enzymes over a temperature range of 35°C-70°C indicated the enzymes lost stability with increasing temperature. Carboxymethyl cellulase (CMCase) and Filter paper unit (FPU) activities of the partially purified eco-enzymes (cellulases) show a higher specific activity for cellulase from *A. niger* than that from *R. species*. This study demonstrated the potential use of orange waste peel as inexpensive material for the production of the eco-enzyme, cellulase from *A. niger*. The study also shows that *A. niger* is the most competent cellulase producer compared with *Rhizopus species*.

KEYWORDS: Eco-enzyme, Cellulase, CMCase, *Aspergillus niger*, orange waste peel.

C 020

PATERNAL IRON DEFICIENCY PROGRAMS INSULIN RESISTANCE AND TYPE 2 DIABETES-LIKE PHENOTYPES IN *Drosophila melanogaster* OFFSPRING

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ABSTRACT

Evidence suggests that paternal nutritional status alters offspring metabolic health and predisposes to diseases. This study explored the generational effects of paternal iron deficiency (ID) and role of high fat diet (HFD) on insulin resistance and type 2 diabetes (T2D) in *Drosophila melanogaster* (*D. melanogaster*) offspring. ID was induced in F0 male flies(Bathophenanthrolinedisulphonate exposure at 200 µmol/10ml diet for 2 weeks) and mated with control females to produce F1 and F2 generations on normal food diet (NFD) and HFD. The levels of iron, glucose, lipid, oxidative stress markers and epigenetic changes were assessed. Significant increases ($p<0.05$) in iron, SOD, glucose and triglyceride were observedin F1 and F2 male offspring raised on both NFD and HFD compared to controls. Hemolymph glycogen decreased significantly ($p< 0.05$) in F1 and F2 male offspring raised on HFD. qRT-PCR showed significant increases ($p< 0.05$)in *mvl, SOD, GPx, DILP2* and *DKDM2* mRNA with decreased *Fer1HCH*, *DGLUT1*, *DIRS and DTET* mRNA levels in F1 and F2 male offspring raised on HFD compared with controls. Our study

demonstrated the transgenerational effect of paternal ID on altered iron homeostasis and antioxidant defense system. Furthermore, paternal ID induced fetal programming of insulin resistance and T2D-like phenotypes which wasmediated via altered epigenetic genes regulating DNA and histone demethylation. HFD as a secondary stressor exacerbated the effects in F2 offspring. This study thus highlighted the potential implications for understanding and addressing the developmental origins of metabolic diseases.

KEYWORDS: Iron deficiency, Insulin resistance, Transgenerational inheritance, Fetal programming, *Drosophila melanogaster.*

C021

Bryophyllum pinnatum LEAF AND ZINC OXIDE NANOPARTICLES POSSESSED ANTI-CONJUNCTIVITIS ACTIVITY IN HISTAMINE CHALLENGED RATS: *IN VITRO* AND *IN SILICO* INVESTIGATION

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ABSTRACT

Bryophyllum pinnatum (BP) is renowned for its medicinal properties. This study investigated the anti-conjunctivitis potential of leaf and zinc oxide nanoparticles (LF-ZnONps) via *In vitro* and *In-silico* approach. Alkaloids and flavonoids (ligands) characterized from BP leaf by HPLC technique were docked against Histamine H1 Receptor, Interleukin 1 Beta (Il-1β), and Tumor Necrosis Factor Alpha (TNF-α). Nanoparticles were characterized. Molecular docking was performed using AutoDock Vina, validated by Schrodinger Maestro 12.5. The *In vitro* study used 25 albino Wistar rats of 5 groups of 5, and conjunctivitis induced by histamine conjunctival vascular hyper permeability. Results showed LF-ZnONPs as flowered crystals. Serum concentrations of IL-1β, Nuclear Factor kappa B-p65 (NFKB-p65), IL-6 and TNF-α cytokines were significantly ($p < 0.05$) reduced by Lf-ZnONPs, carvedilol and leaf-extract when compared with control and control model. The Molecular Mechanics Generalized Bond Surface Area (MMGBSA) of ephedrine (-7.423 Kcal/mol) was higher than histamine (-6.666 Kcal/mol) and carvedilol (-6.723 Kcal/mol) docked against Histamine H1 Receptor. Naringin (-7.316 Kcal/mol) and acacetin (-7.109 Kcal/mol) was greater than that of Byakangelicol (Inhibitor of IL-1β) (-4.861 Kcal/mol) and carvedilol (-5.091 Kcal/mol) against IL-1β. Acacetin (-6.517 Kcal/mol) and astragalin (-6.418 Kcal/mol) was greater than Cynaropicrin (Inhibitor of TNF-α) (-4.899Kcal/mol), and carvedilol (-4.974 Kcal/mol) against TNF-α. The catalytic subunits were involved in electron abstraction, transferand hydrogen bonds generation in target proteins. In conclusion, histamine induced conjunctivitis relapsed after treatment with BP leaf and LF-ZnONps due to the inhibitory effects of ligands on investigated proteins and repositioning them for anti-conjunctivitis drug candidates.Future studies should consider the isolation and purification of these hit alkaloids and flavonoids for anti-conjunctivitis drug development and design.

KEYWORDS: Conjunctivitis, *In Silico*, Cytokines, Anti-inflammatory, Nanoparticles .

C 022

IDENTIFICATION AND ASSESSMENT OF KNOCK DOWN RATE OF *ANOPHELES* MOSQUITOES IN SOME SELECTED LOCAL GOVERNMENTS IN DAURA ZONE, KATSINA STATE

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ABSTRACT

Malaria and other mosquito-borne diseases pose a significant burden on public health in Nigeria. Insecticide-based control strategies are crucial in mitigating the spread of these diseases. However, the efficacy of these strategies is compromised by the limited understanding of the mosquito species composition and their resistance to insecticides. The aim of this study isto identify and assess the knockdown resistance (kdr) of *Anopheles* mosquitoes in some selected local government in Daura Zone, Katsina state. Mosquito larvae were collected from different locations in the study area between July and October and reared to adults in general Biology lab, federal polytechnic Daura. The adult mosquitoes were subjected for bioassay. Five different WHO insecticide-impregnated papers namely Alphacypermetrin, Dichloro Diphenyl Trichloroethane (DDT 4%), Deltametrin, Lambda and Permethrin (0.75%) were used for this study. The impregnated papers were tested against the emerged adults of the collected *Anopheles* mosquitoes using WHO standard operating procedure. The tested mosquitoes were identified and their knock down rates to the test insecticides were determined. Both morphological and molecular identification revealed presence of one specie, *Anopheles arabiensis.* The kdr at 30 minutes was highest (60%) with Alphacypermetrin, while DDT had the least (11%). Similar trend was recorded at 60 minutes after exposure. *Anopheles arabiensis* is the dominant specie and Alphacypermetrin was recorded to be more effective against the mosquitoes of the study area than the other insecticides. The findings from this work could help and guide the malaria control program of Nigeria particularly in the choice of insecticide.

KEYWORDS: Anopheles, Insecticide, Mosquito, Resistance, Kdr.

C023

ARBUTIN ALLEVIATES CISPLATIN-INDUCED HEPATOTOXICITY VIA UPREGULATING NRF2/HO-1 AND SUPPRESSING NF-KB/TNF-A AND CASPASE-3/BAX PATHWAYS IN RATS

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ABSTRACT

Cisplatin (CP) is a potent anticancer agent widely employed in chemotherapy. However, CP causes side effect toxicity in healthy organs, including the liver. We investigated the hepatoprotective mechanism of arbutin (ARB) against CP-induced hepatotoxicity.Rats were orally administered ARB (ARB1 = 50 mg/kg; ARB2 = 100 mg/kg) for 14 consecutive days against hepatotoxicity induced by a single dose of CP (10 mg/kg) on day 15. Three days after the intraperitoneal CP injection, serum and liver tissue were collected for

subsequent analyses.CP triggered marked increases in serum AST, ALT and ALP activities, hepatic malondialdehyde (MDA) and reactive oxygen species (ROS) coupled with a considerable diminution in hepatic activities of superoxide dismutase (SOD), catalase (CAT) and reduced glutathione (GSH). The gene expressions of interleukin-1β (IL-1β), tumor necrosis factor (TNF-α), and IL-6 were notably increased. The pre-administration of ARB1 and ARB2 reduced AST, ALT and ALP in serum and restored SOD, CAT, GSH, ROS, MDA and cytokine levels followed by alleviated hepatic lesions. Further, CP-induced prominent alterations in the gene expressions of nuclear factor erythroid 2-related factor 2 (Nrf2), heme oxygenase-1 (HO-1), iNOS, NF-κB, Bax, Bcl-2, and caspase-3 in the liver. Interestingly, ARB protected the liver and mitigated the CP-induced alterations in serum AST, ALT, ALP, and reduced hepatic redox markers, inflammatory markers and gene expressions.The findings demonstrate that ARB is a potential protective adjuvant against CP-induced hepatotoxicity via inhibition of hepatic oxidative stress, inflammation, and apoptosis.

KEYWORDS: Cisplatin, Inflammation, Chemotherapy, Hepatotoxicity, Apoptosis.

C024

ANTIMICROBIAL EFFECTS AND PHYTOCHEMICAL ANALYSIS OF *Chrysophyllum albidum* PLANT PARTS (LEAVES, ROOTS AND SEEDS) EXTRACTS ON BACTERIAL ISOLATES FROM URINARY CATHETERS

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ABSTRACT

Aqueous and ethanolic extracts obtained from *Chrysophyllum albidum* plant parts (leaves, roots and seeds) were used to evaluate the potential antibacterial activity against bacteria isolated from urinary catheter tips. The following isolates were recovered; *P. aeruginosa* – 7, *S. aureus* – 15, *E. coli* – 11, *P. mirabilis*– 11, and *K. aerogenes* – 6. The agar well diffusion method was used. The average percentages of antimicrobial resistance of the isolates to gentamycin were 45.5% for *P. aeruginosa*, 42.1% for *E. coli*, 46.9% for *K. aerogenes*, and >90% for other isolates. The ethanolic extract mixtures (leaf, root and seed) had the greatest effect on all the isolates, with inhibition zones (IZs) ranging from 8-26 mm and MICs ranging from <16-32 mg/ml. The Potencies of the *C. albidum* extracts based on the IZ and MIC values were greater in the extract mixtures, followed by those in the roots. Phytochemical screening revealed that all the extracts contained phenol except for the seeds while tannins were present in all the extracts except the leaves. The activity of the ethanolic extracts of each part at high and low concentrations was greater than that of the aqueous extracts at the same concentrations ($p<0.05$). The acute toxicity results showed that the LD_{50} of the extracts was >5000 mg/body weight, indicating no toxicity. The antibacterial activities of the extract mixtures and roots on the isolates confirmed the use of *C. albidum* in folk medicine for the treatment of CAUTIs, hence indicating its antibacterial potential for use in novel antibiotic production.

KEYWORDS: Antimicrobials, Extracts, Minimum Inhibitory Concentration, Phytochemicals

C026

PHYSIOLOGICAL AND BIOCHEMICAL RESPONSES OF CASSAVA PLANTS (*Manihot esculentacranta*) TO PREMIUM MOTOR SPIRIT EXPOSURE

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ABSTRACT

The relentless contamination of soil by petroleum products poses a significant threat to plant growth and development. This study delves into the phytotoxic effects of Premium Motor Spirit (PMS) on cassava (*Manihot esculenta Crantz*), a staple crop in many tropical regions. We investigated the impact of varying concentrations of PMS (0, 75, 150, and 300 ppm) on the growth and antioxidant systems of cassava. Our findings reveal that exposure to PMS led to a significant decline ($p < 0.05$) in the activity of antioxidant enzymes, including superoxide dismutase (SOD), catalase (CAT), and reduced glutathione (GSH). Concomitantly, chlorophyll content, total protein, leaf area, and dry weight plummeted, indicating a severe impairment of plant growth and development.The elevation of malondialdehyde levels, further underscores the oxidative stress inflicted by PMS on cassava. Our research unequivocally demonstrates that PMS contamination of soil overtaxes the antioxidant defense mechanisms of plants, rendering them vulnerable to oxidative damage. This study serves as a clarion call to address the environmental and agricultural implications of petroleum pollution, emphasizing the need for sustainable practices to mitigate the devastating impact of PMS on plant growth and ecosystems.

KEYWORDS: PMS, Antioxidant system, RNA: DNA ratio, phytotoxicity, lipid peroxidation, cassava

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C027

LEVEL OF PHTHALATE ESTERS AND HEAVY METALS IN FOOD SAMPLES PREPARED AND STORED IN POLYTHENE BAGS

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ABSTRACT

Phthalate used in polythene production are known to leach into food component posing health risk such as cancer and endocrine disorders. This study was undertaken to determine the levels of phthalate and heavy metals residues in food samples (Moimoi and Tuwo) stored over 6 hours. The levels of phthalate esters and heavy metals were quantified using GC-MS and AAS techniques. The results showed that the level of phthalate esters increased significantly ($p<0.05$) as cooking and storage time increased. The concentration of dibutylphthalate in Moimoi increased significantly from 10.37 ± 0.87 to $47.31 \pm 2.50 \times 10^{-3}$ mg/kg after 6 hours. Similarly the levels of benzylbutylphthalate, bis (2-ethylhexyl) phthalate and di-n-octylphthalate increased significantly ($p<0.05$) from 10.87 ± 0.93, 36.60 ± 1.52 and $11.63 \pm 0.72 \times 10^{-3}$mg/kg to 65.75 ± 2.00, 246.38 ± 4.05 and $94.89 \pm 2.80 \times 10^{-3}$mg/kg respectively after 6hours. The levels of phthalate esters in Tuwo also increased significantly ($p<0.05$) with benzylbutylphthalate and bis (2 e-ehylhexyl) phalate having the highest increase from (45.21 ± 2.00 and $33.28 \pm 1.55 \times 10^{-3}$mg/kg) to ($122.90 \pm 3.00$ and $169.42 \pm 4.00 \times 10^{-}$

^{3}mg/kg) after 6hours respectively. Heavy metals analysed after 1hour revealed the presence of lead (1.3 ± 0.04x10^{-3}mg/l), Cadmium (20 ± 0.50x10^{-3}mg/l) and iron (1.5 ±0.10mg/l). The levels of these heavy metals were found to decrease with cooking and storage time. Findings from this studies revealed that the use of polythene bags for cooking and storing hot foods should be done with caution.

KEYWORDS: Phthalate, polythene, Moimoi, Tuwo, Heavy Metals

C028

PLASTIC PENETRATION: FROM ENVIRONMENT TO HUMAN SYSTEMS, THE HIDDEN THREAT OF MICRO- AND NANO-PLASTICS

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ABSTRACT

The pervasiveness of microplastics and nanoplastics (MNPs) in the environment as persistent contaminants posing threats to public health is well known. However, the infiltration of such invisible, yet lingering particles into the indoor environment and eventually into human tissues is only recently receiving attention. Therefore, this review evaluates the state of evidence regarding the distribution, detection, and toxicology associated with MNPs, with respect to human exposure. The review exposes key challenges including the development of standardized detection methods for sub-micrometer particles, the bioaccumulation mechanisms and determination of the long-term physiological consequences from chronic exposure. Furthermore, the need for identification of biomarkers for health risk assessment, particularly among the vulnerable populations and the socioeconomic disparities that influence material accessibility and health outcomes are revealed. Ultimately, the review calls for an interdisciplinary, all-comprehensive approach to assess and counter the hidden threat of MNPs, in addition to the development of sustainable material alternatives towards protecting both human and environmental health.

KEYWORDS: Microplastics, Sustainable materials, Health risk markers, Vulnerable Population

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C029 A

FUNCTIONALIZATION OF GRAPHENE OXIDE-SILVER (GO-Ag) NANOCOMPOSITE FOR EFFICIENT ANTIBACTERIAL ACTIVITY; AN ECO-FRIENDLY APPROACH

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ABSTRACT

An eco-friendly and cost-effective method for synthesizing graphene oxide-silver (GO-Ag) nanocomposites using *Azadirachta indica* (Neem plant) extracts was developed. Qualitative phytochemical screening of the plant extract revealed the presence of steroids, terpenoids, saponins, tannins, and alkaloids. The materials were characterized using Fourier Transform Infrared (FTIR) spectroscopy, Scanning Electron Microscopy (SEM), and Energy Dispersive X-ray (EDX) analysis. FTIR analysis confirmed the presence of functional groups such as hydroxyl, phenols, alkenes, carbonyl, aliphatic amines, and both primary and secondary amine groups, which suggest the involvement of the plant extract as a capping agent. EDX analysis showed

that the particles contained 59.61% carbon and 3.46% silver, along with other trace elements. SEM images indicated that the GO-Ag nanocomposites were spherical in shape, well-dispersed, and had an average particle size of 7.4 ± 2.3nm.The antibacterial activity of the synthesized nanocomposites was assessed using the disc diffusion method against three pathogenic organisms. Results showed clear zones of inhibition that increased with higher concentrations of the composite. These GO-Ag nanocomposites show promise for use in developing antimicrobial materials with potential applications in the pharmaceutical industry.

KEYWORDS: Graphene oxide, Silver, Nanocomposite, Antimicrobial, Eco-friendly.

C029B

PLANT-BASED APPROACHES TO MANAGE FILARIAL LYMPHOEDEMA AND ASSOCIATED SKIN MANIFESTATIONS

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ABSTRACT

To critically evaluate plant-derived therapeutics for managing established filarial lymphoedema and its dermatological complications, addressing the gap in effective treatment options that leaves patients with body deformities, social stigma, and compromised mental health.This narrative review was conducted using multiple scientific databases including PubMed, Google Scholar, ScienceDirect, Scopus, and Web of Science. The search strategy integrated primary terms such as "lymphoedema," "lymphatic filariasis," and "elephantiasis" with keywords including "phytochemicals," "plant extracts," "antifilarial," "anti-inflammatory," "nanoemulsions," "lymphangiogenesis," and "dermal regeneration." Articles were selected based on their relevance to plant-derived interventions for lymphoedema management, with particular attention to therapeutic mechanisms, formulation strategies, and clinical outcomes. Recent studies indicate that certain plant-derived compounds exhibit dual antifilarial activity while demonstrating significant lymphoprotective, anti-inflammatory, and antioxidant properties relevant to lymphoedema management. Novel formulation strategies including nanoemulsions, nanoemulgels, and lipid-based carriers show promise in enhancing bioavailability of these compounds, with potential efficacy in treating skin manifestations like hyperkeratosis while improving skin integrity and barrier function. Additionally, biofilms and nanoemulsions from plant sources used topically on lymphoedema-related wounds provide antimicrobial protection against secondary infections while promoting tissue regeneration and lymphangiogenesis.Plant-based interventions may offer complementary management strategies for filarial lymphoedema that address multiple pathophysiological aspects of the condition. These approaches could potentially provide functional and aesthetic improvements that have been difficult to achieve through conventional therapies alone, though further clinical validation is needed. Further clinical investigations are needed to standardize formulations and establish evidence-based protocols for integrating phytotherapeutic approaches into mainstream management of filarial lymphoedema, with particular focus on evaluating long-term efficacy and patient-reported outcomes.

KEYWORDS: Lymphoedema, Nanoemulsion, Phytochemicals, Dermal Regeneration, Lymphangiogenesis

C 030

METABOLIC FINGERPRINTING OF EMBRYOGENIC MAIZE (*Zea mays*) CALLUS LINES USING PROTON NUCLEAR MAGNETIC RESONANCE

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ABSTRACT

Morphogenic development in maize callus involves two major processes: Somatic embryogenesis (formation of the somatic embryo) and organogenesis (organ formation,such as shoots). The aim of this study was to evaluate the presence of different metabolites produced during embryogenic development of maize callus lines (CML 406 & CML 419) using proton NMR. About50mg of the freeze-dried embryogenic samples were introduce into 2mL microbute containing NMR buffer for extraction. The dried extracts were transferred to NMR tubes for analysis. The unique compounds discovered in the embryogenic samples are cytidine, phosphor choline, proline, β-glucose, asparagines, acetoacetatic acid, ascorbic acid, aspartatic acid and phenylalanine. Additionally, the common metabolites in embryogenic samples from both lines are β-glucose, sucrose, glutamate, glutamine and valine. The major significance of these findings is that embryogenic competence in maize is attributed to genotype. Secondly, this study hopes to provide complementary information from the biochemical point of view in relation to embryogenesis. This information could be used to identify potential biomarkers, identify gene functions and for drug discovery, among others.

KEYWORDS: Embryogenesis, organogenesis, *Zea mays*, proton NMR, metabolomics

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C 033

ENVIRONMENTAL POLLUTION AND RISK ASSESSMENT OF COVID-19 PERSONAL PROTECTIVE EQUIPMENT DISPOSAL IN NIGERIA: A REVIEW

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ABSTRACT

The growing usage of Personal Protective Equipment (PPE) might result in secondary environmental catastrophes as COVID-19 spreads swiftly throughout Nigeria. To conserve the environment and safeguard public health from approaching health hazards, it is crucial for the relevant authorities to maintain a secure waste disposal system. As of 2015, Nigeria produced about 411000 tons of plastic, and it is anticipated that this volume will rise to 513000 tons due to population growth, rising demand for PPE and other medical facilities, which are primarily made of plastic and 9 percent of which have been recycled and burned, respectively. As the number of people with COVID-19 rises, there is a steady need for PPE, which are plastic items, which increases plastic waste production and the associated environmental damage. We have concentrated on the harmful impacts of these chemicals on air, water, soil, creatures, and human health as well as on the prevalent disposal techniques. Toxic chemicals like phthalates, heavy metals, bisphenol A, brominated flame retardants, nonylphenol, polychlorinated biphenylethers,

dichlorodiphenyldichloroethylene, and phenanthrene are among those found in various plastics used in the manufacture of personal protective equipment (PPE) and medical devices. Every year, an estimated 8 million tons of hazardous medical waste are dumped into the ocean, degrading the marine environment and eventually having an impact on aquatic life. Utilizing PPE and plastic items for an extended period of time and exposing them to high temperatures can cause the leaching of harmful chemical components into food, beverages, and water. Indiscriminate disposal of PPE on land and open air burning can lead to the release of toxic chemicals into the air causing public health hazards. This work also presents mismanagement and risk assessment of PPE wastes disposal.

KEYWORDS: COVID-19, Hazards, Toxic chemicals,s Personal Protective equipment

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C034

ANTI-AGING POTENTIAL OF *Hibiscus sabdariffa* CALYX PHYTOCHEMICALS THROUGH MMP-3 INHIBITION

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ABSTRACT

Skin aging is primarily driven by the degradation of extracellular matrix (ECM) components, such as collagen and elastin, leading to wrinkles, reduced elasticity, and sagging. Matrix Metalloproteinase-3 (MMP-3) plays a crucial role in this process by breaking down structural proteins in the dermis, accelerating skin aging. Natural bioactives have been explored as potential MMP inhibitors, with *Hibiscus sabdariffa* calyces rich in phytochemicals known for their antioxidant and anti-aging properties. This study investigates the potential of *Hibiscus sabdariffa* calyx-derived phytochemicals as MMP-3 inhibitors by analyzing their binding interactions and drug-likeness through computational approaches. Phytochemicals were retrieved from the IMPPAT database, and their structures were prepared for molecular docking. The MMP-3 protein (PDB ID: 1HY7) was selected as the target, and docking simulations were conducted to evaluate binding affinity. The top-scoring compounds underwent further analysis using MM-GBSA for binding free energy calculations and ADMET predictions to assess drug-likeness, skin permeability, and toxicity. Multiple *Hibiscus sabdariffa* phytochemicals, including gossypetin, gossypitrin, hibiscetin, and quercetin, demonstrated strong binding interactions with MMP-3, with docking scores ranging from -10.0 to -9.2 kcal/mol, comparable to known inhibitors. MM-GBSA analysis further confirmed their stable binding, while ADMET predictions indicated good skin permeability and favourable safety profiles, including low toxicity and high metabolic stability. This study identifies promising natural inhibitors of MMP-3 from *Hibiscus sabdariffa*, supporting their potential use in anti-aging skincare formulations. Further experimental validation,in vitro and in vivo validation are recommended to confirm these findings and explore their real-world applications.

KEYWORDS: MMP-3 inhibition, *Hibiscus sabdariffa*, Anti-aging, Molecular docking, Phytochemicals, Skin aging

C035 A

PHYLOGENETIC ANALYSIS OF SELECTED ASTERACEAE PLANT SPECIES WITH SAPONIN PROCLIVITY

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ABSTRACT

The increasing demands for natural saponins along with the need to explore plant sources are prompting interests in identifying and characterizing saponin-rich plant species. The Asteraceae family is one of the largest and most diverse plant families with known phytochemical and ecological relevance. Many species from this family are recognized for their medicinal and industrial values, primarily due to their saponin contents. This study presents a comprehensive phylogenetic analysis of selected Asteraceae species hypothesized or identified for their considerable saponin production using both molecular and morphological taxonomic lines of features. Seven species were selected based on their known and anticipated saponin contents, availability and ecological relevance. Saponins were extracted from the samples followed by morphological and molecular characterizations for phylogenetic investigation. DNA sequence analysis of rbcL markers using MEGA XI software was used for the molecular characterization while PAUP software was used for phenotypic characterization in the morphological phylogenetics. The resulting phylogenetic trees from both expressions via maximum likelihood method with 1,000 bootstrap replicates, though not in total agreement with each other but revealed significant genetic and phenotypic divergence among the species. The saponin yields of the samples showed some levels of connection with their locations on the phylogenetic tree. This study outlines the evolutionary relatedness among the selected Asteraceae species and their different saponin contents, linking evolutionary lineage influence as an additional factor to Species-specific saponin production. These findings have significant implications in selecting Asteraceae species for sustainable saponins production and potential applications.

KEYWORDS: *Asteraceae*, Molecular, Morphological, Phylogenetics, Quantification Saponins.

C 035 B

EXTRACTION QUANTIFICATION AND QUALITATIVE CHARACTERIZATION OF SAPONINS FROM FOUR SELECTED *Asteraceae* PLANTS FOR OIL FIELD RELEVANCE

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ABSTRACT

The need to minimize costs and the negative environmental impacts of oil field operations has led to exploring "green" chemicals for alternatives. Saponins which are secondary metabolite found in many plants

possess great potentials for such Oil field applications. Their detergent property makes them a versatile surfactant in the pharmaceuticals, cosmetics and food industries which can be exploited in the petroleum industry for enhanced oil recovery and oil-polluted soil remediation processes. In this study, the leaves of four selected Asteraceae plants; *Vernonia amygdalina* (Va), *Chromolaena odorata* (Co), *Vernonia cinerea* (Vc) and *Ageratum conyzoides* (Ac) were used for saponins extraction, followed by quantification and characterization. Qualitative analyses for the surface-active properties such as froth test, sodium bicarbonate test, pH, cleaning ability, etc., were investigated. Spectrophotometric analysis using UV-VIS spectrophotometer and FT-IR analysis were also carried out. The yields of saponin from the four specimens vary greatly with Va having the highest yield of 8.683±0.69%, followed by Co with 6.467±0.35%, then Vc with 5.183±0.93% while Ac with 2.567±1.74% had the least yield value. The preliminary qualitative characterization results of the extracted crude saponins showed good surfactant ability in comparison with synthetic surfactant while the instrumentation analysis of FT-IR and UV-VIS spectrophotometer confirmed the presence of good qualities and quantities of distinct saponin types. These results indicate efficient surface activity and high detergency potential which suggest that the saponin from *V. amygdalina* and *C. odorata* can be improved and used as cost effective renewable and eco-friendly alternatives to synthetic surfactants.

KEYWORDS: *Asteraceae, Characterization, Oilfield, Saponins, Surfactant.*

C 036

MOSQUITO BREEDING SITE BIOCHEMISTRY AND INSECTICIDE RESISTANCE: CHALLENGES AND STRATEGIES FOR MALARIA CONTROL FOR ENHANCED PUBLIC HEALTH-A REVIEW

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ABSTRACT

Malaria remains a major global health concern, with 247 million cases and 619,000 deaths reported previously. The effectiveness of malaria control efforts is increasingly jeopardized by the emergence of insecticide resistance in *Anopheles* mosquitoes, the primary vectors of the disease. This review integrates current evidence on the connections between mosquito breeding site biochemistry, insecticide resistance, and malaria transmission, underscoring the critical need for integrated vector management (IVM) strategies that address breeding site dynamics. The review examines a wide spectrum of mosquito breeding sites, ranging from natural wetlands to artificial containers, and evaluates the ecological and biochemical factors influencing their distribution, including temperature, rainfall, organic matter content, and human activities. It delves into the genetic and biochemical mechanisms of insecticide resistance such as target-site mutations,

overexpression of detoxification enzymes, and cuticular resistance highlighting how breeding site characteristics, such as pesticide contamination and habitat stability, drive resistance development. Regional variations in resistance patterns are also discussed, revealing distinct urban and rural dynamics that exacerbate malaria transmission risks. By exploring the interplay between breeding site ecology and resistance, this review calls for adaptive and synergistic interventions targeting both vector populations and resistance mechanisms. Key strategies include environmental management, biological control, and the judicious use of insecticides. Future research directions emphasize the importance of studying gene-environment interactions, leveraging novel control technologies, and understanding the impacts of climate change on breeding site biochemistry. These efforts are pivotal to reducing malaria transmission, managing insecticide resistance, and advancing global malaria elimination initiatives.

KEYWORDS: *Anopheles*, Breeding site, Insecticide, Malaria, Resistance, SDG

C 038

EVALUATION OF TWO STRESS-RELATED ENZYMES IN COVID-19 POSITIVE SUBJECTS

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ABSTRACT

The emergence of new variants of SARS-Cov-2 has emphasized the need to revisit researches done on the wild SARS-Cov-2 and adopt findings that will curtail the spread of the new variant(s) and complications that may arise from it. Therefore, the findings on the evaluation of two stress-related enzymes (Glutathione peroxidase and Catalase) in eleven COVID-19 positive subjects and nine COVID-19 negative subjects (who served as control) is hereby reported. The plasma activity of the Glutathione peroxidase and Catalase were determined using kit specific for each of them. The results of the study show that there was no significant ($P > 0.05$) difference in the Catalase activity between the COVID-19 positive subjects and the control. The results also show that the Glutathione peroxidase activity in the COVID-19 positive subjects was significantly ($P < 0.05$) higher than in the control. These results suggest that oxidative stress is yet to set in the COVID-19 positive subjects as indicated by the Catalase activity, but may soon sets in if appropriate measures are not taken, as the rise in the Glutathione peroxidase activity may be an indication of up-regulation of the antioxidant enzyme as part of cell defensive response against oxidative stress that is about to set in. Thus, the use of antioxidants even at an early, asymptomatic, noncritical stage of SARS-Cov-2 infection and its variant(s) may help in averting the occurrence of oxidative stress whose consequence may include complication of the existing disease condition and (or) resulting to an entirely new disease condition.

KEYWORDS: Catalase, Glutathione peroxidase, SARS-Cov-2, Oxidative stress, Antioxidants.

C-039

PHARMACOKINETICS OF PHENOLIC COMPOUNDS FROM ETHYLACETATE FRACTION OFMETHANOL LEAF EXTRACT OF *Ageratum conyzoides*: AN *IN-SILICO* STUDY

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ABSTRACT

The extent of drug action is in direct relationship with the amount of the drug in aqueous medium in contact with the substrate molecules. The factors affecting this concentration in a biological system can be classified into the pharmacokinetics (PK) phase and the pharmacodynamics phase of drug action. Thus, this research focused on the *in-silico* PKs analyses of phenolics (furocoumarinic acid, liquiritin, isorhamnetin and syringin) identified from ethylacetate fraction of methanol leaf extract of *A. conyzoides* relative to some representative antidiabetic oral drugs. The evaluation of the pharmacokinetics and physicochemical properties was achieved using SwissADME, ADMETlab 2.0 and SuperCYPsPred webservers synergistically. This was validated by experimental*in-vitro*α-amylase and α-glucosidase inhibition assays of the phenolics with best PKs. The findings indicated that the four phenolics are soluble in water, and all the ligands have consensus logP values less than 5 according to Lipinski's Rule of 5, with isorhamnetin being the best (Log*P* 1.6). Also, most of the phenolics are non-inhibitors of the main CYP450 isozymes, but 1A2 and 3A4 were inhibited by isorhamnetin. Similarly, they are mostly non-substrates of the isozymes, but 2C9, 2C19, and 2D6 were metabolized by isorhamnetin. Inhibition validation assays using isorhamnetin-containing sample indicated that the inhibitory effects were more on α-glucosidase (IC_{50} of 18.11 and 15.97µg/ml for acarbose and isorhamnetin, respectively) than on α-amylase. This study has demonstrated that these phenolics from ethylacetate fraction of methanol leaf extract of *A. conyzoides* have relatively good pharmacokinetics within the acceptable limit of drug-like molecules.

KEYWORDS: Pharmacokinetics; *in-silico*; *Ageratum conyzoides*; phenolics; ethylacetate.

C-040

REVIEW: APPLICATION OF PREBIOTICS AND PROBIOTICS IN AFRICAN AQUACULTURE

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ABSTRACT

African aquaculture has successfully produced tilapia and African catfish through different culture systems such as ponds, brush park, cages, tanks, and also advanced tech systems such as flow-through and recirculating systems among others. Serving as an important source of nutrition and livelihood to Africans, aquaculture is constrained by several factors such as lack of adequate fish seeds, high cost of quality feed, insufficient financial resources and most importantly, outbreak of bacterial diseases. This has geared researches into the production of potent, affordable and eco-friendly antimicrobial agents such as prebiotics, probiotics and symbiotic. This is especially so owing to the side effects of synthetic drugs such as transmission of resistant genes, and consumption of residual chemicals in livestock or farmed animals which can be detrimental to the consumers' health.

KEYWORDS: Aquaculture, Prebiotics, Probiotics, antimicrobial, African catfish

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C 041

THE BIOREMEDIATION IMPACTS OF COW DUNGS/FOOD REMNANTS COMPOSITES ON SOIL CONTAMINATED WITH SPENT ENGINE OIL'

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ABSTRACT

Oil pollution is a worldwide threat to the environment and remediation of oil contaminated Soils, sediments and water is a major challenge for environmental research. Bioremediation is a useful method for soil remediation, if pollutant concentration are moderate and non-biological techniques are not economical. The aims of this study were to determine the bioremediation effect of cow dung and food remnant on contaminated soil using spent engine oil and to determine the physicochemical and microbial enumeration of soil samples. Various microbial assay methods were used to determine the soil samples which were gram staining, coagulase and catalase.The samples in week 8 were found to have highest pH and temperature values than samples in Week 2, 4 and 6. At the end of microbial staining, some microorganisms predominantly found were Cocci (*staphylococcus aureus*) rod (*E. coli*), Spirilla, Baccilla and Spirilla cocci. These multiple steps, Sequential staining protocols separate bacteria into four groups based on cell morphology and cell wall structure; Gram Positive Cocci, Gram Negative Cocci, Gram Positive Rods and Gram Negative Rods, the cultures for various sample were found to be aerobic, anaerobic, milky, cream, green and yellow. The results shows that there is catalase Activity in the soil samples, there was effect of coagulase activities in all the samples as it showed to be negative. The results of this research work can be used to establish that cow dungs and food remnants have potential bioremediation effects on oil contaminated soil.

KEYWORDS: Pollution, Bioremediation, Cow dungs, Food remnants, Spent engine oil

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C 042A

GREEN SYNTHESIS OF CHITOSAN AND CHITSOAN SILVER NANOPARTICLES AND ITS POTENTIAL ACTIVITY AS ANTI-MICROBIAL AGENT

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ABSTRACT

Nanotechnology is gaining importance due to its potential use in various industries and medical field stemming from its safety and stability. Chitosan is a cationic polysaccharide naturally existing in some fungi

and produced from chitin deacetylation. It possesses certain properties such as biodegradability, non-toxicity, adsorption which makes it useful in metal nanoparticle synthesis as a safer way of synthesizing nanoparticles. The nanoparticles were synthesized at 90°C under alkaline condition, with chitosan used as a reducing and stabilizing agent. The formation of nanoparticles was shown by a change in the colour of the solution to yellow and then black. The chitosan isolated had a pH of 9.4667 ± 0.1528 and 21.533 ± 1.724 degree of deacetylation with the synthesized nanoparticles having a pH range of 8.333 - 7.867 and 42.857 - 41.993 degree of deacetylation. The DNA of the bacteria and fungi were extracted and quantified using CTAB extraction method and UV-VIS respectively. The synthesized chitosan-based silver nanoparticles exhibited effective antibacterial activity against Gram-negative bacteria: *Escherichia coli* as well as Gram-positive bacteria: *Bacillus subtilis* and anti-fungi activity against *Aspergillus terreus, Fusarium and Malassezia*. Among the different concentrations of silver nitrate solutions, a maximum zone of inhibition against all the microbial cultures was observed with chitosan-based silver nanoparticles produced using 0.5M C-AgNP. The results indicated that C-AgNPs exhibited enhanced antimicrobial and antioxidant properties compared to chitosan alone.

KEYWORDS: Gram-negative bacteria, Gram-positive bacteria, Deacetylation, Chitosan, silver nanoparticle, *Aspergillus terreus, Fusarium*

C-042B

ECOLOGICAL PROXIES TO THE BIOREMEDIATION OF CRUDE OIL POLLUTED MANGROVE SOIL OBTAINED FROM OKERENKOKO, DELTA STATE, NIGERIA.

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ABSTRACT

The impact of pollutants on the mangrove ecosystem has caused several ecological challenges to man and his quest to survive. The mangrove soil samples were obtained from the creeks of Okerenkoko, Delta State, Nigeria and transported to the laboratory. Physicochemical components were determined using analytical grade reagents and procedures. Agro waste was obtained from the markets, slaughterhouses and mills and processed into portions for the bioremediation study. The earthen pots were prepared using 5kg of the polluted soil obtained from the study area using 10% oil palm empty fruit bunch ash, 20% Rumen waste and 30% wood shavings. The study identified that the reduction in the total petroleum hydrocarbon was 90% using the composite in the experiment using the composite mixtures of the feedstock. The total heterotrophic bacterial count increased from 6.8 Log 10 CFU/g to 8.8 Log 10 CFU/g while the pH of the soil increased from 6.2 to 6.7. The predominant flora was *Bacillus* sp., *Aeromonas* sp. and *Pseudomonas* sp. while after the 8 the week of study, *Pseudomonas* sp. and *Staphylococcus* sp. were identified from the study as playing a crucial role in the achievement of the reduction of the pollutant. Molecular investigations revealed that the isolates obtained were *Bacillus axarquiensis* and *Pseudomonas guguanensis* with 100% similarity with the already deposited organisms in the GENBANK. This study has beamed light on the potential of using readily available biomass and feedstock in the resolution of our environmental challenges.

KEYWORDS: Ecological proxies, Pollutants, Mangrove ecosystem, Feedstock, Biomass.

C-043

MODULATION OF *MYCOBACTERIUM TUBERCULOSIS* PROTEIN TYROSINE PHOSPHATASE B BY SHIKONIN AND JUGLONE: POTENTIAL THERAPEUTIC IMPLICATIONS FOR TUBERCULOSIS

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ABSTRACT

Tuberculosis is an infectious disease caused by *Mycobacterium tuberculosis (M. Tuberculosis*). Mtb protein tyrosine phosphatase B (Mtb-PtpB) is a virulence factor required for Mtb survival in host macrophages. Consequently, Mtb-PtpB represents an exciting target for tuberculosis treatment. Naphthoquinones can modulate Ptps activity, offering potential avenues for therapeutic intervention. Therefore, this study evaluated the modulatory effects of naphthoquinones on the monoesterase activity of Mtb-PtpB. The study's objectives were to determine the effect of naphthoquinones on the activity and kinetic parameters of Mtb-PtpBand inhibition constants of Mtb-PtpB in the presence of the naphthoquinones. The monoesterase activity of Mtb-PtpB was determined by measuring the para-nitrophenyl phosphate (pNPP) hydrolysis rate. The effect of naphthoquinones (shikonin and 5-hydroxyl-1,4-naphthoquinone[Juglone]) on Mtb-PtpB activity was monitored spectrophotometrically. Lineweaver-Burk and Dixon's plots were used to determine the enzyme's kinetic parameters and inhibition constant in the presence of naphthoquinones. The results of the study revealed that the V_{max} and K_m for pNPP hydrolysis by Mtb-Ptp B were 2.96 nmol/min and 6.30nM, respectively.V_{max} of Mtb-PtpB was lowest at 10 µM shikonin (1.88 nmol/min), while the K_m was highest at 10 µM 5HNQ (23.18 nM). At the same time, the kinetic analysis of the inhibition patternssuggests a mixed-competitive inhibition mechanism for the compounds. The study concluded that shikonin and 5HNQ inhibited the enzyme at optimal levels. The study recommended exploring those naphthoquinones for tuberculosis drug discovery.

KEYWORDS: *Mycobacterium tuberculosis*, Naphthoquinones, Shikonin, Juglone, Mixed competitive

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C-044

HIGH PREVALENCE OF MULTIDRUG-RESISTANT *Salmonella enterica* SEROVAR TYPHI IN PLATEAU STATE, NIGERIA: IMPLICATIONS FOR PUBLIC HEALTH INTERVENTIONS

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ABSTRACT

Typhoid fever remains a critical public health concern in Nigeria and other low- and middle-income countries. The increasing prevalence of multidrug-resistant (MDR) Salmonella enterica serovar Typhi poses a serious threat to treatment efficacy and disease control, especially in under-resourced regions. This study assessed the prevalence and antimicrobial resistance profile of S. Typhi in Plateau State, Nigeria, and examined the socio-clinical factors associated with MDR infections.A cross-sectional study was conducted among 466 adult residents in Plateau State between January and March 2025. Stool samples were cultured, and isolates were confirmed using biochemical and serological assays. Antibiotic susceptibility testing followed the Kirby-Bauer disk diffusion method. Socio demographic and clinical data were analyzed using logistic and linear regression models in SPSS v25. Of 466 stool samples, 134 (28.8%) were confirmed as S. Typhi. All isolates exhibited MDR, with complete resistance to tetracycline and high resistance to amoxicillin-clavulanate (97.6%) and co-trimoxazole (95.7%). Netilmicin and levofloxacin showed the highest susceptibility (79.0% and 75.7%, respectively). Significant predictors of MDR included frequent febrile illness, recent antibiotic use, and age ($p < 0.05$). The findings reveal an alarming burden of MDR typhoid in Plateau State.

KEYWORDS: Typhoid fever, *Salmonella Typhi*, multidrug resistance, antimicrobial resistance, Plateau State.

C046

IN SILICO ANALYSIS OF THE MOLECULAR INTERACTION OF TELBIVUDINE WITH HUMAN SERUM ALBUMIN

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ABSTRACT

Human Serum Albumin (HSA) is the most abundant protein in human blood. Telbivudine (TBV) is a potent antiviral nucleoside analogue and widely used in treating chronic hepatitis B virus (HBV) infection. This study seeks to pinpoint the specific site or sites where preferential binding occurs for TBV-HSA using molecular docking analysis, predict the types of binding interactions involved and study the stability of the complexes using molecular dynamics (MD) simulation. First, HSA and TBV 3D structures were taken from PDB (Protein Data Bank, PDB Code: 1BM0) and Avogadro 1.1.1 software. Then, the Site-specific molecular docking (Sites I, II, and III) was done via Auto Dock 4.2 and Auto Dock Tools 4.2, and the best complex was selected based on the lowest binding energy, hydrophobic interaction, and number of hydrogen bonds. After that, MD simulation was done via GROMACS 2019. Finally, the structural characteristics of the above complex were evaluated. The findings indicated that TBV forms a complex with the HSA molecule, exhibiting a binding energy of (-27.237 kJ mol^{-1}). Consequently, the Root-Mean-Square fluctuation (RMSF) and radius of gyration results confirmed structural alterations. This complex formation involves hydrophobic interactions between TBV and specific residues, along with the formation of hydrogen bonds. Additionally, the results of the molecular dynamics (MD) simulation process demonstrated that the TBV molecule interacts with the HSA (IIA chain) site I. This *in silico* analysis gives valuable information to understand Telbivudine's behaviour in the human body and may aid in the rational design of more effective antiviral therapies.

KEYWORDS: Human Serum Albumin, Telbivudine, Hepatitis B virus, Molecular Docking, MD simulation,

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C-047

EFFECT OF PHARMACEUTICAL EFFLUENT ON THE ACTIVITY OF SOIL DEHYDROGENASE

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ABSTRACT

This study is aimed at determining the effect of pharmaceutical effluent on the activity of soil dehydrogenase. Soil samples containing the pharmaceutical effluent were collected from the industrial plant discharge points at JUHEL Nigeria limited, Enugu. Soil samples were also collected 500 metres and 1000 metres away from the pharmaceutical company.The activity of soil dehydrogenase was determined using Spectrophotometric

method. The results showed that the dehydrogenase activity was low at the point of liquid syrup effluent discharge ($1.800 \pm 1.040 \times 10^{-5}$ mol/L/hr) when compared with other points. The dehydrogenase activity decreased when fresh soil samples were spiked at different concentrations with drugs (Barbiclox and Flu-j syrup) and monitored within 14 days. These results showed that the discharge of this pharmaceutical effluent on the soil decreases the activity of soil dehydrogenase. There is need for public awareness of the health impact of pharmaceutical effluents and proper treatment of effluent before discharge to the environment to prevent adverse effect of the contaminants on soil, aquatic and human health.

KEYWORDS: Pharmaceutical effluent, Drugs, Soil Dehydrogenase, Environment and Spectrophotometer.

C 048

COMPARATIVE VENOM TOXIN ANALYSES OF NIGERIAN *VIPERIDAE* AND E*LAPIDAE* SNAKES.

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ABSTRACT

Envenoming by snake bite is a serious health problem that maims and kills a large number of people, primarily in rural areas of developing African countries. The first comparative venom proteomic analyses of four snakes from the viperidae (*E. ocellatus* and *B. arietans*) and elapidae (*N. haje* and *N. katiensis*) families are presented in this study. Two-dimensional electrophoresis was combined with matrix-assisted laser desorption ionization time-of- f light mass spectrometry to analyze the venoms. Proteins were identified by comparing mass spectrometry spectra to those in the reviewed Uniprot - Serpentes database. A protein spot was considered differentially present between samples at a p-value of < 0.05 and a fold change of > 2. Viper venoms contained cytotoxic-inducing proteins such as SVMPs, SVSPs, and cytotoxins, whereas elapid snake venoms contained neurotoxic proteins such as PLA_2, 3-FTx, and neurotoxins. The PDQuest annotated protein spots on the 2-DE gels showed that the proteins in these snakes' venoms were differentially expressed between snake families and species. The elapid venoms were predominantly acidic (low pI) with low molecular masses, whereas the viperid venoms had high molecular masses and a pI in the region of 7. Venom phosphodiesterase, L-amino acid oxidase and cysteine-rich venom protein were common in the venoms of these snakes, while an uncommon protein ac- tiflagelin was detected in the Naja venoms. Our findings show that there is significant variation in the toxin profiles of these snakes, both at the species and family levels. This has an impact on the clinical manifestations of envenomation. A thorough understanding of the various toxins found in venomous snakes may aid in the development of new and improved therapeutic strategies.

KEYWORDS: Neglected tropical disease, Snakebite envenoming, Snake venom, Proteomics, 2-DE MALDI-TOF MS

C 050

DETERMINANTS OF POOR COMPLIANCE WITH DIABETIC REGIMENS AMONG DIABETIC PATIENTS ATTENDING GENERAL HOSPITAL KATSINA

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This study identified the determinants of poor compliance with diabetic regimens among diabetic patients attending General Hospital Katsina. Descriptive survey research design was used in this research. Sample size determination was carried out by adopting Morgan's table 1970 in which 40 respondents were selected as the sample size from the target population. The data used was collected using Questionnaire. To arrive at conclusion, the data gathered was analyzed using frequency tables. The study shows that the rate of non-compliance to diabetic regimen is high among diabetic patients; it also reveals that factors such as lack of income, lack of family support, attitude of health care providers, and side effect of drugs contribute to it. It also shows that the ways of reducing the rate of this negative attitude among diabetic patients toward therapeutic regimen include public awareness campaign on proper health education on its effect to diabetic patient, encouraging involvement of family members in the treatment and care of diabetic patients and educating patients on how to source low carbohydrate food from locally available food. It can be recommended that health care providers should be aware of the need to screen patient for non-compliance when they report poor improvement with their prescribed therapeutic regimen, communication and relationship between patients and health care providers should be improved and health care providers should recognize that diabetic patients may adhere better in some aspects of their regimen while finding it difficult to with some aspects of the regimen.

KEYWORDS: Diabetes, Compliance, Regimens, carbohydrate, Non-compliance

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C 051

EXPLORING THE BREAST CANCER–DIABETES CROSSTALK AND THE MOLECULAR MECHANISTIC ACTIVITY OF *Dacryodes edulis*: A NETWORK PHARMACOLOGY APPROACH

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ABSTRACT

Cancers and diabetes are two of the most common and life-threatening global health challenges. Epidemiological and limited mechanistic studies report an increased risk of breast cancer and mortality in diabetic patients; however, the underlying molecular mechanisms remain poorly understood, complicating management. This study investigated shared genes, targets, and pathways between breast cancer and diabetes, and explored the potential molecular mechanisms of *Dacryodes edulis (DE)* against these conditions. Differentially expressed genes (DEGs) were analyzed from independent GEO microarray datasets of the diseases, while the disease-associated genes were also retrieved from curated databases. The database-derived disease targets were systematically combined with DEGs for further analysis. Bioactive compounds from *DE* were obtained from previous literature, and their targets predicted using Swiss Target Prediction, Similarity Ensemble Approach, and Binding DB. Gene intersections and unions were visualized using Venny 2.1, protein-protein interactions (PPI) analyzed with STRING, and networks constructed in

Cytoscape. The study identified 15 upregulated and 98 downregulated DEGs common to both conditions, 228 upregulated in breast cancer but downregulated in diabetes, 58 showing the reverse pattern while 218 common genes resulted from database. A total of 117 genes intersected between *Dacryodes edulis* targets, breast cancer, and diabetes genes. The PPI network analysis identified key hub genes, including EGFR, SRC, AKT1, CCND1, ESR1, PPAR, GSK3β, FASN, and HMGCR. These hub genes were validated using TCGA data. The enrichment analysis revealed pathways including EGFR tyrosine kinase inhibitor resistance, insulin resistance, MAPK, AMPK, HIF-1, Rap1, Ras, and PI3K-AKT signalling. Quercetin, afzelin, ellagic acid, and β-sitosterol emerged as key compounds with high docking scores and important interactions with hub-target. This study highlights shared molecular mechanisms in breast cancer and diabetes and suggests *DE* as a promising natural therapeutic candidate.

KEYWORDS: Breast Neoplasms, Diabetes Mellitus, Phytotherapy, Network Pharmacology, *Dacryodes edulis.*

C-052

ROSMARINIC ACID RESTORED TESTICULAR FUNCTION AND STEROIDOGENIC HORMONE CAPACITY IN MALE WISTAR RATS EXPOSED TO PERFLUOROOCTANOIC ACID TOXICITY

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ABSTRACT

Perfluorooctanoic acid (PFOA) is an environmental toxicant which causes adverse health effects including male infertility and DNA damage in the germ line. This study seeks to assess the restorative effect of Rosmarinic acid (RA) on PFOA-induced toxicity in male Wistar rats.Twenty adult male rats (150-250g) were categorized into four groups (n =5). Animals in group 1 (control) took distilled water. Animals in categories 2-4 which were induced with toxicity by PFOA (20 mg/kg body weight) were treated with distilled water, RA (40 mg/kg body weight) and Vitamin E, a standard antioxidant drug (180 mg/kg body weight) respectively. Treatment continued for 14 days after which the epididymis was used for sperm analysis while blood sample was used for hormonal biomarker assay. Induction of PFOA substantially ($p<0.05$) lowered body weight, testes weight, sperm count, sperm motility, sperm morphology, testosterone, LH and FSH when compared with the distilled water treated control animals. The PFOA-induced reproductive toxic animals, showed substantive ($p<0.05$) drop in sperm count, high ($p<0.05$) amount of non-motile sperm cells, as well as an increased ($p<0.05$) occurrence of abnormally-shaped sperm cells when compared with the control group of rats. However, treatment with RA revealed ($p<0.05$) heightened sperm count, increase ($p<0.05$) in number of motile sperm cells as well as reduced ($p<0.05$) amount of abnormally shaped sperm cells which was comparable to the animals treated with vitamin E. From the above results it can be suggested that RA possess a potential therapeutic effect against PFOA- induced testicular damage.

KEYWORDS: Rosmarinic acid, male infertility, oxidative stress, sperm motility, environmental toxicant.

C 053

LETHALITY OF *Echis ocellatus* VENOM AND ANTIVENOM ACTIVITY OF SOME MEDICINAL PLANTS USED IN KEBBI STATE NIGERIA.

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ABSTRACT

Snakebite injuries affect an estimated 2.7 million people yearly; majority of which are people who live in remote, poorly developed and underdeveloped or developing tropical regions of the world, the venom of *E. ocellatus* is highly toxic, primarily comprising majorly of metallo proteinases which possess hemorrhagic, nephrotoxic, cardiotoxic and anti-coagulant effects. This research work was aimed at evaluating the intraperitoneal lethal doses (50% and 100%) of *Echis ocellatus* venom and antivenom potentials of some medicinal plants used in Kebbi State, Nigeria. The snake specie (*Echis ocellatus*) was captured with the help of snake charmers and was duly authenticated by a zoologist. The venom was milked and their lethal doses were determined using Probit analysis, all the plants used in this study were extracted with methanol. While antivenom effect of the medicinal plants were screened against venom-induced lethal effect in albino rats using standard procedures. The lethal doses, 50% (LD_{50}) and 100% (LD_{100}) of *Echis ocellatus* venom were calculated to be 0.316mg/kg body weight and 3.55mg/kg b. wt. respectively. The antivenom activity of some medicinal plants against *Echis ocellatus* revealed non-significant ($P>0.05$) differences in mean survival time of *Sclero caryabirrea* (A.Rich.) Hochst leaves, *Catunaregam nilotica* (Stapf) Tirveng root, *Crinum ornatum*(Aiton) Herb. bud, *Sclerocarya birrea* (A.Rich.) Hochst root, *Ficus platyphylla* Delile stembark and *Faidherbia albida* (Delile) A. Chevroot methanol extracts compared to both normal and positive control. While *M.inermis* root revealed a significant ($P<0.05$) decrease in mean survival time compared to both normal and positive control and was not significantly ($P>0.05$) different compared to negative control**.** The findings of this study document the lethal profile of *Echis ocellatus* venom and further disclose that some indigenous medicinal plants used in kebbi State have potent antivenom potentials and thus can serve as a guide towards the synthesis and development of conventional antivenoms.

KEYWORDS: *E. ocellatus*, Medicinal Plants, Venoms, Lethal doses.

C-054

MECHANISTIC INSIGHTS INTO THE ANTIOXIDANT POTENTIALS OF *Catunaregam nilotica* ROOT-BARK EXTRACT ON *Echis ocellatus* VENOM-INDUCED OXIDATIVE STRESS IN ALBINO RATS

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ABSTRACT

Snakebite envenomation remains a significant public health concern in tropical regions, especially in Sub-Saharan Africa. In West African ethnomedicine, the root bark of *Catunaregam nilotica* is traditionally used to treat snakebites; however, its underlying mechanisms in counteracting oxidative stress are not fully understood. This study evaluated the antioxidant potential of *Catunaregam nilotica* root-bark extract and its solvent fractions in albino rats envenomed with *Echis ocellatus* venom. Crude methanol extract and successive solvent fractions, n-hexane (n-HF), ethyl acetate fraction (EAF), and butanol fraction (n-BF) were administered post-envenomation. Oxidative stress biomarkers including malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), and reduced glutathione were assessed. MDA levels were considerably elevated by envenomation, while SOD, CAT, and GSH activities were decreased. Antioxidant enzyme activities were restored, and oxidative damage was significantly reduced after treatment with *C. nilotica* n-hexane fraction (nHF) ($p < 0.05$). Interestingly, the synergistic protective effects of nHF and antivenom serum (ASV) were better than those of either treatment alone. These results offer mechanistic proof in favor of the traditional uses of Catunaregam as an antivenom agent

KEYWORDS: Snakebite, *Echis ocellatus*, Antioxidant, *Catunaregam nilotica*, antivenom.

C 055

SYNTHETIC BIOLOGY, APPLICATION AND CHALLENGES

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ABSTRACT

Synthetic biology, a rapidly evolving interdisciplinary field, merges biology, engineering, and computer science to create novel biological components or reprogram existing ones for practical uses. Its core aim is to make biological engineering as predictable and efficient as traditional engineering. This field holds immense potential across various sectors. In medicine, it facilitates the development of engineered microbes for drug delivery, advanced biosensors, and synthetic vaccines, alongside engineered cells for cancer therapy. For agriculture, synthetic biology supports the creation of genetically modified organisms with enhanced crop yields, improved resistance to pests and drought, and higher nutritional value. In the energy sector, synthetic organisms are designed to produce biofuels and biodegradable plastics from renewable resources. Furthermore, environmental applications include developing microbes for bioremediation, carbon capture, and detecting toxic substances. Despite its transformative promise, synthetic biology faces significant hurdles. These include ethical concerns, potential biosafety risks, regulatory uncertainties, and technical limitations in gene editing and integrating complex biological systems. Overcoming these challenges necessitates strong interdisciplinary collaboration, the establishment of robust ethical frameworks, and vigilant regulatory oversight to ensure the safe and responsible advancement of synthetic biology innovations.

KEYWORDS: Synthetic biology, Medicine, Agriculture, Energy, Environmental management

C 056

ASSESSMENT OF POLYCYCLIC AROMATIC HYDROCARBONS IN SOIL AND *Telifairia occidentalis* LEAVES AROUND A DUMP SITE AT OYIGBO L.G.A, RIVERS STATE

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ABSTRACT

Polycyclic aromatic hydrocarbons (PAHs) are common contaminants in the environment that can threaten the populace living close to contaminated soil. Leachates from dumpsites have been known to pollute the environment with deleterious effects. The study examined the level of polycyclic aromatic hydrocarbons (PAHs) in *telifairia occidentalis* leaves and soil obtained from a dumpsite at Oyigbo L.G.A, Rivers State. The concentrations were evaluated using a gas chromatography incorporated with a flame ionization detector (GC-FID). Sixteen (16) PAHs were analyzed in *telifairia occidentalis* leave samples from the dumpsite showing a total PAH content of 171.84 ± 0.15mg/kg and 1389.93 ± 0.98mg/kg in soil. The average levels of PAHs in *telifairia occidentalis* leaves and soil around a dumpsite ranged from 14.34±0.08 - 48.58 ± 0.06mg/kg and 112.79 ± 0.06 - 322.27 ± 0.07mg/kg respectively. Some PAHs such as Pyrene, Fluorine, Chrysene and Benzo[k]Fluoranthene were detected in high levels. Results obtained showed that the studied dumpsite had higher levels of PAH pollution and significant statistical difference when compared with the control site. The study showed that the soil and *telifairia occidentalis* leaves have high levels of carcinogenic PAHs when compared with recommended standards which can be harmful for human consumption and can lead to further environmental contamination.

KEYWORDS: PAHs, Concentration, *Telifairia occidentalis,* Contamination, Soil.

C 057

ENVIRONMENTAL HEALTH RISK EVALUATION OF HEAVY METAL LEVELS IN FISH SAMPLES ALONG RIVER IBI TROUGHS NORTH-EAST NIGERIA

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ABSTRACT

Heavy metals in particular are significant global aquatic environmental pollutants that can be found in microplastics. This research work focus on the environmental and health risk associated with heavy metals in fish from river Ibi. Approximately, 1kg fish samples were purchased from fisher men from river Ibi and transported to laboratory for analysis. Heavy metals (Fe, Zn, Cu, Cd, and Cr) in fish were determined by ICP-OES using the standard procedure. The analysis of heavy metals in fish samples obtained from river Ibi revealed the presence of the following heavy metals; Fe, Zn, Cu, Pb, Cd, Cr, As, and Hg. Fish samples from river Ibi had heavy metal concentrations that ranged from 70.780 ± 0.001 to 0.100±0.005 (ppm) respectively. The results obtained from this study showed that fish samples from the sampling locations are not suitable for human consumption and also confirm the presence of heavy metals in river Ibi.

KEYWORDS: Fish, Heavy metal, Health risk, River Ibi, Concentration Limit.

C-059

TOXIC METALS (LEAD AND CADMIUM) IN PATHOGENESIS OF CHRONIC DISEASES

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ABSTRACT

The environmental toxicants (Lead and Cadmium) enter body through; skin contact, systems of respiratory and digestive, and accumulated. Their electronic structure allowed them to replace or mimic some vital minerals in body systems, hence potentially hazardous tohealth. The study designed to evaluate effect(s) of Lead and Cadmium on some Biochemical indices and structure of blood vessels collagens inof rats. Thirty-two (32) albino rats categorized into; GI (normal control) and G II, III, and IV (experimental groups), orally administered with 9.5 mg/kg body weight (b.w.) of cadmium chloride, 9.0 mg/kg b.w. lead-acetate, and combined metal concentration respectively for twenty-three. The effect of metals on the groups were evaluated using; biochemical and haematological indices, histopathology (heart, liver, and kidney), and the structure of blood vessels collagen using electron scan microscope (ESM). GII, GIII and GIV had a significant ($p<0.05$) higher blood Pb concentration compared control group.Visceral organs (heart, liver, kidneys) displayed different concentration of the metals. Catalase activities is lower in GII compared to GI. Indices of oxidative stress were differently affected among the groups. Histopathology of liver, kidney and heart showed an unremarkable change. ESM examination, interpreted using Image J software, showed alteration in blood vessels collagen pore size/diameter across the groups. Finding may indicate induction of oxidative stress, change in collagen's structure probably due to replacement of calcium which may lead to loss in bloodvessels elasticity, hence assumed a permanent diameter and pressure buildup.

KEYWORDS: Toxic metals, Oxidative stress, Collagen, Chronic diseases, Visceral organs

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C 060

CHEMICAL PROFILING OF *Datura stramonium* LEAVES AND STALK CRUDE EXTRACTS USING GAS CHROMATOGRAPHY-MASS CHEMICAL PROFILING OF *Datura stramonium* LEAVES AND STALK CRUDE EXTRACTS USING GAS CHROMATOGRAPHY-MASS SPECTROMETRY: A COMPARATIVE ANALYSIS

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ABSTRACT

This study aimed to compare the chemical fingerprints of methanol extracts from the leaves and stalks of *Datura stramonium* to identify common phytoconstituents with potential pharmacological relevance. Crude extracts were analyzed using Gas Chromatography-Mass Spectrometry (GC-MS) on a Perkin Elmer AutoSystem XL, employing an Elite-5MS capillary column (30 m × 0.25 mm ID × 0.25 µm film thickness), with helium as the carrier gas. Compound identification was based on mass spectral matching against the NIST library.The chromatographic analysis revealed 46 peaks in the leaf extract and 35 peaks in the stalk extract. Six compounds were common to both: 5-methyl-2-furfural (1.89-2.19%), glycerol (1.60-2.06%), 4H-pyran-4-one (1.42-8.24%), octadecanoic acid ethyl ester (2.25-3.81%), 2-pentadecanone (0.72-1.23%), and methyl palmitate (1.03-6.75%). Distinct compounds included phytol (12.24%), oleic acid (1.08%) and rhamnose (1.77%) in leaves, and scopolamine (0.51%), vitamin E (1.14%), and hydroquinone (3.75%) in stalks. Several of these compounds have documented pharmacological properties such as anticancer, anti-

inflammatory, and neuroprotective effects. These findings suggest that select phytochemicals may serve as candidate biomarkers for standardizing *D. stramonium* extracts. Further pharmacological and toxicological validation is recommended to support therapeutic applications.

KEYWORDS: *Datura stramonium,* stalk, standardization, phytoconstituents, chemical markers.

C 061

BIOLARVICIDAL POTENTIAL OF SPORES AND METABOLITES EXTRACTS OF *PENICILLIUM* SPP.AGAINST *ANOPHELES* MOSQUITOLARVAE

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ABSTRACT

The development of pesticide resistance in the population of mosquitoes significantly contributes to the persistence and dissemination of malaria. There is a rising consent of the necessity of producing ecologically sustainable bioactive constituents to reduce the proliferation of *Anopheles* mosquitoes during their larval stage. This study aims to assess the larvicidal effects of metabolites and spores extracts of *Penicillium spp.* against the malaria vectors. Four different test concentrations of spores (0.38×10^8, 0.75×10^8, 1.5×10^8 and 3.0×10^8) were obtained by measuring the optical density (OD). Equal volume of ethyl acetate and methanol has been used for the extraction of metabolites at four different test concentrations (10, 20, 30, and 40 mg/mL).The extracted chemical components were characterized using FT-IR and GC-MS analysis. The lethal concentrations (LC_{50} and LC_{90}) were calculated using Probit analysis. A significant mortality rate was recorded at highest concentrations of spores and metabolites extracts of *Penicillium spp.* The main bioactive components disclosed by GC-MS analysis include 3-Eicosene, (E)-, caryophyllene, 1-Octadecene, 1-Docosene and squalene. The findings of this research revealed that metabolites and spores extracts of *Penicillium spp.* possess the ability for controlling the mosquito vectors.

KEYWORDS: *Anopheles* mosquito, Fungal spores, *GC-MS analysis,* Metabolites, *Penicillium spp.*

C 063

EFFECT OF DICHLOROMETHANE-ETHYL ACETATE FRACTION OF *Commiphora pedunculata* ON PARASITEMIA AND PATHOLOGICAL ALTERATIONS INDUCED BY *Plasmodium berghei*

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ABSTRACT

Malaria continues to pose a significant public health challenge, particularly in developing countries, due to widespread parasite resistance to most available treatments. Against this backdrop, the dichloromethane-

ethyl acetate fraction of *Commiphora pedunculata*, a medicinal plant known for its antioxidant and anti-inflammatory properties, was evaluated for its therapeutic potential against *Plasmodium berghei* as well as its effect on anaemia and oxidative organ damage triggered by *P. berghei*. Mice infected with a chloroquine-sensitive strain of *P. berghei* were orally treated with dichloromethane-ethyl acetate (20:1) fraction of *C. pedunculata* at doses of 50 and 100 mg/kg body weight for seven days. The parasitemia, packed cell volume and oxidative stress biomarkers (including levels of thiobarbituric acid reactive substances, reduced glutathione, superoxide dismutase activity and catalase activity) sin the spleen, brain and liver were estimated. Results revealed that dichloromethane-ethyl acetate fraction of *C. pedunculata* significantly ($p < 0.05$) suppressed *P. berghei* multiplication in a non-dose-dependent manner. Moreover, the fraction significantly ($p < 0.05$) mitigated anaemia and oxidative organ damage caused by *P. berghei*. These findings indicated that dichloromethane-ethyl acetate fraction of *C. pedunculata* has antiplasmodial potential and ameliorative role towards *P. berghei*-induced pathological changes.

KEYWORDS: *Commiphora pedunculata*, Malaria, *Plasmodium berghei*, Anaemia; Oxidative stress.

C 064

ASSESSMENT OF PORTABLE WATER QUALITY IN RIVER STATE UNIVERSITY PORT HARCOURT CAMPUS

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ABSTRACT

Water contamination in the Niger delta region is prevalent and on constant increase with the health risk it poses a safety concern. This study assessed potable water from selected staff quarters in Rivers State University, Port Harcourt Campus. Nine water samples were collected from three stations (staff quarters).Station I represents Block A;station II represents Block 3 andstation III represents Block C all in Road A.The samples were analyzed to determine total heterotrophic bacterial count (THBC), total coliform count (TCC) and total fecal coliform (TFC) using standard microbiological methods. Results for the plate count of microorganism showed varying concentrations across stations. The THBC concentrations were ($1.45 \pm 0.07 \times 10^3$CFU/ml), ($4.45 \pm 1.41 \times 10^3$CFU/ml) and ($7.5 \pm 0.71 \times 10^3$ CFU/ml) for stations I, II and III respectively.The TCC had ($7.5 \pm 0.71 \times 10^3$ CFU/ml),($1.2 \pm 1.55 \times 10^3$CFU/ml) and ($4.05 \pm 0.79 \times 10^3$CFU/ml) for stations I, II and II respectively. The total fecal count (TFC) was not detected in water samples across all stations. Further, the presence of *Bacillus sp* was confirmed in water samples across all stations, *Klebsiella sp* and *Staphylococcus aureus* were also confirmed in samples of station II only while *Escherichia coli* was confirmed in water samples of station III. Results of the biochemical identification ofisolates showed 5 isolates for *Bacillus sp* and *Klebsiella sp* each with their reactions to catalase, citrate and oxidase confirmed positive while indole was negative. More so, *E.coli. and S. aureus* 2 each were isolated from the water samples, while their reactions to catalase was positive and citrate showed negative. All isolated organisms had their motility ability confirmed positive except for *S. aureus* that showed negative. The presence of *E. coli* and the high level of total heterotrophic bacteria above 100CFU/ml in the water samples indicate contamination and render the water unsafe for drinking.

KEYWORDS: Water contamination, microbiological quality, portable water, stations, River State University

C-065

BIOSYNTHESIS OF SILVER NANOPARTICLES USING *Detarium microcarpum* STEM-BARK EXTRACT: CHARACTERIZATION, ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES

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ABSTRACT

The growing interest in sustainable and eco-friendly approaches to nanomaterial synthesis has led to the exploration of plant-mediated methods. In this study, silver nanoparticles (AgNPs) were synthesized using the methanol stem-bark extract of *Detarium microcarpum*, a medicinal plant rich in bioactive phytochemicals. These phytochemicals served as natural reducing and stabilizing agents in the green synthesis process. The formation of AgNPs was confirmed by a surface Plasmon resonance peak using UV-Vis spectroscopy. Fourier-transform infrared spectroscopy (FT-IR) revealed the presence of functional groups responsible for nanoparticle stabilization, while X-ray diffraction (XRD) analysis confirmed the crystalline nature of the nanoparticles with characteristic peaks at 2θ values of 28.00°, 31.80°, 41.10°, 53.60°, 63.60°, 76.40°. Scanning electron microscopy (SEM) demonstrated spherical nanoparticles with sizes below 50 nm. The antioxidant potential of the synthesized AgNPs was evaluated using 2,2-Diphenyl-1-picrylhydrazyl (DPPH), 2,2-azino-bis-3-ethylbenzothiozoline-6-sulfonic acid (ABTS), and Ferric reducing Antioxidant power (FRAP) assays, yielding IC values of 114.4µg/mL, 354.3µg/mL, and 440.6µM, respectively—indicating significant free radical scavenging activity. Anti-inflammatory properties were assessed via protein denaturation and membrane stabilization assays, with AgNPs showing up to 85% inhibition, surpassing standard drugs (73%) at a concentration of 100µg/mL ($p < 0.05$). These results suggest that *Detarium microcarpum*-mediated silver nanoparticles exhibit strong antioxidant and anti-inflammatory activities, highlighting their potential for future therapeutic applications.

KEYWORDS: *Detarium microcarpum*, silver nanoparticles, Antioxidants, Anti-inflammatory.

C-066

DETERMINATION OF PROTEASE PRODUCTION POTENTIALS BY WASTE DUMPSITES BACTERIA USING SELECTED AGRICULTURAL WASTES AS CARBON SOURCE

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ABSTRACT

Protease enzyme plays a pivotal role in many industrial processes. Hence, the demand for proteases has experienced upsurge industrial demand. Among the factors to be considered for maximum microbial protease production are viable microbial strain, and a low-cost utilizable substrate. The use of cheap materials with nutrients capable of enabling the growth of microorganisms such as agricultural waste

materials could help in meeting industrial proteases demand. In this study, the ability of several selected agricultural wastes comparing to that of glucose which is the sole carbon source in the production of most industrial enzymes to support microbial growth and serve as sources of carbon and other nutrients was evaluated. The bacteria were isolated from soil samples of different dumpsites, sewage sludge and cow rumen ingester were screened on skimmed milk agar to observe their zone of hydrolysis. The proteolytic isolates were identified and cultured in different agricultural waste to evaluate the responses using glucose as standard carbon source. The active protease producers in this study were identified to be *Bacillus licheniformis, Proteus mirabilis, Klebsiella pneumoniae, Bacillus brevis, Bacillus coagulans, Pseudomonas* sp., *Clostridium* sp., and *Bacillus licheniformis.* The activities of proteases produced with agricultural waste materials were significantly ($p < 0.05$) higher than that of glucose as carbon source under optimum pH and temperature conditions. Among these isolates, *Clostridium* sp. isolated from refuse dumpsite was observed to be the best protease producer (409.99 ± 2.98 U/ml) in rice husk substrate. Therefore, these agricultural wastes and isolates, especially rice husk and *Clostridium* sp could be considered in the low-cost production of protease enzyme for industrial application.

KEYWORDS: Protease, agricultural wasties, *Clostridiumsp*., Rice husk, Glucose

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C-067

SOCIODEMOGRAPHIC DETERMINANTS, CLINICAL CORRELATES, AND ANTIBIOTIC RESISTANCE DYNAMICS OF TYPHOID FEVER AND MULTIDRUG-RESISTANT *Salmonella Typhi* IN KOGI STATE, NIGERIA

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ABSTRACT

Typhoid fever, caused by *Salmonella enterica* serovar Typhi (*S.* Typhi), remains a persistent public health threat in Nigeria, compounded by escalating multidrug resistance (MDR). This study investigated the interplay of sociodemographic factors, clinical profiles, and antibiotic resistance patterns in typhoid fever prevalence and MDR in Kogi State, Nigeria. A cross-sectional study of 428 participants was conducted, employing microbiological culture, biochemical and serological assays, Kirby-Bauer disk diffusion for antibiotic susceptibility, and multiple regression analysis to assess predictors of typhoid prevalence and resistance. Socio demographic variables, clinical histories, and resistance to eight antibiotics were evaluated. Typhoid prevalence was 36.4% (95% CI: 31.9–41.0), with peaks in the 18–27 age group (37.4%), semi-urban residents (48.1%), and users of borehole water (29.2%) and pit latrines (47.7%). MDR prevalence was highest among those with monthly hospital visits (39.5%) and prior Amoxicillin (40.7%) or Ciprofloxacin (23.8%) use. *S.* Typhi isolates showed extreme resistance to Tetracycline (100%), Co-trimoxazole (97.0%), and Ceftriaxone (70.5%), with preserved sensitivity to Levofloxacin (75.7%) and Netilmicin (79.8%). Age (β=44.19, p=0.000019) and prior antibiotic exposure (β=0.298, p=0.036) were significant predictors of resistance. These findings revealed a complex nexus of environmental, behavioral, and clinical drivers of typhoid and MDR in Kogi State, Nigeria, necessitating urgent interventions in water sanitation, rational use of antibiotics, and surveillance systems.

KEYWORDS: Typhoid fever, multidrug resistance, *Salmonella Typhi*, socio-demographic factors, antibiotic resistance

C-068

ASSESSMENT OF HEAVY METALS IN DIFFERENT LIPSTICKS USED BY STUDENTS OF TARABA STATE UNIVERSITY AND TARABA STATE POLYTECHNICS, JALINGO, TARABA STATE, NIGERIA

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ABSTRACT

This study assess the concentration of some heavy metals (Hg, Pb) in lipsticks commonly used among students of Taraba State University and Taraba State Polytechnics, Jalingo, and as well as to ascertain the hazard quotation associated with it. Different lipstick samples were collected, according to their trademark names and crushed into fine powder and heavy metals was analysed using flame atomic absorption spectrophotometer (AAS-240 FS AA model). The data obtained were analyzed using one way analysis of variance on SPSS version 27 at ($p < 0.05$) statistically confidence level. Lead (Pb) concentrations in cosmetics used by Taraba State University students indicated(0.309±0.002 mg/kg) in Matte, (0.247±0.002 mg/kg) in Iman, (0.185±0.001 mg/kg) in Yanga - beauty, (0.425±0.005 mg/kg) in Classic Make-ups and (0.450± 0.047 mg/kg) in Hegai and Esther. These values exceed the Food and Agriculture Organization (FAO) reference limit. For Taraba State Polytechnics, lead (Pb) concentrations in make ups indicated (0.395±0.002mg/kg) in Matte, (0.267±0.002mg/kg) in Iman,(0.165±0.001 mg/kg) in Yanga - beauty, (0.395±0.005mg/kg) in Classic makeups, (0.350±0.047 mg/kg) in Hegai and Esther while the concentrations for Mercury (Hg) are (0.098±0.001mg/kg), (0.115±0.002mg/kg), (0.120±0.002mg/kg), (0.290±0.002mg/kg), (0.183±0.047mg/kg) in Matte, Iman, Yanga - beauty, Classic makeups and Hagai and Esther respectively. These findings are expected to create public awareness because frequent uses of contaminated makeups can lead to heavy metal toxicity such as neural, renal and respiratory disorders.

KEYWORDS: Lipsticks, Heavy metals, toxicity, students and Taraba State.

C-069

ROLES OF CYTOCHROME P450 CYP6Z3 AND L1014F ALLELE IN PYRETHROID-RESISTANCE PHENOTYPES OF *Anopheles gambiae* S.L. COMPLEX FROM LAGOS, NIGERIA

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ABSTRACT

Insecticide resistance have been a limiting factor in malaria elimination. Mutation in *para* voltage gated sodium channel (VGSC) and metabolic resistance are the two major mechanisms linked with pyrethroid resistance. Recently there are reports of escalated role of metabolizing enzymes, hence this study. Larvae were collected from Ajeromi-Ifelodun and Kosofe Local Government Areas, Lagos State, reared to adult and exposed to deltamethrin (0.5%) and permethrin (3.75%) through susceptibility and synergist (Piperonyl butoxide (PBO)) tests. Resistant and susceptible phenotypes were identified by PCR, genotyped for L1014F mutation and subjected to transcriptional profiling of a known pyrethroid metabolizing enzyme. The test

population consisted of only *An. coluzzii*. Resistance to permethrin and deltamethrin was observed. PBO significantly ($P < 0.05$) increased the efficacy of both insecticides on *An. gambiaes.l*., implicating the role of Cytochrome P450s.The frequency of 1014F allele ranges between 0.4-0.57. Transcriptional profiling revealed cytochrome P450 CYP6Z3 overexpressed in resistance phenotypes compared to the fully susceptible laboratory colony, *Kisumu*. Highest fold change (FC) was observed in deltamethrin resistance phenotypes (FC = 4.2). Two-tailed t-test carried out between the expression levels in the resistance phenotypes and *Kisumu* revealed expressions in deltamethrin and permethrin resistance phenotypes to be significantly higher than *Kisumu* atP = 0.032 and 0.024 respectively. Findings from this study implicated metabolic resistance (cytochrome P450 CYP6Z3) and target-site (L1014F allele) in pyrethroid resistance. This suggests multiple resistance mechanism in these mosquito populations. More screening for role of other metabolizing enzymes is pertinent to improve national malaria control programs.

KEYWORDS: Pyrethroid, metabolizing enzymes, *kdr* mutations, *Anopheles gambiae s.l.*

C-070

EVALUATION OF MACRONUTRIENT AND MICRONUTRIENT MINERAL CONTENTS OF *Nymphaea pubescens* (WATERLILY) OBTAINED FROM A MASSOMA RIVER IN BAYELSA STATE

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ABSTRACT

Nymhaea pubescens belongs to the family *Nymhaeaceae.* It is commonly known as waterlily. It has been recognised for its medicinal value in traditional medicine to treat diseases like diabetes, indigestion, ulcer and haemorrhages. This study evaluated the macronutrients and micronutrients present in the aqueous leaf extract of *Nymhaea pubescens* collected from entries of river in Ammasoma town in Bayelsa State. Leaves of fresh waterlily were collected, washed to remove debris and air-dried at room temperature of 27± 1^{O}C for 4 weeks and thereafter oven-dried at 37±1^{O}C to a constant weight. The dried leaves were pulverized with the aid of Marlex Excellent grinder (Mumbai, India). The ground samples were then passed through a sieve of 0.5 mm pore size to obtain a fine uniform powder. The powdered samples were kept in an airtight container until required. Flame Atomic Adsorption Spectrometer (FAAS) was used to assay for the following minerals: Iron (Fe),Magnesium (Mg), Manganese (Mn), Selenium (Se), Zinc (Zn), Calcium (Ca), Sodium (Na),Potassium (K), and Copper (Cu) in the leaf extract. The values from the results obtained is presented following the highest concentration to the lowest concentration order: Zn = 0.843 ± 0.194g/L, K= 8.909 ± 0.179g/L, Mn= 5.278 ±125g/L, Ca= 9.234 ± 0.107g/L, Fe = 3.782 ± 0.045g/L, Na=8.909 ±0.041g/L, Mg=7.892 ± 0.028g/L, Cu =1.078±0.010g/L, and Se=0.082± 0.001g/L. These finding suggest that the plant is rich in both macronutrients and micronutrients and can be exploited further for nutraceutical and medicinal benefits.

KEYWORDS: *Nymphaea pubescens*, Flame Atomic Adsorption Spectrometer, Mineral contents, macronutrients, micronutrients

C-071

MICROBIAL PATHOGENICITY PROFILING IN PRE-HOSPITAL ENVIRONMENTS: A METAGENOMICS-BASED APPROACH

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ABSTRACT

The profiling of antimicrobial resistomes and pathogenic elements from ambulances is crucial for the effective control of infection dissemination, and the formulation of strategies to tackle antimicrobial resistance. The Ambulances serve as the first point of contact between the patients and hospitals, as well as vector for the transmission of nosocomial infections (NI). In this study, assembly using MetaSpades was conducted on 300 pre-processed metagenomic-reads sequenced from ambulance samples. The assembly generated an average of 27,054 contiguous sequences (contigs) with the largest having a mean length of 10,798,799 base pairs (bp). The Taxonomic assignments conducted using the contigs identifies several clinically relevant pathogenic species (such as *Staphylococcus aureus*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*). Also, opportunistic pathogens such as *Stenotrophomonas maltophilia* and *Pseudomonas oryzihabitans* were among the highly abundant species identified. AMR genes such as *mecA* and *oxa-23* were profiled from the contigs while, a number of shared plasmids including *ColpVC_1, IncFIB(K)_1_Kpn3* and *IncP1_2* was identified across locations. Moreover, virulence factors and their associated virulent mechanisms within the pathogenic species were predicted. For instance, a positive correlation coefficient ($p<0.05$) was observed between biofilm formation and adherence, while a negative correlation coefficient ($p>0.05$) between stress survival and the other mechanisms was determined. In conclusion, the mapping of the pathogenic elements from the ambulances could help in designing effective public health interventions to minimize their transmission. Our future studies will focus on conducting AMR resistomes and pathogenic elements profiling from prehospital settings across Africa.

KEYWORDS: Antimicrobial Resistance, Metagenomic Assembly, Nosocomial Infections, MetaSpades, Contigs, Plasmids, Public Health

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C-072

FINGERTYPING OF HUMAN-INFECTING *Schistosoma spp* IN FRESHWATER SNAILS OBTAINED FROM SABON GARI LOCAL GOVERNMENT, KADUNA STATE

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ABSTRACT

Schistosomiasis is a neglected tropical disease that ranks second to Malaria, causing ~200,000 deaths annually in sub-Saharan Africa. This study was set to finger-type and assess the distribution of human-infecting *Schistosoma spp* and the prevalence of vectors – freshwater snails (FWS) – within Sabon Gari Local Government, Kaduna State. The study was conducted between August and September, being the peak of the rainy season in northern Nigeria. Morphological and molecular identifications of the FWS from sixteen hotspots within the study area were conducted. Only eight of the sixteen sites had FWS infestation. A total of 1,415 FWS were sampled. The genetic identity of the prevailing *Schistosoma spp* was analyzed from the *Dra1* gene sequence of each gDNA isolated. Five of the sites had infestation with *Bulinusspp* (*B. senegalensis*, *B. truncates* and *B. globosus*) only, while three sites had species from both the *Bulinus* and *Biomphalaria* genera (*B. pfeifferi* and *B. camerunnensis*). The prevalence of *Schistosoma spp*-infected and uninfected FWS per hotspot were determined and a geospatial atlas of schistosomiasis at risk areas within the study area was constructed. Twelve communities were identified based on elevation as potentially at risk of schistosomiasis should there be potentiating factors as flooding, contamination of water bodies and irrigation sites. Sabon Gari Local has an abundance of human-infecting *Schistosoma spp,* with the possibility of an outbreak of schistosomiasis.

KEYWORDS: Freshwater snails, Schistosomiasis, Prevalence, Geospatial, Atlas

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C-073

DETERMINATION OF SOME HEAVY METALS, BIOCHEMICAL AND HEMATOLOGICAL PARAMETERS IN MINERS OF ADUDU MINING SITE OBI NASARAWA STATE

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ABSTRACT

This study investigated the impact of prolonged exposure to heavy metals on the health of miners at the Adudu Mining Site in Obi, Nasarawa State. The study examined the concentrations of blood lead (Pb) and zinc (Zn), liver function and hematological parameters in 40 miners, categorized by years of exposure to mining activities (1-2 years, >2-4 years, >4-6 years, and >6 years), and compared these findings with 27 control participants. Data were gathered through a structured questionnaire to capture demographic information, followed by blood sample collection for laboratory analysis. Blood lead concentration significantly ($p<0.05$) increased with longer exposure, reaching 4.67 ± 4.43 µg/dL in miners exposed for >4 years and 4.85 ± 5.15 µg/dL in those exposed for >6 years, when compare with 0.72 ± 0.51 µg/dL in controls. Conversely, serum zinc concentrations showed a decline with prolonged exposure, with controls maintaining a significantly ($p<0.05$) higher mean when compare with value of 80.51 ± 15.57 µg/dL. Liver function tests highlighted notable changes, particularly in AST activity, which was significantly ($p<0.05$) elevated in miners exposed for more than 6 years (46.04 ± 9.54 U/L). ALT levels were significantly ($p<0.05$) higher in miners exposed for 2-4 years, but the peak was observed in those with >6 years of exposure. ALP activity, however, remained statistically insignificant ($p>0.05$) across all groups. Bilirubin levels (both direct and

total) showed no significant ($p>0.05$) variation across the exposure groups. Hematological analysis revealed significant ($p<0.05$) increases in white blood cell (WBC) counts in miners, except for the >6-year exposure group. Red blood cell (RBC) and hemoglobin (Hb) levels were significantly lower in miners with 1-2 years of exposure, but no significant ($p>0.05$) differences were found in the other groups. The packed cell volume (PCV) remained stable, while platelet (PLT) counts significantly ($p<0.05$) decreased in miners exposed for 4-6 years, but interestingly, increased in those with >6 years of exposure. This study underscored the detrimental effects of prolonged heavy metal exposure on the miners' health, particularly the elevation of blood lead levels, reduced zinc concentrations, liver dysfunction, and notable hematological changes. To mitigate these health risks, the implementation of workplace safety measures and regular health monitoring is highly recommended.

KEYWORDS: Lead, Zinc, Hematological parameters, Liver function parameters, Miners, Obi- Nasarawa State.

C-074

ASSESSMENT OF HYDROCARBONS POLLUTION IN OMUIGWE-ALUU (RIVERS STATE, NIGERIA) SOILS AND HEALTH RISK CONSEQUENCES OF HUMAN EXPOSURE

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ABSTRACT

This study evaluated hydrocarbon pollution in soils of Omuigwe-Aluu, Rivers State, Nigeria, and assessed the associated human health risks due to exposure. Soil samples were collected from hydrocarbon-polluted and control sites (50 m apart) at depths of 0–15 cm and 15–30 cm using a stainless-steel auger. The samples were analyzed for total petroleum hydrocarbons (TPH), total hydrocarbon content (THC), polycyclic aromatic hydrocarbons (PAHs), and benzene, toluene, ethylbenzene, and xylene (BTEX) using gas chromatography-mass spectrometry (GC-MS). Pollution levels were evaluated using contamination factor (CF) and pollution load index (PLI), while human health risks were assessed using hazard quotient (HQ) and incremental lifetime cancer risk (ILTCR). Results revealed severe contamination, with BTEX recording the highest CF (4000), followed by PAHs (>2500), TPH (>1500), and THC (>500), indicating extensive pollution from artisanal refining activities. PAHs in polluted control plots exhibited extreme persistence (CF = 7807.5). A greenhouse phyto remediation experiment using waterleaf (WLF), okra (OKR), and maize

(MAZ) in a randomized complete block design (RCBD) demonstrated significant hydrocarbon reduction. Waterleaf achieved a 99.8% reduction of THC by day 30 and reduced BTEX and PAHs by 59.3% and 56.9%, respectively, by day 90. Initial HQ values exceeded safe thresholds, especially for TPH (HQ = 1,858,701 for children), indicating significant non-carcinogenic risk. By day 90, HQ and ILTCR values declined substantially, although residual PAHs remained above acceptable levels. The findings underscore the ecological and health risks posed by hydrocarbon pollution in the area and highlight phyto remediation, particularly with waterleaf, as an effective mitigation strategy.

KEYWORDS: Omuigwe-Aluu Soils, Hydrocarbons Pollution, Human Health, Risk Assessment, Phyto remediation.

C 075

MATHEMATICAL ASSESSMENT OF HEAVY METALS AND POLYCYCLIC AROMATIC HYDROCARBONS IN COMMONLY CONSUMED SEAFOOD: HEALTH RISK IMPLICATIONS IN IDEMA-ABURENI CLAN, OGBIA, BAYELSA STATE

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ABSTRACT

This study carried out the mathematical evaluation of health risk of heavy metals and polycyclic aromatic hydrocarbons in selected seafood in Idema-Abureni Clan, Bayelsa State. Seafood were collected from Idema River. Heavy metals, PAHs, estimated daily intake (EDI), life cancer risk (LCR), total life cancer risk (TLCR), target hazard quotient (THQ), and hazard index (HI) heavy metals were investigated based on standard methods of estimation. The Pb, Cd, and Ni in *Grapsidae* seafood were 6.16±0.08mg/kg, 2.94±0.07mg/kg, and 10.15±0.11mg/kg respectively, which were higher than the reference values for seafood as recommended and similar pattern were perceived in *P. busungwe, C. armatum, Bagrus bajad,* and *A. silverside.* The estimated daily intakes of Pb, Cd, and Cr in P. busungwe were 0.026mg/kg, 0.05mg/kg, and 0.006mg/kg respectively, were higher than the reference values for seafood as recommended. The THQ and HI of Pb, Cd, Cr, and Ni in *Grapsidae* were 0.006mg/kg, 0.001mg/kg, 0.006mg/kg, and 0.002mg/kg respectively, were higher than the reference values for seafood as recommended and similar fashion were noticed in *Potamonautes busungwe, Cardisoma armatum, Oxudercinae, H. bivittatus, Mystus tengara, Bagrus bajad*, *Atlantic silverside, Portunus armatus,* and *C. roseus* seafood. LCR and TLCR of Pb, Cd, Cr, and Ni studied in *Grapsidae* were 1.007 mg/kg, 3.080 mg/kg, 0.005mg/kg, 0.056 mg/kg respectively, were significantly higher the reference values for seafood as recommended and similar occurrences were observed in *Oxudercinae, Bagrus bajad, Portunus armatus,* and *Catharanthus roseus.* Consumption of the studied seafood in Idema River could lead to cumulative toxic effects.

KEYWORDS: Idema River, seafood, polycyclic aromatic hydrocarbons, heavy metals, total life cancer risk, hazard index

C 076

NEW APPROACHES IN METHODOLOGIES FOR TOXICOLOGICAL SAFETY ASSESSMENT: A REVIEW

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ABSTRACT

Toxicology serves as the cornerstone for assessing the safety of chemical, physical, and biological agents, providing a structured approach to uncover toxicity mechanisms and evaluate their potential effects on biological systems. New approaches in toxicology testing methods are crucial for improving accuracy and efficiency. Animal testing has long been the gold standard for assessing the potential impact of chemicals on human health. The results from such tests are used to identify any possible hazard and, where possible to assess potency, so that informed decisions about safety can be made. However, studies in experimental animals are time consuming, expensive and may be of limited biological relevance, in addition to presenting animal ethical concerns. New approach methods (NAMs) provide a promising alternative to conventional animal-based techniques for toxicological assessment. NAMs encompass a wide range of methodology, technology, approach or combination thereof that can be used to replace, reduce or refine animal toxicity testing. A number of NAMs have been developed over the past years with the ultimate goal of providing a system that is scientifically better, more efficient and more ethical. Representative NAMs approaches include Quantitative Structure-Activity Relationship (QSAR), Deductive Estimation of Risk From Existing Knowledge (DEREK), Molecular Docking, Adverse outcome pathway (AOP), Organ-on-a-Chip Technology, Artificial Intelligence, Omics Technologies and High-Throughput Screening. NAMs not only serve as alternative non-animal approaches but can also be combined with in vivo test methods, in vitro studies and clinical observations. Advancement in NAMs are clearly reshaping and revolutionizing traditional toxicity testing for the better.

KEYWORDS: Toxicology, NAMs, QSAR, Molecular Docking and Omics

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C 077

PREVALENCE OF ANTIBIOTIC RESISTANCE IN GRAM-NEGATIVE BACTERIA FROM CLINICAL ISOLATES

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ABSTRACT

The rising incidence of antibiotic resistance among Gram-negative bacteria presents a major obstacle to the effective treatment of infectious diseases globally. This study investigated the prevalence of antibiotic resistance in Gram-negative bacteria isolates obtained from clinical samples at Yariman Bakura Specialist Hospital in Gusau, Zamfara State, Nigeria. A total of 100 isolates were collected from specimens such as

urine, blood, wound swabs, and sputum. Of these, 69% originated from female patients and 31% from male patients. The isolates comprised Escherichia coli (57%), *Klebsiella species* (27%), and Proteus species (16%). Bacterial isolation and identification were conducted through culturing, sub-culturing, Gram staining, and biochemical testing. Antibiotic susceptibility was evaluated using the disk diffusion method, in accordance with Clinical and Laboratory Standards Institute (CLSI) guidelines. The results indicated a high level of resistance to commonly prescribed antibiotics including ampicillin, tetracycline, and azithromycin. A substantial proportion of the isolates exhibited multidrug resistance, complicating treatment strategies. These findings highlight the critical need for ongoing surveillance of resistance patterns, prudent antibiotic use, and strengthened infection control practices to combat the spread of resistant Gram-negative bacteria in healthcare settings.

KEYWORDS: Antibiotic resistance, Gram-negative bacteria, Clinical isolates, Multidrug resistance, Antimicrobial susceptibility

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C078

BIOACTIVITY-GUIDED FRACTIONATION FOR HEPATOPROTECTIVE PROPERTIES AND CONSTITUENTS OF *Gymnema sylvestre* LEAF EXTRACT

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ABSTRACT

The liver is vital for detoxification and metabolism. Synthetic hepatoprotective drugs often have side effects, necessitating safer natural alternatives. *Gymnema sylvestre* ("gurmar"), known for antidiabetic and antioxidant properties, possesses a rich phytochemical profile (saponins, flavonoids, gymnemic acids) suggesting potential hepatoprotection, but the specific bioactive components are under explored. This study employed bioactivity-guided fractionation to identify hepatoprotective constituents from *G. sylvestre* leaves. The ethyl acetate fraction (EAF) was isolated via solvent partitioning. Its hepatoprotective activity was evaluated in CCl -induced liver-damaged albino rats (150-200 g) treated for 14 days. Groups included: normal control, CCl -damaged control, sylamarin standard (III), and EAF at 100 mg/kg (IV), 200 mg/kg (V), and 300 mg/kg (VI). Biochemical markers (ALT, AST, ALP, bilirubin, total protein, and albumin) were assessed. Carbon tetrachloride (CCl) significantly elevated serum markers (ALT: 142.31±0.21 IU/L; AST: 224.2±1.01 U/L; ALP: 319.23±0.56 U/L; bilirubin: 1.3±0.22 mg/dL) versus normal (ALT: 33.34±0.33 IU/L; AST: 85.84±0.31 U/L; ALP: 136.34±0.03 U/L; bilirubin: 0.4±0.11 mg/dL). EAF treatment significantly reduced these elevations dose-dependently. The 300 mg/kg dose (VI) showed the strongest effect (ALT: 98.6±0.28 IU/L; AST: 153.9±0.26 U/L; ALP: 169.12±0.45 U/L; bilirubin: 0.9±0.23 mg/dL), comparable to sylamarin (III). EAF also normalized protein levels altered by CCl . The Ethyl acetate fraction of *G. sylvestre* leaves demonstrated significant, dose-dependent hepatoprotective activity, potentially attributable to its gymnemic acid content. This supports its traditional use and identifies a key bioactive fraction.

KEYWORDS: Hepatoprotective Activity, Bioactivity Guided Fractionation, *Gymnema sylvester,* Liver Function Test.

C 079

BIOREMEDIATION OF CRUDE OIL CONTAMINATED SOIL USING BANANA TRUNK BIOCHAR

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ABSTRACT

Oil pollution is a major global environmental threat, and remediating crude oil-contaminated soils remains a significant challenge. Bioremediation, using indigenous microbial communities to degrade pollutants, offers a cost-effective, eco-friendly approach. This study assessed the potential of banana (Musa spp.) trunk-derived biochar to enhance microbial degradation of crude oil in contaminated soils. Samples were collected from Ogoni land, Bayelsa State, Nigeria, and amended with five dosages of biochar (0.5 g, 2.5 g, 5.0 g, 7.5 g, and 10.0 g per 100 g of soil) alongside a control with no biochar. Treatments were conducted in triplicate, incubated at 30 °C with 60% water holding capacity for six weeks, and manually tilled weekly to stimulate microbial activity. Key analyses included hydrocarbon-degrading bacterial counts, soil physicochemical assessments, and residual total petroleum hydrocarbons (TPH) via Soxhlet extraction and gas chromatography. The results showed increased bacterial populations in all biochar-treated units, especially Unit A (0.5 g), where counts rose from 1.14 × 10 to 9.80 × 10 cfu/g. TPH levels decreased significantly across treatments, with Unit A showing the greatest reduction from 69.415 ppb to 23.778 ppb. Other units followed similar trends, while the control showed a lesser decrease to 40.054 ppb. All biochar treatments achieved over 50% hydrocarbon degradation, unlike the control. Unit A also showed notable improvement in soil properties. The 0.5 g of banana trunk biochar was most effective in enhancing microbial crude oil degradation, positioning it as a promising amendment for bioremediation of contaminated soils.

KEYWORDS: Bioremediation, Biochar, Contaminated soil, Total petroleum hydrocarbons and Crude oil

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C 080

MICROBIOLOGICAL AND MOLECULAR CHARACTERIZATION OF BACTERIA ISOLATED FROM KLISHI MEAT AND THEIR ASSOCIATED HEAVY METAL LOAD IN GUSAU, NIGERIA

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ABSTRACT

Klishi, a locally prepared sun-dried meat delicacy, is widely consumed in Northern Nigeria but often processed and sold under unhygienic conditions, raising concerns about public health risks. This study was carried out to investigate the microbiological quality of Klishi meat sold in selected markets across Gusau metropolis, with emphasis on molecular detection of bacterial contaminants and assessment of associated heavy metal levels. Samples were collected from different locations and subjected to conventional microbiological techniques including streak plate method, Gram staining, and biochemical tests for preliminary identification of bacterial isolates. The predominant organisms identified *included Salmonella spp., Escherichia coli, Staphylococcus aureus, Staphylococcus epidermidis, Listeria monocytogenes, Pseudomonas aeruginosa,* and *Shigella spp*. Molecular characterization using polymerase chain reaction (PCR) was employed to confirm selected bacterial species, particularly *Salmonella spp*. and *E. coli*, due to

their high prevalence and pathogenic potential. The result of PCR analysis revealed that *inv*A gene, a virulence determinant gene was detected in more than 30% of the samples analysed among the *Salmonella spp.* highlighting the potential risk of consuming poorly processed Klishi in the study area. Additionally, concentrations of heavy metals such as lead (Pb), cadmium (Cd), copper (Cu), and chromium (Cr) was determined using atomic absorption spectrophotometry (AAS). Results indicated that most heavy metals detected exceeded the permissible limits set by regulatory organisation such as FAO/WHO, except for copper and chromium in some samples. The findings highlight the dual threat posed by microbial contamination and toxic metal exposure through the consumption of Klishi meat. There is an urgent need for improved hygienic practices, stricter regulatory oversight, and public health education to ensure the safety of this popular meat product.

KEYWORDS: Klishi, *Salmonella,* Heavy metal, *PCR, invA gene*

C 081

A SURVEY OF THE UNDERGROUND WELL WATER QUALITY ALONG UMUIKOWO-OZALLA AREA, NKANU WEST ENUGU STATE

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ABSTRACT

Provision of clean water is one of the United Nations sustainable development Goals. Water quality assessment is an ongoing exercise, in view of the threat of contamination from natural sources and human activities. Groundwater quality was investigated in four locations: Umuikowo, Umugwutowo, Ozalla-express and umuokorongwu in Enugu state. Physicochemical analyses followed standard methods. The results of the analysis of the four samples show pH range of 5.09 - 6.08, and conductivity values of 30.00 – 66.62. Acidity ranged from 1.52 – 72.96, while alkalinity values were between of 2.44 – 20.68. The total dissolved solid (TDS) and total suspended solid (TSS) values ranged from 0.04 - 4.34 and 0.02 - 0.06 respectively. The nitrate level varied from 0.02 – 1.75. Sodium content was highest in all the samples with a range of 15.58 – 19.49 mg/L, while copper level was the lowest with a range of 0 – 0.07 mg/L. Potassium showed a range of 3.06 – 5.21 mg/L. The amount of Lead was between 0.32 – 0.51 mg/L while that of cadmium varied from 0.03 – 0.08 mg/L. The pH values recorded were below the WHO permissible limit (6.5 – 8.0) corroborating the high acidity level beyond the WHO standard for acidity (0 mg/L for drinking water). Alkalinity and nitrate values obtained were within the WHO acceptable limit of 250mg/L and 50mg/L. The obtained TDS, TSS and conductivity values were within the WHO recommended limits of 300mg/L, 500mg/L and 1000 µs/cm respectively. Cadmium and Lead concentrations were above the WHO recommended levels of 0.003mg/L and 0.01 mg/L. The amounts of copper, potassium and sodium were below the permissible standard set by WHO. The study reveals that the groundwater sources in Enugu State are contaminated with high acidity and heavy metals like cadmium and lead, posing potential health risks to consumers. Regular monitoring and treatment of these water sources are necessary to ensure they meet safe drinking water standards and mitigate potential health hazards.

KEYWORDS: pH, conductivity, acidity, alkalinity, nitrate, heavy metals.

C 082

VISUALISATION AND TRANSPORT OF RIBOSOMAL SUBUNITS IN AXONS OF *DROSOPHILA* LARVAE

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ABSTRACT

Growth cones are the part of the developing axon which responds to guidance cues to bring about a change in direction. Local axonal translation is essential to enable the growth cone to respond quickly to guidance cues. However it was believed that ribosomes were not present in axons, thus local axonal translation could not take place. This theory arose due to experimental evidence from electron microscopy which did not show ribosomes in the axons or growth cones. This resulted in the theory that proteins are synthesized in the cell body and transported by slow axonal transport to the growth cone. This theory is steeped in many problems, for instance axons can be a metre long and it would take several years for a protein to be transported the entire length by slow axonal transport. However compelling evidence from laboratories indicates that there is a protein synthesizing machinery in axons. To investigate this issue further, the bimolecular fluorescence complementation assay (BiFC) that was recently developed in our laboratory that reports 80S assembly *in vivo* was employed. With this technique coupled to fluorescent tagging of the small and large ribosomal subunits, the presence of the large and small ribosomal subunits along axons of Drosophila third instar larvae was visualised. The outcome of this study contributes further to the body of evidences that ribosomes are present in axons. Furthermore we have also proved that the ribosomal subunits are transported along the microtubules of axons.

KEYWORDS: Axons, Ribosomes, Drosophila, Larvae, Translation

C 083

HIGH-EFFICIENCY PROTEIN PURIFICATION: EMERGING TECHNIQUES AND HYBRID SYSTEMS

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ABSTRACT

Innovations in protein purification methodologies have substantially enhanced resolution and recovery of target biomolecules from cellular lysates and biological fluids. This analytical review evaluates contemporary separation paradigms: (1) phase-partitioning systems employing Aqueous Two-Phase Extraction (ATPE) and Solid-Phase Extraction (SPE); (2) chromatographic modalities encompassing size-exclusion, hydroxyapatite, Hydrophobic Interaction Chromatography, and Reversed-Phase High-Performance Liquid Chromatography; (3) electrophoretic techniques; and (4) engineered systems including MCPA (Multi-Column Plate Adapter) and SUMO-Ulp1 (Small Ubiquitin-like Modifier - Ubiquitin-like protease 1) platforms. These approaches exploit protein properties - hydrodynamic radius, isoelectric point, surface hydrophobicity, and ligand-binding to achieve >95% purity. Of note, developments focus on orthogonal method integration to overcome limitations in dynamic range, through put, and process economics. ATPE demonstrates particular utility for labile proteins through its aqueous microenvironment, while MCPA systems facilitate parallelized affinity purification. Advanced membrane separations, particularly tangential flow ultrafiltration and SFC, now enable industrial-scale processing of recombinant

therapeutics and viral vectors. The findings herewith underscore how rational purification scheme design underpins advances in structural proteomics, enzymology, and biologics manufacturing. Emerging priorities include: (i) development of mixed-mode chromatographic matrices, (ii) continuous purification workflows, and (iii) engineering of bio affinity ligands. Such innovations are critical for addressing the increasing complexity of recombinant expression systems and the demand for analytical-grade proteins preprations.

KEYWORDS: Protein purification, Chromatography, MCPA system, SUMO-Ulp1, Ultrafiltration.

C 084

MOLECULAR IDENTIFICATION OF WATER HYACINTH COLLECTED FROM EFFLUENT-IMPACTED WUPA RIVER, ABUJA

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ABSTRACT

This study explores the molecular characterization of water hyacinth (*Eichhornia crassipes*) and evaluates the physicochemical and heavy metal status of the effluent-impacted Wupa River in Abuja, Nigeria. Water and sediment samples were collected from three distinct sites along the river to assess variations in water quality and contamination levels. Key physicochemical parameters- including temperature, pH, turbidity, electrical conductivity, biochemical oxygen demand (BOD), and dissolved oxygen (DO), were analyzed. Molecular identification of the water hyacinth was conducted through DNA extraction, PCR amplification and sequencing. Physicochemical results showed water temperatures ranging from 28.00±0.70°C to 29.33±1.05°C and pH values between 7.81±0.04 and 8.06±0.21, while sediment temperatures varied from 29.66±0.75°C to 30.70±1.30°C. Cadmium levels in water samples ranged from 0.10±0.01 mg/L to 0.12±0.00 mg/L, and iron levels ranged from 0.57±0.23 mg/L to 0.83±0.26 mg/L, both surpassing recommended thresholds. Sediment lead levels reached up to 5.69±1.61 mg/L. The studyrevealed notable spatial differences, particularly in temperature and pH. Heavy metal analyses showed elevated concentrations of lead, zinc, copper, cadmium, and iron, some exceeding WHO permissible limits, thus indicating significant pollution risks from effluent discharges. Themolecular identification showed high sequence identity (88.69%–98.74%) with known chloroplast DNA of *E. crassipes*. The genetic data suggest that the water hyacinth population is either native or well-established, demonstrating a capacity to bio-accumulate environmental contaminants. These findings highlight the dual role of *E. crassipes* as both an invasive species and a potential bio-indicator, emphasizing the need for continuous water quality monitoring and informed ecosystem management strategies.

KEYWORDS: Water hyacinth, Molecular identification, Heavy metals, Wupa River, Bioaccumulation, Effluent

C-085

EFFECTS OF ZINC AND SELENIUM ON SOME BIOCHEMICAL MARKERS IN *Vigna unguiculata* AND *Zea mays* SEEDLINGS SUBJECTED TO WATER DEFICIT CONDITION

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ABSTRACT

The effects of zinc and selenium on some biochemical markers (lipid peroxidation, ascorbate, glutathione, growth rate, mineral content, catalase and glutathione peroxidase activities) in cowpea and maize seedlings subjected to water deficit condition were investigated. Plants seedlings were exposed to water deficit condition for 14 days. The relative water content in whole plant tissues was reduced from 78.6% (control) to 50.0% (water deficit) and 70.1% (control) to 37.3% (water deficit) for cowpea and maize samples respectively. Selenium-treated samples showed higher RWC values for both normal and water deficit samples. Under water deficit conditions, general increase in the levels of the biochemical markers was recorded. Effects of water deficit were more pronounced on the maize samples than cowpea. At $P<0.05$, water deficit samples showed significant increase in MDA levels and antioxidant enzymes activities; the activity of selenium in reducing water deficit effects reached statistical significance and was also found remarkable due to its non-accumulation in the plant samples. In this present investigation, water deficit induced 7 times, 10 times and 12 times increases in the Fe, P and N contents respectively of water deficit cowpea samples. The water deficit maize samples also showed 6 times and 5 times levels of P and N respectively. Water deficit cowpea sample treated with selenium once weekly (WOS) returned back to full turgor after 6 days of rehydration with water. Rehydration caused significant reductions in MDA levels and antioxidant enzymes activities. The use of antioxidant chemicals particularly selenium is therefore recommended in this study to farmers that reside in the zone of short term drought.

KEYWORDS: Selenium, Zinc, Growth rate, Water deficit, Maize, Cowpea.

C 086

EVALUATION OF ORGANOCHLORINE PESTICIDES RESIDUES BY GC-MS IN PROPRIETARY COMPLEMENTARY FOODS IN LAGOS STATE, NIGERIA

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ABSTRACT

Complementary foods (CF), which are required for infants aged 6-23 months in addition to breast milk, provide healthy nutrition to promote optimum growth and development. Traces of contaminants, including unhealthy amounts of pesticide residues (Lindane isomers (α, β, γ, δ), Endosulfan derivatives, Aldrin, Dieldrin and Heptachlor) have been reported in foodstuff from which CF are made. Therefore, the levels of organochlorine pesticide residues (OPR) in ten branded CF were evaluated using Gas Chromatography Mass Spectrometry (GC-MS). β- Endosulfan (0.02mg/L-0.53mg/L), Dieldrin (0.02mg/L-1.39mg/L), and Endosulfan ether (0.13mg/L-12mg/L) were found in all the CF studied, whereas heptachlor was absent in most of the CF studied. Endosulfan ether in Sample J (12.00 mg/L), Dieldrin in Sample E (1.39 mg/L), and Sample F (1.18 mg/L) far exceeded the Maximum Residue Limits (MRL) (0.1 mg/L). The exceeded CF

raises concerns on potential health risks associated with chronic exposure, particularly in infants and young children. The findings underscore the need for strict monitoring and regulatory enforcement to ensure safer complementary feeding, alongside public health policies that protect vulnerable populations such as infants and young children, to mitigate the leaching of OPR. There is urgent need for improved agricultural and manufacturing practices.

KEY WORDS: Complementary Foods, Organochlorine Pesticide Residues, Gas Chromatography-Mass Spectrometry, Maximum Residue Limits, Endosulfan ether

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C 087

GENOMICS OF NOVEL *Pseudomonas aeruginosa STRAINS* FROM IYEDE–OWHE, DELTA STATE NIGERIA REVEAL POTENTIALS FOR MANAGEMENT OF PETROLEUM-POLLUTED ENVIRONMENT

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ABSTACT

Petroleum drilling and processing are often accompanied by oil spills that give rise to significant negative impact on ecosystems, plants, animals, and human health. There is dire need for a sustainable remedy to this environmental menace. Microbiota that can mineralize petroleum abound in nature. This study isolated two strains of *Pseudomonas aeruginosa* from crude oil contaminated soil in Iyede- Owhe oil and gas field 9, Isoko Local Government Area of Delta State, Nigeria. The isolates were observed for petroleum degradation using culture method. The whole genome sequences were studied using Bioinformatics tools for genetic potentials to degrade petroleum. Raw single end reads generated were trimmed with BBduk; assembled using SPAdes; quality assessed with check M; and annotation done with PGAP. Single Nucleotide Polymorphism and Average Nucleotide Identity analyses identified the bacteria. The assembled circular genomes were obtained revealing *Pseudomonas aeruginosa* Strain A3_S24 and *Pseudomonas aeruginosa* Strain A3_S23. Their genome features were: quality 99%; Size 6,166,974 and 6,760,157 bp; GC content 67.01 and 68.62% respectively. Functional annotation revelation: CDS 5,628 and 6,181 including 4,966 and 5,357 protein coding genes assigned with functions; clusters of orthologous genes 2,381 and 2,415; CRISPR 6 and 8 respectively. Other features displayed were contigs sizes, scaffolds, RNAs and N_{50} values. Both strains carried many genes encoding proteins for diverse purposes. Those associated with polyaromatic hydrocarbon degradation included *Cat A, Cat B, Cat C*as well as genes (*rh1A, rh1B and rh1C*) encoding enzymes forrhamnolipids biosynthesis. Rhamnolipids are biosurfactants. These novel *Pseudomonas aeruginosa* strains possess petroleum degrading potential which can be further explored for bioremediation and management of petroleum-polluted environments.

KEYWORDS: Environment, Petroleum, Genomics, *Pseudomonas aeruginosa*

C 088

MULTI-EPITOPE BASED VACCINE DESIGN AGAINST *Bacillus anthracis* VIA IMMUNOINFORMATICS AND BIOINFORMATICS APPROACH

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ABSTRACT

Anthrax is a severe and extremely contagious infection that can be lethal. It is caused by a gram-positive, toxic, and spore-forming bacillus, *Bacillus anthracis*. Anthrax infects warm-blooded mammals. Clinicians find it very challenging to prevent anthrax. Vaccination is the best preventive measure against Anthrax. The development of epitope-based vaccines has received great attention as they can trigger strong immune responses. In this study, immunoinformatics and bioinformatics tools were employed to design a novel epitope-based vaccine against *Bacillus anthracis*. T-cell and B-cell epitopes were predicted from *Bacillus anthracis* outer membrane protein. Lead T- cell and B-cell epitopes, linked with appropriate linkers and adjuvant, were used to design the vaccine construct. Furthermore, antigenic, toxic, and allergic properties of the vaccine construct were determined. Homology modeling and 3D-structural validation were used to predict the quality structure of the vaccine construct. The vaccine construct is highly antigenic, non toxic and non allergy. Molecular docking showed strong interactions between the vaccine construct and the TLR4, indicatingthat the vaccine construct can trigger a strong immunological response. This result may help in the development of experimental vaccine against *Bacillus anthracis*.

KEYWORDS: Multi-Epitope, Vaccine, *Bacillus anthracis*, Bioinformatics, Immunoinformatics.

C 089

SOCIODEMOGRAPHIC AND CLINICAL DETERMINANTS OF TYPHOID FEVER PREVALENCE AND MULTI-DRUG RESISTANCE IN NIGER STATE, NIGERIA

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ABSTRACT

Typhoid fever persists as a critical public health issue in in sub-Saharan Africa, where inadequate sanitation, restricted access to potable water, and excessive antibiotic usage drive high infection rates and the emergence of multidrug-resistant (MDR) strains. This study assessed the prevalence of typhoid fever and factors associated with MDR in Niger State, Nigeria. A cross-sectional study was conducted among 624 participants, with stool samples analyzed for *Salmonella* Typhi and antibiotic resistance patterns using standard microbiological methods. Socio demographic and clinical data were collected via questionnaires and analyzed using regression models. The study revealed a high prevalence of *Salmonella* Typhi (36.5%), with 76% of isolates exhibiting multidrug resistance. Young adults (18–27 years) and residents of semi-urban areas had the highest infection rates, while males showed a slight predominance. Contaminated water sources, particularly boreholes and tap water, were significantly associated with higher typhoid prevalence. Antibiotic resistance patterns indicated complete resistance to Amoxicillin/Clavulanic Acid (100%) and high resistance to Cotrimoxazole (73.5%) and Tetracycline (79.5%). Netilmicin demonstrated the highest sensitivity (98%), suggesting its potential as an empirical treatment option. Self-prescription of antibiotics, frequent hospitalizations, and recent antibiotic use were significant predictors of reduced antibiotic

sensitivity, highlighting the role of healthcare practices in driving resistance. These findings indicate that targeted interventions are vital for reducing typhoid prevalence and combating antibiotic resistance in Niger State.

KEYWORDS: Typhoid fever, Multidrug resistance, *Salmonella enterica* Typhi, Socio demographic factors, Niger State, Public health

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Pp C 005

ASSESSMENT OF PESTICIDE RESIDUE LEVELS IN EDIBLE CROPS FROM MARKETS ACROSS ZAMFARA STATE, NIGERIA USING GC-MS TECHNIQUES

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ABSTRACT

The widespread use of pesticides in agriculture raises significant concerns regarding food safety and public health, particularly in regions with limited regulatory oversight. This study assessed pesticide residue levels in 60 food crop samples—including vegetables, fruits, and cereals—collected from major markets in Gusau, Kaura Namoda, Anka, and Talata Mafara in Zamfara State, Nigeria. Samples were prepared using QuEChERS extraction and analyzed via Gas Chromatography-Mass Spectrometry (GC-MS) to detect organophosphate, organochlorine, carbamate, and pyrethroid residues. Several pesticides were detected above the Maximum Residue Limits (MRLs) set by FAO/WHO. Notably, Oxydisulfoton showed mean concentrations far exceeding MRLs in grains (3.41 mg/kg), vegetables (38.29 mg/kg), and fruits (0.93 mg/kg). Ethoprophos was particularly high in grains (2962 mg/kg), with elevated levels also found in other samples. Organochlorines like DDT and lindane were frequently detected, suggesting continued use of restricted substances. The findings underscore an urgent need for stricter regulatory enforcement, farmer education on safe pesticide use, and the promotion of safer alternatives. This study provides essential baseline data to inform policy aimed at safeguarding public health in Zamfara State.

KEYWORDS: Pesticide residues, Edible Crops, GC-MS, organochlorine/Organophosphorus

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Pp C 006

EVALUATION OF LIPASE AND ESTARASE EXPRESSED BY DUMPSITE MICROOGANISMS FOR THE DEGRADATION OF LOW DENSITY PLASTICS

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ABSTRACT

Low density polyethylene produced for packaging is one of the major sources of environmental pollution. Current methods for plastic disposal such as recycling, incineration and land fill are quite expensive, releases toxic chemicals to the environment and occupy space. Biodegradation of low density polyethylene is still a problem. This research was aimed at evaluating extracellular lipase and esterase expressed by dumpsite microorganisms for the degradation of low-density plastics. The degradation ability of the organisms was monitored spectrophotometrically at interval of 10 days for a period of 30 days. The enzyme lipase was assayed spectrophotometrically with tween 80 as substrate while esterase assayed titrimetrically in correlation with microbial growth, with olive oil as substrate and the microscopic examination of low density

polyethylene before and after degradation was carried out. It was observed from the growth of the microbial isolates that *pseudomonas sp* had high lipase activities of 0.001760±0.0000280umol/secand *Bacillus sp* had high esterase activities of 0.0230± 0.00072umol/min both at 30days. These exhibited higher efficiency in the degrading low density polyethylene compared to other microbial isolates which also have notable esterase *(Penicillium notatum)*, and both activities (*Aspergillus fumigatus*). The microscopic examination of low density polyethylene after degradation showed surface erosion of the plastics due to enzyme activities. This work therefore concludes that the microbial isolates are all responsible in degrading low density polyethylene using lipase and esterase.

KEYWORDS: Low density polyethylene, Degradation, Lipase, Esterase and Microbial isolates

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Pp C 008

EFFECTS OF EXPOSURE TO MOSQUITO REPELLENTS ON LIVER FUNCTION INDICES DURING GESTATION IN FEMALE RATS AND THEIR OFFSPRING

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ABSTRACT

Mosquito repellents provide protection against lethal mosquito borne diseases. However, apart from repelling the insect, toxicities associated with the inhalation of these insecticides poses severe health hazards. The use of mosquito repellent is increasing on a daily basis and yet to receive enough attention of both policy maker and general public. The current study was aimed to assess effects of mosquito repellents on liver function indices during gestation on female rats and their offspring. A total of 35 rats were used for the experiment out of which 25 were females. The rats were allowed to acclimatize for 7 days after which they were grouped as 2 males to 1 female to alow mating. After approximate gestation period, the male rats were removed and the females were grouped into five groups of five rats each. Four out the five groups were exposed to four various mosquito repellents brands; Baygon® and Rambo® (sprays) as well as Boxer®, and Green Arrow® (coils) for 30 minutes per day. The exposure was discontinued after given birth. Blood samples were drawn from both mothers and pups and liver function indices including alanine transaminase (ALT), aspartate transaminase (AST), alkaline phosphatase (ALP), serum total protein, serum bilirubin, and serum Albumin were analyzed. The results showed that exposure to Baygon®, Rambo®, Boxer®, and Green Arrow® caused significant ($P<0.05$) elevation of AST, ALT and ALP, and bilirubin levels and reduction of serum albumin and total protein of the mothers. Some of the parameters of the pups were also significantly altered. These findings suggest that mosquito repellants exert adverse effects on the liver.

KEYWORDS: Mosquito repellents; Insecticides; Exposure; Liver; Toxicity;

Pp C 013

PREVALENCE, CHARACTERIZATION AND DRUG RESISTANCE OF GRAM-NEGATIVE BACTERIA ISOLATED FROM DOMESTIC AND ENVIRONMENTAL WATER SOURCES IN GUSAU, ZAMFARA STATE

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ABSTRACT

Access to clean and safe water is essential for human health, yet water contamination with pathogenic microorganisms, particularly Gram-negative bacteria, remains a major public health challenge, especially in developing regions. This study investigated the prevalence, phenotypic characterization, and antibiotic resistance patterns of Gram-negative bacteria isolated from various domestic and environmental water sources in Gusau Metropolis, Zamfara State, Nigeria. A total of 50 water samples were randomly collected from wells, taps, streams, dams and pond. Standard microbiological and biochemical methods were employed for the isolation and identification of Gram-negative bacteria species. Antibiotic susceptibility testing was conducted using the disk diffusion method in accordance with Clinical and Laboratory Standards Institute (CLSI) guidelines. The total bacterial count ranged from 1.03×10^{-2} to 5.06×10^{-8}cfu/ml. The results revealed the presence of multiple Gram-negative bacteria, including *Escherichia coli, Klebsiella spp., Salmonella spp, Enterobacter spp, Shigella spp* and *Proteus spp*. Notably, a significant proportion (46%) of isolates exhibited resistance to commonly used antibiotics such as tarivid, gentamycin, ampicillin, ceporex, nalidixic acid, augmentin and septrin while higher susceptibility was observed for ciproflox, streptomycin, andreflacine. The detection of multidrug-resistant strains in both domestic and environmental water samples underscores the potential health risks posed by untreated or poorly managed water sources. These findings highlight the urgent need for improved water sanitation infrastructure, regular monitoring of water quality, and strategic public health interventions aimed at controlling the spread of antimicrobial resistance through environmental pathways.

KEYWORDS: Gram-negative, water, Antibiotic, Bacteria, Salmonella spp.

Pp C 014

IMMUNOINFORMATIC DESIGN, GENETIC CONSTRUCTION AND EXPRESSION OF A MULTI-EPITOPE ROTAVIRUS VACCINE

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ABSTRACT

Rotavirus is the most common cause of severe and acute gastroenteritis in young children worldwide, associated with approximately 215,000 child deaths annually. The available rotavirus vaccine poses a risk of reversion to virulence and has potential of causing intussusception. Immunoinformatic approach was used to predict epitopes from rotavirus proteome. The total epitopes predicted and screened were 7, 33, and 20, respectively for Helper T cells, Cytotoxic T cells, and B cells epitopes. Two different candidates each were designed to target structural proteins, non-structural proteins and the proteome of rotavirus by joining a HTL with a CTL and an LBL epitopes with either KK or AAY linkers exclusively. Out of the six designed vaccine candidates, two were selected (1 and 3) one each from structural and non-structural proteins based on their stability, solubility, molecular weight, non-allergenicity, antigenicity, and candidates with least percentage of outlier values of Ramachandran plot. Further, the immune response simulation showed that both candidates have the potential to induce robust activation of both humoral and cell-mediated immune responses. Reverse translated and codon optimised sequences were sythesised and cloned into pET28a (+) expression vector. Thereafter, successful transformation of the plasmids on BL21 DE3 cells was confirmed by colony PCR using T7 promoter and terminator primers. Observation of bands in the screened colonies transformed with construct 3 on 12% SDS-PAGE after induction of expression at 50 kDa indicates an expression of the construct. Unfortunately, there was no clear band at the expected molecular weight of 57 kDa for vaccine construct 1.

KEYWORDS: Rotavirus, Acute-gastroenteritis, immunoinformatic, multi-epitope vaccine,immunogenic.

Pp C 025

Genetically Engineered Microbial Systems for Chromium Detoxification in Tannery Waste: Advances in Biochemical and Environmental Bioremediation Engineering

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ABSTRACT

The leather tanning industry is a major source of hexavalent chromium [Cr(VI)] pollution, especially in low- and middle-income countries lacking effective regulatory oversight and advanced wastewater treatment infrastructure. Cr(VI) is a highly toxic and carcinogenic pollutant that threatens both environmental and human health. This review critically examines the application of genetically engineered microbes (GEMs) as an emerging and promising strategy for the bioremediation of Cr (VI)-laden tannery effluents, with a focus on biochemical engineering approaches and synthetic biology innovations. An in-depth literature synthesis was conducted on the mechanisms of microbial chromium detoxification, emphasizing genetic engineering techniques such as chromate reductase gene overexpression (chrR, yieF, nfsA/B), CRISPR-Cas9 genome editing, synthetic operon construction, and adaptive laboratory evolution. Experimental evidence from laboratory, pilot-scale, and immobilized bioreactor studies was also reviewed. Genetically modified strains have demonstrated enhanced Cr (VI) reduction efficiencies exceeding 90% under optimized conditions, with improved survival and performance in harsh industrial effluents. Bioprocess innovations, including packed-bed and fluidized-bed bioreactors and immobilization on alginate and biochar supports, have enabled continuous and scalable treatment. However, ecological risks such as horizontal gene transfer and regulatory gaps remain critical challenges for field deployment. GEMs represent a transformative tool for sustainable tannery wastewater treatment, offering precision, scalability, and reduced environmental impact. Their successful integration into bioreactor systems, coupled with biosafety strategies such as kill switches and

containment circuits, underscores their potential within circular bioeconomy frameworks. Advancing policy alignment and public engagement is essential for responsible implementation.

KEYWORDS: Genetically Engineered Microbes, Chromium Bioremediation, Tannery Wastewater, Chromate Reductase, Synthetic Biology, Environmental Biotechnology

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Pp C 031

PROSPECT OF *ASAIA* BACTERIA AS A PARATRANSGENIC TOOL TO INFLUENCE VECTOR COMPETENCE IN *CULEX* AND *ANOPHELES* MOSQUITOES FOR CONTROL OF LYMPHATIC FILARIASIS AND HUMAN MALARIA

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ABSTRACT

Asaia spp, a genus of acetic acid bacteria, is a dominant symbiont in the microbiota of mosquitoes, including Anopheles and Culex mosquitoes, vectors of human malaria and lymphatic filariasis, respectively. These bacteria are Gram-negative, easy to culture, able to undergo genetic manipulation, and are capable of both vertical and horizontal transmission. The bacteria are localized in the mosquito mid gut, salivary gland, and reproductive tissues,which positions the bacteria as the ideal candidates for immune priming and para-transgenesis, a method that uses genetically engineered symbionts to block pathogen development. As such, this study aimed to elucidate the potential of *asaia* bacteria for para-transgenes is to influence vector competence for pathogens. This systematic review was conducted using literature from PubMed, Google Scholar, and Scopus. Search terms included "*Asaia*," "paratransgenesis," "*Anopheles*," "Culex," "malaria," and "filariasis." Studies were chosen for their relevance to Asaia. Colonization, genetic engineering, and their effect on vector competence. Engineered Asaia strains expressing antimalarial effectors (e.g., scorpine, SM1 peptide) have significantly reduced Plasmodium development in Anopheles mosquitoes. While data on Asaia in Culex are largely limited to prevalence, its confirmed presence in filariasis vectors like Culex quinque fasciatus suggests potential for similar applications. Compared to *Pantoea*, Asaia offers broader tissue colonization, although it may produce lower effector loads. *Asaia* shows high potential as a paratransgenic tool for disrupting malaria and filariasis transmission. Future work should focus on engineering anti-filarial *Asaia* strains, improving delivery strategies, and conducting field trials. Integration with existing vector control tools could significantly strengthen global disease eradication programs.

KEYWORDS: Asaia spp., Paratransgenesis, Vector competence, *Anopheles*, *Culex*, *Plasmodium*.

SUB-THEME 4

D001

CHEMICAL INTERACTION, FOURIER TRANSFORM INFRARED AND RHEOLOGICAL PROPERTIES OF KENAF SEED, SOYBEAN AND KENAF SEED-SOYBEAN BLEND TOFU

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ABSTRACT

Kenaf seed has emerged as a viable source for tofu production, presenting an alternative to traditional soybean tofu. This study aimed to investigate the chemical interactions, functional groups, and rheological properties of three tofu variants: 100% kenaf seed tofu (100%K), a mixture of 70% kenaf seed and 30% soybean (70K:30S), and 100% soybean tofu (100%S). Results indicated that kenaf seed tofu lacked disulfide (-S-S) bonds and exhibited slower coagulation, with a final storage modulus (G′f) of 0.41 Pa. In contrast, the incorporation of 30% soybean significantly enhanced the coagulation rate, resulting in a G′f of 1.13 Pa and the formation of -S-S bonds. This substitution also reduced the coagulation temperature from 75°C in 100% K to 71°C in 70K: 30S. In comparison, the coagulation of 100% soybean tofu occurred more rapidly at 65°C, achieving a much higher G′f of 263.60 Pa.All tofu variants were stabilized through ionic, hydrogen, and hydrophobic interactions, with hydrogen and hydrophobic interactions being the predominant non-covalent bonds. The contribution of hydrogen bonds was significantly higher in 100% S tofu compared to both 100% K and 70K:30S variants, whereas hydrophobic interactions were more pronounced in the kenaf-based formulations. FTIR spectral analysis revealed that 70K:30S tofu exhibited significantly higher intensity in the amide A, B, I, and II regions, with a prominent peak in the amide I range (1622.4 to 1631.0 cm^{-1}) indicating a β-sheet structure. Overall, the 30% substitution of kenaf seed with soybean improved the coagulation rate and lowered the coagulation temperature of the tofu.

KEYWORDS: Kenaf seed, non-covalent interaction, Rheological properties, Substitution, Tofu blend.

D002

EFFECT OF INCLUSION OF *Theobroma cocoa*, *Zingiber officinale* AND *Monodora myristica* ON PHYSICOCHEMICAL, BIOACTIVE, ANTIOXIDANT, POSSIBLE ANTIDIABETIC AND SENSORY CHARACTERISTICS OF YOGHURT

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ABSTRACT

Presently, the demand of consumption of health-relevant food products especially yoghurt is increasing. This study is aimed at evaluating the effects of inclusion of botanicals (*Theobroma cocoa* (TC), *Zingiber officinale* (ZO) and *Monodora myristica* (MM)) at 2.5%, 5.0%, 7.5% and 10.0% on the physicochemical, bioactive, antioxidant, possible antidiabetic and sensory characteristics of freshly made yoghurt. The results revealed that supplemented yoghurts possessed enhanced bioactive and antioxidant potentials which is proportional to

the level of inclusion of the botanicals. The highest phenolics content (113.59 mg GAE/100g) was exhibited in TC-supplemented yoghurt while the highest flavonoid content (17.63 mg QUE/100g) was exhibited in ZO-supplemented yoghurt. The 21.24 mg AAE/100g exhibited by TC-supplemented yoghurt, 67.39 mg Fe^{2+}/100g exhibited by TC-supplemented yoghurt and 10.06 mg AAE/100g exhibited by ZO-supplemented yoghurt were highest for total antioxidant capacity, ferric reducing antioxidant potential and reducing potential, respectively. The DPPH and ABTS scavenging potentials showed that percentage inhibitions was increased in TC-supplemented yoghurt (74.75 %, 202.63%); ZO-supplemented yoghurt (84.34%, 105.11%) and MM-supplemented yoghurt (63.85%, 152.84%), respectively. The ability of the yoghurt to inhibit amylase and glucosidase was also increased upon supplementation; highest inhibition in amylase was exhibited by MM-supplemented yoghurt (13.89- 41.67 %) while ZO-supplemented yoghurt exhibited highest in glucosidase inhibition at 11.81-46.67 %. The sensory evaluation of the yoghurts revealed that the supplemented yoghurt was well accepted relative to control yoghurt. Therefore, the study has proven that inclusion of the botanicals can improve health-functionality of yoghurt.

KEYWORDS: Antioxidant, Bioactive, Possible antidiabetic, Sensory, Yoghurt.

D-0003

NUTRITIONAL COMPOSITION, PHYTOCHEMICAL ANALYSIS AND GC-MS PROFILE OF HYDRO-ETHANOLIC LEAF AND SEED EXTRACTS OF *Piper guineense* (BLACK PEPPER)

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ABSTRACT

Piper guineense (Black pepper) is a medicinal plant and spice from the family *Piperaceae*. Several studies have shown that apart from the use of this plant as spice and condiment, it has been used widely in ethnomedicine for its biological and pharmacological benefits. This study aimed to evaluate the proximate composition, phytochemical analysis and GC- MS profile of hydro-ethanolic leaf and seed extracts of *Piper guneense*. The proximate composition, phytochemical analysis and phytochemical analysis were evaluated using standard methods, while GC-MS profile was carried out to identify and quantify bioactive compounds. The chromatogram peaks were matched with a known compound in the National Institute of Standards and Technology (NIST) library. The Proximate analysis revealed that the leaf extract is richer in crude carbohydrate, fibre and moisture (60.04 ± 0.54%,14.49 ± 0.46% and 9.37 ± 0.63%, respectively) than the seed extract (45.73 ± 0.32%, 13.17 ± 0.75% and 8.22 ± 0.10% for carbohydrate, fibre and moisture respectively). The seed extract has higher composition of crude protein (18.57 ± 0.04%), ash (5.69 ± 0.32%) and fat (8.04 ± 0.61%) when compared with the leaf extract (crude protein 12.15 ± 1.59%, ash 4.89 ± 0.24% and 5.80 ± 0.87%). The qualitative and quantitative phytochemical analysis revealed the presence of alkaloids, saponins, tannins, phenols, flavonoids and proanthocyanidins in both extracts. Nine (9) bioactive compounds were identified in the leaf extract while twenty-two (22) were identified from the seed extract and out of these, thirteen (13) were fatty acids and its derivatives. The bioactive compounds identified and quantified include Oleic acid (25.22%), Phytol (11.77%), Methyl Stearate (10.47%), n-Hexadecanoic acid (19.07%), Piperine (1.14%), Pentadecanoic acid (17.41%), Thunbergol (8.18%), as the most dominant

bioactive compounds with varying pharmacological activities. This study therefore has revealed the nutritional benefits, pharmacologically significant bioactive compounds in *Piper guineense,* validating its pharmaceutical potential and relevance in drug development.

KEYWORDS: *Piper guineense*; hydro-ethanolic extracts; nutritional composition; phytochemical analysis; GC-MS profile.

D-004

GROWTH PERFORMANCE AND BIOACTIVE COMPOUNDS COMPOSITION OF *Pleurotus tuber Regium* (SING) MUSHROOM GROWN IN UAES, FARMLAND UMUAGWO SUPPLEMENTED WITH PIG AND CHICKEN DUNGS

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ABSTRACT

Mushroom grown from *Pleurotus Tuber regium* (Sing), have being known to possess useful metabolites. Growing of mushroom from *P. Tuber regium* have been established using the appropriate substrates at a controlled and confined location but growing in a wild normal farmland is yet to be explored. The aim of this study is to explore the possibilities of growing of *P. Tuber* regium in a wild University of Agriculture and Environmental Sciences Umuagwo farmland, with varying treatments and to conduct a bioactive assay of the grown mushrooms. Spawning material was obtained from a local market in Owerri, Imo State and identified by a Mycologist at the Ministry of Agric, Imo State for identification prior to its preparation and planting. A plot of University of Agriculture and Environmental Sciences Imo State (UAES) farmland was mapped out, cleared, secured and divided into three segments (A, B and C). Segment A was supplemented with pig dungs, segment B was supplemented with chicken dungs and C served as the control (non- supplemented). Thereafter the prepared spawning materials was planted appropriately on the prepared farmland and observed for a week for mushroom growth. The samples of the grown mushroom from the segmented farmland were harvested, room-dried and assayed for bioactive compounds presence using GC-MS. The mushrooms (sizes of stipe and pilus) obtained from the various segments were not significantly different. Though that of pig dungs looks more robust. The Gas Chromatographic-Mass Spectrometric analysis of the n-hexane extracts of the *Pleurotus tuber-regium* mushroom identified several bioactive compounds. Bioactive compounds found majorly in sample A were n-Hexadecanoic acid (24.45 %), linoelaidic acid (40.05 %), tetradecanoic acid (8.37 %), and cis-13-Octadecenoic acid (4.72 %). That of sample B was n-Hexadecanoic acid (30.26 %), 9, 12-Octadecadienoic acid (Z, Z)-(30.63 %) and ergosterol (5.95 %). While n-Hexadecanoic acid (28.54 %), 10, 13-Octadecadienoic acid (6.44 %) and 9, 12-Octadecadienoic acid (Z, Z) (51.34 %) respectively were found in sample C. The farmland supported the growth of mushroom from *P. Tuber regium* appreciably with the farmland segment supplemented with pig dungs (A) looking more robust, followed by chickens' dung (B) and the control (C). Bioactive compounds found have been known for their nutraceutical and medicinal properties as stated in several published literatures.

KEYWORDS: Mushroom, Bioactive compounds, *Pleurotus tuber regium,* chromatography

D005

EFFECT OF SPROUTING ON PROXIMATE AND ANTI-NUTRIENT PROFILES, SENSORY SCORE AND MICROBIAL LOAD OF BAMBARANUT-BASE INFANT FORMULA

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ABSTRACT

The nutrient adequacy of complementary foods is critical for proper growth and development particularly in regions suffering from food insecurity. researchers have focused on formulating complementary foods from locally available, accessible ingredients to reduce malnutrition, infant mobidity and mortality. Hence, this study was conducted to develop a cereal-legume base complementary food accessing its nutritional quality and the effects of processing methods on the proximate, anti-nutrient and microbial profile to enhance shelf life and reduce nutrient loss. Flour from sprouted and unsprouted bambaranut (sample A and B) respectively were subjected to treatments following standard methods. Sensory evaluation was carried out using a 9-point hedonic scale and microbial analysis by serial dilution method. sample A showed reduced moisture(5.20%), ash(3.79%), fat(3.09%), crude fibre (0.62%), carbohydrates(68.23%), with increased protein(11.25%) as compared to sample B with 8.01%, 4.07%,4.16% and 0.89%,71.10% and 10.50% respectively. Sample A had reduced concentration of taninn (1.58, 2.21%), saponin(10.50, 16.05%), phytate (3.24, 4.24%) and oxalate(11.50, 24.15%) as compared to B respectively. There was presence of *Bacillus spp, Saccharomyces cerevisiae* with total vial counts of 0 and 49×10^4 CFU/mL respectively for sample A, *E. coli* and *Aspergillus flavus* with total viable counts of 5.1×10^5 CFU/mL and 5.8×10^5 CFU/mL respectively for B. There was a general acceptance value of 80% and 60% for Sample A and B respectively. It may be concluded that processing method plays significant role in improving the nutritional profile and sensory attributes of food while enhancing growth of beneficial microbes that may improve the gut micro-biome.

KEYWORDS; Complementary Food, Malnutrition, Food Security, Sprouting, Nutrient profile

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D-007

COMPARATIVE ANALYSIS OF ANTIOXIDANT VITAMINS AND PROXIMATE COMPOSITION OF FLESH, SEEDS, AND BACK OF *CITRULLUSLANATUS* (WATERMELON) AND *CARICA PAPAYA* (PAWPAW)

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ABSTRACT

Citrullus lanatus (Watermelon) and *Carica papaya* (Pawpaw) are two widely consumed fruits in many parts of the world, known for their nutritional and medicinal properties. This study aimed to compare the antioxidant vitamin content and proximate composition of the flesh, seeds, and back of *Citrullus lanatus* and *Carica papaya*. The study involved the biochemical analysis of antioxidant vitamin content (vitamin C and vitamin A) and proximate composition (moisture, ash, protein, and fat) of the different parts (flesh, seeds, and back) of *Citrullus lanatus* and *Carica papaya*. Standard laboratory techniques were used to determine the vitamin and proximate nutrient levels.The results showed significant variations in the antioxidant vitamin content, with *Citrullus lanatus* having higher levels of vitamin C(0.9900 ± 0.0320mg/mL) while Carica *papaya* exhibited higher levels of vitamin A(4.1000 ± 0.3300mg/mL). The proximate analysis revealed that

the flesh of both fruits (*Citrullus lanatus* and *Carica papaya)* had higher moisture content (15.2±0.1% and 13.02±0.2%) respectively and lower ash content (1.7±0.2% and 1.3±0.3%) compared to the seeds and back. The seeds of both (*Citrullus lanatus* and *Carica papaya*) fruits were found to have higher protein (4.4±0.2% and 3.2±0.1%) and fat content (4.4±0.3% and 3.4±0.2%). The moisture content, ash content, protein and fat of *Citrullus lanatus* are significantly higher compared with *Carica papaya*. The findings provide valuable insights for nutritionists, food scientists, and the general public regarding the importance of consuming different parts of these fruits for their nutritional benefits. Further research could explore the bioavailability and potential health benefits of these nutrients in human diets.

KEYWORDS: Antioxidant v itamins, Proximate composition, Watermelon, Pawpaw.

D-008

DETERMINATION OF ENZYMATIC AND NON-ENZYMATIC ANTIOXIDANTS LEVELS OF TWO MAIZE (*ZEA MAYS* L.).VARIETIES TREATED WITH DIFFERENT CONCENTRATION OF SALT.

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ABSTRACT

Salinity is one of the principal abiotic stresses that affect plant productivity by inducing osmotic stress. Maize is an economically important cereal crop affected by high salinity.The study were aim to evaluate the effect of salinity stress on the antioxidants defense responses of roots, mature leaves, and young leaves of two maize cultivars (Oba super 2 16-11-kd-155-159 and Sammaz 37) cultivated at various NaCl concentration. In this study two varieties of maize seedlings were exposed to various concentrations (50, 100 and 150 mM) of NaCl. The Roots, mature leaves and young leaves were harvested after 21 days of sowing. Enzymatic and non-enzymatic antioxidant markers were quantified and compared with control treated with water solution. The root, young and mature leaves showed increased in malondialdehyde (MDA) and Hydrogen peroxide (H_2O_2) concentration at 50, 100 and 150 mM NaCl. Activities of enzymatic antioxidants, Catylase (CAT, E .C 1.11.1.6), Ascorbate peroxidase (APX, EC 1.1.11.1) increase in all organs of salt treated maize seedling, while Superoxide dismutase (SOD, 1.15.1.1) activity decreased specifically in root and young leaves at 50 and 100 mM NaCl. Under salinity stress reduced Ascorbic acid (Asc) and total Tocopherol content increased in both roots and leaves. These results indicates the possible role of ROS in the systemic signaling from roots to leaves, allowing leaves to activate their defense mechanism for better protection against salt stress.In conclusion, this high antioxidant activity could improve salinity tolerance in both the two varieties of maize.This study suggests that both varieties express high antioxidant activity.

KEYWORDS: Maize, Salinity, Antioxidant, oxidative stress markers and reactive oxygen species (ROS).

D009

ANTIOXIDANT AND ENZYME INHIBITION PROPERTIES OF OKRA-ORANGE (*Abelmoschus esculentus–Citrus sinensis*) JUICE BLEND: DEVELOPMENT, STABILITY, AND FUNCTIONAL POTENTIAL

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ABSTRACT

This work evaluated the antioxidant and antihyperglycemic potential of a beverage developed from okra (*Abelmoschus esculentus*) and orange (*Citrus sinensis*) juice blend. Orange juice and okra fruit juice were prepared and blended in the following ratios 98:2 (2%), 96:4 (4%), 94:6 (6%), 92:8 (8%), 90:10 (10%) and control 100:0 (0%), respectively. The okra orange juice blend was also stored for 14days. The Total phenolic content (TPC), Total flavonoid content (TFC), Total Antioxidant Capacity (TAC), Ferric Reducing Antioxidant Power, DPPH radical scavenging activity, ABTS radical scavenging ability, a-amylase, and a-glucosidase inhibition assay were assessed.The total phenol and flavonoid content of orange juice was enhanced by the addition of okra juice, which increased significantly ($P < 0.05$) with an increase in okra juice percentage added.During storage, the total phenol and flavonoid content of the okra-orange juice blend remained significantly higher than that of orange juice alone at different storage intervals and remained stable. The juice blend scavenged DPPH and ABTS radicals, exhibited a very good ferric reducing antioxidant property (FRAP) and total antioxidant capacity (TAC), these properties increased as the added okra juice percentage increased. The juice blend inhibits α-amylase and α-glucosidase, the inhibitory activity increased directly as the added okra juice percentage increased. The juice blend exhibited a higher α-amylase inhibition than α-glucosidase even in storage. Therefore, okra orange juice blend has the potential of stabilizing free radicals, control postprandial blood glucose level and be used in formulating functional beverage for the mitigation of hyperglycemia.

KEYWORDS: Antioxidant, Okra-Orange juice blend, Okra juice, orange juice, Total phenol,

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D 010

ASSESSMENT OF EFFECT OF PROVITAMIN A BIOFORTIFIED MAIZE (PVA SYN 13) ON SERUM VITAMIN A PRODUCTION IN MALE WISTER RATS

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ABSTRACT

Pro-vitamin A carotenoids have been improved in staple foods through biofortification to tackle vitamin A deficiency prevalence but strategies to reduce the prevalence through supplementation and food fortification are not effective. This research was aimed at investigating the effect of consumption of different maize food formulations on serum retinol in male Wister rats. Different feed formulations were designed for the analysis. A total of thirty male Wister rats were divided randomly into five groups of six rats each. Group 1(control) was fed with animal feed, groups 2, 3, 4 and 5 were fed with whole biofortified maize (WBM), dehulled biofortified maize (DBM), whole yellow maize (WYM) and dehull yellow maize (DYM) respectively. Feed was given twice daily i.e morning and evening while water was given ad libitum for six weeks; food β-carotene content and Serum retinol were determined by HPLC. The concentration of β-carotene ranges from 8.70 µg/g inWBM to 4.53 µg/g in control while serum retinol content ranges from 65.75 µg/dL WBM to 37.79µg/dL in DYM. Therefore, provitamin A biofortified maize (sammaz 52) could be considered as a dietary intervention to curtail vitamin A deficiency in children and promote nutrition and health.

KEYWORDS: Biofortification, Vitamin A deficiency, Provitamin A Biofortified maize (sammaz 52), retinol and β-carotene.

D-011

A RETROSPECTIVE STUDY ON PROXIMATE COMPOSITION OF FARM FORMULATED BROILER FEEDS COMPARED TO STANDARD

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ABSTRACT

The formulation of nutritionally balanced poultry feed is critical for poultry productivity, yet compliance with established standards remains a persistent challenge among small- and medium-scale farmers in resource-limited settings.The aim of the study was to assessed adherence to the Standards Organisation of Nigeria (SON) guidelines for broiler feeds onlocally formulated feed among farmers in Plateau State, Nigeria. A total of 147 feed samples submitted to the Nutrition Laboratory of the National Veterinary Research Institute, Vom, were analysed for crude protein, using macro-Kjeldahl method for protein content and association of analytical chemist (AOAC) protocols was used to estimate fat, fibre, moisture, and metabolizable energy. Major deviations observed were, excessive protein level of 41% non-compliant samples in 2020, low protein at 28% in 2022 and 21% in 2023, high fat content of 25%, and elevated metabolizable energyat 19% respectively,noticeably, 2021 exhibited the highest compliance rate 52% over all, though this coincided with the smallest sample size (n=12), potentially linked to COVID-19 disruptions. Larger sample cohorts in 2019 (n=50) and 2023 (n=40) revealed low compliance 22% and 35%, respectively. The resultsshows that there is a general formulation challenge, thus, despite fluctuating annual trends, non-compliance rates remained high 48–78%, driven by recurrent deviations in different parameters. Seasonal variability, farmer education gaps, and economic constraints likely contributed to inconsistent nutrient profiles, which may compromise feed efficiency. These findings highlight the need for targeted interventions, including enhanced extension services, and policy support to improve food security.

KEYWORDS: Broiler feed, Standard Organization of Nigeria (SON), Farm-formulated, Nutrient imbalance, Metabolizable energy.

D 012

COMPARATIVE EVALUATION OF THE POTENTIAL OF *Citrullus lanatus* AGAINST *Citrullus colocynthis* SEEDS FOR FEED FORMULATION

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ABSTRACT

The seeds of *Citrullus lanatus* are generally meant for re-cultivation; at the same time, the majority are thrown to waste. The seed belongs to the same family as the *Citrullus colocynthis*, which forms part of a popular cuisine in Western African diets. This study evaluated the possible effects of *Citrullus lanatus* seeds on some biochemical indices if repurposed as part of the human diet. The proximate composition of the seeds was carried out using a standard method. The effects of compounded feeds with *Citrullus lanatus* (*C. lanatus*) were compared with the *Citrullus colocynthis* (*C. colocynthis*) in mice. The mice were fed with feeds

compounded with 10, 20, 30 and 40% *C. lanatus* and *C. colocynthis* seeds, while the Control group was fed with animal feeds for 21 days. Hematological indices, plasma total protein, cholesterol, and high-density lipoprotein-cholesterol (HDL-C) were assessed. Hepatic and renal activities of superoxide dismutase (SOD) and glutathione peroxidase (GPx), and levels of reduced glutathione (GSH), lipid peroxidation (malondialdehyde; MDA), free fatty acids and phospholipids were evaluated. Blood and bone marrow Micronuclei formation in polychromatic erythrocytes (PCE) and tissue histology were studied.

The results of the proximate analysis showed that *C. lanatus* compared with *C. colocynthis* have higher moisture content (9.98%; 6.08%), protein (9.54%; 11.73%), fat (35.00%; 45.77%), fiber (3.62%; 11.02%) and ash (2.48%; 6.37%), respectively. The compounded feeds of both seeds did not differ significantly in their effects on hematological indices, total protein, cholesterol, SOD, GPx, GSH, MDA, free fatty-acids and phospholipids. Compared to the control group, neither compounded feed significantly affects micronuclei formation in bone marrow and blood PCE. Liver and kidney architectures were not different when compared with the control group. This study showed that both seeds elicited no toxicological effects, implying that *C.* lanatus may be suitable for repurposing as food.

KEYWORDS: Polychromatic Erythrocyte, *Citrullus lanatus*, *Citrullus colocynthis*, lipid peroxidation and Feed formulation.

D 013

THE ROLE OF DIETARY AND HERBAL PHYTOCHEMICALS IN UROLOGIC CANCER PREVENTION AND MANAGEMENT: FOCUS ON *Chrysophyllum albidum* AND RELATED MEDICINAL PLANTS

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ABSTRACT

This review aims to explore the potential roles of dietary interventions and herbal phytochemicals in the prevention and management of urologic cancers. A particular focus is placed on bioactive compounds derived from *Chrysophyllum albidum* (African Star Apple), as well as other medicinal plants such as *Mangifera indica* (Mango), *Garcinia kola* (Bitter kola), and *Annona muricata* (Soursop), all known for their anticancer, antimicrobial, and antioxidant properties. A comprehensive review of existing scientific literature and clinical studies was undertaken to evaluate the efficacy of antioxidant-rich diets and phytochemical supplementation. The analysis focused on how bioactive components such as polyphenols, terpenoids, and carotenoids influence key carcinogenic pathways by reducing oxidative stress, mitigating inflammation, and promoting apoptosis in cancerous cells.Findings indicate a strong correlation between antioxidant-rich dietary patterns and reduced risks of urologic cancers. *C. albidum* emerged as a particularly potent source of phenolics and flavonoids with demonstrated anticancer potential. It also has antioxidant, anti-inflammatory and cellular protection effects. Many studies have shown that antioxidant rich-diets may help reduced prostate cancer risk. Clinical intervention trials support the use of phytochemical-rich supplements as complementary therapy to improve patient quality of life and reduce side effects of conventional treatments. Additionally, compounds such as curcumins found in turmeric, lycopene (from tomatoes), genistein (from soybeans), and green tea extracts have shown efficacy in the dietary management of most urologic cancers particularly, prostate cancer.Natural dietary and phytochemical interventions present promising avenues in the integrative management of urologic cancers. Their antioxidative and anti-inflammatory properties contribute significantly to the modulation of cancer development and progression.An evidence-based, integrative oncology approach is recommended—merging conventional treatment with strategic dietary modifications and phytochemical supplementation. This strategy offers a practical pathway to enhance treatment outcomes, minimize side effects, and improve the overall well-being of patients with urologic cancers.

KEYWORDS: Dietary intervention, herbal medicine, oxidative stress, integrative oncology, polyphenols.

D014

COMPARATIVE STUDY OF ANTIOXIDANT AND PHYTOCHEMICAL PROPERTIES OF LETTUCE AND CABBAGE

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ABSTRACT

The consumption of *Lactuca sativa* L. (lettuce) and *Brassica oleracea* (white cabbage) has risen among various communities in the Northwestern region of Nigeria. This has prompted a comparison of their phytochemical and antioxidant vitamin contents to explore their potential therapeutic benefits. This study focuses on evaluating these parameters in the aqueous extracts of *Lactuca sativa* L. and *Brassica oleracea*. The leaves were collected, dried, and extracted using distilled water. Standard methods were used for the analyses. The antioxidant vitamins A, C, and E were found in *Lactuca sativa* L. at concentrations of 0.727 ± 0.006, 21.033 ± 0.115, and 0.074 ± 0.004, respectively, while *Brassica oleracea* contained 0.187 ± 0.006, 20.183 ± 0.284, and 0.051 ± 0.009. Qualitative phytochemical analysis of *Lactuca sativa* L. revealed the presence of alkaloids, flavonoids, tannins, phenols, saponins, glycosides, steroids, and terpenoids, while anthraquinones were absent. In contrast, the analysis of *Brassica oleracea* showed alkaloids, flavonoids, phenols, saponins, glycosides, steroids, and terpenoids, with tannins and anthraquinones absent. These findings indicate that both *Lactuca sativa* L. and *Brassica oleracea* possess significant antioxidant vitamins and bioactive compounds, suggesting their potential as therapeutic agents.

KEYWORDS: Antioxidants, Phytochemicals, Lettuce, Cabbage.

D 015

PROXIMATE AND MINERAL COMPOSITION OF BLACK SEEDS (*Nigella sativa*)

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ABSTRACT

Black seed (*Nigella sativa*), also known ass black cumin or kalonji, is a flowering plant native to Southwest Asia. Its seeds have been widely used in traditional medicine for their potential health benefits and are consumed in various forms, including oil, powder, and whole seeds. Due to its reported nutritional value, *Nigella sativa* has gained significant attention for its rich proximate and mineral composition, making it a valuable ingredient in both human and animal nutrition. This study aimed to determine the proximate and mineral composition of black seeds to evaluate their nutritional potential and possible applications in food and feed formulations. Standard laboratory procedures were used to analyze the proximate composition,

including moisture, protein, fat, fiber, ash, and carbohydrate content. Additionally, the mineral content, including calcium, iron, phosphorus, and sodium, was determined. The analysis revealed that black seeds contain 20.58% protein, 32.46% fat, 5.64% ash, 3.37% moisture, 8.48% fiber, and 29.47% carbohydrate. The mineral composition analysis showed that black seed contains 1.5% calcium, 0.9% phosphorus, 0.005% iron, and 0.05% sodium. The findings suggest that black seeds possess a rich nutritional profile, making them a valuable addition to both human and animal diets. Their high protein, fat, and mineral content support overall health, while their low moisture content enhances storage potential. These attributes highlight black seeds as a promising ingredient for food and medicinal applications. Further research into their detailed nutrient composition and therapeutic potential could provide deeper insights into their broader applications in nutrition and health.

KEYWORDS: *Nigella sativa*, Black seed, Proximate composition, Mineral composition, Nutritional profile.

D 017

EVALUATION OF STORED COWPEA VARIETIES FOR THEIR LEVELS OF DIGESTIVE ENZYME INHIBITORS

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ABSTRACT

A study was conducted to evaluate stored cowpea varieties for their levels of digestive enzyme inhibitor. Ten varieties of cowpea were screened for bruchid resistance under laboratory conditions for 6 weeks and they were also assayed for amylase inhibitor activity. Observations were made for percentage weight loss, percentage weevil perforated index and percentage adult mortality. The cowpea variety TVu2027 (3.87%) had the least percentage weight loss while IT99K-573-1-1 (33.3%) had the highest percentage weight loss. moderate weight loss was seen in varieties IT03KD-338-1 (11.07%) and IT90KD-76 (9.20%). TVu2027 (16.90%) had the least percentage weevil perforated index while IT99K-573-1-1 (93.07%) had the highest. TVu2027 (99.27%) also had the highest percentage adult mortality while IT99K-573-1-1 (46.13%) had the lowest adult mortality. The amylase inhibitor activity among varieties exhibited slight correlation between amylase inhibitor and bruchid resistance. The variety IT99KD-76 showed highest inhibition activity while IT97K-499-35 had the lowest inhibitor activity. There were however presence of high activity of amylase inhibitor among some susceptible varieties which may be due to the combined effect of amylase inhibitor and other antinutritional factors. The varieties TVu2027, IT03KD-338-1 and IT99KD-76 can be used in the development of transgenic crops that will be resistant to bruchid.

KEYWORDS: Cowpea, bruchid, enzyme inhibitor, transgenic crops.

D018

EXPLORING THE THERAPEUTIC POTENTIAL OF QUERCETIN: HEALTH BENEFITS AND MECHANISMS OF ACTION

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ABSTRACT

Quercetin, a major bioflavonoid found in various plant sources, is commonly consumed in the human diet, particularly in developed countries, with an average daily intake of 25 mg. It is known for its anti-inflammatory, anti-allergic, anti-microbial, and anti-thrombotic properties, primarily due to its inhibition of cyclooxygenase and lipoxygenase enzymes. Quercetin is extracted from plant materials like onions using solvents such as chloroform, ethanol, and ethyl acetate, with advanced methods like pressurized liquid extraction (PLE) enhancing efficiency.In the body, Quercetin undergoes biotransformation in the small intestine and liver, where it is conjugated with glucuronic acid, sulfate, or glycine. These conjugates are detected in plasma and urine. In the colon, microbial degradation produces phenolic acids, which are also absorbed into the bloodstream. Quercetin's antioxidant activity involves its ability to neutralize reactive oxygen species (ROS) and chelate metal ions, contributing to the reduction of oxidative DNA damage and prevention of tumorigenesis. At higher concentrations, Quercetin can exhibit pro-oxidant activity, which may help target tumor cells.Quercetin also promotes apoptosis via mitochondrial and death-domain pathways and inhibits protein chaperones, contributing to cell death. It is widely consumed in foods like nuts, teas, and vegetables and is available as a supplement. Due to its anti-inflammatory effects, Quercetin holds promise for managing conditions such as asthma and arthritis. Overall, it is a bioactive compound with diverse therapeutic potential, warranting further research into its health applications.

KEYWORDS: Quercetin, Phytochemical, Antioxidant activity, Anti-inflammation, and Anti-microbial agent.

D019

COMPARATIVE STUDY ON THE NUTRIENTS, ANTINUTRIENTS, AMINO ACID PROFILE AND *IN VITRO* PROTEIN DIGESTIBILITY OF *Vigna unguiculata* L. WALP SAMPEA 20-T AND *DAN MISIRA* COWPEA

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ABSTRACT

Cowpea (*Vigna unguiculata L.Walp*) grains provide considerably amounts of nutrients, however it contains naturally occurring anti-nutrients that reduces its nutritional value and impair digestibility. Sampea 20-T is an improved variety of cowpea designed to increased yield and with appreciable pest resistance. This

improvement in Sampea 20-T did not particularly focus on the nutritional quality, hence, the aim of this study to compare the proximate composition, mineral content, anti-nutrient, protein digestibility and amino acid profile of the new cowpea cultivar Sampea 20-T and a local cowpea cultivar *Dan Misira*. The results of proximate analysis revealed significant($p<0.005$) decrease in moisture content, crude fat and crude fiber content of *Dan Misira* compared with Sampea 20-T while crude protein and carbohydrate contents were higher in the improved cultivar. Mineral content of all minerals analysed were significantly ($p<0.005$) higher in Sampea 20-T than in *Dan Misira*. The result of amino acid profile showed higher values for leucine, lysine, isoleusine, phenylealanine, valine, methionine and threonine in Sampea 20-T while other amino acids where higher in *Dan Misira*. The improved cultivar has the value of compared to of *Dan Misira*. Protein digestibility of Sampea 20-T was seen to be 59.33±8.75, significantly ($p<0.005$) higher than 42.23±2.29 of *Dan Misira*. The anti-nutrients; tannin and trypsin inhibitor have greater values of 0.75±0.15 and 1.42±0.02 respectively than 0.06±0.02 and 0.94±0.05 of *Dan Misira*. On the other hand, the phytate and oxalate contents of *Dan Misira* were shown to be 0.98±0.27 and 8.70±0.92 respectively which were significantly ($p<0.005$) higher than 0.08±0.02 and 0.11±0.02 of Sampea 20-T. Overall, the improvement did not depreciate the nutritional quality of Sampea 20-T (the improved cultivar).

KEYWORDS: Antinutrients, *Vigna unguiculata,* Sampea20-T, *Dan Misira,* Digestibility.

D 020

IMPACT OF PROCESSING TECHNIQUES ON THE NUTRITIONAL AND ANTI-NUTRITIONAL CONTENTS OF SOYBEAN (*Glycine max*)

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ABSTRACT

Soybean (*Glycine max*) is a nutritionally rich legume widely used in food, feed, and industrial products due to its high protein content and essential nutrients. However, its nutritional value can be hindered by anti-nutritional factors such as oxalates, phytic acid, and tannins, which reduce nutrients bioavailability. This study evaluates the effects of various processing s on the nutritional and anti-nutritional content of soybean. Proximate composition was analyzed using protocol as described by AOAC, along with anti-nutritional factors like oxalates, phytic acid, and tannins. Results indicate that processing significantly influenced nutritional profile of soybean; cooked soybean exhibited the highest crude protein content at 53.69%, while roasted soybean showed increase in crude fiber 14.83% and NFE 12.21%. Lipid content also increased across all processed samples. However, cooked soybean has higher lipid of 17.80% when compared with other treatments. Anti-nutritional factors were significantly lowered by processing, with roasted soybean showing the lowest levels of oxalates 17.62 mg/100g, phytic acid 4.48mg/100g, and tannins 0.33 mg/100g. The

reduction in anti-nutrients was attributed to thermal and enzymatic degradation during processing. These findings highlight the effectiveness of traditional processing methods in enhancing soybean's nutritional quality while mitigating anti-nutritional factors. The study underscores the potential of these methods to improve the dietary value of soybean, aligning with global efforts to optimize legume processing for better nutrient bioavailability and health outcomes. Future research could explore combining traditional and modern techniques to further enhance soybean's nutritional profile and investigate the impact on other legumes.

KEYWORDS: Soybeans, Anti-nutrient, Proximate, *Glycine max*

D-021

PROXIMATE AND VITAMIN COMPOSITION OF COFFEE MADE FROM GINGER *(Zingiber officinale) FORTIFIED WITH DATE PALM KERNEL (Phoenix dactylifer)*

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ABSTRACT

The global consumption of commercial coffee has not only raised concerns about the potential negative effect of caffeine on certain individual but its nutritional qualities are questionable, prompting interest in developing non-caffeinated alternatives. This study investigates the production of a ginger fortified, non-caffeinated coffee alternative from date palm kernels as an alternative which are nutritionally rich and naturally caffeine free. Date palm kernel provides the base that mimics the roasted flavor profile of coffee while ginger offers an additional layer of health benefit. Ginger is widely known for its bioactive compounds which exhibit potent anti-inflammatory, antioxidant and digestive enhancing properties. The aim of the study was to evaluate the vitamin and proximate composition of the resulting coffee. Samples were analyzed for protein, fat, ash, moisture, fiber, carbohydrate and vitamins using standard methods. The results demonstrated that the ginger fortified coffee had a significantly higher content of protein (up to 7.13%) and fiber (up to 11.80%) compared to commercially available coffee. These findings suggests that fortifying date palm kernel coffee with ginger enhances its nutritional profile, potentially providing health benefits such as improved digestion,enhanced satiety and blood sugar regulation. Further research is recommended to explore a long term benefit of this product.

KEYWORDS: Date palm kernel coffee, microbial analysis, sensory evaluation, coffee substitute, food security

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D-022

EFFECT OF STORAGE METHODS ON PROXIMTE COMPOSITION OF IRISH AND SWEET POTATOES

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ABSTRACT

This research was designed to study the effect of different storage methods on the nutritional composition of Irish (*Solanum tuberosum*) and sweet potato (*Ipomoea batatas* Lam.). The Irish and sweet potato tubers were collected from a local farm in Mangu, a Local Government in Plateau State, Nigeria. For the nutritionalcomposition, samples from the fresh tubers were thoroughly sorted, washed, peeled and subjected to analysis for moisture, ash, protein, fat, fibre and carbohydrate. The rest of the tubers were subjected to storage at room temperature, refrigerator and underground. Samples were taken from various storages 21 days after storage, processed and subjected to proximate Composition analysis. Results of the proximate analysis carried on the fresh Irish potato samples showed 44.25±28.49% moisture, 1.65±0.02% ash, 2.25±0.01% protein, 0.57±0.01% fat, 0.47±0.01 % fibre, 26.68±0.55% carbohydrate. The result for fresh sweet potato samples showed 1.69±0.41% carbohydrate, 1.16±0.02% fat, 0.07±0.02% fiber, 1.74±0.03% ash, 74.35±1.04% moisture and 21.36±0.16% carbohydrate. The results of the analysis of the stored samples of Irish potato in room temperature showed 2.61± 0.51% for protein, 59±0.02% for fat, 0.42±0.02% fiber, 1.54±0.04% ash, 44.25±28.49% moisture and 32.39±0.06% for carbohydrate. No significant variations ($p>0.05$) in fibre, ash and moisture with the storage methods and time but showed that Protein, fat, carbohydrate, varied significantly ($p<0.05$). Storage in refrigerator and underground showed changes in the nutritional values but no significant variation. The result for fresh sweet potato samples showed 1.69±0.41% protein, 16±0.02% fat, 0.07±0.02% fiber, 1.75±0.03% ash, and 74.35±1.04% moisture and 21.36±0.16% carbohydrate. The research suggest that underground storage help preserve the nutritional content of both potato varieties and is recommended to farmers and distributors for storage.

KEYWORDS: Nutritional composition, Irish potatoes, Sweet potatoes, underground storage, Refrigerator.

D 023

AMINO ACID COMPOSITION OF CASSAVA SEED PROTEIN CONCENTRATE

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ABSTRACT

The aim of this study was to determine the amino acid composition of cassava seed protein concentrate. Preparation of the protein concentrate from defatted cassava seed flour was carried out by isoelectric precipitation extraction method. Amino acid analysis was carried out using automated amino acid analyzer. The amino acid score was calculated using World Health Organization (WHO) provisional scoring pattern for preschool children (1-2years). The obtained result showed that a total of 18 amino acids were identified in cassava seeds protein concentrate consisting of 9 essential amino acids and 9 non-essential amino acids. The total amino acid content was 79.88 ± 7.99 g/100g.Generally, glutamic acid (13.78 ± 2.15 g/100g) was the highest amino acid while tryptophan (0.83 ± 0.99 g/100g) was found to be the least amino acid. The concentration of the total non-essential amino acid was 48.75 ± 3.49 g/100g,for essential amino acids, the total essential amino acids was 29.76 ± 2.56 g/100g. The concentration of total Sulphur-containing amino acid was 2.90 ± 0.85 g/100g while concentration of total aromatic amino acid was 7.22 ± 0.02 g/100g. Lysine was the limiting amino acid (amino acid score = 0.88). The findings suggest that cassava seed protein concentrate could be a rich source of amino acids for human and animal diet therefore improving protein quality in diets. It is recommended that cassava seed protein concentrate could be incorporated into food to alleviate protein energy malnutrition in Africa since it is nutritionally rich in protein.

KEYWORDS: Cassava seed, Protein concentrate, Amino acid, Amino acid score, Diet.

D 024

NEGLECTED GEMS: ASSESSMENT OF THE UNTAPPED BENEFITS OF ONE OF THE UNDER-UTILIZED LEGUMES – AFRICAN YAM BEAN (*Sphenostylis stenocarpa*) IN NUTRITION AND DIABETES MELLITUS.

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ABSTRACT

African yam bean, *Sphenostylis stenocarpa* is an under-utilized, nutrient-dense legume. Diabetes mellitus is a chronic metabolic disease that is associated with abnormal metabolism of carbohydrates, proteins and fat. It is usually associated with excretion of excess sweet urine known as glycosuria. This study determined the anti- diabetic activity of seed milk extract in Alloxan-induced diabetic rats. The seed milk extract at a concentration of 100, 200, 300 and 400 mg/kg body weight were orally administered to alloxan- induced diabetic rats for a period of fifteen (15) days. The oral glucose tolerance test was also carried out using animal experimental method. The phytochemical analysis of the milk extract revealed the presence of flavonoids, isoflavones, saponin, tannin, phytosterol, lignin and anthocyanidine at moderate concentrations. The acute toxicity test showed no lethality of *Sphenostylis stenocarpa* seed milk up to a concentration of 5000 kg/body weight. In oral glucose tolerance test, the *S. stenocarpa* seed milk extract exerted the highest response, similar to glibenclamide after 15 minutes and 30 minutes of administration compared with the control. The *S. stenocarpa* seed milk extract recorded the highest blood glucose- lowering effect after day 15 of treatment ($p < 0.05$) compared with the diabetic rats that were administered normal saline and 0.3 mg/kg body weight of glibenclamide. The seed milk extract of *S. stenocarpa* possessed anti-diabetic activity like the reference drug glibenclamide, and the results of this study revealed that the graded doses of the seed milk extract have blood glucose-lowering effect in a time and concentration-dependent manner.

KEYWORDS: Staple food, Food fortification, Nutraceuticals, Glycosuria, Diabetes, Alloxan.

D-025

THE EFFECT OF SPROUTING ON PHYSIOCHEMICAL PROPERTIES, PHYTONUTRIENTS AND ANTIOXIDANTS LEVELS OF PURPLE AND ORANGE FLESHED SWEET POTATOES.

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ABSTRACT

Purple and orange fleshed sweet potatoes are potato variants rich in carbohydrates, dietary fiber, and minerals. Both variants contain a bioactive compound called anthocyanin. This compound has antioxidant, anticancer, anti-hyperglycemic and anti-hypertensive properties. Despite the nutritional value of orange and purple fleshed sweet potatoes, there is scanty report on the consumption of these variants of potato due to their scarcity. This study evaluates the effect of sprouting on the physiochemical properties, phytonutrients and antioxidants levels of purple and orange fleshed sweet potatoes. For orange fleshed sweet potatoes, Vitamin B_3 and B_6 were highest at week 0 of sprouting (109.0336mg/100g and 152.882mg/100g respectively). Vitamin B_1, B_9, flour yield, antioxidant activity for DPPH, FRAP, ILP and anthocyanin levels peaked at week 1 of sprouting (151.374 mg/100g, 128.709mg/100g, 36.27g/100g, 32.14 ± 7.83, 36.43 ± 8,53, 29.18 ± 7.15,

61.51 ± 0.51 respectively). For purple fleshed sweet potatoes, vitamin B_7 and B_9 were highest at week 0 of sprouting (3.8978mg/100g and 22.6364mg/100g respectively). Vitamin B_3 peaked at week 1 of sprouting (44.1591mg/100g). Flour yield, antioxidants activity for DPPH, FRAP, ILP and anthocyanin levels peaked at week 2 of sprouting (36.47g/100g, 72.63 ± 0.53, 78.37 ± 0.55, 67.21 ± 0.44, 55.91 ± 0.05 respectively). Vitamin B_1 and B_5 peaked at week 3 of sprouting (48.7711mg/100g and 4.1041mg/100g respectively). Vitamin B_6 peaked at week 4 of sprouting (27.7194). From the results obtained, it can be concluded that sprouting is an effective technique for improving the physiochemical and nutritional components of purple and orange fleshed sweet potatoes.

KEYWORDS: Phytonutrients, Sprouting, Antioxidant, Anthocyanin, Anticancer.

D 026

NUTRITIONAL EVALUATION OF CHICKEN PARTS

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ABSTRACT

The nutritional composition of chicken parts was determined using standard methods of analysis.
The four breeds analyzed included broiler, layer, cockerel and native fowl. The mean moisture content was found to be 76.63 ± 0.84%. The meat was found to be high in crude protein and crude fat with values of 65.72 ± 1.36% and 29.78 ± 1.03% respectively. The exceptionally high protein content of this meat accounts for its use as primary protein source. The meat was found to be low in carbohydrate and thus it not used as primary energy source. It was found to contain some good quantity of calcium, 7.74 ± 0.72mg/100g, which is important in bone and teeth formation. The zinc content, 0.058±0.03mg/100g, was low compared to other sources. The lead content was very low and almost insignificant. The findings were discussed with a special reference to the nutritive value of chicken meat.

KEYWORDS: Broiler, Layer, Cockerel, Chicken and Protein.

D-028

COMPARATIVE EVALUATION OF THE NUTRITIONAL COMPOSITION AND ANTIOXIDANT ACTIVITY OF ROASTED AND UNROASTED DATE SEED (*Phoenix dactylifera)* POWDER EXTRACTS

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ABSTRACT

The date seed *(Phoenix dactylifera* L.*),* a member of the *Arecaceae* family, produces seeds rich in dietary fiber, phenolics and essential nutrients. This study investigated the nutritional composition and antioxidant

potential of roasted and unroasted *Phoenix dactylifera* seed powder extracts. Proximate, vitamin and mineral analyses were conducted using standardized methods. Roasting decreased moisture (5.60 ± 0.04 to 3.38 ± 0.04 %) and protein (7.61 ± 0.09 to 6.21 ± 0.05 %), while carbohydrate and fat increased slightly (carbohydrate: 73.92 ± 0.13 to 76.80 ± 0.06 %; fat: 5.54 ± 0.02 to 5.90 ± 0.04 %). Ash and crude fiber showed minor variations. Roasting reduced vitamins C (12.29 ± 0.06 to 7.98 ± 0.03 mg/100 g), B1 (1.23 ± 0.04 to 0.83 ± 0.04 mg/100 g), B2 (1.07 ± 0.00 to 0.70 ± 0.03 mg/100 g), B3 (0.91 ± 0.06 to 0.50 ± 0.05 mg/100 g) and A (32.57 ± 0.00 to 16.28 ± 0.42 µg/100 g). Mineral analysis showed high potassium in both samples (232.10 ± 0.10 vs. 229.00 ± 0.10 mg/kg), while roasted samples had more iron (5.20 ± 0.01 vs. 3.70 ± 0.10 mg/kg) and zinc (13.05 ± 0.05 vs. 11.20 ± 0.20 mg/kg). with magnesium, calcium and phosphorus also well represented. Antioxidant activity by DPPH assay revealed IC of 26.91 ± 0.68 µg/mL (unroasted) and 44.97 ± 0.63 µg/mL (roasted), while standard ascorbic acid showed 1.62 ± 0.04 µg/mL. FRAP peaked at 93.60 ± 0.46 % (unroasted), 92.00 ± 0.28 % (roasted) and 98.40 ± 0.27 % (ascorbic acid). Unroasted seed powder retains more nutritional and antioxidant value, supporting its use in functional foods and nutraceuticals.

KEYWORDS: *Phoenix dactylifera,* Antioxidant activity, Proximate composition, Vitamins, Minerals, Roasting.

D-029

NUTRITIONAL AND PHYTOCHEMICAL PROFILING OF *Cucumis metuliferus* (KIWANO) AS A POTENTIAL PHYTOGENIC FEED ADDITIVE FOR POULTRY

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ABSTRACT

Recently, attention has been shifted to using plants with medicinal efficacy as alternates to used of antibiotics in food of Animal origin, because of the rising antimicrobial resistance (AMR) which prompted regulatory bans in the EU (2006), US (2017), intensifying the need for sustainable alternatives.The aim of this study is to evaluates the nutritional, antinutritional, and phytochemical profiles of *metuliferus* (kiwano) in other to assess its viability for poultry feed additive. Freshmelon of *Cucumis metuliferus* was gotten within NVRI, in Vom, and processed to dry, Proximate and phytochemical analysis was done using AOAC protocol Results revealed high crude protein content (28.03%) and fiber (21.30%), together with moderate lipids (8.90%) and metabolizable energy (281.10 kcal/kg), which indicating a goodnutritive value. Phytochemical screening identified beneficial compounds, such as saponins, flavonoids, and cardiac glycosides, while tannins, alkaloids, steroids, and anthraquinones were absent. Antinutritional analysis detected oxalate (347.5 mg/100g), phytic acid (47.71 mg/100g), and tannins (25.27 mg/100g), which may require mitigation strategies. The presence of beneficial phytochemicals and immune-modulating compounds indicate kiwano's potential to enhance feed efficiency and pathogen suppression. These findings position kiwano as a natural alternative to the used of antimicrobial agent in poultry which aligning with sustainable poultry production and AMR mitigation goals. The level of antinutritional components necessitate processing or dietary adjustments to optimize poultry health.

KEYWORDS: Phytochemicals, Phytogenic, *Cucumis metuliferus*, Poultry nutrition, Proximate.

D 031A

DETERMINATION OF PESTICIDE RESIDUES LEVEL IN GARDEN EGGS (*Solanum melongena*) ACROSS WUDIL LOCAL GOVERNMENT AREA, KANO STATE.

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ABSTRACT

The widespread use of pesticides in agricultural practices has raised concerns about the potential risks to human health and the environment. Garden eggs may contain residues of these harmful chemicals. This study aimed to investigate the levels of pesticide residue in garden eggs at Kasuwar Wudil Market, Kano State. A total of 30 samples were collected and analyzed using GC- MS techniques. The results showed that α-BHC (Alpha Benzene Hexachloride), β-BHC (Beta Benzene Hexachloride), Δ-BHC (Delta Benzene Hexachloride) contained detectable levels of pesticide residues. Also, the organochlorine pesticides from the parental compound (original pesticide-P1) were the most commonly detected viz; P1,P-DDE (1,1-Dichloro-2, 2-bis,Para-chlorophenyl) ethylene), P1,P-DDD ((1,1-Dichloro-2,2-bis,Para-chlorophenyl) ethane) and P1,P-DDT (Dichlorodiphenyltrichloroethane). The concentrations of pesticide residues ranged from 0.047mg/kg to 0.153mg/kg of the samples exceeding the maximum residue limits (MRLs) set by the European Food Safety Authority (EFSA). This study highlights the need for regular monitoring of pesticide residues in garden eggs and emphasizes the importance of implementing integrated pest management practices to minimize the use of harmful pesticides.

KEYWORDS: Garden Egg, Pesticide, Benzene Hexachloride, Organochlorine, Chlorophenyl

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D 031B

CHEMICAL PROFILING AND NUTRITIONAL ANALYSIS OF *Luffa cylindrica* and *Cucurbita maxima* SEEDS AND OILS

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ABSTRACT

Medicinal plants and their essential oils have been shown to possess bioactive and nutritional properties. In order to establish the medicinal and nutritional values of *Luffa cylindrica* and *Cucurbita maxima*, the proximate, phytochemical, anti-nutrients composition and antioxidant activity of the seeds were evaluated. For the essential oils, parameters including saponification, iodine, acid and peroxide values were determined. Total phenols were highest in *Luffa cylindrica* (134.66±2.10 mg/100g) and *Cucurbita maxima* (129.13±2.75 mg/100g) seeds while tannins, flavonoids, saponins and alkaloids were also present in considerable amounts. Proximate analysis revealed the presence of considerable amounts of moisture and ash followed by fat with relatively low concentrations of fiber, protein and carbohydrate. The anti-nutrient with the highest concentration was phytate with 7.77±0.59 mg/100g and 5.14±0.19 mg/100g in *Luffa cylindrica* and *Cucurbita maxima* seeds respectively. The other anti-nutrients namely oxalate and cyanide were present in relatively lower concentrations when compared to phytate. The yield of oil from seeds of *Cucurbita maxima* (43.30±0.01%) and *Luffa* cylindrica (26.30±0.2%) were both higher than the standard of 17% as stated by the

Food and Agricultural Organization which indicates that both are suitable sources of oil. Using DPPH, FRAP, and ABTS scavenging assays and Vitamin C as the standard, the seeds also exhibited strong antioxidant activity. Generally, the percentage inhibition increased as the concentration level increased. Overall, findings from this study indicate that seeds of *Cucurbita maxima* and *Luffa cylindrica* are nutritious and have a wide range of uses as phytomedicine.

KEYWORDS: Antioxidants, Antinutrients, Phytochemicals, C*ucurbita maxima, Luffa cylindrica*

D 032

RIBRAMO: A NUTRIENT-DENSE ALTERNATIVE RUTF FOR THE TREATMENT OF SEVERE ACUTE MALNUTRITION

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ABSTRACT

Severe acute malnutrition (SAM) remains a critical public health challenge, particularly in low- and middle-income countries. While standard peanut and milk-based Ready-to-Use Therapeutic Foods (RUTFs) have demonstrated success, they are often constrained by high costs, accessibility, allergenic risks, and limited cultural acceptability. In response, the development of alternative formulations is vital. To evaluate the nutritional composition of Ribramo, a novel RUTF formulated from stabilized rice bran and *Moringa oleifera.* Standard analytical procedures were employed for the nutritional analysis. Ribramo contained 10.9% protein, 39.3% lipids, 40.0% carbohydrates, 5.9% fiber, 1.6% moisture, and 2.3% ash. It was rich in vitamin A (5.25 mg/100g) and vitamin E (0.17 mg/100g). Mineral content included calcium (26.2 mg/100g), magnesium (246.5 mg/100g), iron (50.6 mg/100g), potassium (438.8 mg/100g), zinc (3.8 mg/100g), and copper (2.8 mg/kg). Fatty acid analysis showed 20.54% monounsaturated and 19.32% polyunsaturated fatty acids. Ribramo demonstrates strong potential to meet the nutritional needs of children with SAM, with favorable macro- and micronutrient content. Its affordability, local ingredient base, and cultural acceptability support further clinical evaluation to confirm its effectiveness in treating malnutrition.

KEYWORDS: Severe Acute Malnutrition (SAM), Ready-to-Use Therapeutic Food (RUTF), Rice Bran, *Moringa oleifera* and Nutritional Rehabilitation

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D-033

FORMALDEHYDE AND HEAVY METAL CONTAMINATION IN FROZEN FISH, CHICKEN AND TURKEY SAMPLES COLLECTED FROM THREE MAJOR MARKETS IN ABUJA NIGERIA

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ABSTRACT

This work was aimed at quantifying the concentration of formaldehyde and heavy metal levels in poultry and fish products obtained in three markets in Abuja. The levels of heavy metals in the frozen poultry ranged from 11.15 to 14.06ppmzinc; 0.58 to 3.30ppm cadmium; 24.10 to 29.20ppmiron;4.66 to 5.89 ppm arsenic;0.20

ppm for lead and 0.12 to 0.17 ppm chromium, while for the various frozen fish species the average level of heavy metals (represented as mean±SEM) ranged from 6.65±0.82 to 11.81±2.57 ppm zinc; 1.26±0.02 to 2.85±0.24 ppm cadmium; 11.66±2.25 to 24.04±4.35 ppm iron; 0.46 ± 0.01 to 6.52 ± 0.11 ppm arsenic; 0.12±0.01 to 0.42±0.02 ppm lead and 0.05±0.00 to 0.45±0.02 ppm chromium across the three markets. The formaldehyde concentration in the frozen turkey ranged from 0.65 to 0.73ppm, the frozen chicken sample ranged from 0.55 to 0.76 ppm while that for the frozen fish species ranged from 0.53 to 0.78 ppm. The heavy metals were highest in turkeys obtained from Kado market and least in chicken samples obtained from same location, with cadmium and chromium having the overall lowest heavy metal concentration respectively. The formaldehyde concentration detected was well above the WHO standard in all three markets.The findings of this study reveal that much work would need to be done by the authorities within Abuja, if the level of heavy metals and formaldehyde are to come under range of the FAO/WHO standard.

KEYWORDS: Formaldehyde, Heavy Metals, Fish, Poultry, Food safety.

D-034

TRUE NUTRIENT RETENTION FACTORS OF SOME COMMONLY CONSUMED TRADITIONAL DIETS IN SOME STATES OF NORTHWEST GEOPOLITICAL ZONE, NIGERIA.

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ABSTRACT

Advances in food composition studies made it possible to estimate nutrient composition of prepared diets from raw food using nutrient retention factors. This study is aimed at determining true nutrient and antinutrients retention factor of some commonly consumed traditional diets in some states of northwest zone, Nigeria. Documentation, selection and preparation of commonly consumed diets in some states that constitute the northwest geopolitical zone (Kano, Katsina and Jigawa) were done by administration of questionnaire. Twelve (12)most commonly consumed traditional diets according to the respondents were categorized into highly-, moderately- and the least- consumed diets, four (4) diets each were selected from each state. Proximate composition, minerals, vitamins and antinutrients were determined using standard methods. The nutrient retention factors for a cooked food were calculated. From the results, the higher contents of macronutrients in some of the ingredients and selected prepared diet may qualify or make these ingredients/diets to be good sources of nutrients.The absence of cadmium, nickel, lead and cobalt in the selected prepared diets in the study may indicate that, they are good for human consumption.This study also observed the presence of antinutrients in prepared diets. Therefore, there is need for adequate processing to reduce the anti-nutritional factors in plants used as human foods and animal feeds.The variations observed in vitamin contents of the ingredients and prepared diets may be due to differences in cooking time and processing methods used for each prepared diet. The striking observation from the results of true nutrient retention factor is that, *tuwonmasara* served with *kuka* soup (TWM SWKS) appeared to be the most highly selected/consumed in all the three states yet it appeared to have least nutrient retention factor. This could be due to nature and number/types of ingredient involved in preparing the diets, cooking time/temperature. Therefore, effort should be geared towards adapting processing methods and cooking time that will minimize nutrient loss because changes in the nutrient content of foods after preparation may have implications for nutrient intake of individuals and groups.

KEYWORDS: True nutrient retention factor, traditional diets, antinutrients, northwest geopolitical zone, Nigeria

D-035

EVALUATION OF NUTRITIVE VALUE AND ACCEPTABILITY OF CARROT-BASED JAMS PREPARED USING SUGAR AND JAGGERY

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ABSTRACT

Carrot (Daucus carota) is a nutrient-rich vegetable valued for its high content of beta-carotene, fiber, vitamins, and minerals. This study evaluated the nutritional composition and consumer acceptability of carrot-based jams formulated using sugar and jaggery. Two jam variants were prepared from 500 g of grated carrots, each incorporating either 250 g of refined sugar or jaggery, with lemon pulp pectin as a natural gelling agent. Proximate analysis revealed that the jaggery-based jam contained significantly higher levels of ash (1.97%), crude fiber (2.47%), and protein (1.20%) compared to the sugar-based jam. Mineral analysis showed elevated concentrations of iron, magnesium, and zinc in the jaggery-based product. Vitamin assays indicated that the jaggery jam had the highest vitamin A (450.00 µg/dl) and vitamin E (2.23 mg/dl) levels, while vitamin C levels were not significantly different between samples. Sensory evaluation showed no significant differences in sweetness and flavor, but the jaggery-based jam was rated lower in appearance, texture, and overall acceptability. Despite its superior nutritional profile, the jaggery jam's reduced sensory appeal suggests the need for formulation optimization. The study revealed that jaggery is a viable, nutrient-enhancing substitute for sugar in carrot jam, with potential for development into a more widely accepted functional food.

KEYWORDS: Jaggery, Carrot, Jam, Nutritional evaluation, Sensory analysis.

D-036

EFFECT OF PROCESSING ON NUTRIENTS, ANTI-NUTRIENTS AND FUNCTIONAL PROPERTIES OF NCRICAS1 CASTOR CAKE

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ABSTRACT

Castor plant (*Ricinuscommunis* L.) is one among the underutilized and under cultivated crops. The seeds are used for the production of castor oil; as a result of this process castor seed cake is obtained. The seed cake is usually discarded due to the presence of toxic anti- nutrients such as ricin, ricinine and allergens. This study evaluated castor seed cake for its nutrients for possible inclusion in animal feeds and to identify best processing method that will eliminate its anti-nutrients to an innocuous level. The proximate and mineral compositions were carried out according to the protocol of Association of Officio Analytical Chemist (AOAC). Amino acids profile was carried out using automated amino acid analyzer (Applied Biosystems PTH Amino Acid Analyzer). Anti-nutrient compositions and functional properties of the cake were also determined to standard methods. Physical processing methods of heat treatment (toasting and cooking), fermentation and their combinations totaling seven (7) different processes were employed to eliminate anti-

nutrients. The results of the proximate analysis revealed that NCRICAS 1 is rich in protein (39.93 %), minerals (ash 6.24 %). Amino acids profile also revealed its rich essential amino acids with 6.18 mg/g leucine, 4.19 mg/g lysine, 2.08mg/g methionine, 1.06mg/g cysteine, 1.93mg/g tyrosine. Phytochemical analysis of the cake shows 3.44 mg/100 g for ricin and 0.53 mg/100 g for ricinine. Lectins, oxalates tannins and phytates compositions in mg/100 g were 4.46, 2.11, 0.13 and 1.48 respectively. The results of processing revealed that cooking castor cake at 84°C for 65 minutes combined with fermentation at 40°C for 5 days is the best method by reducing ricin by 99.7% (3.44mg/100g to 0.009mg/100g) and also increased protein from 39.93% to 40.48%. From the study, it could be concluded that NCRICAS1 has rich nutritional potential for its inclusion in animal feeds but for its proper utilization the anti-nutritional factors such as ricin, ricinin electins tannins etc must be eliminated or reduce to harmless level. Cooking of castor cake at temperature of 84°C for 65 minutes and allowed to ferment at 40°C for five days may be recommended for the elimination of these anti-nutrients in castor cake and encourage its inclusion in animal feed.

KEYWORDS: Castor cake, Nutrients, Anti-nutrients, functional, Fermentation, Cooking

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D-037

ANTI-OXIDATIVE AND ANTI-TUMOR EFFECT OF TOMATO AND CARROT

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ABSTRACT

Cancer is still a menace to public health. This research investigated the preventive effect of tomato and carrot supplementation in Wistar rats administered breast carcinogen, Dimethylbenz-[a]-anthracene (DMBA). Tomato and carrot were dried under shade and pulverized. Forty-eight female rats were randomly distributed into 8 groups. Groups 1 and 2 comprised of unexposed rats fed standard diet and DMBA-administered group fed standard diet respectively. Groups 3-5 were DMBA-administered groups fed diets containing 20% tomato, 20% carrot and 20% of an equally mixed tomato and carrot respectively. Groups 6-8, unexposed rats fed diets containing 20% tomato, 20% carrot and 20% of an equally mixed tomato and carrot respectively. The feeding was for a period of 10 weeks. Proximate composition of the formulated diet was analyzed, oxidative stress markers and tumor markers were assessed. The results showed significant variations in the proximate composition of the formulated diet. The result of the oxidative stress showed significantly ($p<0.05$) higher activities of SOD, CAT and decreased MDA level in the group exposed to breast carcinogen-administered fed with tomato and carrot supplemented diet. Result of the tumor markers showed significant ($p<0.05$) decrease in the concentrations of CA and CEA in the breast carcinogen-administered groups fed tomato and carrot supplemented diet in relation to the breast carcinogen-administered group fed standard diet. It is therefore concluded that supplementation of diets containing carrot and/or tomato reduced the risk of breast cancer through improved anti-oxidative and anti-tumor defense systems in rats exposed to breast carcinogen.

KEYWORDS: Breast Cancer, Carrot, Dimethylbenz-[a]-anthracene, Tomato, Tumor

D 038

ANTI-NUTRITIONAL FACTOR ASSESSMENT IN POPULAR NORTH CENTRAL NIGERIAN FOODS

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ABSTRACT

This research investigated the levels of anti-nutrients: oxalate, phytate, cyanogenic glycosides (HCN), saponins, and total phenols in commonly consumed diets and ingredients from North Central Nigeria to assess their potential impact on nutrient bioavailability. Quantitative analysis revealed significant variations in concentrations of each anti-nutrient. Notably, Okpa exhibited the highest oxalate content at 0.66 ± 0.01 mg/g, raising concerns about its potential to reduce calcium absorption, particularly in populations reliant on this staple. Palm Oil Rice showed elevated phytate levels at 1.47 ± 0.01 mg/g, which can hinder the uptake of essential minerals like iron and zinc. Pounded Yam Egusi presented the highest concentration of hydrogen cyanide (HCN) at 6.95 ± 1.44 mg/kg, indicating a potential toxicity risk if consumed without proper preparation. Additionally, high saponin levels were found in Pounded Yam Egusi and Palm Oil Rice, which may influence lipid metabolism and offer health benefits, but excessive intake could lead to gastrointestinal disturbances. Conversely, Moringa Food and Tuwo as well as dried Okro exhibited high phenolic content (60.92 ± 5.01 mg/g and 52.42 ± 1.04 mg/g) respectively, suggesting antioxidant benefits but also potential interference with mineral absorption. This data underscores the importance of awareness regarding anti-nutrient levels in these foods, especially in the regions with limited dietary diversity, where reliance on a narrow range of staples may exacerbate nutrient deficiencies. Further research into processing methods to reduce high levels of these anti-nutrients is recommended to enhance food quality and improve nutrient bioavailability, ultimately supporting better dietary health in the region.

KEYWORDS: Anti-nutrients, Foods, North Central, Yam, Egusi

D 039

NUTRITIONAL EVALUATION OF COMMONLY CONSUMED DIETS IN NORTH CENTRAL NIGERIA

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ABSTRACT

This study aimed to evaluate the proximate composition, mineral elements, and vitamin contents of commonly consumed diets in the North Central zone of Nigeria. The analysis revealed significant variations in moisture, ash, crude protein, crude fiber, crude fat, and nitrogen-free extract across the samples. Notably, the mineral content analysis highlighted essential nutrients such as calcium, iron, potassium, and zinc in both processed foods (e.g., Beans Porridge, Jollof Rice, and MoiMoi) and raw ingredients (e.g., Moringa, Bambara Nut, and Crayfish). Moringa emerged as a particularly rich source of calcium, with 68.53 mg, indicating its potential to address calcium deficiencies in the region. The study also assessed vitamin content, revealing significant disparities between processed and raw foods. Processed items like Beans Porridge and

MoiMoi provided higher levels of thiamine and riboflavin, while raw ingredients often showed undetectable levels of these vitamins. Furthermore, the analysis of cadmium, cobalt, chromium, and other trace elements indicated that most processed foods posed minimal health risks, although some items contained trace amounts of cadmium and lead, necessitating monitoring for food safety. Overall, the findings contribute valuable data to the limited existing food composition resources for the North Central region of Nigeria, emphasizing the importance of dietary diversity for adequate nutrient intake. This data can inform dietary recommendations and interventions aimed at improving nutritional health in the region. It is recommended that these findings be utilized in developing food composition tables and databases to promote healthier dietary choices within the community.

KEYWORDS: Proximate Composition, Mineral elements, Vitamin, Diets, North Central zone

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D040

COMPARATIVE ANALYSIS OF NUTRITIONAL, BIOCHEMICAL, AND PHYSICOCHEMICAL PROPERTIES OF NATURALLY RIPENED AND CALCIUM CARBIDE-RIPENED MANGO, BANANA, AND PAWPAW

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ABSTRACT

Calcium carbide is widely used for artificial ripening despite its potential negative effects on fruit quality and consumer health. This study compares the nutritional, biochemical, and physicochemical properties of mango, banana, and pawpaw fruits ripened naturally versus those ripened using calcium carbide. The research analyzed key parameters, including moisture, protein, fiber, carbohydrate content, acidity, ethylene production, enzymatic activity, texture, and shelf life. The results revealed that calcium carbide-ripened fruits had 5.2% lower moisture content, 20% lower protein content, and 14.3% lower fiber content, while carbohydrate content increased by 23% compared to naturally ripened fruits. Biochemically, artificially ripened fruits exhibited 86.5% higher ethylene production, 75% higher acidity levels, and 32% higher polyphenol oxidase activity, leading to increased enzymatic browning and altered taste. Physicochemical analysis showed a 20% reduction in firmness, 50% increase in weight loss, and a shorter shelf life (3 days vs. 6 days in naturally ripened fruits). Additionally, the health risk assessment detected calcium carbide residues, including arsine and phosphine, exceeding WHO/FAO permissible limits, raising concerns about long-term health effects. The study concludes that calcium carbide ripening significantly alters fruit quality and poses potential health risks. It recommends stricter regulations, public awareness campaigns, and the promotion of safer ripening methods such as ethylene-based ripening.

KEYWORDS: Calcium carbide, natural ripening, fruit quality, biochemical properties, food safety

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D 041

NUTRITIONAL EFFICIENCY OF CORN AND AFRICAN PEAR CONSUMED AS COMPLEMENTARY SNACKS

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ABSTRACT

This study aimed to determine the nutritional composition of boiled *Zea mays* and *Dacryodes edulis.* This study evaluated the proximate, phytochemical, vitamin, and mineral composition of boiled *Zea mays* (maize) and *Dacryodes edulis* (African pear) as a valuable source of nutraceuticals. Standard biochemical methods were used to evaluate these nutritional contents. Proximate analysis revealed that both samples contained appreciable levels of all nutrient classes, with *Z. mays* exhibiting higher moisture (83.89%) and higher carbohydrate (9.61%) contents, while *D. edulis* was richer in fat (18.67%), carbohydrate (32.44%), and ash (2.28%). Scarce plant protein was present in both samples at 3.07% in *Z. mays* and 3.67% in *D. edulis*. Phytochemical analysis revealed the presence of tannins, phenolics, flavonoids, terpenoids, glycosides, and alkaloids in both species, with *D. edulis* showing higher concentrations of these compounds. Anti-nutritents such as hydrocyanide, trypsin inhibitors, hemagglutinin, oxalate, and phytate were present at trace levels. Vitamin analysis demonstrated the presence of some important vitamins, with vitamin A being the most abundant (1.83 mg/100 g in *Z. mays*; 2.43 mg/100 g in *D. edulis*), followed by appreciable amounts of vitamins C, B_1, B_2, B_6, B_{12}, and E. Mineral analysis identified some elements, with *Z. mays* containing higher levels of potassium (217.59 mg/100 g) while *D. edulis* showed greater levels of iron and calcium. These findings highlight the nutritional and phytochemical richness of both boiled *Zea mays* and *Dacryodes edulis*, supporting their complimentary consumption and inclusion in health-promoting diets. They have potential use in functional food development.

KEYWORDS: *Zea mays*, *Dacryodes edulis,* Nutraceuticals, Proximate, Phytochemicals, Vitamins, and

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D 042

EFFECT OF MAIZE AND AFRICAN PEAR EXTRACTS ON LIVER FUNCTIONS, LIPID PROFILE AND ELECTROLYTE PROFILE OF FREUD'S ADJUVANT INDUCED INFLAMMATION IN WISTER ALBINO RATS.

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ABSTRACT

Crops such as maize (*Zea mays*) and African pear (*Dacryodes edulis*) are widely consumed in tropical regions and recognized mostly for their nutritional properties. This study aimed to evaluate the effect of aqueous extracts of *Z. mays* and *D. edulis* on lipid profile, liver and kidney functions in Freud's adjuvant-induced inflammation in Albino rats. Standard biochemical methods, chemicals and reagents of analytical grades were used in this investigation. Fifty-four male (54) Wistar albino rats were divided into nine groups (n = 6). Inflammation was induced in groups 2 to 9 by intra-dermal injection of complete Freund's adjuvant (0.1 ml with Olive oil in the ratio of 1:1) in the hind paw. Group 1 was normal control with free access to water and feed while group 2 was left untreated. Group 3 standard controls was treated with 0.5 mg/kg dexamethasone, while Groups 4-6 and groups 7–9 received 200, 400, and 600 mg/kg of *Z. mays* and *D. edulis* extract respectively. The test treated groups showed significant ($p < 0.05$) reductions in paw size. The kidney function improved as urea and creatinine levels decreased in all extract treated groups compared to group 2.The values were generally comparable with the dexamethasone treated standard group. Electrolyte levels (Na , K , Cl) were elevated in extract-treated groups relative to the control group 2, with the highest level of potassium observed in group treated with 600 mg/kg *D. edulis*. Analysis of the lipid profile showed

reduced total cholesterol, TG, and LDL in the extract treated groups when compared with the negative control in group 2 whereas the 400 mg/kg *D. edulis* treated group showed the greatest reduction. HDL increased moderately in treated groups but remained lower than in the dexamethasone treated group. Liver enzymes (ALT, AST, ALP) decreased significantly in extract groups compared to the untreated inflamed group, with the 200–400 mg/kg *D. edulis* group showing values closest to the positive control. Total protein, albumin, and globulin were elevated in the groups treated with the extracts and standard drug relative to the negative control in group 2. The maize and African pear extracts demonstrated significant hepatoprotective properties and enhance kidney functions as well as improved lipid profile in the treated groups. The results were comparable to the effect elicited by the standard drug treatment and validate their traditional use as food source of nutraceutical that can be used in the management of oxidative stress and inflammation as well as inclusion as functional food material.

KEYWORDS: Maize, African pear, Oxidative stress, Inflammation, Nutraceuticals, Liver enzymes, Lipid profile.

D 043

COMPARATIVE EFFECTS OF BOILING, FRYING, AND SOAKING ON THE NUTRITIONAL COMPOSITION OF WHITE KIDNEY BEANS (*Phaseolus vulgaris*)

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ABSTRACT

Processing methods can markedly alter the nutritional profile of legumes. In this study, white kidney beans (*Phaseolus vulgaris*) were subjected to boiling, frying or soaking to evaluate changes in proximate composition—moisture, protein, crude fibre, ash, lipids and carbohydrates. Boiling increased moisture content to 40.3% and yielded the highest fibre level (23.3%), but protein concentration dropped to 5.0%. Frying preserved protein (11.5%) and lipids (2.3%) most effectively and retained the greatest carbohydrate fraction (55.5%). Soaking led to the highest ash content (23.0%), reflecting superior mineral retention, yet resulted in the lowest protein (4.8%) and lipid (1.1%) levels. Statistical analysis ($p < 0.05$) confirmed significant differences across treatments for all measured parameters. These findings illuminate the nutritional trade-offs inherent in common bean preparation techniques and offer guidance for selecting processing methods tailored to specific dietary goals—whether maximizing protein and energy density or enhancing dietary fibre and mineral intake.

KEYWORDS: *Phaseolus vulgaris*, Proximate composition, Processing methods, Nutrient retention, Dietary fibre

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Pp D 007

EVALUATING THE EFFECT OF SELECTED VARIETIES OF *Solanum lycopersicum* ON HIGH-FAT DIET FED ALBINO RATS

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ABSTRACT

High fat diet has been associated with obesity and some metabolic diseases, which are known as major public health problems globally. The study examines the effects of various *Solanum lycopersicum* varieties on body weight, fasting blood sugar levels, lipid profiles, liver and kidney function, and antioxidant activity in rats fed a high-fat diet. The two varieties were administered with 200mg/kg body weight using a total of 30 rats groups into five (5) groups of six (6) rats each. The study included both experimental and control groups, such as rats given an high fat diet, rats treated with Supplements of *Solanum lycopersicum* (200 mg/kg) and lovastatin (5 mg/kg) as standard drugs. The administration of extracts lasted for 28 days. The effect of the supplements on weight, fasting blood glucose, total protein, albumin, bilirubin, urea, creatinine, total cholesterol, triglycerides, low-density lipoprotein and high-density lipoprotein. The toxic effect of the extract was determined using biochemical enzyme markers. Treatment with the supplements showed a significant ($p < 0.05$) reduction in elevated blood levels of glucose, cholesterol, and proteins, as well as other biochemical parameters associated with hyperlipidemia. The extract possessed no toxic effect as indicated by the lowering of ALP and ALT levels and may be used therapeutically to treat diseases associated with diets rich in fat.

Pp D 020

EVALUATION OF FUNCTIONAL PROPERTIES OF OKRA AND JUTE SEEDS PROTEIN

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ABSTRACT

Okra and jute seeds proteins were evaluated for their potential use in the food industries. Since their use depends on their protein behavior, this study evaluated the potential of okra and jute seed protein isolates for use in the food industry by examining their functional properties, amino acid profiles, and protein fractions. Protein isolates were extracted from okra and jute seeds using 1 N NaOH, precipitated at pH 4, and freeze-dried. The protein yield was 10% for okra and 5% for jute.The functional properties showed that okra protein had a bulk density of 0.45 g/cm³, water absorption of 1.2 g/g, and oil absorption of 1.0 g/g, while jute protein had a bulk density of 0.36 g/cm³, water absorption of 1.4 g/g, and oil absorption of 1.2 g/g. Both proteins exhibited similar emulsification activity and stability (54.42% for okra and 55.75% for jute) and foaming capacities (5% for okra and 7% for jute). Gelation occurred at concentrations of 2%, 4%, 6%, 8%, and 10% for both proteins.The amino acid profile revealed that okra contained 40.08% essential amino acids, while jute contained 47.11%. The protein fraction analysis showed that okra had 15.16% albumin and 84.84% globulin, while jute had 8.33% albumin and 91.67% globulin. The essential amino acids in these protein isolates suggest their potential for improving human health when incorporated into food products.

KEYWORDS: Okra, Jute, Emulsification, Bulk Density, Gelation.

Pp D024

EVALUATION OF THE NUTRITIONAL COMPOSITION OF FRUIT PEELS BLEND WITH WHEATBRAN AS A POTENTIAL SUBSTRATE FOR *Tenebrio molitor* LARVAE

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ABSTRACT

The increasing demand for sustainable protein sources has led to the exploration of agricultural by-products as substrates for the growth of insects. This study investigates the nutritional composition of pineapple peels and watermelon rinds individually and in combination with wheat bran to evaluate their suitability as substrates for the growth of *T. molitor* larvae. Five substrates were prepared as thus; D1 (control-100g wheat bran), D2 (50g wheat bran + 50g pineapple peels), D3 (50g wheat bran + 50g watermelon rinds), D4 (50g wheat bran + 25g pineapple peels + 25g watermelon rinds) and D5 (50g pineapple peels+ 50g watermelon rinds) respectively. Proximate, mineral and energy composition were carried out according to standard procedures. The results revealed that pineapple peels were higher in moisture (21.17±0.60), ash (6.67±0.02), fat (0.76±0.14) and fiber (16.65±0.01). While watermelon rinds were higher in protein (6.77±0.10) and carbohydrate (56.93±0.02), in terms of minerals and energy composition, watermelon rinds were higher in calcium (1.58±0.02), iron (8.17±0.05), magnesium (0.59±0.01), manganese (2.46±0.01), phosphorous (1.59±0.01), potassium (4.30±0.11) and energy content (2590 kcal/kg). There were significant differences ($p<0.05$) in the nutritional composition between the two fruit peels. When mixed with wheat bran which is rich in carbohydrate and moderate in protein, the nutritional profile improved. These findings suggest that fruit peels, such as pineapple and watermelon supplemented with wheat bran may serve as a sustainable substrate for *T. molitor* larvae contributing to waste valorization and alternative protein production.

KEYWORDS: Energy, Fruit peels, Minerals, Nutrition, *Tenebrio molitor* larvae

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Pp D 029

NUTRITIONAL AND PROXIMATE ASSESSMENT OF TIGER NUT MILK TO ENHANCE BREAST MILK IN LACTATING MOTHERS

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ABSTRACT

There is a growing demand for vegetable milk as a substitute for dairy milk to meet consumer needs. Tiger nut (*Cyperus esculentus*) is a grass-like edible perennial root crop. Tiger nut has long been used as a functional food with many health benefits such as vitamins, minerals, sugars, fibre and is rich in protein. The aim of the study was to analyze the nutritional and proximate quality of tiger nut milk using standard methods. Fresh tiger nut milk (*Cyperus esculentus*) was aseptically processed in the laboratory. The results of proximate analysis show that moisture, ash and carbohydrate were not significant ($p>0.05$), but crude fibre, protein and fat were significant ($p<0.05$). The pH of all samples ranged from 7.1 to 7.2 and the titratable acidity from 0.81 to 0.85. Based on a preliminary consumer sensory evaluation, texture was not significant for all samples, appearance, aroma, taste, consistency and overall acceptability were significant. Nutritional and proximate analysis indicated that moisture, carbohydrate, protein and fat were quantitatively the major components of the drink and the pH was in the neutral range and suitable for people suffering from ulcers and other colic problems. This provides an improved energy drink with high nutritional and economic potential. It is suggested that tiger nut milk can be recommended for lactating mothers.

KEYWORDS: Tiger nut, proximate analysis, lactating mothers, nutrition, economic potential

Pp D 030

SOLID STATE FERMENTATION FOR OPTIMIZATION OF LIPASE PRODUCTION FROM *Aspergillus niger*

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ABSTRACT

Lipase is amongst the most utilized industrial enzymes with high economic value which can be produced by a number of filamentous fungi such as *Aspergillus niger*. The aim of this work was the optimization of lipase production from *Aspergillus niger by s*olid state fermentation using rice bran and wheat bran as substrates for 5 days with variations of inducer and extractant. Fermentation media were prepared using substrates of rice bran and wheat bran supplemented with different nutrients formulations coupled with addition of several vegetable oils (olive, shea butter and palm oils) as inducers fermentation product was extracted, filtered and centrifuged. The supernatant was assayed for extracellular lipase activity sphectrophotometrically using paranitrophenyl laurate (*p*NPL) as substrate. The result shows that inducer optimization with 1% of olive oil yielded lipase with highest activity (153.3±0.36 U/ml with 2% shea butter yield 115.5 ±0.05 U/mlwith rice bran s substrate.. With wheat brain as substrate, the lipase activity was found to be (121.4± 0.11547 U/ml) with 1% olive oil as inducer where as lowest activity of (90.0 ±0.1) was recorded with 2% shea butter as inducer. Optimization with extract solution revealed that 0.5% NaCL+1% Triton X-100 was the best extract solution, lipase activity of 191.2±0.05 U/ml.

KEYWORDS: Solid-state fermentation, Lipase, Optimization, *Aspergillus niger*

SUB-THEME 5

E-001

INNOVATIONS IN BIOCHEMISTRY AND MOLECULAR BIOLOGY: TOOLS FOR SUSTAINABLE DEVELOPMENT AND POVERTY ALLEVIATION

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ABSTRACT

Innovation in drug discovery often finds its roots in nature, with natural products serving as a vital source of novel therapeutic agents. Taxol (paclitaxel), a prominent example, is a groundbreaking anticancer compound originally isolated from the bark of the Pacific yew tree (*Taxus brevifolia*) in the 1960s. Its discovery marked a significant milestone in oncology, as it introduced a unique mechanism of action-stabilization of microtubules- that disrupted the mitotic process in cancer cells, ultimately inhibiting cell division and promoting apoptosis. Taxol's complex structure posed considerable challenges for large-scale production, prompting the development of innovative extraction techniques, semi-synthetic pathways using precursor molecules from renewable sources such as the needles of *Taxus* species, and the use of plant cell fermentation. The journey of Taxol from a rare natural extract to a widely used chemotherapeutic agent illustrates the critical role of multidisciplinary innovation in natural product drug discovery. This includes advancements in natural product chemistry, high-throughput screening, formulation science, and biotechnology. Moreover, the success of Taxol encouraged renewed interest in the exploration of plant-derived compounds, leading to the discovery of other important natural drugs. It also underscored the importance of sustainable sourcing and conservation strategies for medicinal plants. In essence, Taxol is not just a pharmaceutical triumph but a symbol of how nature's chemical diversity can drive transformative innovation. Its development reflects the intricate relationship between natural products and scientific ingenuity, reinforcing the continued value of natural sources in the search for new and effective therapies in modern medicine. Researchers are exploring the potential of paclitaxel in treating other types of cancer and diseases. Nanotechnology: The use of nanoparticles to deliver paclitaxel is being investigated to improve its efficacy and reduce side effects.

KEYWORDS: Taxol, Natural products, Drug discovery, Anticancer agents, Paclitaxel

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Pp E 001

BIOPHYSICAL AND BIOCHEMICAL INSIGHTS INTO LEATHER PROCESSING: TOWARDS A SUSTAINABLE ROADMAP FOR INDUSTRIAL PRACTICES IN NIGERIA

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ABSTRACT

The Nigerian leather industry holds significant economic and cultural relevance, with the country possessing the largest stock of goatskin and kidskin in Africa. However, the sector remains hampered by outdated technologies, reliance on hazardous chemicals, and limited integration of scientific innovation, leading to severe environmental and public health consequences. This paper aims to provide an interdisciplinary

synthesis of the biophysical and biochemical aspects of leather processing in Nigeria, with a focus on proposing science-based, sustainable alternatives to existing industrial practices. The goal is to outline practical, scalable solutions aligned with global environmental and industrial standards. The paper critically analyses scientific literature, case studies, and field data covering thermal and mechanical processing, spectroscopic monitoring, nanotechnology applications, toxicological risks, and innovations in green chemistry. Emphasis is placed on integrating local realities with global best practices and policy frameworks. Key findings highlight the detrimental effects of conventional agents such as chromium salts, aldehydes, and synthetic dyes on both human and ecological health. On the other hand, using plant-based tannins, enzyme tanning, and processes that use nanomaterials show good results for heat resistance, strength, and being safe for the environment. Spectroscopic and thermo gravimetric tools enhance process monitoring and quality control, while biodegradable materials like sodium alginate and silica-based agents offer viable chrome-free alternatives. Policy gaps, limited R&D infrastructure, and insufficient industrial-scale adoption remain major challenges. An integrated roadmap for sustainable leather production in Nigeria is proposed, emphasizing technological modernisation, regulatory reform, and institutional leadership, particularly by the Nigerian Institute of Leather and Science Technology (NILEST). Bridging scientific insight with policy and practice is essential for transforming the leather sector into an eco-efficient, globally competitive industry.

KEYWORDS: Leather processing, sustainable development, biophysics, biochemistry, green chemistry, toxicology, Nigeria, NILEST

Pp E 012

ENZYMATIC HYDROLYSIS OF SWEET POTATO PEEL WASTE FOR REDUCING SUGAR PRODUCTION

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ABSTRACT

This study was aimed at optimization of reducing sugar production via hydrolysis of sweet potato peels using cellulose enzyme. The effects of temperature, pH, and substrate and enzyme concentration as process parameters on reducing sugar production were investigated. The proximate and chemical compositions of the peel were determined using standard analytical methods. The effects of substrate concentration, enzyme concentration, temperature, and pH during hydrolysis were determined using One Factor at a Time (OFAT) method. However, Central Composite Design (CCD) method was used to optimize the temperature and pH. The result showed that sweet potato peel to have a high carbohydrate and a high lignocelullosic biomass to reducing sugar production. The optimum temperature and pH at which the hydrolysis of cellulase enzyme yielded a higher reducing sugar were observed to be 50^0C and 5.0 respectively and 11. 11 mg/ml and 18.71mg/ml of reducing sugar were obtained at the earlier stated temperature and pH. Consequently cellulose enzyme hydrolysis on sweet potato peel waste can be used to produce high yield of reducing sugar for onward production of bio ethanol.

KEYWORDS: Reducing sugar, Sweet potato peel, Cellulase, Temperature and pH

SUB-THEME 6

F 001

NATURAL ANTIBACTERIAL ALTERNATIVES WITH ENTREPRENEURIAL PROMISE: A STUDY OF *Carica papaya* EXTRACTS AGAINST PATHOGENS FROM DIABETIC FOOT

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ABSTRACT

The condition diabetic foot infection impacts 25% of patients and results in lower limb amputations mainly in low-resource areas because these regions lack sufficient effective treatment options. The research examines the antibacterial effectiveness of *Carica papaya* fruit extracts derived from methanol, petroleum ether and dichloromethane against bacterial isolates obtained from diabetic foot infection patients. The extraction process employed cold maceration and phytochemical screening revealed that the methanol extract contained tannins, alkaloids, saponins, flavonoids and steroids phytonutrients. The antibacterial activity of extract(s) at 50 mg/ml, 100 mg/ml and 200 mg/ml concentrations was tested against test isolates and compared to ampiclox (4.0µg/ml) through the agar well diffusion method. The methanol extract at 200 mg/ml concentration produced zones of inhibition that measured 20.50 ± 0.03mm against *Pseudomonas aeruginosa* and 16.00 ± 0.08 mm against *Streptococcus pyogenes*. The petroleum ether extract at 200 mg/ml concentration showed maximum effectiveness against P. *aeruginosa* with 17.50 mm ± 0.20 mm and produced the largest zone of inhibition against S. *pyogenes* at 23.00 ± 0.06 mm. All isolates demonstrated resistance to the dichloromethane extract. The MIC and MBC values of both extracts against S. *pyogenes* and P. *aeruginosa* ranged from 100 to 200 mg/ml. *Carica papaya* shows strong antibacterial properties as a natural resource that could provide an affordable solution for diabetic foot infection treatment. The research aligns with current biochemistry initiatives that focus on developing indigenous plant-based medicines to enhance public health results and create accessible healthcare solutions for poverty reduction.

KEYWORDS: *Carica papaya*, phytochemicals, Diabetic Foot Infection (DFI), antibacterial activity, plant-based therapy

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F 002

ANTIOXIDANT PROPERTIES OF *Hibiscus sabdariffa* L. EXTRACTS: A NATURAL ALTERNATIVE TO COMMERCIAL SOFT DRINKS

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ABSTRACT

The rising prevalence of chronic diseases such as type 2 diabetes and cancer has spurred interest in natural dietary sources rich in antioxidants. *Hibiscus sabdariffa L.*, widely used in traditional beverages, offers taste and potential health benefits. This study evaluated the *in-vitro* antioxidant properties of red and black hibiscus extracts to assess their potential as superior alternatives to commercially available soft drinks. Total phenolic content (TPC), total flavonoid content (TFC), and antioxidant vitamins (A, C, and E) were quantified using gravimetric and standard analytical methods. Antioxidant activity was assessed using DPPH radical scavenging assays. The black hibiscus variety exhibited higher TPC (28.58 ± 0.02 GAE/100g) and TFC (6.46 ± 0.15 mg/g) compared to the red variant (24.35 ± 0.03 GAE/100g and 4.00 ± 0.10 mg/g, respectively). Vitamin analysis revealed considerable levels of vitamins A, C, and E, with slightly higher concentrations in red hibiscus. DPPH scavenging activity was concentration-dependent, with the highest activity recorded in black hibiscus at 73.38 ± 0.01%. These findings support the potential of *Hibiscus sabdariffa* as a functional beverage ingredient, offering both antioxidant protection and nutritional value. Incorporating hibiscus-based drinks into regular consumption may serve not only as healthier refreshment but also as a nutraceutical agent to mitigate oxidative stress.

KEYWORDS: *Hibiscus sabdariffa*, antioxidants, flavonoids, DPPH assay, nutraceutical beverages.