Abstract: Wo/2018/001

ANTI-HYPERTENSIVE POTENTIALS OF TRI-TERPENOIDS DERIVED FROM MYRICA CERIFERA PLANT EXTRACTS IN VITRO AND IN VIVO

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Abstract

Basic research discovery classically translates to new medications for clinical bedside applications. However, the community consumes so many herbal remedies believed with little or no scientific validation as efficacious. The science, called "reverse translation," of one such remedies, methanolic extract of *Myrica cerifera*plant leaves (named SPOO2P), is hereby presented as a showcase of (i) medicinal plant investigations, and (ii) challenges and prospects to developing commercially viable pharmaceuticals from ethnobotanicals in Nigeria.Elevated endothelin level is associated with hypertension and the methanol extract of *M. cerifera* plant leaves is rich in myriceric acid A and C (triterpenoids) known to inhibit endothelin-1 (ET-1)-induced Ca^{2+} flux in rat aortic smooth muscle cells, we hypothesized that SPOO2P could be a source of a non-peptide antagonist of endothelin A (ET_A) receptors. Specifically, we determined the anti-hypertensive potentials of SPOO2P on blood pressure of anesthetized rats and on aortic muscle contractions *in vitro*. Blood pressure of control and hypertensive rats was measured via carotid artery under pentobarbital anesthesia. Hypertension was induced with nitro-L-arginine methyl ester (L-NAME; 1 g/L) in

drinking water for 4 weeks. Contraction of aortic rings bathed with physiologic salt solution (37^{o}C; gassed with carbogen) was measured with force displacement transducers coupled to Tissue Force Analyzers (Micromed, Louisville, KY). SPOO2P (100 mg/kg; orally) significantly reduced the mean arterial blood pressure (MAP) and heart rate (HR) of control and L-NAME hypertensive rats. SPOO2P (20-100 µg/ml) concentration-dependently antagonized aortic contractions elicited by endothelin-1, and also contractions induced by phenylephrine, 5-hydroxytryptamine, excess potassium, or sodium fluoride. The contractile effects were not reversible by short-term washing. Dimethyl-sulfoxide (DMSO; vehicle for SPOO2P), did not inhibit muscle contractions or reduce MAP and HR in anesthetized rats. SPOO2P is a non-selective, inhibitor of smooth muscle contraction. It could be a potentially useful anti-hypertensive botanical drug if it meets safety standards.

[Support: University of Louisville Research Initiation Grant to A.S. Adeagbo].

Abstract: Wo/2018/002

APPLICATION OF ORGANIC SPECTROSCOPY IN STRUCTURE ELUCIDATION OF BIOACTIVE METABOLITES OF PLANTS AND MICROBIAL ORIGIN: A CONTEMPORARY APPROACH

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Abstract

Organic spectroscopy simply refers to the use of spectroscopic methods viz. UV/VIS, Infrared, Mass and NMR spectroscopy in structure elucidation of organic compounds. Although advances in these techniques have led to rapid structural assignment of even the very complex molecules, the traditional approach which involves the knowledge and combined applications of various spectroscopic techniques has also been successfully applied in accurate structural assignment of organic compounds isolated from plants and microorganisms. In this lecture, the various diagnostic information derivable from different forms of spectroscopy which will aid easy and unequivocal determination of the structures of even the very complex organic compounds will be discussed. Adequate knowledge of UV/VIS spectra of organic compounds can be predictive of the skeleton of different phenolic compounds namely, flavonoids, xanthones or simple phenolic acids. The skeletal types of the flavonoids viz. flavones, flavanols, isoflavones,

flavans or flavanones have also been predicted. Similarly, the presence ellagic acid, gallic acid, caffeic acid nuclei can be speculated from their UV/VS spectra. The specific aglycones, the number and types and in some cases the sequence of sugars can de determine by careful analysis of the MS fragments of flavonoid glycosides. Finally, adequate understanding of the coupling patterns viz. ABC, ABX, AA'BB', AA'BB'C etc. in aromatic systems has consistently given clues on the possible structural motifs in a compound. In order words, the possible structural features derivable from various spectroscopic methods can be harnessed for easy, accurate and unequivocal structural assignments of secondary metabolites commonly isolated from plants and fungi.

KEYWORDS: Organic spectroscopy, Structure elucidation, Secondary metabolites, UV/VIS, MS, NMR.

Abstract: W1/2018/001

STRUCTURAL ELUCIDATION OF PHYTOCHEMICAL CONSTITUENTS OF *ANNONA MURICATA* LEAF USING GAS CHROMATOGRAPHY-MASS SPECTROSCOPY AND FOURIER TRANSFORM INFRARED TECHNIQUES

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Abstract

The phytochemical constituents of the powdered leaf of *Annona muricata*was investigated usingGas Chromatography-Mass Spectroscopy and Fourier Transform Infrared Techniques. The compounds detected in the sample were analyzed using National Institute of Standards and Technology(NIST) library. The GC-MS detected sixteen compounds that were identified as 3, 5-Dihydroxy-6-methyl-2, 3-dihydro-4H-pyran-4-one (3.05%), Iberin nitrile (6.24%),7,12-Dihydro-6,7-bis(4-hydroxyphenyl)-6H-[1,2,4]triazolo [1',5':1,2] pyrimido[5,4c]chromen-2-ol (2.11 %), Cyclopentane, 4-cyano-2,2-dimethyl-1-methylene (4.06%), Cyclopentane-4-cyano-2,2-dimethyl-1-methylene (2.19%), Methyl-14-methylpentadecanoate (3.83%), 1-Pentadecane-carboxylic acid (13.62%), Methyl trans, trans-9,12-octadecadienoate (1.67%), 6-Methyl-1-heptanol (1.28%), Methyl-cis-9, 12, 15-octadecatrienoate (1.19%), cis-9-Octadecenoic acid (45.09%), Hystrene T-70 (11.73%), cetane (0.55%), 9-Octadecenal (1.21%), 2-Methyl-Z, Z-3,13-octadecadienol (1.36%) and icosane (0.81%). Similarly, the FTIR spectrum gave seven peaks that corresponded to sulfonic acids, sulfoxides, alcohols, nitroso compounds and halogeno, charged amines, alkanes and primary amides and free NH respectively. The phytochemicals exerts different pharmacological activities individually and synergistically.

KEYWORDS: phytochemicals**,** Spectroscopy, structural elucidation, *Annona muricata*

Abstract: W1/2018/002

ANTI-DIABETIC ACTIVITY OF METHANOL EXTRACT OF*ACALYPHA CILIATE* LEAVES

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Abstract
Diabetes mellitus is a metabolic disease characterized by high blood sugar (glucose) level which results from defects in insulin secretion or action.The anti-diabetic property of methanol extract of *Acalypha ciliata*leaves was studied on alloxan-induced diabetic albino rats.Thirty rats were divided into 6 groups of five rats in each group. Group 1 was the normal control rats, groups 2, 3 and 4 were administered varying doses of methanol extracts (100, 200 and 300)mg/kg respectively, group 5 was treated with Metformin (50mg/kg) and group 6 was the untreated control. Diabetes was induced by a single dose of alloxan (150mg/kg). Treatment of rats commenced only when diabetes was established on the experimental rats withglucose levels above 200mg/dl and lasted for fourteen days. On the 14th day, glucose levels of the groups treated with 100mg/kg, 200mg/kg and 300mg/kg doses of *Acalypha ciliata*extract(87.33 ±1.86 , 93.33 ± 4.81 and 145.00 ± 16.17 mg/dl respectively)were significantly reduced when compared withthat of thediabetic untreated rats (285.00 ± 47.44)mg/dl. Groups treated with (100, 200 and 300) mg/kg of the extracthad significantly reduced levels of the liver enzymes (Aspartate aminotransferase, Alanine aminotransferase and Alkaline phosphatase) when compared with the diabetic untreated rats. This research shows that methanol extract of *Acalypha ciliata* leaves has anti-diabetic activity.

KEYWORDS: Diabetes mellitus, liver enzymes, blood glucose,*Acalypha ciliate* leaves

Abstract: W1/2018/003

DERMATOLOGICAL PHARMACOLOGY OF *MUCUNA PRURIENS* LEAF EXTRACTS

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Abstract

The dermatological activity of *Mucuna pruriens* leaf extracts were assessed with particular emphasis on the antifungal and wound healing effects. The crude ethanol as well as the aqueous extracts of the dried leaves obtained by 72 h maceration in ethanol and water respectively were investigated employing modified agar-well diffusion method while the wound healing activity was assessed using standard method, in which three groups comprising five mice each were used. Group I received petroleum jelly (Vaseline) only and served as negative control. Groups II and III received 10% and 20% extract/Vaseline mixture respectively. The aqueous leaf extract showed less pronounced antifungal activity against *Candida albicans* and *Aspergillus spp* than the ethanol extract. Considerable signs of dermal healing was observed on wounds treated with 10% and 20% extract/ Vaseline mixture compared to Vaseline (Control) only. The leaf extracts of *M.pruriens* accelerated wound healing process in albino mice and exerted antifungal effect.

KEYWORDS: *Mucuna pruriens*, dermatological activity, antifungal, wound healing, test organisms.

Abstract: W1/2018/004

THERAPEUTIC POTENTIALS OF *VERNONIAAMYGDALINA* AND *OCIMUM GRATISSIMUM:* A COMPARATIVE ASSESSMENT

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Abstract
The therapeutic value of *Vernonia amygdalina* referred to as "bitter leaf" and *Ocimum gratissimum* called "scent leaf" were compared as regards their flavouring properties. Their phytochemical analysis as well as total antioxidant, total reducing properties, total flavonoids, and Vitamin C content were determined. For total antioxidants (phenols) and total flavonoids, colorimetric method was adopted using Gallic acid and Rutin as standard reagents, respectively. Using trichloroacetic acid colorimetric and 2, 6-dichlorophenol indophenols titrimetric methods, the reducing properties and Vitamin C contents were determined. Both plants showed significant antioxidant activity, good reducing power, wide distribution of flavonoids, and appreciable Vitamin C contents. *V. amygdalina* however, had higher values except for total reducing properties, than *O.gratissimum*. The leaf extract of *V. amygdalina* may be associated with wider therapeutic utility than that of *O. gratissimum*.

KEYWORDS: *Ocimum gratissimum, Vernonia amygdalina,* therapeutic utility, comparative assessment, chemical content

Abstract: W1/2018/005

ACTIVITÉ ANTIBACTÉRIENNE AND PHOTOCHIMIQUE DE QUELQUES PLANTES UTILISÉES DANS LE TRAITEMENT DES ENTÉROPATHOGÈNES MULTI RÉSISTANTS AU SUD BÉNIN

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Résumé

La présente étude a été initiée dans objectif général, d'évaluer l'activité biologique et chimique des extraits aqueux et éthanoïques de quelques plantes du Sud Bénin à savoir *Cajanus cajan* (feuilles), *Vernoniaamygdalina* (feuilles)*et Psidium guayava* (feuilles et racines) sur des souches bactériennes multi-résistantes.Des travaux sur le terrain suite à une enquête ethnobotanique ayant permis de sélectionner les plantes efficaces, suivi des travaux de laboratoire à travers des tests bactériologiques et de biologie moléculaire ont permis d'étudier l'efficacité de ces diverses plantes dans le traitement des entéropathogènes in vitro.

Ainsi, toutes les plantes sélectionnées ont présenté des teneurs intéressantes en flavonoïdes et en polyphénols et sont toutes non toxiques à la concentration de 100 mg/ml. Les méthodes de diffusion en milieu gélosé et en milieu liquide ont été utilisées pour le test de sensibilité et la détermination de la concentration minimale inhibitrice (CMI) et de la concentration minimale bactéricide (CMB). Les extraits aqueux et éthanoïques des plantes utiliséessont antibactériens. Les CMI et CMB des extraits actifs ont varié en fonction des extraits et des souches bactériennes. Les CMI et de CMB les plus faibles ont été obtenus à la concentration de 25 mg. Les divers extraits de plantes sélectionnés ont montré une efficacité thérapeutique aux diverses souches entéropathogènes testées et pourraient donc constituer des substituants aux antibiotiques suite à des transformations en médicaments traditionnels améliorés.

MOTS CLÉS:enquête ethnobotanique, souches entéropathogènes, extraits aqueux, extraits éthanoïques, composés phénoliques.

Abstract: W1/2018/006

ANTIOXIDANT POTENTIALS OF THE LEAF EXTRACT AND FRACTIONS OF *SABICEA BREVIPES* WERNHAM (RUBIACEAE)

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Abstract

Radical scavenging activity of the leaf extract of *Sabicea brevipes* was investigated using DPPH, Total Antioxidant Capacity (TAC) and Ferric Reducing Antioxidant Power (FRAP) models. Theleaveswere defatted, air dried and extracted with methanol. Purification of the extract was done using solvent-solvent partitioning and the aqueous portion was successively partitioned against *n*-hexane, ethyl acetate and *n*-butanol to obtain the solvent fractions. The estimated median lethal dose (LD_{50}) of the methanol extract was > 5000 mg/kg. The methanol extract exhibited the most significant amount of Total phenolics, flavonoids and tannins contents while ethyl acetate fraction had the least. The antioxidant results showed that the methanol extract and the fraction had the highest DPPH free radical scavenging ability (93.69 %) with (IC_{50}) of (0.601± 0.02 µg/mL) and TAC of (96.79 ± 0.31 mg (AAE/g) of extract) with IC_{50} (0.798± 0.01 µg/mL) than the ascorbic acid standard. Methanol extract and *n*-butanol fraction of *S. brevipes* had lower ferric reducing antioxidant power (187.325 ± 4.90 µmol Fe^{2+}/g of the extract) when compared to the standard. The DPPH and TAC values of the methanol extract and *n*-butanol fraction were significantly different at ($p< 0.05$) with the standard. Moreso the FRAP of the methanol extract and fraction were significantly different at ($p< 0.05$) with the Gallic acid standard. Our result provides evidence that the methanol extract and solvent fraction of *S. brevipes* is a potential source of lead for drugs used in the treatment of diseases caused by oxidative stress.

KEYWORDS:*Sabicea brevipes*, Antioxidant activity, 1,1-diphenyl-2-picryl hydrazyl, Total antioxidant capacity, Ferric reducing antioxidant power

Abstract: W1/2018/007

HEPATOPROTECTIVE EFFECT OF AQUEOUS-METHANOL EXTRACT OF*OCIMUM GRATISSIMUM* LEAVES ON CARBON TETRACHLORIDE (CCL4) INDUCED LIVER DAMAGE IN WISTER ALBINO RATS

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Abstract

The effect of aqueous-methanol leaf extract of ***Ocimum gratissimum*** was investigated in rat model of injured liver induced with carbon tetrachloride. Oral acute toxicity test showed that the crude extract was non toxic after 5000mg/kg body weight of the extract was administered. Phytochemical analysis revealed the presence of alkaloids, flavonoids, glycosides, carbohydrates, reducing sugar, terpenoids, phenolics, steroids, tannins and saponins. Hepatoprotective effect of the extract was established by pre-treating the test groups of rats respectively with standard drug (silymarin) and graded doses (200, 400 and 600) mg/kg body weight of the extract for seven days before the intraperitoneal administration of 0.5 ml/kg body weight of carbon tetrachloride in olive oil 1/1 on the eighth day. The activities of the serum aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP) and histopathology of the liver were assayed after 24 hours. The result showed that the liver marker enzymes: AST, ALT, ALP activities and hepatocyte degenerations were significantly reduced in the treated groups ($P<0.05$) when compared with the untreated. Theresults of the study indicated that ***Ocimum gratissimum*** might be an effective drug for patients with hepatopathy.

KEYWORDS: *Ocimum gratissimum,* phytochemistry, hepatoprotective, AST, ALT, ALP.

Abstract: W1/2018/008

ANTI-HYPERGLYCEMIC ACTIVITIES OF METHANOL RIPE FRUIT EXTRACT OF *DURANTA ERECTA* IN NORMOGLYCEMIC AND ALLOXAN-INDUCED HYPERGLYCEMIC RATS

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Abstract

This work evaluated the anti-hyperglycemic activities of methanol ripe fruit extract of *Duranta erecta* (MrFDE) in normoglycemic and hyperglycemic rats. Effects of MrFDE on the lipid profile of hyperglycemic rats were also evaluated. Oral glucose tolerance test (OGTT) and alloxan-induced hyperglycemia models were used to study the effect of MrFDE (100, 200 and 400 mg/kg orally). Reference drug was glibenclamide (2 mg/kg orally). Effect of sub-acute administration of MrFDE (25, 50 and 100 mg/kg) and glibenclamide (0.6 mg/kg) on the fasting blood sugar (FBS), OGT and lipid profile in hyperglycemic rats was studied for 21 days. In the OGTT, significantly ($p < 0.05$) lower blood sugar was observed in normoglycemic rats treated with MrFDE at the dose of 200 mg/kg from 30-120 min post-glucose administration compared with untreated and other MrFDE-treated groups and 30 – 60 min compared with glibenclamide. The highest dose of MrFDE (400 mg/kg) caused 67.7% reduction in blood sugar compared to 53.5% for glibenclamide at 6 h post-treatment in hyperglycemic rats. After 21 days of treatment MrFDE (25 mg/kg) caused 87.2% reduction in FBS compared to 72.5% for glibenclamide. Oral glucose tolerance of 62% was determined for MrFDE (100 mg/kg) as against 49.2% for glibenclamide. There was significant ($p < 0.05$) reduction in total cholesterol and low density lipoprotein (LDL) in hyperglycemic rats treated with MrFDE (100 mg/kg). Phytochemicals present were flavonoids, tannins, terpenes, glycosides, polyuronides and saponins. Our findings showed that MrFDEhas potent bioactive antihyperglycemic and antihyperlipidemic principles.

KEYWORDS: *Duranta erecta*, hyperglycemia, anti-hyperglycemia, diabetes, glucose tolerance.

Abstract: W1/2018/009

EVALUATION OF THE ANTI-ULCER ACTIVITY OF LEAF EXTRACT OF *CHROMOLAENA ODORATA* IN RODENTS

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Abstract

Peptic ulcer is a sore on the lining of the stomach or duodenum. Peptic ulcer disease is the most prevalent gastrointestinal disorder. The aim of this study is to evaluate *C. odorata* leaf extract for its antiulcer activity in rodents. The methanol/methylene chloride (1:1) leaf extract of *C. odorata* was assessed for anti-ulcer activity using indomethacin, absolute ethanol and hypothermic restraint stress induced ulcers in rats. Other anti-ulcer related activities of the extract such as the effects on gastrointestinal motility, and the activity on contractions evoked by standard agonists on isolated guinea pig ileum and rabbit jejunum were also investigated. Phytochemical analysis and lethality tests (LD_{50}) were carried out using standard methods.Pre-treatment with *C. odorata* (200 mg/kg/*p.o.* and 400 mg/kg/*p.o.*) significantly ($p<0.05$) decreased the ulcer indices in indomethacin and hypothermic restraint stress induced ulcer. Significant decrease ($p<0.01$) was also seenat 400 mg/kg/p.o. in absolute ethanol induced ulcer. The extract revealed a non-significant decrease in peristaltic activity in mice. Increasing concentrations of the extract produced spasmogenic effect on the isolated rabbit jejunum. On the isolated guinea pig ileum, the extract produced a dose-related inhibition of contractile responses to acetylcholine and histamine with IC_{50} of 2.26 and 5.88 mg/ml, respectively. Oral LD_{50} value greater than 5000 mg/kg was obtained indicating the safety of the plant for consumption. Phytochemical analysis showed the presence of tannins, alkaloids, saponins and flavonoids.The results suggest that extract of *C. odorata* possess anti-ulcer activity.

KEYWORDS: Anti-ulcer activity, *Chromolaena odorata*, ulcer indices, histamine, peptic ulcers

Abstract: W1/2018/010

CYTOTOXIC EFFECTS OF CRUDE EXTRACTS OF THE LEAF ANDSEED OF *MORINGA OLEIFERA* LAM

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Abstract

The cytotoxic effect of crude extracts of the leaf and seed of *Moringa oleifera* was studied usingAllium test. Different concentration solutions of the ethanolic extract leaf and seed of the plant were obtained respectively (50mg/l, 500mg/l, 1000mg/l of the leaf extract and 50mg/l, 500mg/l, 1000mg/l of the seed extract). *Allium sativum* bulbs were grown and these concentrations were used to treat them and the effect checked with respect to time. The result showed mitoclassic and chromatoclassic actions of the plant extracts. The two extracts were found to be mito-depressive in nature and their mito-depressive effects were found to increase with increase in concentration and duration of treatment. Induced abnormalities were observed which included spindle breakages, chromosome contraction, mild and sticky metaphase, star anaphase as well as disturbed prophase. It was also observed that the rate of inhibition of mitosis caused by the seed extract was greater than that of the leaf. In this study *M. oleifera* was proved to be cytotoxic and conclusion was made that since the cytotoxicity of the extracts increases with increased concentration of the plant, and time when an overdose or high concentration of the plant is taken over a long period of time it might result to severe consequences for an organism including man. More researches are needed to arrive at safety dosage for the "miracle plants".

KEYWORDS: Cytotoxicity, Moringa, Mitoclassic, Chromoclassic, Mito-depressive

Abstract: W1/2018/011

EVALUATION OF ANTI-DIARRHOEAL PROPERTIES OF *COSTUS AFER* STEM IN MALE ALBINO RATS

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Abstract

The study investigated the antidiarrhoeal properties of *Costus afer* stem on castor oil induced diarrhea in male albino rats. The antidiarrhoea property was investigated by evaluating the effects of extract on normal defecation, gastrointestinal motility and enteropooling of the test animals. Male albino rats (24) weighing 100-140 g were used for the study. The animals were randomly divided into six groups, with each group containing four (4) albino rats. Group 1 served as the normal control; group 2 received normal saline while group 3 received loperamide (2 mg/kg); groups 4, 5 and 6 received the graded doses of the extract (200, 400 and 600 mg/kg b.w). The result of effect of extract on normal defecation revealed that the groups that received 200 mg/kg b.w extract and loperamide inhibited defecation compared to the groups that received 400 and 600 mg/kg b.w extracts with 2.33 ± 1.53 and 3.67 ±1.36 feacal droppings respectively. There was a significant ($p<0.05$) increase in percentage inhibition of propulsion (35.16%) in the group that received 200 mg/kg b.w extract compared to the groups that received 400 and 600 mg/kg b.w extracts (33.32 and 32.17 respectively). There was a significant ($p<0.05$) increase in percentage inhibition of enteropooling in the group that received 200 mg/kg b.w extract compared to the groups that received 400 and 600 mg/kg b.w respectively. The study showed that *Costus afer* stem possesses anti-diarrhoeal properties at lower doses.

KEYWORDS: Diarrhea, *costus afer*, castor oil, gastrointestinal motility, enteropooling

Abstract: W1/2018/012

EVALUATION OF THE ANALGESIC PROPERTIES OF THE FLAVONOID FRACTION OF *EUGENIA UNIFLORA* RIPE FRUIT PULP

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Abstract
This present study was carried out to determine the phytochemical constituents and analgesic activities of the flavonoid fraction from the ripe fruit pulp of *Eugenia uniflora*. Flavonoid was extracted using solvent-solvent extraction technique. The acute toxicity study (LD_{50}) of the flavonoid fraction was determined according the method of Lorke (1983). The analgesic study was carried out in mice usingacetic acid-induced writhing and tail immersion test. The dose 50 mg/kg body weight of the flavonoid fraction was administered orally by cannula. The activity was compared with a standard reference drug 10 mg/kg diclofenac and normal control. The different phytoconstituents in the fruit pulp are the alkaloids (75.20 mg/g), flavonoids (280.74 mg/g), glycosides (6.79 mg/g), reducing sugar (315.36 mg/g), tannins (28.70 mg/g), terpenoids (61.30 mg/g), saponins (2.55 mg/g) and steroids (2.06 mg/g). Flavonoid is one of the most active compounds of *E. uniflora* and polyphenolic compound have been found to have many biological and pharmacological activities.The result of the LD_{50} of the flavonoid fraction of *E. uniflora* fruit pulp produces no mortality after 48 hours observation period even at the dose of 5000 mg/kg. The fraction and the standard drug significantly lowered ($p > 0.05$) the total number of writhes induced by acetic acid. The percentage inhibition decreased from 0% in the normal control to 57.78% at 50 mg/kg of the fraction. The fraction significantly increased ($p < 0.05$) the pain reaction time (PRT) induced by tail immersion test compared to the standard drug and control groups.The results suggest that *Eugenia uniflora* fruit pulp possesses effective analgesic activity mediated via peripheral and central mechanism.

KEYWORDS: *Eugenia uniflora*, phytochemicals, flavonoids fraction, analgesic and pain

Abstract: W/12018/013

EVALUATION OF THE ANTI-INFLAMMATORY ACTIVITY OF THE *COMMELINAASCENDENS* J.K MORTON (COMMELINACEAE) AERIAL PART EXTRACT

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Abstract

To evaluate the anti-inflammatory effect of *Commelinaascendens* using experimentally induced inflammatory models (paw edema and cotton pellet induced granuloma) in rats.Oedema was induced on the rat hind paw by the injection of 0.1mL of undiluted fresh egg albumin (phlogistic agent) into the subplantar surface of the right rat paw. Oedema was assessed in terms of volume of distilled water displaced by the paw. Tissue granuloma was induced in the rats by the subcutaneous implantation of two sterile cotton pellet (20 mg each) in both axillae region of anaesthetised rats. *Commelina ascendens* extract was orally administered to the rats for seven consecutive days. On day 8, the animals were sacrificed and the pellets surrounded by granuloma tissue were dissected out, dried and weighed. Phytochemical screening and acute toxicity test were carried out using standard procedures. Extract of *Commelina ascendens* significantly (p <0.05) reduced the fresh egg albumin-induced rat paw oedema. The extract at 400mg/kg significantly (p <0.05) reduced the granuloma tissue formation in the treated groups when compared to the control. The extract was safe up to a dose of 5000 mg/kg and did not cause any mortality in rats, thus an indication of high safety profile. Phytochemical analysis showed the presence of tannins, saponins, glycosides, carbohydrates, proteins, alkaloids, steroids and flavonoids. This study shows that the *Commelinaascendens* possess anti-inflammatory activity.

KEYWORDS: *Commelinaascendens, e*gg albumin, cotton pellets, edema, granuloma

Abstract: W1/2018/014

*IN-VIVO*ANTI-PLASMODIAL ACTIVITIES OF METHANOL LEAF EXTRACT AND FRACTIONS OF *PHYLLANTHUS MUELLERIANUS*IN *PLASMODIUM BERGHEI* INFECTED MICE

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Abstract

Malaria is a life-threatening disease caused by parasites that are transmitted to people through bites of infected female *Anopheles* mosquitoes. The disease is more prevalent in the African continent with the region recording 91% of malaria deaths in 2016 alone. The disease therefore constitutes a huge economic burden to these low-income and middle-income countries. The rapid spread of drug resistance by the parasites to commonly existing antimalarials makes the need for a search of new agents imperative. Majority of people in Africa still rely on medicinal plants for their health needs because of side effects, inaccessibility and high cost of conventional antimalarials. *Phyllanthus muellerianus* is a monoecious plant found in all the tropical regions of the earth. Various parts of this plant is used folklorically in the treatment of fever and pain among other ailments. Decision was therefore taken to screen powdered dried leaves of the plant extracted with methanol (ME) for antimalarial activity in *Plasmodium berghei*-infected mice. The ethylacetate fraction (EF) of the extract was also screened accordingly. The ME and EF at all dose levels, significantly ($p< 0.001$) cleared the parasite load better than artesunate with ME having slightly higher activity than EF in curative model. In suppressive treatment, only 200 mg/kg caused significant ($P< 0.05$) suppression of parasitemia while in prophylactic treatment, both the treatment and standard groups elicited no significant protection. The LD_{50} was found to be greater than 5g/kg. The extract and fractions tested positive for alkaloids, flavonoids, glycosides, saponins, steroids, tannins and terpenoids. The results therefore justify the folkloric use of this plant in the treatment of malaria. It is however, not suitable for prophylaxis against malaria.

KEYWORDS: Antiplasmodial effect, *Phyllanthus muellerianus*; *Plasmodium berghei*

Abstract: W1/2018/015

ANTIOXIDANT AND ANTI-INFLAMMATORY EFFECT OF *CEIBA PENTANDRA* (L) GAERTNER (MALVACEAE) METHANOL BARK EXTRACT ON ACETIC ACID-INDUCED ACUTE COLITIS IN RATS

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Abstract

The available drugs for the treatment of Ulcerative colitis (UC) have proven to be beneficial, but are too expensive and prone to severe adverse effects. There is need to search for cheaper, effective and less toxic agents. Thus, the aim of this study is to evaluate the anti-inflammatory effect of *Ceiba pentandra* (L) Gaertner (Malvaceae) methanol extract on acetic acid- induced acute colitis in rats identified from a previous ethnobotanical study.*Ceiba pentandra* stem-bark methanol extract (50 – 400 mg/kg) and 2 mg/kg of prednisolone (standard drug) was orally administered 48, 24 and 1 hour prior to the induction of colitis and continued for 7 consecutive days. Changes in body weight, water intake, and stool consistency were scored daily for each animal. The colonic damage was assessed macroscopically, histologically and biochemically. Level of pro-inflammatory cytokine including Tumor Necrosis Factor-alpha (TNF-α) was estimated. Acetic acid untreated, 50 mg/kg and 100 mg/kg treated dose group were characterized by increased colonic wall thickness, oedema, diffused inflammatory cell-infiltration, decreased glutathione (GSH), decreased Superoxide-Dismutase (SOD), increased Myloperoxidase (MPO) activities and TNF-alpha levels. On the contrary, 200 and 400 mg/kg treatment significantly ($p<0.05$) reduced the macroscopic inflammation scores and morphological alterations associated with an increase in the mucus secretion. Similarly, the degree of neutrophil infiltration and the cytokine level (TNF-α) were significantly ameliorated. We have shown that the *C. pentandra* extract exert marked protective effects in acute experimental colitis and therefore might be useful in the treatment of Inflammatory bowel diseases (IBD).

KEYWORDS: Colitis, Inflammatory, Chronic, Macroscopically, Biochemically.

Abstract: W1/2018/016

EFFECT OF METHANOL EXTRACT OF *PROSOPIS AFRICANA* FERMENTED SEED ON PARACETAMOL-INDUCED LIVER DAMAGE IN WISTAR ALBINO RATS

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Abstract

Liver is a metabolically active organ responsible for biotransformation and clearance of xenobiotics from the body. It is an important target of drugs that may initiate liver cell damage. Fermented *Prosopis africana* seeds commonly known as 'okpehe' are popularly used as food seasoning in Nigeria. This study investigates the possible hepato-protective and ameliorative effects of methanol extract of fermented seeds of *Prosopis africana* on paracetamol-induced liver damage in rats. Folch's method for lipid extraction was used for this study. 32 male albino rats weighing 120-180g were randomly divided into 8 groups of 4 rats each. Groups 1 and 2 served as normal and positive control respectively. Groups 3 and 4 received 100 and 400mg/kg of extract respectively. Groups 5 and 6 received 100 and 400mg/kg of extract + paracetamol respectively. Groups 7 and 8 received paracetamol + 100 and 400mg/kg of extract respectively. *Prosopis africana* contained flavonoid (0.077±0.006mg/100g), cyanogenic glycosides (4.394±0.003 mg/100g), alkaloids (3.341±0.004 mg/100g), steroids (1.645±0.002 mg/100g), saponins(1.137±0.002 mg/100g) and tannins (5.445±0.005 mg/100g). Serum ALP, AST and ALT activities significantly ($p<0.05$) decreased in all the test groups compared to positive control. Incorporation of the fermented seed of *Prosopis africana* in the human diet may protect against liver damage. The extract could also say to have potential therapeutic value in the treatment of some liver disorders.

KEYWORDS:*Prosopis african*, Phytochemistry, Liver, Paracetamol, Toxicity.

Abstract: W1/2018/017

ETHNOBOTANICAL SURVEY OF PLANTS USED FOR TREATMENT OF INFECTIONS AND INFLAMATION BY PEOPLE IN NSUKKA LGA OF ENUGU STATE, EASTERN NIGERIA

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Abstract

Microbial infection has been a health problem that has attracted international attention for many years past, especially with the appearance of microbial strains resistant to conventional antimicrobial agents. The aim of this work is to identify plants used in Nsukka LGA of Enugu state, Nigeria for the treatment of microbial infections and inflammations, investigate if they have similar use in other parts of the world, and search for reports of any laboratory investigations of their antimicrobial activities. An ethno-botanical survey on the medicinal plants used in treating infections by traditional healers in the study area was conducted using structured and semi-structured interviews. Available literature including online resources was searched for similar use of cited plants in other places, and check if there has been any scientific investigation of their antimicrobial and anti-inflammatory activities. Ethno-botanical indices were applied to analyze the information gathered. The result of this investigation showed that there are a number of plants with antimicrobial and anti-inflammatory activities in the area surveyed. There are 55 plant species belonging to 37 families being used in the treatment of microbial infections and inflammation in the area. A 55.0 % of

the plants are cultivated and 81.0 % are readily available. Majority of the plants are trees, accounting for 54.0 % followed by shrub (21.0 %). The major families are Fabaceae (10), Asteraceae (4) and 2 of each of the following; Anacardaceae, Liliaceae, Verbenaceae, Apocyanaceae, Euphorbiaceae and Poaceae. The most cited plants for treatment of inflammation were *Elaeis guineensis, Acanthus montanus and Pentaclenptra macrophylla* with 4.35 % occurrence of each. Among the plants used for treatment of microbial infections, *Buccholzia coriacea, Cymbopogon citrates, Psidium guajava, Carica papaya, Ocimum gratissimum, Vernonia amygdalina* and *Prosopis biglobosa* has the highest Frequency of citation (2.9 % each). Leaves are the most frequently used parts (40.0 %), followed by roots (22.0 %). Water is the most commonly used solvent, while infusion is the most common method of preparation employed. The use of these plants as antimicrobial and anti-inflammatory agents is neither chance nor an isolated case restricted to Eastern Nigeria. They have the same use in some other parts of the world and the microbial activities of some have been demonstrated by laboratory evaluations.

Abstract: W1/2018/018

EFFECTS OF N-HEXANE FRACTION OF *Gongronema latifolium* ON SOME BIOCHEMICAL PARAMETERS IN ALLOXAN-INDUCED DIABETIC ALBINO WISTAR RATS

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Abstract

Diabetes mellitus has been known to be associated with hyperglycaemia, lipid disorders and cardiovascular complications. This work was undertaken to ascertain the effects of the N-hexane fraction of the leaves of *Gongronemalatifolium* as an anti-diabetic agent using standard methods. Diabetes was inducedusing alloxan and the animals were administered 300mg/kg and 400mg/kg of the fraction. The results indicated a significant increase ($p<0.05$) in the body weight of animals that were administered 300mg/kg and 400mg/kg of the fraction.The blood glucose resultsshowed a significant decrease ($p<0.05$) in the fraction treated animals. Lipid profile indicated a significant increase ($p<0.05$) in HDL-C these animals. TG, TC, LDL and VLDL showed a significant decrease ($p<0.05$) in the fraction treated animals. The results of this study suggest that the N-hexane fraction of *Gongronemalatifolium* possesses hypoglycaemic and hypolipidaemic effects and seems to weaken the haematopoietic system.

Key words: Diabetes mellitus, *Gongronemalatifolium*, alloxan,hypoglycaemic, hypolipidaemic

Abstract: W1/2018/019

ACTIVITIES OF THE METHANOL FRACTIONS OF *Lophira lanceolata* TIEGH (OCHNACEAE) ON *Plasmodium berghei* IN RODENTS

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Abstract

The emergence of drug resistant malaria parasites as well as cost limitations, side effects and limited potency of existing synthetic drugs has necessitated the urgent need for the development of novel antimalaria drug entities. Accordingly, this study evaluated the antiplasmodial activities of the methanol fractions of *Lophira lanceolata* Teigh (Ochnaceae). The *in vivo* antimalarial screening was carried out according to standard procedures, using suppressive (early infection), curative (Established infection) and prophylactic (Residual infection) methods in *Plasmodium berghei*-infected mice. The methanol fraction of plant material was extracted sequentially by column chromatography using n-hexane, ethyl acetate and methanol. The result shows that the 400 mg/kg dose of the n-hexane fractionexhibited a dose dependent significant ($P<0.05$) inhibition in established, early and residual infections (84.68 %, 16.14 %, 74.76 %) respectively. The methanol fraction (MF) at 400 mg/kg showed a significant ($p<0.05$) inhibition of parasitaemia on the residual infection (69.7 %) and established infection (75.7%) comparable to artesunate 5 mg/kg (67.7 %, 93.0%) respectively. Suppression of parasitaemia was not shown with MF at early infection. The ethyl acetate fraction (EF) showed a highly significant decrease in parasitaemia across the models used with its activity been higher than that shown by Artesunate. EF at 400mg/kg dose exhibited a dose dependent significant ($P<0.05$) suppression in established infection (92.8 %), early infection (82.0%) and residual infection (95.0%) comparable with the standard, artesunate 5mg/kg (91.5%, 79.0% and 68.0%) respectively.This study suggests that the methanol fractions of *L. lanceolata* possess promising antimalaria activity as earlier established.

KEYWORDS: Antimalarial activity; *Lophira lanceolata* Teigh (Ochnaceae); Malaria; *Plasmodium berghei*

Abstract: W1/2018/020

SUB-ACUTE TOXICITY INVESTIGATIONS OF METHANOL LEAF EXTRACT OF *LOPHIRA LANCEOLATA* (*OCHNACEAE*) ON ALBINO RATS

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Abstract

Modern medicine makes use of many plant-derived compounds as the basis for pharmaceutical products and phytotherapy works to apply modern standards of effectiveness testing to these medicines. Toxicological profiling is therefore a crucial component of plant product evaluation. The present investigation was aimed to evaluate the potential sub-acute toxicity and haematological effects of the methanol leaf extract of *Lophira lanceolata*. *L. lanceolata* is widely used in Nigeria and other countries in the traditional treatment of many ailments. However, there is little toxicological information regarding safety following repeated exposure. Fresh leaves were collected, dried, ground and extracted by maceration in 70 % methanol for 72 hrs with constant agitation to yield 108.81g of extract. The oral LD_{50} testing was evaluated at 5,000mg/kg. In the Sub-acute toxicity studies, four groups of five rats each (100-150g) were orally administered extract of *L. Lanceolata* at doses of 10, 100, 400 and 1000 mg/kg for 14 days. Blood samples were collected through the retro-bulbar route after fourteen (14) days and subjected to haematological and liver function tests. Results showed no marked toxicity. Serum alanine aminotransferase (ALT), alkaline phosphatase (ALP) and aspartate aminotransferase (AST) revealed no significant effects. Haematological indices showed a non-dose dependent increase in lymphocytes and total white blood cell counts. Organ weight examination suggested no increase, when compared with the control, even at doses as high as 1000mg/kg. There was no death. The study showed that the methanol leaf extract of *Lophira lanceolata*, a plant with diverse potentials is not toxic.

KEYWORDS: Sub-acute Toxicity, *Lophira lanceolata,*Alanine aminotransferase, Aspartate aminotransferase, Alkaline phosphatase.

Abstract: W1/2018/021

PHYTOCHEMICAL ANALYSIS AND EVALUATION OF INVIVO ANTIMALARIA ACTIVITY OF METHANOL LEAF EXTRACT OF *PENNISETUM PURPUREUM* AGAINST *PLASMODIUM BERGHEI* IN MICE

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Abstract

The present study sought to investigate the phytochemical and antimalaria effect of methanol leaf extract of *Pennisetum purpureum* on *Plasmodium berghei*infected mice invivo. The methanol leaf extract of *P. purpureum* were prepared by exhaustive cold maceration. Thirty mice were randomly selected into six groups of five animals each. Groups 1, 2 and 3 were pretreated with 100mg/kg, 200mg/kg and 400mg/kg crude extract of *P. purpureum* respectively, group 4 were pretreated with 7mg/kg of the standard drug arthemeter/lumefantrine, group 5 were uninfected and untreated and group 6 which served as the control were infected and administered only dimethlysulfoxide. Drugs were administered once daily for three consecutive days after intraperotonial transfection of mice with an inoculum size of 1×10^6 of *P. berghei.* Blood was withdrawn from animals for the quantification of packed cell volume, hemoglobin concentration, white blood cell and parasitemia. *P. purpureum* methanol extract treatment caused significant ($P<0.001$) dose dependent suppressive activity and decreased parasitemia when compared with the infected untreated mice. The crude extract significantly ($P<0.01$ and $P<0.001$) restore the hematological parameters to a near normal state. . The phytochemical analysis revealed the presence of alkaloids, flavonoid, saponins, tannins, glycoside, terpenoids, steroids, soluble carbohydrate, reducing sugars, carotenoids and phenols. It can be concluded that *P. purpureum* could be harnessed as a source of antimalarial agent and justifies the folkloric use of the plant in treatment of malaria.

KEYWORDS:*Pennisetum purpureum,* parasitemia, Phytochemical analysis, Antimalarial effect, *Plasmodium berghei***.**

Abstract: W1/2018/022

PHYTOCHEMICAL ANALYSIS AND EVALUATION OF THE INVIVO ANTIMALARIAL ACTIVITY OF METHANOLIC LEAF EXTRACT OF *PERSEA AMERICANA* AGAINST *PLASMODIUM BERGHEI* IN MICE.

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Abstract

The study evaluated the antimalarial activity of methanol leaf extract of *Persea americana* and its amelioration of plasmodium-induced changes in haematological indices and parasite count. Haematological indices which are packed cell volume, total white blood cell count, haemoglobin concentration and parasitemia level was carried out. A total of thirty mice consist of six groups was used for the study. Groups 1, 2, 3 (malaria-infected mice) were treated orally with 100, 200, and 400mg/kg body weight of *P. americana* methanol leaf extract respectively, Group 4 was infected and treated with arthemether/ lumefantrine (positive control) at a dose of 7mg/kg, group 5 was uninfected and treated with vehicle only while group 6 (negative control) was infected and left untreated. Phytochemical analysis was done using standard operating procedures. Infection with *P. berghi* increased percentage parasitemia and white blood cell count but reduced packed cell volume and haemoglobin concentration. Phytochemical analysis revealed the presence of alkaloids, flavonoids, saponin, terpenoid, tannins, soluble carbohydrates, reducing sugar, phenol, glycoside and steroids. Treatment with the methanol leaf extract and positive control significantly ($P< 0.05$) increased the packed cell volume, haemoglobin concentration and reduction in malaria parasitemia in a dose dependent manner. The extract also restored haemotological changes produced by malaria infection in groups 1, 2, 3, 4, and 5 when compared to group 6. Findings from this study suggest that the extract could be harnessed as a source of antimalarial agent and justifies the folkloric use of *P. americana* .

KEYWORDS:*Persea americana*, Parasitemia, Antimalaria, Phytochemical analysis.

Abstract: W1/2018/023

HAEMATOLOGICAL PROFILE OF ALBINO RATS INFECTED WITH *TRYPANOSOMA BRUCEI BRUCEI FOLLOWING* THE ADMINISTRATION OF AQUEOUS LEAF EXTRACTS OF AFRICAN MISTLETOE, *LORANTHUS MICRANTHUS* LINN. (*LORANTHACEAE*)

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Abstracts

Effects of aqueous leaf extracts of *Loranthus micranthus* on haematological parameters of albino rats infected with *Trypanosoma brucei brucei* were investigated for 28days. Seventy-two (72) adult-male albino rats were randomly divided into six groups (A-F) comprising of three replicates of four (4) rats per group. Blood samples were collected on weekly basis for haematological indices using standard methods. The HB, PCV, RBC and its indices (MCH, MCV and MCHC) of the infected rats significantly decreased ($P < 0.05$) at various dose levels of the extractswhen compared with the control groups. The WBC counts of the treatment groups and those of the negative control group showed significant increases ($P < 0.05$) in all the weeks when compared with the normal control. The WBC differentials revealed that neutrophils were significantly higher ($P < 0.05$) in the test group in comparison with the positive control group at week 3, however lymphocytes, eosinophils, basophils were not significantly different ($P > 0.05$) from the positive control in week 3. Furthermore, minimal increases in the WBC differentials were observed in the group administered 800mg/kg of the plant extract. Data generated in the present study showed that all test rats as well as the negative control group died from the resultant overwhelming parasitaemia at week 4 unlike the case of those administered the standard drug. This is an indication that the extract lacks anti-tryopanocidal activity. Thus, the aqueous leaf extract of *Loranthus micranthus* inhabiting the host plant (*Kola acuminate)* is an inadequate anti-trypanosomal agent.

Key words: Parasitaemia, Trypanosomiasis, Haematological profile, aqueous leaf extracts, *Loranthus micranthus*

Abstract: W1/2018/024

PHARMACOGNOSTIC STUDIES AND ANTIDIABETIC EFFECTS OF LEAVES OF *VITELLARIA PARADOXA* C.F GAERTN (SAPOTACEAE)

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Abstract

This research was aimed at evaluating the antidiabetic effects of the methanol extract of leaves of *Vitellaria paradoxa* in alloxan-induced diabetic rats and also to establish the pharmacognostic standards of the leaves of *Vitellaria paradoxa* for proper and easy identification. Phytochemical analysis and quality control standards were carried out using standard methods. Diabetes mellitus was induced in rats by single intraperitoneal injection of alloxan monohydrate (140 mg/kg). The extracts at doses of 200, 400 and 800 mg/kg exhibited a significant dose-dependent reduction of 38.5, 40.9 and 59.6 % respectively of the blood sugar level in hyperglycemic rats on the seventh day; 28.1, 34.1 and 58.2 % respectively in normoglycemic rats. The results of the microscopic analysis revealed the presence of unicellular non glandular trichome, upper epidermal cells with no stomata, epidermal cells with numerous paracytic stomata, phloem parenchyma cells, anular xylems with phloem cells, calcium oxalate. The analytical standards were as follows: total ash (8.55 %), acid insoluble ash (2.61 %), water soluble ash (5.92 %), sulphated ash (7.77 %), water soluble extractive (11.86 %), alcohol soluble extractive (5.46 %) and moisture content (6.42 %). In conclusion, the study shows that the methanol extract of leaves of *Vitellaria paradoxa* possesses antidiabetic properties on alloxan- induced diabetic rats. The data obtained from the pharmacognostic study can be used in the standardization of the leaf of *Vitellaria paradoxa* and for the preparation of its monograph for inclusion in the Pharmacopoeia.

Keywords:*Vitellaria paradoxa,* Pharmcognostic studies, Phytochemical analysis, Diabetes, Sapotaceae

Abstract: W1/2018/025

ANTIMICROBIAL AND PHYTOCHEMICAL PROPERTIES OF *Terminalia avicennioides*

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Abstract

The anti-microbial and phytochemical properties of *Terminalia avicennioides* (Combretaceae) were studied. The crude (95%) aqueous methanol extract of leaves, stem bark and root of *T. avicennioides* were prepared by exhaustive cold maceration of the powdered dried parts. The standard solutions 10mg/ml of the crude extracts and the positive control were carefully prepared in dimethlysulfoxide. The antimicrobial activity (IZDs) of leaves, stem bark and root was determined by the agar well diffusion method against the clinical strains of *Escherichia coli, Salmonella typhi, Klebsiella pneumonia, Shigella dysentery, Streptococcus pyrogens, Staphlococcus aureus, Candida albicans* and *Aspergillus niger*, using benzyl penicillin, ciprofloxacin, clotrimazole and chloramphenicol as positive controls. The most active crude extract of *T. avicennioides* was the stem bark and this was fractionated using n-hexane, ethylacetate, absolute methanol, water. Phytochemical analysis was done using standard operating procedures. Fractions of *T. avicennioides* stem bark(SB) which are n-hexane soluble of SB, ethylacetate soluble of SB, absolute methanol soluble of SB and water insoluble of SB were screened for antimicrobial activity using the same clinical strains of microorganism and method. The antimicrobial constituents of *T. Avicennioides*(SB) located mainly in the ethylacetate soluble fraction with the highest(IZD=28mm), n-hexane(IZD=13mm), absolutemethanol (IZD= 17mm), water insoluble(IZD=18mm). The phytochemical analysis carried out on the various fractions of *T. avicennioides* revealed the presence of tannins, saponins, alkaloids, glycosides, terpenes. However tannins and alkaloids were present in greater abundance. These activities justify the ethno medicinal and pharmacological uses of the plant *T. avicennioides*

KEYWORDS: Phytochemical analysis, Antimicrobial screening, Ethlylacetate soluble fractions, *Terminalia avicennioides*

Abstract: W1/2018/026

PHARMACOGNOSTIC STANDARDIZATION AND LARVICIDAL ACTIVITY OF N-HEXANE AND ETHYL ACETATE LEAVES OF HYPTIS SUAVEOLENS POIT (LAMIACEAE)

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Abstract

The rate of development of resistance to drugs used in the treatment of malaria is on the increase. Thus emphasis is being laid on the use of alternative vector control methods that are target-specific, biodegradable, environmentally friendly and readily available. In a bid to achieve this, a lot of phytochemical extracts are being tested for their biopesticidal activities at different points in the life cycle of mosquitoes. Study Objective: To study the larvicidal activity of n-Hexane and Ethyl acetate extracts of the leaves of Hyptis Suaveolens using the 4th instar larvae of Anopheles gambiae, and to carry out the phytochemical analysis of the extracts.: n-Hexane and Ethyl acetate extracts of Hyptis Suaveolens were analyzed for their phytoconstituents. The doses of 60-3600 ppm of both extracts were used on ten fourth Instar larvae per 250 ml of water over 72 hours. Phytochemistry shows that both extracts contain all the tested phytoconstituents except oil that was absent in n-Hexane extract. Ethyl acetate caused 100% larvae death in 24hrs at 1200 ppm dose. Conclusion: Ethyl acetate extract has more potent larvicidal activity against Anopheles gambiae. The leaves of Hyptis Suaveolens could be a good source of alternative biopesticide for mosquito larva.

Keywords: Hyptis Suaveolens, Anopheles gambiae, larvicidal, phytochemical

Abstract: W1/2018/027

PHENOLIC ACIDS AND FLAVONOID GLYCOSIDES FROM THE BUTANOL FRACTION OF *VITEX DONIANA* FRUIT EXTRACT MAY BE RESPONSIBLE FOR THE OBSERVED ANTIOXIDANT ACTIVITY

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Abstract

Plant secondary metabolites such as flavonoids are widely known for their biological activities which include antioxidant activity. The aim of this work is to screen for the antioxidant property of the fruit of *Vitexdoniana* and identify the bioactive compounds present in the plant. Methanol extract of the fruit of *Vitex doniana* was subjected to liquid-liquid fractionation. The butanol fraction obtained was subjected to vacuum liquid chromatography using binary combinations of Dichloromethane: Methanol to obtain fractions F1-F6 which were further subjected to HPLC-DAD analysis. Fractions F2-F5 were screened for antioxidant property *in vitro* using DPPH scavenging assay, Ferric-Reducing Antioxidant Power (FRAP) assay both at concentrations ranging from 7.81 to 500 µg/ml. The Total Phenolic Content was also determined. Using HPLC-DAD analysis, gallic acid derivatives, catechin derivatives, luteolin glycoside, apigenin glycoside, and benzoic acid derivatives were found to be the major bioactive compounds. The plant showed good antioxidant activity with the different methods. Fraction F2 showed the highest antioxidant activity in each of the methods while the least activity was shown by F5. This correlates with their total phenolic content and the nature of the constituents. The higher the phenolic content, the better the antioxidant activity and conversely. *Vitex doniana* has significant antioxidant activity. The result of HPLC-DAD analysis indicated the presence of gallic acid derivatives, catechin derivatives, luteolin glycoside, apigenin glycoside, and benzoic acid derivatives as the major bioactive compounds which may account for the observed antioxidant activity especially in fraction F2.

Key words: *Vitex doniana*, Phenolic acids, Flavonoid glycosides, Antioxidant activity, HPLC-DAD

Abstract: W1/2018/028

EVALUATION OF IMMUNOMODULATORY PROPERTIES OF *DESMODIUM RAMOSSISIMUM* LEAF

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Abstract

The study was carried out to investigate the immunomodulatory properties of *Desmdium ramossisimum* leaf. A known weight, (2.2kg) of the dried leaf powder was macerated in chloroform and ethanol mixture at the ratio of 2:1 for 48 hours. The filtrate was further separated into chloroform and ethanol fractions by adding 20% distilled water. The final mixture was shaken and suspended in a separating funnel. The immunomodulatory properties of the leaf extracts were investigated by evaluating the effect of extracts on delayed type hypersensitivity response induced using sheep red blood cell (SRBC) as antigen. The vehicles, levamisole and the graded doses of extracts were administered to the animals three days prior to sensitization of the test animals by subcutaneous injection of 0.1 ml (1×10^9) SRBC in the plantar region of the right hind foot paw on the third day. The administration of SRBC was repeated on day 5. The change in the hind foot paw was determined. The results of the effects of extracts and standard drug on delayed hypersensitivity showed that there was a non-significant ($p>0.05$) increase in paw size diameter when the groups that received levamisole and graded doses of the extracts were compared to the normal control. Also, the results of effect of extracts on leucocyte mobilization showed a non significant ($p>0.05$) decrease as the doses of the extracts increase from 100 to 200 mg/kg b.w. The results of the study showed that the leaf extracts possess immunomodulatory properties with significant effect comparable to levamisole.

Key words: *Desmodium ramossisimum*, levamisole, delayed type hypersensitivity, immunomodulatory properties, leucocyte mobilization

Abstract: W1/2018/029

EVALUATION OF ANTI-DIARRHOEAL PROPERTIES OF *COSTUS AFER* STEM IN MALE ALBINO RATS

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Abstract
The antidiarrhoea property of *Costus afer* stem was investigated by evaluating the effect of extract on normal defecation, gastrointestinal motility and enteropooling of the test animals. The animals were randomly divided into six groups, with each group containing four (4) albino rats. Group 1 served as the normal control; group 2 received normal saline while group 3 received loperamide (2 mg/kg); groups 4, 5 and 6 received the graded doses of the extract (200, 400 and 600 mg/kg b.w). The result of the extract on normal defecation revealed that the groups that received 200 mg/kg b.w extract and loperamide inhibited defecation compared to the groups that received 400 and 600 mg/kg b.w extracts with 2.33 ± 1.53 and 3.67 ±1.36 feacal droppings respectively. There was a significant ($p<0.05$) increase in percentage inhibition of propulsion (35.16%) in the group that received 200 mg/kg b.w extract compared to the groups that received 400 and 600 mg/kg b.w extracts (33.32 and 32.17 respectively). There was a significant ($p<0.05$) increase in percentage inhibition of enteropooling in the group that received 200 mg/kg b.w extract compared to the groups that received 400 and 600 mg/kg b.w respectively. The study showed that *Costus afer* stem possesses anti-diarrhoeal properties at lower doses.

Keywords: Diarrhea, *costus afer*, castor oil, gastrointestinal motility, enteropooling

Abstract: W1/2018/030

THE ANTIMALARIALACTIVITY OF *COMBRETUM NIGRICANS* CRUDE LEAF EXTRACT IN MICE

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Abstract

About 40% of the world's population is currently at risk of being infected with malaria.Africa accounts for most of the global malaria cases, and mortality. *Combretum nigricans* (Combretaceae) is a small, smooth bark tree used in traditional medicine for the treatment of prurigo, dysentery, fever and other symptoms of acute malaria in North-Central Nigeria. The aim of this study was to evaluate the antimalarial activity of *C. nigricans* crude leaf extract against *Plasmodium berghei* in mice. The Peters' 4-day suppressive test against early malaria infection and Rane's curative test against established malaria were employed for the assessment of its antimalarial activity. All doses of *C. nigricans* crude leaf extract employed for the study (200 – 800 mg/kg b.w. p.o.) gave significant (P<0.05) chemosuppressive effect against *P. berghei*, this effect was observed to be dose-related; while the 400 mg/kg extract dose gave the highest curative effect. Compared to control, the extract also prolonged the mean survival time at all doses, and as well prevented the characteristic decrease in body temperature elicited by *P. berghei* in mice. The LD_{50} of the extract was >5000 mg/kg b.w. p.o. in mice. The result from the study indicates that *C. nigicans* crude leaf extract possesses significant antimalarial activity, and this may serve as a scientific justification for its application in ethnomedicine as an antimalarial agent.

Keywords: *Combretum nigricans*,Antimalarial, *Plasmodium berghei*

Abstract: W1/2018/031

GC-MS ANALYSIS AND LARVICIDAL ACTIVITIES OF *CLERODENDRUM POLYCEPHALUM* BAKER

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Abstract

The study was conducted to determine the larvicidal activity of *Clerodendrum polycephalum* and also find out the chemical compounds of the active fraction using GC-MS. Therefore, the leaves of *Clerodendrum polycephalum* were collected and extracted with methanol and concentrated to dryness using rotary evaporator. The methanol extract of *C. polycephalum* was tested for larvicidal activities against three species of mosquitoes viz *Anopheles gambiae, Aedes aegypti* and *Culex quinquefasciatus*. The extract was separated, using Vacuum Liquid Chromatography, into dichloromethane, n-hexane, ethyl acetate and ethanol fractions which gave 0.0, 5.0, 0.0 and 77.5 % larval mortalities respectively at 1000ppm. The ethanol fraction was subjected to column chromatography and yielded eight different fractions based on their Thin Layer Chromatography characteristics. The sub-fraction that was UV-active was analysed with GC-MS machine. The machine identified 17 compounds out of which ethyl iso-allocholate was the most abundant compound (23.69%) while 2-Hydroxy-5-methylbenzaldehyde (7.5%) and 4-((1 E)-3-Hydroxy-1-propenyl)-2-methoxyphenol (6.07%) are prominent compounds. It was concluded that *C. polycephalum* is a medicinal plant with insecticidal potential which could be exploited in mosquito control.

Keywords:*Clerodendrum polycephalum,* extract, fractions, GC-MS, compounds.

Abstract: W1/2018/032

SCREENING FOR ANTIOXIDANT ACTIVITY OF THE SECONDARY METABOLITES PRESENT IN ETHYL ACETATE FRACTION OF *VITEX DONIANA*

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Abstract

Vitex doniana is widely usedin ethnomedicine for many therapeutic indications. In this study, we investigate the antioxidant activity of the fruit of *Vitex doniana* and identified some bioactive constituents The methanol leaf extract of the fruit of *Vitex doniana* was subjected to Liquid-liquid Fractionation and the ethyl acetate fraction further subjected to VLC using binary mixtures of n-Hexane:Ethyl Acetate and then Dichloromethane:Methanol to obtain fractions E1 to E11. The antioxidant activity of these fractions was investigated *in vitro* using DPPH scavenging assay and Total Phenolic content assay. The secondary metabolites present in this fraction were identified using HPLC-DAD analysis. The various VLC fractions showed good antioxidant activity with IC_{50} ranging from 2.28 to 290.90 µg/ml. Fractions E3, E4, E5 and E6 showed better activity with IC_{50} values of 2.28, 3.59, 4.55 and 22.65 µg/ml respectively compared with ascorbic acid (IC_{50} 40.03 µg/ml). The total phenolic contents of the various fractions were in the range of 104 to 809 mg Gallic Acid Equivalent/g (GAE/g) with samples E3, E4, E5, E6 and E7 giving the best values at 326, 602,744, 809 and 416 mg GAE/g. A positive correlation in the results obtained by the two assay methods was observed. HPLC-DAD analysis suggests the presence of isoflavones, cinnamic acid, caffeic acid derivatives, isoquercetin, orientin, vitexin and anthocyanins. These compounds have been shown to possess good antioxidant properties. In conclusion, *Vitex doniana* possess good antioxidant activity which may be connected with the secondary metabolites detected in the extracts by the dereplication studies.

Key words: *Vitex doniana*, Secondary metabolites, Antioxidant activity.

Abstract: W1/2018/033

HYPOGLYCAEMIC ACTIVITIES AND BIOCHEMICAL PARAMETERS MODULATION OF HERBAL FORMULATIONS OF ALLIUM CEPA L. IN ALLOXANIZED DIABETIC RATS

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Abstract
Allium cepa L. is used in traditional medicine for the treatment of various diseases including diabetes mellitus. This study was carried out to design and evaluate herbal tablets prepared with aqueous extract of *Allium cepa* for *in vitro* tablet properties, hypoglycaemic effects and for their effects on some biochemical parameters. *Allium cepa* extract compatibility with some tablet excipients was assessed using Fourier Transform Infrared Spectroscopy (FTIR) and Differential Scanning Calorimetry (DSC). *Allium cepa* tablets consisted of aqueous extract of *Allium cepa* L, gelatin (GT), polyvinyl pyrrolidone (PVP), carboxymethyl cellulose (CMC), Primogel®, Ac-di-sol®, Avicel® PH102, anhydrous lactose, talc and stearic acid. Tablets were prepared to standard physical properties using wet granulation method. The tablets were evaluated for hypoglycaemic properties and for their effects on some biochemical parameters in alloxan induced diabetic rats. The extract-excipient compatibility test indicated compatibility of the extract with GT, PVP, CMC, Primogel®, Ac-di-sol®, Avicel® ph102, anhydrous lactose, talc and stearic acid. The prepared tablets maintained adequate mechanical integrity and dissolution profiles after preparation and storage for six months. There was significant reduction in blood glucose level upon daily administration of the tablets compared to the negative control. Maximum reduction of blood glucose levels ranging from 20 - 70 % were achieved within 21 days of daily administration of the different batches of the tablets. The plasma levels of liver enzymes such as ALT, AST and ALP were significantly reduced together with total cholesterol and triglycerides. There were also reduced activities of catalase, gluthathione reductase and malondialdehyde.
Keywords: *Allium cepa*, hypoglycaemia, biochemical parameters, alloxan, wet granulation

Abstract: W1/2018/034

ANTIHYPERGLYCEMIC PROPERTIES OF A TRITERPENOID ISOLATED FROM *CUSSONIA ARBOREA* ROOT BARK

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Abstract
The aim of this study was to isolate and characterize the active principle responsible for hypoglycemic activity of *Cussonia arborea* using alloxan-induced diabetic rat. The root bark of *C. arborea* (2 kg) was extracted with 80 % methanol by cold maceration method. Phytochemical composition of the extract was carried out. The extract was bioassay-guidedly fractionated using column and thin layer chromatography. Hyperglycemia was induced in rats by single intraperitoneal injection of alloxan monohydrate at the dose of 160 mg/kg. Rats with fasting blood sugar (FBS) levels higher than 126 mg/dl were considered diabetic (hyperglycemic). Hypoglycemic fraction (subfraction 2:1) was subjected to ^{1}H proton nuclear magnetic resonance (NMR). The acute toxicity study results showed that the methanol root bark extract of *C. arborea* did not produce any sign of toxicity even at the highest dose of 5000 mg/kg body weight (bw) 48 h post administration. Phytochemical analyses revealed the presence of terpenes, tannins, saponins, alkaloids, flavonoids and glycosides. Fractionation of the crude extract using column chromatography produced 7 fractions of which fraction 2 was most hypoglycemic in action (reduced FBS from 307.00 ± 18.77 mg/dl to 77.33 ± 3.17 mg/dl). Further purification of fraction 2 yielded 3 subfractions with subfraction 2:1 producing most profound antihyperglycemic activity (reduced FBS from 310.00 ± 5.77 mg/dl to 74.00 ± 0.57 mg/dl). Spectroscopic examination of subfraction 2:1 produced spectra typical of triterpenoids. It was concluded that the antihyperglycemic activity of *Cussoniaarborea* root bark is attributed to its triterpenoid content.

Keywords: Antihyperglycemia; *Cussonia arborea*; Phytochemical Constituents; Triterpenoid

Abstract: W1/2018/035

ANTIULCER POTENTIALS OF CRUDE AQUEOUS AND METHANOL EXTRACTS OF *VITEX DONIANA* AGAINST TWO RODENT ULCER MODELS

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Abstract

This study investigates the antiulcerogenic potentials of crude aqueous and methanol extracts of *Vitex doniana* against ethanol and indomethacin induced gastric ulcers in experimental albino rats. Each experiment comprised seven groups of five animals each. Gastric ulcers were induced in the animals either by a single dose of 1 ml/kg of absolute ethanol or 60 mg/kg body weight of indomethacin after a 3-day prior treatment with a low dose (200 mg/kg body weight) and high dose (400mg/kg body weight) crude aqueous and methanol extracts of *V. doniana*. Cimetidine at 100 mg/kg body weight was used for the positive control groups. The negative control groups received no treatment prior to ulcer induction. The animals were sacrificed under anaesthesia, the stomachs excised and the ulcers scored. Ulcer index (UI) and percentage ulcer protective index (UPI) were calculated and compared statistically. Histological analysis of the tissues was also performed.The extracts afforded varying degrees of protection against both ulcer models ranging from 22% to 82%. The extracts appeared to afford better protection against ethanol induced gastric ulcers (22% - 82% UPI; average 59.8% across extract treated groups) than indomethacin induced variant (27% - 70% UPI; average 50.5% across extract treated groups).Crude extracts of *V. doniana* possess antiulcer effects against both ethanol and indomethacin induced gastric ulcers.

Keywords: Antiulcer, *Vitex doniana*, Phytochemicals, Natural products, Antioxidants

Abstract: W1/2018/036

PRELIMINARY INVESTIGATION OF THE ANTIINFLAMMATORY ACTIVITY OF *HARUNGANA MADAGASCARIENSIS* LAM.EX POIR (HYPERICACEAE) LEAF EXTRACT IN RATS

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Abstract

The anti-inflammatory activity of *Harungana madagascariensis* (Hypericaceae) leaf was evaluated using formaldehyde-induced acute edema and arthritis respectively, and cotton pellet granuloma in rats. The leaf extract was obtained by cold maceration in methanol:dichloromethane (1:1) for 72 hours. The extract was also subjected to acute toxicity test and phytochemical analysis. Acute toxicity test revealed that the extract had an oral LD 50 > 5000 mg /kg. Results showed that the extract elicited non-significant and non-dose related inhibition of formaldehyde-induced acute edema in rats. The extract inhibited formaldehyde-induced arthritis, but however failed to inhibit cotton pellet-induced granuloma formation. Phytochemical analysis revealed the presence of alkaloids, saponins, tannins, proteins, reducing sugars, carbohydrates, flavonoids, terpenoid, steroids, acidic compounds, resins, glycosides, fats and oils in the extract. In conclusion, the extract exhibited mild inhibition of acute and chronic edema but has no effect on granuloma formation. The observed effects are likely due to the phytoconstituents of the leaf extract.

Keywords: *Harungana madagascariesis*, inflammation, antiinflammation, edema, granuloma

Abstract: W1/2018/037

SPASMOLYTIC ACTIVITY OF *HOSLUNDIA OPPOSITA* VAHL (LAMIACEAE) LEAF EXTRACT AND FRACTIONS ON ISOLATED INTESTINAL TISSUES

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Abstract

Hoslundia opposita Vahl (Lamiaceae) leaf is used in ethnomedicine to manage abdominal pains. This study investigated the spasmolytic effect of *H. opposita* leaf extracts on isolated intestinal tissues. *H. opposita* leaf extract was obtained by cold maceration in dichloromethane:methanol (1:1) for 48 hours. The extract (HOE) was fractionated using column chromatography to obtain the n-hexane (HOHF), ethylacetate (HOEF), and methanol fractions (HOMF). The effects of HOE and fractions on acetylcholine (64 µg/ml)- and histamine (64µg/ml)- induced contractions of isolated guinea pig ileum and rabbit jejunum were evaluated using standard experimental protocols. Also, the extract and fractions were subjected to phytochemical analysis. Results showed that HOE, HOHF, HOEF and HOMF elicited dose-dependent inhibitions of acetylcholine (64 µg/ml)- and histamine (64 µg/ml)- induced contractions of guinea pig ileum and rabbit jejunum. The HOEF (640µg/ml) elicited the highest spasmolytic effect on the guinea pig ileum, with 95.83 and 96.29% inhibitions of acetylcholine- and histamine- induced contractions respectively. On the rabbit jejunum, HOMF (1280 µg/ml) elicited the highest inhibition (75.56%) of acetylcholine (64µg/ml)-induced contractions, while the inhibition of histamine- induced contractions was insignificant. Phytochemical analysis revealed the presence of alkaloids, glycosides, tannins, resins, and saponins amongst others in HOE and fractions. These findings justify the use of *H. opposita* leaf in ethnomedicine to manage abdominal pains.

KEYWORDS: *Hoslundia opposita*, Spasmolytic, Guinea pig ileum, Rabbit jejunum

Abstract: W1/2018/038

ANTICONVULSANT ACTIVITIES OF METHANOL STEM BARK EXTRACT OF *BOMBAX BUONOPOZENSE* P. BEAUV (*BOMBACEAE)* IN MICE

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Abstract

Bombax buonopozense is a plant used traditionally for the treatment of feverish conditions, diarrhea, epilepsy and pains. The present work investigated the sedative and anticonvulsant activity of *Bombax buonopozense*, using the MEST, PTZ and STN induced seizure models at doses of 100, 200, and 400mg/kg. The extract significantly ($p<0.05$) and dose dependently decreased the onset of diazepam induced sleep with a marked increase in the duration of sleep 590.4s to 1037.29s in the 400mg/kg treated group. In the Pentylenetetrazole induced seizure test, the extract protected the animals from seizures 60% - 80% compared to the negative control group. The data obtained from this study suggest that the methanol extract of *Bombax buonopozense* may possess sedative and anticonvulsant effect since it decreased the onset of sleep, reduced the mortality rate in strychnine as well as delayed the onset of seizure produced by pentylenetetrazole.

KEYWORDS: Seizure; Diazepam; *Bombax buonopozense*; Pentylene tetrazole and Strychnine.

Abstract: W1/2018/039

EFFECTS OF *MONODORA MYRISTICA*(GAERTN, DUNAL.) (ANNONACEAE)ROOT BARK ON ACUTE AND CHRONIC INFLAMMATION

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Abstract

Several researches have established the antioxidant, antibacterial and antiinflammatory activities of the seeds and stem bark of *Monodora* myristica while scientific data on the pharmacological activities of the roots is sparse. Hence, this work evaluated the effects of methanol extract of the root bark of *M. myristica* on acute and chronic inflammation. The root bark was extracted by cold maceration in methanol to yield MME. The MME was subjected to phytochemical screening and acute toxicity test. The effects of MME on acute inflammation were evaluated using carrageenan-induced rat paw edema and xylene-induced topical ear edema in mice. While formaldehyde-induced arthritis and cotton pellet induced granuloma in rats were used to investigate its effects on chronic inflammation. The MME was found to be relatively safe (LD_{50} >5000 mg/kg). Phytochemical screening revealed presence of glycosides, carbohydrates, reducing sugars, resins, terpenoids, steroid and proteins in MME. The MME elicited 58.1% inhibition of xylene induced topical ear edema and dose-dependent reduction of carrageenan induced rat paw edema with 800 mg/kg causing 57.4% inhibition. However, there was no activity against chronic inflammation. Results demonstrate the ability of root bark of *M. myristica* to ameliorate acute inflammation thus justifies the ethnomedicinal use of the plant to manage inflammation.

KEYWORDS: *Monodoramyristica*, carrageenan-induced pedal edema, formaldehyde-induced arthritis, cotton pellet granuloma, acute inflammation, chronic inflammation

Abstract: W1/2018/040

ACUTE ORAL TOXICITY STUDY OF CHEMICALS DERIVED FROM THE ASH OF THE DE-SEEDED FRUIT HEAD OF OIL PALM ELAEIS GUINEENSIS IN MICE BY OECD 425

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Abstract

Filtrate from ash of de-seeded fruit head of the oil palm (*Elaeis guineensis*) – DFHCOP, is a common dietary constituent in Southern part of Nigeria. Chemicals derived from DFHCOP: DFHCOP-A, DFHCOP-B^{α} and DFHCOP-B^{β}have remarkable high pH; 12-14 hence an alkali.Being a common dietary constituent, no studies on its toxicity potential have been reported.The study was designed to evaluate acute toxic potential of aqueous solutions of DFHCOP-A, B^{α} and B^{β} orally, according to OECD TG No. 425.For the limit test, female mice were divided into four groups (n =5). One group served as control while the others as treated group received 5000mg/kg of DFHCOP-A, B^{α} and B^{β}orally. The main test was done on DFHCOP-A only. Fifth group (n=5) was administered 175mg/kg, 550mg/kg and 2000mg/kg, using the up and down procedure. Control and treated groups were observed for 14 days. Blood samples were collected by cardiac puncture, under chloroform general anaesthesia and were subjected to biochemical analyses. Vital organs of anesthetized animals were preserved for histopathological examination. LD_{50} of DFHCOP-A was greater than 2000 mg/kg while DFHCOP-B^{α} and B^{β} were both greater than 5000mg/kg. In comparison with control group, there was significant increase in levels of ALT, AST, while ALP, Amylase, Creatinine, Urea levels appeared normal. There were mild to moderate periportal lymphocytic infiltrates in the liver with no necrosis, and no remarkable alterations in the kidney.Despite mild elevation of liver enzymes, safe doses can be extrapolated to explore DFHCOP-A, $B^{\alpha}$and B^{β} potentials as therapeutic alkalizers.

Abstract: W1/2018/041

ANTIBACTERIAL ACTIVITY OF CRUDE EXTRACT OF *CHROMOLAENA ODORATA* AND THE EFFECT OF ITS COMBINATION WITH CONVENTIONAL ANTIBIOTICS ON *PSEUDOMONAS AERUGINOSA* FROM WOUND SAMPLES

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Abstract
A wound is a disruption of normal anatomic structure and function of the skin. Wound healing is delayed by infection caused by microorganisms including *Pseudomonas aeruginosa.* The emergence of antibiotic resistance has compromised effective treatment of wound infections with conventional antibiotics. This has led to the search for alternative wound healing agents from plants like *Chromolaena odorata* commonly known as Siam weed. Methanolic extraction of *C. odorata* was carried out. The crude extract was fractionated using n-hexane, ethyl acetate and methanol and then analysed for the presence of phyto-constituents. Plant extract antimicrobial testing was carried out after which its minimum inhibitory concentration (MIC) and minimum bacteriocidal concentration (MBC) were determined. The results of this study showed that the *P. aeruginosa* woundisolates were susceptible to the *C. odorata* extract. The mean values of zones of inhibition increased with concentration and ranged from 7.5mm to 15.5mm. The MIC and MBC were observed mostly at high concentrations (200mg/ml and 400mg/ml). The result of the combination therapy presented remarkable increase in bioactivity against the isolates compared to the potency recorded when the extract was tested separately. The potency of the combinations did not diminish with incubation. Methanolic crude extract of *C. odorata* contained all the phytochemicals analyzed with tannin, phenol, terpenoid and reducing sugar in abundance (+++). The n-hexane fraction did not produce any inhibitory effect unlike methanol and ethyl acetate fractions. The results of this study show that *C. odorata* can be used for treatment of *P. aeruginosa* infected wounds, supporting the folkloric use of the plant for treatment of wounds.
KEYWORDS*: Pseudomonas aeruginosa; C. odorata: crude extracts; phytoconstituents; combination therapy.*

Abstract: W1/2018/042

ANTI-INFLAMMATORY STUDY ON THE AQUEOUS EXTRACT OF *DATURA STRAMONIUM* (JIMSON WEED) LEAVES

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Abstract

Previous studies have shown that *Datura stramonium* leaves possess antinociceptive, hypolipidemic, anti-inflammatory, antispasmodic, anti-asthmatic, hypnotic, narcotic, antioxidantand hypoglycemic agents and activities. This study was conducted to further consolidate the anti-inflammatory property of the aqueous extract of *Datura stramonium* leaves. The anti-inflammatory study was investigated using two models, *in vitro* and *in vivo* models. The *in vitro* model investigated the membrane stabilization effect of the extract. Heat and hypotonicity-induced haemolysis of human red blood cells (HRBCs) were used to determine the effect of the extract on membrane stabilization. Different concentrations (0.1, 0.2, 0.4, 0.6 and 0.8 mg/ml) of the extract was used. Indomethacin (0.4 mg/ml) was used as the standard drug. The *in vivo* model investigated its effect on egg-albumin induced paw oedema. The effect of the extract on heat and hypotonicity-induced haemolysis of HRBCs showed a significant ($p < 0.05$) decrease in haemolysis at the various concentrations compared to the control. In comparison with indomethacin which inhibited heat-induced haemolysis by 21.39%, the extract showed a significant ($p<0.05$) inhibition of 52.89 and 44.47% at 0.1 and 0.2 mg/ml of the extract respectively. Hypotonicity-induced haemolysis showed that at 0.8

mg/ml of the extract, there was a significant ($p<0.05$) decrease in haemolysis, with inhibition of 68.67% compared to indomethacin which inhibited haemolysis by 43.08%. The *in-vivo* anti-inflammatory study revealed a significant ($p < 0.05$) decrease in the size of the paw for all groups from 30 minutes to 5 hours, with 600 mg/kg b.w of the extract inhibiting inflammation at 5 hours by 92.85%. Results from this study suggest that the aqueous leaf extract of *Datura stramonium* possess anti-inflammatory effect. Its mechanisms of action could be via the inhibition of the synthesis of inflammatory mediators, achieved by inhibiting the activity of prostaglandin synthase and the concentrations of histamine, serotonin and kinin. This research, thus, consolidates the use of this plant in the management of inflammatory conditions and can serve as an adjuvant to the conventional drugs.

KEYWORDS: Inflammation, membrane stabilization, heat-induced haemolysis,

Abstract: W1/2018/043

ANTI-INFLAMMATORY ACTIVITY AND ACCELERATED STABILITY STUDIES OF CRUDE RESIN EXTRACTS OF *CANNABIS SATIVA* LINE (MORACEAE) SYRUP

Obonga, W. O.[1*], Nnadi, C. O[1]., Okarfor, S. N[1]., Agbo, M. O., Omeje, E. O[1]., Okoli, C.O.[2] and Osadebe, P. O.[1]

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Abstract

The study was to develop Cannabis sativa syrup and determine the anti-inflammatory potential of the formulations. Method: The syrup was developed by trials of different ratios of the crude Cannabis sativa resin (CCR), propylene glycol, aspartame, sucrose, sodium metabisulphite (SMBs) and ethylenediamine tetraacetic acid (EDTA). The stability of the formulations was determined by accelerated stability technique. The anti-inflammatory activity of CCR and different formulations was evaluated by the egg albumin induced paw edema model in rats. The biochemical assay was determined by Reitman and Frankel colorimetric assay method while the hematological assay was evaluated by standard protocols. Results: The syrup containing EDTA (CE) showed the highest stability with shelf-life 1190 days (K_{25} 0.000089 /day)while the syrup containing without EDTA and SMBs (CS) has shelf-life of 35 days (K_{25} 0.002947day). The syrups containing higher propylene glycol showed improved anti-inflammatory activity compared to those containing lower amount. All the formulations showed higher anti-inflammatory activity than CCR with a dose-dependent inhibition of paw edema compared with the control. There was no significant difference ($p<0.05$) between the SGOT (13.821±0.190-16.008±1.012), SGPT (19.241±1.027-22.901±1.093) and urea (9.812±0.252-10.054±0.252) levels of the treated and 16.856±1.053, 24.960±0.101 and 10.654±0.925 of the control animals

respectively. With the exception of eosinophil that disappeared from the blood on the third week, all the hematological parameters showed gradual increase in the third week compared to the control. Conclusion: Formulation of CCR as syrup using efficient carriers improved the pharmacological activity of the resin. SMBs and EDTA enhanced the stability of the syrup. The biochemical and hematological parameters showed that the components of the developed syrup were generally safe.

KEYWORDS: *Cannabis sativa,* syrup, anti-inflammatory, stability, hematological parameter

Abstract: W1/2018/044

EVALUATION OF ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF *MARANTOCHLOA lEUCANTHA(MARANTACEAE)* LEAVES AND STEM EXTRACTS

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Abstract

This work studied the evaluation of antioxidant and anti-inflammatory properties of *Marantochloa leucantha(Marantaceae)*. Dried powered leaves and stem of *Marantochola leucantha* were extracted with methylenechloride and methanol, the extracts was concentrated to obtain solid rasin and its phytochemical compositions determined. The *in vitro* antioxidant activity of *M. leucantha* leaves and stem extracts were assessed using 1,1-dephenyl-2-picrylhydrazyl (DPPH) radical scavenging assay and ferric reducing antioxidant power (FRAP) assay and *in vivo* anti-inflammatory activity of the stem extracts and its fractions was studied using the rat paw edema method.The qualitative phytochemical screening of *M. leucantha* indicates the presence of tannins, terpenoids, steroids, flavonoids, reducing sugar and phenols. The *in vitro* antioxidant assay revealed that all the extracts exhibited high antioxidant activity which was comparable with that of the standards, ascorbic acid and gallic acid. In DPPH assay, the antioxidant activity of the ethylacetate fraction was (93.92 ± 1.75 %) at concentration 250 $\mu g/mL$ (EC_{50} 0.82 $\mu g/mL$) for leaves and (91.92 ± 0.29 %) at concentration 1000 $\mu g/mL$ (EC_{50} 1.38$\mu g/mL$) for stem, while the ferric antioxidant reducing power for ethylacetate leaves fraction was found to be 31.12 ± 0.70 and 92.01 ± 2.17 $mMFe^{2+}$ per gram of dry sample for both the leaves

and stem, respectively at concentration of 1000$\mu g/mL$ Ferrous sulphate equivalent. The results of anti-inflammatory potential showed that the crude stem resin and fractions of *M. leucantha* at doses of 200, 400, and 600 mg/kg exhibited significant ($p>0.01$) dose-related inhibition of paw edema in rats. The ethylacetate fraction at dose of 200 mg/kg exhibited percentage inhibition of 18.8 % whereas the standard drug diclofenac showed inhibition of 20 % after two hours of observation of albumin challenge. The findings suggest that *M. leucantha* is considered a good source of antioxidant and anti-inflammatory compound that can be employed in the treatment of the different diseases associated to the oxidative stress.

KEYWORDS: *Marantochola leucantha,* antioxidant and anti-inflammatory

Abstract: W1/2018/045

PHYTOCHEMICAL EVALUATION OF EXTRACTS AND GC-MS ANALYSIS OF OIL FROM *MONODORA MYRISTICA* SEED (GAERTN.) DUNAL

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Abstract
Monodora myristica is one of the plants used as anti-malarial remedies in Igbo-Nigeria folkloric medicine. It has been reported to possess anti-oxidant properties and high nutritional content. The seed yields a colourless oil with pleasant taste. The present study investigated the phytochemical properties of the oil using conventional methods and gas chromatography-mass spectrophotometry. Terpenoids, sterols, saponins, tannins, flavonoids and cardiac glycoside were present while the GC-MS revealed presence of potentially bioactive fatty acids, terpenoids and related compounds.

KEYWORDS: *M. myristica*, Oil, Phytochemical and GC-MS

Abstract: W1/2018/046

ANTIBACTERIAL ACTIVITIES AND SYNERGISTIC EFFECTS OF SOME EXTRACTS OF *ALLIUM CEPA, ALLIUM SATIVUM, ZINGIBER OFFINICALE* AND *GARCINIA KOLA* ON SOME MULTIPLE DRUG RESISTANT BACTERIA

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Abstract

In this study, the phytochemical, antibacterial and synergistic potency of extracts from *Allium cepa, Allium sativum, Zingiber offinicale* and *Garcinia kola* were investigated against some multi resistant microorganisms: *Listeria monocytogenes*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae.* Phytochemical analysis of the extracts performed using recommended methods, showed that the extracts were composed of alkaloids, flavonoids, glycosides, tannins, saponins and steroids in varying amounts. Aqueous, ethanolic and hexane extracts of the plants materials were used to assay and investigate their activities against the aforementioned test isolates. Results obtained showed that the microorganisms were highly susceptible to the aqueous and ethanol extracts, but showed poor susceptibility to the hexane extracts which mainly extracts oily components. Of all the bacteria tested, *Klebsiella pneumoniae* showed the most resistance to all the extracts. Synergism of the extracts with one another was positive as they produced higher antimicrobial effects on the organisms. The minimum inhibitory concentration (MIC) ranged from 25mg/ml to 200mg/ml. The aqueous extract recorded the lowest MIC, 25mg/ml. Considering the increasing incidence of multidrug resistance by microorganisms generally, the results of this study positively suggests that natural plants could serve as credible alternatives in the management of many infections even better than many new generation medications.

Abstract: W1/2018/047

SAFETY AND LD50 INVESTIGATION OF A FRACTIONATED ACETONE-WATER NEEM LEAF EXTRACT, IraC® IN ALBINO MICE AND RATS.

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Abstract

Extracts from neem tree also called "*dogonyaro*" in Nigeria are most consistently recommended in ancient medical texts for various disorders and decoctions of neem taken regularly to prevention diseases and boost up the immune system. To determine the safety of a fractionated acetone-water neem extract (IraC®) in albino mice and rats.Twenty four healthy mice weighing 25-32g were used for this study. Animals were maintainedunder standard laboratory conditions (temperature of 29-31^{0}C with 12-hours light/dark cycle)and provided with pelletized diet and water ad libitum.Acute toxicity was done in 2 stages by 'a modified OECD 423 guidelines' for testing of chemicals.Animals were divided into 4 groups of six mice each (3 males and 3 females).A starting dose of 2000mg/kg body weight (bw)IraC®was administered to group A (orally) and B(subcutaneously). In stage 2, Group C and D received 5000mg/kg bwIraC®orally and subcutaneouslyrespectively. The animals were observed for mortality and any other signs of toxicity for 7 days. IraC® at both concentrations showed no observable signs of toxicity in both male and female mice in all the test groups. No death was recorded 7 days after IraC® administration in treated animals. LD50 value of IraC®, oral and subcutaneous in male and female mice is >5000mg/kg. IraC® appears to have a high safety margin and is safe for oral and subcutaneous administration. The results suggests its safety and suitability for further investigation of its potentials as a therapeutic agent.

Key words: IraC®, Safety, LD50, Albino Mice, Rats.

Abstract: W1/2018/048

ANTI-PLASMODIAL AND ANTIOXIDANT ACTIVITIES OF THE FRUIT EPICARP OF *PICRALIMA NITIDA* DURAND AND HOOK, (APOCINACEAE)

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Abstract

This study investigated the acute toxicity of the crude extract of the fruit epicarp of *Picralima nitida* (PN) and also evaluated the crude extract and its fractions for their antiplasmodial and antioxidant activities. This is with a view to providing scientific information on its antiplasmodial potential and possible correlation with its antioxidant activities. The powdered dried fruit epicarp was extracted with 70 % ethanol at 60 ^{o}C for 72 hours, using a soxhlet extractor. The extract was and kept in the refrigerator till needed. The acute toxicity (LD_{50}) of the concentrated,lyophilized dry extract was determined using Lorke's method. Twenty five (25) mice of both sexes were randomly grouped into five (n=5). For 4-days suppressive test, mice were inoculated intraperitoneally with *Plasmodium berghei* (ANKA) (0.2ml). Extract (250, 500 and 1000mg/kg) was administered orally to the mice in group 1-3 respectively four hours after infection for four consecutive days while group 4 and 5 received chloroquine (10mg/kg) and normal saline (0.2ml) respectively. Parasitemia was observed day after treatment stopped by thin smear. For curative test, another 25 inoculated (0.2ml) mice were separated into 5 treatment groups and extract (250, 500 and 1000mg/kg) administered orally to the mice in group 1-3 respectively while group 4 and 5 received chloroquine (10mg/kg) and normal saline (0.2ml) respectively on the day 3,5 and 7 respectively. The animals were observed for 28 days. The crude extract was further separated into solvent of increasing

polarity; n-hexane, dichloromethane, ethylacetate and methanol using vacuum liquid chromatography (VLC). Fractions were tested for their antiplasmodial activities following the previous procedures. Quantitative antioxidant activities of the extract and fractions were also evaluated using DPPH, ABTS, NO and FRAP assays and results subjected to statistical analysis. Result shows the oral toxicity (LD_{50}) was greater than 5000mg/kg. At doses of 250, 500 and 1000mg/kg, percentage chemosuppression were 80.07, 79.80 and 87.41 respectively, while chloroquine showed 69.36 % suppression. The mean parasitemia at these concentrations were 1.37 ± 0.10, 1.47 ± 0.57 and 1.78 ± 0.24 respectively as against 1.78 ± 0.24 and 5.81 ± 0.43 for positive and negative control respectively. The percentage chemo suppression by the fractions at a concentration of 500mg/kg gave a rank order of n-hexane (74.23 %) < dichloromethane (81.04 %) < ethylacetate (84.60 %) < methanol (95.14 %). The LC_{50} of crude extract in DPPH, ABTS, and NO are 0.09 ± 0.001, 1.83 ± 0.03 and 0.72 ± 0.06 respectively, while equivalent concentration was 234.06± 0.83. For methanol and dichloromethane fractions, the DPPH, ABTS and NO assays gave 0.46 ± 0.03 and 0.16±0.009, 1.12±0.03 and 3.68±0.13, 0.92±0.04 respectively. The study concluded that PN fruit epicarp is not toxic. The extract and fractions demonstrated significant ($p<0.05$) antiplasmodial and antioxidant activities with methanol fraction being the most active. There was also a correlation between the antiplasmodial and antioxidant activities.

KEYWORDS: *Picralima nitida*, antiplasmodial activity, antioxidant activity, *Plasmodium bergei*, Parasitaemia

Abstract:W1/2018/049

BLOOD GLUCOSE LOWERING EFFECT OF THE METHANOLIC STEM-BARK EXTRACT OF *TAMARINDUSINDICA* L. IN TWO TYPE 2 DIABETES MODELS

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Abstract

This study evaluated the potentials of *Tamarindusindica*L., in lowering blood glucose level in two models of type 2 diabetes. Using standard laboratory procedures,descriptive and inferential statistical analyses were conducted on the obtained readings. The phytochemical constituents of the methanolic stem-bark extract were determined to be carbohydrates, glycosides, triterpenes, flavonoids, tannins and alkaloids. With a yield of 8.99% after extraction, the LD_{50} was determined to be greater than 5,000 mg/kg (po) in wistar rats. For the acute extract treatment model, the extract at 1,000 mg/kg showed activity when compared to the oral glucose-treated/control group, with the most pronounced activity starting at 2 hours after glucose ingestion. The significant activity (p<0.05) was however shown at 2, 3 and 5 hours. At 250 mg/kg, the hypoglycemic activity was shown at 1, 2 and 3 hours after the ingestion of glucose but not significant at p<0.05. For the insulin resistance model, the extract at 1,000 mg/kg showed hypoglycemic effect that was statistically significant (p<0.05). That was the only dose that showed such significant blood glucose lowering effect as the extract at 500 mg/kg and 250 mg/kg showed no hypoglycemic effects. The extract at 1,000 mg/kg also showed an increase in body weight when compared to the model control, although it was not statistically significant at p<0.05. The work concludes that the plant has blood glucose lowering effect in type 2 diabetes models.

Key Words: stem-bark extract, *Tamarindusindica*, L., blood glucose lowering effect, type 2 diabetes models.

Abstract:W1/2018/050

EVALUATION OF MEMBRANE STABILIZATION ACTIVITY OF LEAF EXTRACT OF LEPTADENIA HASTATA (PERS.)DECNE

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Abstract

Leptadenia hastata leaves extracts have demonstrated a positive effect on wound healing and has been used since antiquity amongst people of Eastern Nigerian for that purpose. However, the underlying mechanism for this is hitherto unexplored. Erythrocytes membrane is the model system used for many in vitro investigations of drug and membrane interactions. This study aims to investigate the membrane stabilization potential of Leptadenia hastata leaves extracts using an in vitro hemolytic assay. The extract of leaves of Leptadenia hastata was prepared by cold maceration using methanol at room temperature (27±2^{o}C). The phytochemical analysis of the extract was also carried out and revealed the presence of typical phytochemical constituents with relatively high concentrations of flavonoids and terpenoids. The effect of the extract on heat-induced and hypotonic solution-induced haemolysis was evaluated. The result indicated that LHE (50,100,200 and 400 µg/ml) exhibited significant ($p<0.05$) inhibition of hypotonic solution-induced haemolysis but not heat-induced haemolysis. Therefore, it can be inferred that the anti-inflammatory actions of Leptadenia hastata may partly be due to membrane stabilization.

Keywords: Membrane Stabilization, Leptadenia hastata, Wound-healing, Heat-induced haemolysis, Hypotonicity-induced haemolysis

Abstract:W1/2018/051

ANTIDIABETIC ACTIVITY AND PHYTOCHEMICAL SCREENING OF METHANOL EXTRACT OF LEAVES OF *PSYDRAX HORIZONTALIS* (K. SCHUM. & THONN.) BRIDSON IN ALLOXAN INDUCED DIABETIC RATS

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Abstract

The present study was aimed at investigating the anti-diabetic activity and phytochemical profile of the methanol extract (ME) of *Psydrax horizontalis* leaves in normoglycemic and alloxan-induced diabetic albino rats. The normoglycemic and alloxan-induced diabetic groups were administered orally with 100 mg/kg, 200 mg/kg and 400 mg/kg of the methanol extract (ME); 5 mg/kg of glibenclamide (positive control) and 2 mL/kg of Tween 80 (negative control). The fasting blood glucose level (FBGL) was monitored at 0 h, 1 h, 3 h, 6 h, 1st day, 3rd day and 5th day for the two categories using ACUU CHEK® glucometer and the results were statistically analysed. The phytochemical screening of ME was also carried out by standard procedures. Also acute toxicity test was done using the Lorke's method. Result showed an oral median lethality dose (LD50) greater than 5000 mg/kg, an indication of high safety profile. Phytochemical screening of ME revealed the presence of alkaloids, carbohydrates, proteins, tannins, flavonoids, steroids, saponins and terpenoids. Results of the anti-diabetic study showed significant dose-dependent reduction ($p<0.05$).There were significant mean reductions in blood glucose concentration at doses 100 mg/kg, 200 mg/kg and 400 mg/kg which continued after 6 hours and peaked on the 5th day of treatment to give 72.80%, 78.66% and 83.26% respectively in alloxan-induced group. In the normal rats 100 mg/kg, 200 mg/kg and 400 mg/kg of ME gave 27.94%, 27.33% and 27.94% respectively when compared to glibenclamide (24.23%.) after 24hours.The methanol extract of leaves of *Psydrax horizontalis* possesses anti-diabetic activity and hence supports its folkloric use in the management of diabetes.

KEYWORDS: Psydrax horizontalis, phytochemical screening, glibenclamide, diabetes, alloxan

Abstract:W1/2018/052

HEPATOPROTECTIVE AND IN VITRO ANTIOXIDANT PROPERTIES OF THE ROOT BARK EXTRACT OF NAUCLEA DIDERRICHII (DE WILD) MERR.

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Abstract

This study evaluated the hepatoprotective and antioxidant properties of the root bark extract of *Nuclea diderrichii* on paracetamol-induced liver toxicity. Dried root barks of *N. diderrichii* were extracted using methanol and dichloromethane (1:1) to obtain *N. diderrichii* extract (NDE). Wistar albino rats were divided into 6 groups (n=5); group 1 served as normal control; group 2 served as hepatoxin group; group 3 served as standard control (silymarin) while groups 4, 5 and 6 received *N. diderrichii* extract (100, 200, 400 mg/kg). Serum enzyme levels of alanine aminotransferase (ALT), aspartate aminotransferase (AST) and alkaline phosphatase (ALP) were estimated along with the estimation of superoxide dismutase (SOD), catalase (CAT) and malondialdehyde (MDA) levels. The in vitro antioxidant activity was evaluated by various assays, including 1,1-diphenyl-2-picrylhydrazyl (DPPH), hydrogen peroxide (H2O2), ferric reducing antioxidant power (FRAP) and nitric oxide (NO) assay using various concentrations with ascorbic acid as a standard. The results showed marked reduction of the elevated levels of ALT, AST, and ALP in a dose dependent manner with maximum hepatoprotective effect at 400 mg/kg dose level. Similarly, the reduction in SOD and CAT activities were significantly ($p < 0.05$) increased. A positive scavenging activity on DPPH, H2O2, FRAP and NO was also obtained with increasing concentrations of the extract. From the results, it is obvious that the root bark extract of *N. diderrichii* has hepatoprotective potentials in hepatocellular disorders as well as considerable antioxidant activity. Further studies are needed to isolate and characterize the bioactive compounds responsible for the hepatoprotective and antioxidant activities of N. diderrichii.

Keywords: *Nuclea diderrichii*, paracetamol, hepatoprotection, anti-oxidant

Abstract: W1/ 2018/053

ESTIMATION OF TOTAL PHENOLICS, TOTAL FLAVONOIDS CONTENT AND *IN VITRO* ANTIOXIDANT ACTIVITIES OF EXTRACT AND FRACTIONS OF *ASPLENIUM PLATYNEURON*

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Abstract

The leaves of *Asplenium platyneuron* were screened for the presence of phenolic and flavonoids. The total phenolics and flavonoids content (TPC and TFC) of the leaves of *Asplenium platyneuron* was examined using Folin-Ciocalteau and aluminium chloride colorimetric assays respectively. Gallic acid was used as internal standard for total phenolics while quercetin was used as internal standard for total flavonoids. The *in vitro* antioxidant activities of the extract and solvent fractions were quantitatively determined using 1, 1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging activity, Feric reducing antioxidant power (FRAP) and the phoshpomolybdate assay (TAC). Phytochemical screening of the methanol extract showed the presence of various bioactive constituents such as phenolics and flavonoids. The highest yield of solid residue was obtained using methanol as extraction solvent. Ethyl acetate fraction showed the most significant amount of phenolics (9.31 ± 0.76 mg gallic equivalent per gram (mg GAE/g) of extract) while *n*-hexane fraction showed the least total phenolic content (1.33 ± 0.61 mg GAE/g of extract). The total flavonoid content, for ethyl acetate fraction had most significant value (139.73 ± 8.03 mg quercetin equivalent per gram (QE/g) of extract)

while *n*-butanol fraction showed (35.73 ± 15.01 mg QE/g of extract). However, the ethyl acetate fraction showed the most significant total antioxidant capacity (TAC) (97.11 ± 0.73 mg ascorbic acid equivalent (AAE/g) of extract), while *n*-hexane fraction had the least total antioxidant capacity (87.86 ± 1.05 mg AAE/g of extract). Results obtained showed that the ethyl acetate fraction had the highest DPPH free radical scavenging capacity (80.50 %), and also had the most significant ferric reducing antioxidant power (413.00 ± 1.28 mg GAE/g of extract). Ethyl acetate fraction was purified by Vacuum Liquid Chromatography (VLC) using *n*-hexane in ethyl acetate (10:0 0:10) and dichloromethane in methanol (9:1 1:9) yielded 7 sub-fractions (AP_1-AP_7). AP_5 (94.45 ± 0.26 mg AAE/g of extract), AP_3 (69.94 ± 0.38 %), and AP_2 (1636.33 ± 50.03 mg GAE/g of extract) showed high TAC, DPPH, and FRAP values respectively when compared to other fractions. Correlation between various antioxidant models against, TPC, and TFC of extract and fractions had strong positive significance except for the methanol extract, *n*-hexane, and *n*-butanol fractions that had weak significance. HPLC dereplicated analysis of AP_5 identified thirteen (13) phenolic suspected compounds from the family aspleniaceae, three (3), namely; Apigenin 6-C-hexoside-8-C-pentoside **(13)**, Kaempferol 3-O-(caffeoylsophoroside) **(11)**, Schaftoside **(7)**, were most probable.

Abstract W1/2018/054

ANTI-PLASMODIAL AND ANTIOXIDANT ACTIVITIES OF THE FRUIT EPICARP OF *PICRALIMANITIDA* DURAND AND HOOK, (APOCINACEAE).

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Abstract

This study investigated the acute toxicity of the crude extract of the fruit epicarp of *Picralimanitida* (PN) and also evaluated the crude extract and its fractions for their antiplasmodial and antioxidant activities. This is with a view to providing scientific information on its antiplasmodial potential and possible correlation with its antioxidant activities.The powdered dried fruitepicarp was extracted with 70 % ethanol at 60 ^{o}C for 72 hours, using a soxhlet extractor. The extract was and kept in the refrigerator till needed. The acute toxicity (LD_{50}) of the concentrated, lyophilized dry extract was determined using Lorke's method. Twenty five (25) mice of both sexes were randomly grouped into five (n=5). For 4-days suppressive test, mice were inoculated intraperitoneally with *Plasmodium berghei*(ANKA) (0.2ml). Extract (250, 500 and 1000mg/kg) was administered orally to the mice in group 1-3 respectively four hours after infection for four consecutive days while group 4 and 5 received chloroquine (10mg/kg) and normal saline (0.2ml) respectively. Parasitemia was observed day after treatment stopped by thin smear. For curative test, another 25 inoculated (0.2ml) mice were separated into 5 treatment groups and extract (250, 500 and 1000mg/kg) administered orally to the mice in group 1-3 respectively while group 4 and 5 received chloroquine (10mg/kg) and normal saline (0.2ml) respectively on the day 3,5 and 7 respectively. The animals were observed for 28 days. The

crude extract was further separated into solvent of increasing polarity; n-hexane, dichloromethane, ethylacetate and methanol using vacuum liquid chromatography (VLC). Fractions were tested for their antiplasmodial activities following the previous procedures. Quantitative antioxidant activities of the extract and fractions were also evaluated using DPPH, ABTS, NO and FRAP assays andresults subjected to statistical analysis.Result shows the oral toxicity (LD_{50}) was greater than 5000mg/kg. At doses of 250, 500 and 1000mg/kg, percentage chemosuppression were 80.07, 79.80 and 87.41 respectively, while chloroquine showed 69.36 % suppression. The mean parasitemia at these concentrations were 1.37 ± 0.10, 1.47 ± 0.57 and 1.78 ± 0.24 respectively as against 1.78 ± 0.24 and 5.81 ± 0.43 for positive and negative control respectively. The percentage chemo suppression by the fractions at a concentration of 500mg/kg gave a rank order of n-hexane (74.23%) < dichloromethane (81.04%) <ethylacetate (84.60%) < methanol (95.14 %). The LC_{50} of crude extract in DPPH, ABTS, and NO are 0.09 ± 0.001, 1.83 ± 0.03 and 0.72 ± 0.06 respectively, while equivalent concentration was 234.06± 0.83. For methanol and dichloromethane fractions, the DPPH, ABTS and NO assays gave 0.46 ± 0.03 and 0.16±0.009, 1.12±0.03 and 3.68±0.13, 0.92±0.04 respectively.The study concluded that PN fruit epicarp is not toxic. The extract and fractions demonstrated significant ($p<0.05$) antiplasmodial and antioxidant activities with methanol fraction being the most active. There was also a correlation between the antiplasmodial and antioxidant activities.

Key words: *Picralima nitida*, antiplasmodial activity, antioxidant activity, *Plasmodium bergei*, Parasitaemia

Abstract W1/2018/055

ANTI-TRYPANOSOMAL EFFECT OF *OLDENLANDIA AFFINIS*: AN *IN VIVO* STUDY

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Abstract

African trypanosomiasis is a vector-borne protozoan disease which affects the poor rural dwellers and their livestock in sub-Saharan Africa. The existing drugs for the treatment are toxic, expensive, with the problem of resistance and not readily available. Hence, there is serious need for the discovery of anti-trypanosomal agent with better potentials, less toxic, readily available and cheap. Many plant products have been developed with better medicinal potentials in the recent past. In this research, the aerial part of *Oldenlandiaaffinis* plant was investigated for anti-trypanosomal activity in albino mice infected with *T. bruceibrucei* and *in vitro* with *T. b rhodesiense.* The crude extracts were prepared from the dried aerial parts using methanol and successive partitioning carried out using hexane, ethyl acetatate, butanol and water to obtain their respective fractions. Acute toxicity test was carried out to determine the LD_{50} of the fractions. These fractions were administered intraperitoneally to determine their effects on mice infected with the pathogens. The anti –trypanosomal potentials of these plant parts were established using rapid "matching" method for estimating the parasitemia.The *in vivo* results showed that the butanol fraction had significant activity which leads to further chromatographic separation using VLC and semi-preparative HPLC. The weights of the albino mice were also measured weekly. The cytotoxicity assay for the *in vitro* studies was carried out. Data obtained were analyzed with one way analysis of variance (ANOVA). The chromatographic separations of the butanol fraction gave rise to three distinctive peaks at the

following retention time 20.560, 28.487 and 30.380 mins exhibited significant anti-trypanosomal activity when tested *in vitro* with its cytotoxicity effects evaluated as well. The LD_{50} of the hexane and ethyl acetate fractions were above 5000 mg/Kg while that of butanol and water fractions were 1265 and 245 mg/Kg respectively. The *in vivo* studies showed the plant has notable anti-trypanosomal activity. The phytochemical analyses of *Oldenlandiaaffinis*revealed the presence of diverse phytochemicals. *Oldenlandia.affinis* exhibited anti-trypanosomal activity as the butanol fraction was effective against *T. bruceibrucei in vivo* and *T. bruceirhodesiensein vitro.*

Abstract: W2/2018/001

COMPARATIVE EVALUATION ON SOME FUNCTIONAL PROPERTIES AND PHYSICAL MODIFICATIONS OF STARCH FROM SPHENOSTYLIS STENOCARPA AND ZEA MAYS FOR PHARMACEUTICAL APPLICATIONS.

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Abstract

This investigation evaluated changes in the functional properties of starch from Sphenostylis sternocarpa (African Yam Bean) and Zea mays (Maize). The native starches were modified by heat moisture treatment and Annealing. The starch properties analysed and compared include yield, flow rate, pH, moisture content, bulk density, tapped density, swelling power, Carr's index, Hausner ratio, iodine test and paste clarity. Native, heat moisture treated and annealed Sphenostylis stenocarpa starches had lower densities in the range: 0.48, 0.37 and 0.35 (bulk density) and 0.53, 0.45 and 0.38 (tapped density) g/ml respectively; while Zea mays had higher densities in the range: 0.58, 0.53 and 0.42 (bulk density) and 0.79, 0.64 and 0.5 (tapped density) g/ml respectively. The flow rate of the starches were higher for Zea mays than Sphenostylis stenocarpa, while the Carr's index and Hausner ratio were lower for Sphenostylis stenocarpa starches. The pH of both starches ranged from 5.5 – 7.6. Sphenostylis stenocarpa had higher paste clarity percentage and swelling power than Zea mays. The swelling power for Sphenostylis stenocarpa starches ranged from 3.79 to 4.7 while Zea mays ranged from 3.12 to 3.15. All starches had low moisture content which decreased after heat moisture and annealing treatments. The results suggest that starch from Sphenostylis stenocarpa possess impressive properties and could be considered for applications in pharmaceutical formulations (such as herbal tablet formulation using starch and gelatin paste) thereby increasing the value added to this highly neglected and underutilised legume.

Keywords: Functional properties, starch, Sphenostylis stenocarpa, Zea mays, modification

Abstract: W2/2018/002

CYTOMORPHOMETRIC ANALYSIS OF ADIPOCYTES FROM VISCERAL ADIPOSE TISSUES OF HIGH-FAT DIET-FED RATS TREATED WITH COLOCASIA ESCULENTA LEAVES EXTRACT

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Abstract

The objective of the present study was to evaluate the effect of crude aqueous extract of *Colocasiaesculenta*leaves on the cytomorphometry of adipocytes from visceral adipose tissues of high-fat diet-fed rats.Preliminary phytochemical analysis and acute toxicity testing of the extract were conducted.Eighteen (18) healthy adult male rats (Wistar strain) were divided intothree groups of 6 rats each as follows: normal, high-fat diet [HFD] control, and HFD + 400mg/kg *C. esculenta* extract (*CEE*) groups. The rats were fed a HFD [20% Lard, w/w] for 10 weeks. Body weights and adipose tissue weights of all animals were measured after a 28-day*CEE*treatment [Day 43 - 70] via oral gavage. Blood samples were obtained via retro-obital puncture for serum total cholesterol (TC) and triglycerides (TG) analyses. Paraffin wax embedding technique for light microscopy was employed for histological processing of excised adipose tissues. Adipocytes cytomorphometry wasconducted after identification of tissue sections using Haematoxylin and Eosin staining technique.Phytochemistry revealed abundant amounts of saponins and alkaloids. An oral LD_{50} of >5g/kg body weight was obtained from the acute toxicity testing. Results showed significant reduction ($p<0.05$) in body weight gain, total adipose tissue weights, adipocyte diameter and TG levels in *CEE*-treated rats compared to HFD-control rats. Histological examinationof the adipose tissuesfrom HFD-control rats revealed hypertrophy of the adipocytes whereas normal adipocytes sizes were observed in *CEE*-treated rats similar to normal control. In conclusion, our data suggest that *CEE* inhibits HFD-induced fat accumulation and weight gain in albino rats.

Abstract: W2/2018/003

THE ADJUVANT EFFECT OF *ZINGIBER OFFICINALE* EXTRACTAND SORBITAN MONOSTEARATE NIOSOMES ON LA SOTA® VACCINE IN BROILERS

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Abstract

Newcastle disease is one of the most devastating viral diseases affecting poultry and economy. This research seeks to investigate the adjuvant effect of *Zingiberofficinale* (ZO) and sorbitan monostearate(Span 60) niosomes on La Sota® vaccine in broilers.The vesicles of the niosomal La Sota® vaccine was characterized for particle size and zeta potential. Five groups of twenty birds each were evaluated for immune responses to Newcastle disease vaccine. One group was given *Zingiberofficinale* as well as La Sota® vaccine encapsulated in sorbitan monostearate noisomes was administered.The birds vaccinated with the ZO/Span 60 niosomal ND vaccine had the highest mean antibody titer of (log_2) 8.20$\pm$0.13 which was significantly higher than the live La Sota® group with (log_2) 6.40$\pm$0.56. The unvaccinated groups did not produce any immune responses to Newcastle disease antigen. Nine out of ten birds in the unvaccinated group died while none of the birds died from the vaccinated groups. The stability of the ZO/Span 60 niosomal ND vaccine was also assessed through haematology and biochemical studies. The results showed stability at extreme conditions. Administering *Zingiberofficinale* with La Sota® vaccine encapsulated in sorbitan monostearate niosomes could be a promising immunoenhancement for La Sota® vaccine.

KEYWORDS: adjuvant, La Sota® vaccine, newcastle disease, niosome, sorbitan monostearate, *Zingiber officinale*

Abstract: W2/2018/004

EFFECT OF METHANOL EXTRACT OF *SYNSEPALUM DULCIFICUM* PULP ON SOME BIOCHEMICAL PARAMETERS IN ALBINO RATS

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Abstract

Synsepalum dulcificum is an evergreen plant and produces fruits or berries that, when eaten, causes sour foods (including lime and lemon) consumed later to taste sweet. The berry contains an active glycoprotein molecule, with some trailing carbohydrate chain called miraculin. When the fleshy part of the fruit is eaten, the molecule binds to the tongue's taste buds, causing sour foods to taste sweet. While the exact cause of this change is unknown, one theory is that the glycoprotein, miraculin works by distorting the shape of sweetness receptors so that they become responsive to acids, instead of sugar and other sweet things. This effect can last for 10minutes – 2hours. The objective of this study was to determine the effects of the methanol extract of the pulp on some biochemical parameters in albino rats.In this study, 24 rats were randomly distributed into 4 groups of 6 rats each: 0 (as normal group), 100 mg/kg (group 2), 200 mg/kg (group 3) and 500 mg/kg (group 4) body weight/day of the methanol extract for 14 days and 28 days. After which biochemical parameters like blood glucose, liver function parameters(ALT, AST, ALP, bilirubin, total protein, albumin and globulin) and histology were analysed using standard methods.Acute toxicity study showed that the methanol extract was not toxic to mice up to 5000 mg/kg. The 100 mg/kg doses of the extract significantly ($p<0.05$) reduced serum levels of

bilirubin, ALT, and glucose after the 14 day study compared with the 28 day study. However, no significant difference ($p<0.05$) was observed across the groups in their serum ALP, AST, albumin and globulin levels on the 14th day compared with the 28th day. A significant difference ($p<0.05$) was observed in the serum protein concentration in the 500 mg/kg test group while glucose concentration decreased significantly ($p<0.05$) in the 100 mg/kg and 500 mg/kg test group after the 14 day study compared with the 28 day study. Histopathological examination shows normal liver architecture across the groups at 100 mg/kg, 200 mg/kg and 500 mg/kg.The findings indicate that the fruit which is popularly eaten as a sweetener has no negative effect on some biochemical parameters, at least in rats.

KEYWORDS: *Synsepalum dulcificum*; methanol extract; biochemical parameters; histology; rats.

Abstract: W2/2018/005

SELF-MICROEMULSIFYING DRUG DELIVERY SYSTEM AS A PROMISING APPROACH TO IMPROVE THE POOR SOLUBILITY OF ARTHEMETER

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Abstract

The oral bioavailability of new chemical moieties is low due to poor aqueous solubility. This leads to poor dissolution, absorption and bioavailability challenges. To tackle this problem, artemether-loaded self microemulsifying drug delivery system (SMEDDS) was formulated and some *in vitro* and *in vivo* properties evaluated. Solubility studies, pseudoternary phase diagrams, pre/post formulation visual isotropicity test, emulsification time, refrigeration cycle, centrifugation, aqueous dilution, globule size analysis, *in vitro* release profile of the drug and *in vivo* antimalarial activity of the artemether were carried out. Results showed that artemether had high solubility in Triacetin®, Labrasol®, and Transcutol® P. The globule size ranges of 0.412±0.020 – 3.689±0.010 µm were obtained. Emulsification time was in the range of 18-19 sec. The optimized batches retained their organoleptic properties with no phase separation in the refrigeration cycle test. The drug release profiles of batches showed T_{50} and T_{85} values that ranged between 5-20 and 30-45 min, in SIF, 0-5 and 5-20 min, in SGF respectively. The SMEDDS-treated group had a significantly ($p < 0.05$) higher antimalarial activity than the other groups. The poor aqueous solubility challenge of artemether was improved when formulated as SMEDDS.

KEYWORDS: Artemether; SMEDDS; Surfactant; Oil; Co-surfactant.

Abstract: W2/2018/006

A FORMULATION OF THE AQUEOUS LEAF EXTRACT OF *FICUS SUR* FORSSK PROMOTES WOUND HEALING IN MICE

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Abstract

Accidents are common occurrences which frequently results in wounds. *Ficus sur* Forssk leaves are used for wound management in alternative medicine in Northern Nigeria. This work was aimed at determining the effect of a formulation of the aqueous extract of *Ficus sur* on wound healing. Powdered leaves of *Ficus sur* was extracted using distilled water. Phytochemical test was carried out on the extract which was then formulated into cream preparation of 5, 10 and 20 % concentrations. Skin irritation tests were conducted by topical application of the formulation. Effects of topical application of 5, 10 and 20 % of the cream on created wounds using the excision wound and burn wound methods were evaluated. Phytochemical compounds including tannins, flavonoids, alkaloids and saponins were detected. The formulation did not produce any irritant reaction as noerythema or oedema was observed on shaved treated animal skins. The 10 % and 20 % formulation produced decrease in wound diameter created by excision and also promoted regeneration of the epidermis, fibroblast and keratinocytes proliferation along with enhancement of deposition of collagen and elastic fibers in the wound. The 20% cream treated group decreased healing time significantly when compared to control.The formulation of the aqueous extract of *Ficus sur* accelerated wound healing and decreased the wound healing time which may be attributed to synergistic actions of the phyto-constituents of the extract.

KEYWORDS: Wounds, burns, skin irritation, herbal cream

Abstract: W2/2018/007

FORMULATION DEVELOPMENT AND *IN VITRO - IN VIVO* EVALUATION OF INDOMETHACIN–LOADED SOLID LIPID MICROPARTICLES BASED ON DIKA WAXMATRICES

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Abstract

The aims of the study were to formulate indomethacin-loaded solid lipid microparticles (SLMs) and to evaluate its properties both *in vitro* and *in vivo*. The lipid matrices were prepared by fusion using admixtures of Phospholipon® 90G and dika wax. Indomethacin–loaded SLMs were formulated by hot homogenization and evaluated for particle size, encapsulation efficiency (EE%) and pH. *In vitro* release was evaluated in simulated intestinal fluid (SIF, pH 7.2). Results revealed that the particle size of SLMs ranged from 0.50 ± 0.07 µm to 2.50 ± 0.14 µm. The pH ranged from 4.03 ± 0.09 at 24 h to 3.87 ± 0.05 at 30 days. Highest EE% of 94 % was obtained. SLMs exhibited about 100 % drug release range between 60 – 150 min and was significantly ($p < 0.05$) affected by ratio of the lipid matrix. The higher the ratio of dika fat, the faster the drug release from SLMs. Anti-inflammatory studies revealed about 78 % oedema inhibition at 6 h. SLMs also inhibited the ulcerogenicity of indomethacin by about 75%. Therefore, SLMs based on dika wax matrices exhibited good properties for the oral delivery of indomethacin.

KEYWORDS: Dika fat; solid lipid microparticles; ulcerogenicity; anti-inflammation; NSAIDS.

Abstract: W2/2018/008

FORMULATION AND EVALUATION OF *GARCINIA KOLA* (HECKEL) LOADED LIPOSPHERES BASED ON FAT FROM *CAPRA HIRCUS*

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Abstract

The aims of the study were to formulate *Garcinia kola*-loaded lipospheres and to evaluate the properties of the formulations. The methanolic extract of *Garcinia kola* seed were formulated into lipospheres by hot homogenization using lipid matrix consisting of mixture of goat fat and Phospholipon® 90H (3:1). The lipospheres were characterized by determining the particle size and morphology, pH and encapsulation efficiency (EE%). The antibacterial properties were also determined. The results showed that the lipospheres had a taste masking effect on the extract. Particles size ranged from 20.23 ±0.11 to 28.09 ± 0.24 µm. EE% of 92.2 %, 93.6 % and 95.7 % were obtained for the lipospheres loaded with 5, 1 and 3 % of extract respectively. The pH ranged from 5.4 to 6.3 at 7 and 30 days. The lipospheres had inhibition zone diameter (IZD) of about 20 ± 0.91 mm for *Staphylococcus aureus* but, had no action against *Escherichia coli*, while the reference drug (tetracycline) had 25 ± 0.53 mm for *Staphylococcus aureus and* 35 ± 0.83 mm for *Escherichia coli*. *Garcinia kola* seed-loaded lipospheres however, had improved palatability and could be used to enhance patient's compliance to this herbal drug.

KEYWORDS: *Garcinia kola,* lipospheres, lipids, goat fats, IZD

Abstract: W2/2018/009

EVALUATION OF WOUND HEALING PROPERTIES OF *NEWBOULDIA LEAVIS* ROOT BARK EXTRACT AND FRACTIONS IN 5-FLOUROURACIL INDUCED IMMUNOCOMPROMISED RATS

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Abstract

The study was carried out to evaluate the wound healing potential of *Newbouldia laevis* root-bark in 5-Flourouracil Immunocompromised rats. 5-Flourouracil (12 mg/kg.b.w) was administered intraperitoneally for three (3) consecutive days after which a maintenance dose of (6 mg/kg.b.w) was administered every four (4) days. The effect of 5-Flourouracil induction on total white blood cell count of the rats was determined. The extract and fractions of *Newbouldia laevis* root-bark were formulated into ointment and applied topically on the wounds of the rats once daily for 18 days. The wound healing activity was studied using the excision wound model, rate of wound contraction and assessment of hydroxyproline, hexosamine and hexuronic acid contents of the scab. The induction with 5-fluorouracil significantly ($P<0.05$) decreased the total WBC count of all the groups compared to the normal control. Significant ($P<0.05$) increases in wound contraction, hydroxyproline, hexosamine and hexuronic acid concentrations were observed in treated groups compared to the untreated groups of immunocompromised rats. Amongst the groups treated with the extract, ethylacetate and methanol fractions, the group that received 0.4% (w/w) methanol fraction revealed the highest percentage wound contraction (98.41%) after day 18. From the study, it could be stated that *Newbouldia leavis* extract and fractions significantly promote wound healing and were able to overcome the wound healing suppressing effect of 5-flourouracil.

KEYWORDS: Wounds, *Newbouldia leavis*, excision-wound model, 5-Flourouracil, percentage wound contraction

Abstract: W2/2018/010

PREBIOTICS AS THERAPEUTIC FOODS: A REVIEW

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Abstract

The increase in the health education of consumers have led to a global surge for functional foods, with prebiotics receiving greater attention in research circles. Prebiotics are nondigestible foods which selectively stimulate the growth of beneficial flora in the gut and negatively affect the growth of exogenous pathogens. Such changes in the gastrointestinal microbiota leads to the enhanced wellbeing and health of consumers. From milk used in feeding infants, to different plant compounds, prebiotics are abundant in nature and are easily synthesized from different sources. These therapeutic plant products have been used in the treatment of chronic diseases and infections. In this review, we explored the different classes of prebiotics as well as the criteria used in their laboratory characterization. We also offer an exquisite discussion on different mechanisms which have been delineated for prebiotics action. Furthermore, we discussed the concept of synbiotics, an innovative tool which tends to enhance the activity of prebiotics by combining them with beneficial microorganisms called probiotics. The increasing discrepancies and loopholes associated with prebiotics activity is worrisome, thus, we try to proffer some solutions with this review. It is our hope that researchers will see the need for more standardized research in the prebiotics field. Key terms: prebiotics, probiotics, synbiotics, functional foods, microbiota.

Abstract: W2/2018/011

USE OF HOMO LIPID FOR DELIVERY OF ANTI-MALARIAL DRUGS

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Abstract

Solid lipid microparticles (SLMs) which are recent drug delivery system employed in the delivery of drugs, have advantages of being biocompatible, less toxic, long term stability etc. In this study, lipid was extracted from the goat fat using wet rendering method. The lipid matrix was prepared by fusion method and the drug loaded (chloroquine phosphate, halofantrine, and artemether/lumefantrine) SLMs formulated by hot homogenization. The *in vivo* activity of the SLMs on *Plasmodium berghei* infected mice was done using Peter's four day suppressive protocol and the histological studies performed after the mice were sacrificed. The SLMs were stable. The SLMs containing arthemeter/lumefantrine had 87.01 % parasite clearance while the commercial formulation of arthemeter/lumefantine had 80.0 % parasite clearance; SLMs containing chloroquine phosphate had 87.10 % parasite clearance while the commercial formulation of chloroquine phosphate had 84.12 % parasite clearance; SLMs containing halofantrine had 72.96 % parasite clearance while the commercial formulation of halofantrine had 85.71 % parasite clearance.The group G which received no treatment had 14.89 % parasite clearance. The SLMs formulation had good *in vivo* activity compared to the commercial formulations and were not harmful to the vital organs of the mice therefore SLMs can be an alternative means of formulating these antimalarials.

Abstract: W2/2018/012

SENNA MIMOSOIDES: A PROBABLE ANTAGONIST FOR LACTOSE INTOLERANCE AND AN ELECTROLYTE-INDUCING AQUEOUS EXTRACT

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Abstract

The best milk an infant can have remains the breast milk. However, with increased pollution in the ecosystem, infants may yet again be exposed to toxicity from breast milk. Adults who continue to take milk are bedeviled with lactose malabsorption characterized by abdominal pain, distension, borborgmi, diarrhea etc.*Senna mimosoides* leaves are used in Nsukka folklore medicine, particularly in Ukehe Enugu State, Nigeria precisely to treat breastmilk toxicity in neonates. In this study, the aqueous extract of *Senna mimosoides* leaves were used on Wistar albino rats to determine its potency in lactose breakdown via lactase activity and its concomitant effect in the induction or inhibition of electrolytes.Results showed a significant increase ($P<0.05$) in the lactase activity with increasing concentrations of the extract made evident by 10 µl, 20 µl, 30 µl, 40 µl and 50 µl of extract respectively, which liberated 37.12 µg, 40.66 µg, 43.29 µg, 47.90 µg and 51.62 µg of glucose respectively. Results for electrolytic ion (Na^+, Ca^{2+}, Mg^{2+}, Zn^{2+}, K^+ and Se^{2+}) showed a dose-dependent increase in the levels of the ions which was significant at $p<0.05$. For two other electrolytes (Fe^{2+} and HPO_4^-), results showed a decline in the levels of the ion which was not significant at $P<0.05$. The findings from this work have shown that the leaves of *Senna mimosoides* do not only possess the potential for alleviating toxicity, combating lactose intolerance but there is also possibility of its use in mineral dehydration and rehydration and in breast cancer treatment.

KEYWORDS: *Senna mimosoides*, breastmilk toxicity, lactase activity, electrolytes, aqueous extract.

Abstract: W2/2018/013

DETERMINATION OF *IN VIVO* PARASITEMIA ACTIVITY OF *CISSUS POPULNEA* BASED-ARTEMETHER-LUMEFANTRINE ORAL TABLETS USING DIFFERENT ANTIMALARIAL MODELS

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Abstract

The aim of the study was to determine the *in vivo* evaluation of *Cissus populnea* based-artemether-lumefantrine oral tablets using different antimalarial models.Cissus gum was extracted by standard method. Granule batch sizes of 100 g each of 2 %, 5 % and 10 % *Cissus populnea* with magnesium stearate as lubricant (1 and 2 %), were made up to 100 % with lactose as diluent. The drug loaded tablets containing28 % artemether-lumefantrine [artemether (14.286 %) and lumefantrine (85.714 %)] of the formulations were produced and the *in vivo* evaluations of *Cissus populnea* based-artemether-lumefantrine oral tablets were carried out using different antimalarial models:curative, suppressive and prophylactic models.The reference artemether-lumefantrine tablets had the least parasitemia level and thus the greatest antimalarial activity while the *Cissus populnea* formulated artemether-lumefantrine tablets showed higher parasitemia level thereby exhibiting lesser antimalarial activity in all the three models. Curative model showed that the *Cissus populnea* formulations had 7.64% parasitemia reduction while the reference drug had 26.04%

which was almost four times the activity of formulated drugs. Prophylactic model showed that formulated drugs had 32% parasitemia and reference drug had 11.75% parasitemia while suppressive model showed that formulated drugs had 1% parasitemia and reference drug has 0.5% parasitemia level.*Cissus populnea* extracted by evaporation did not show any improvement over the binder in the reference tablets since a lesser antimalarial activity were shown by the *Cissus populnea* formulated artemeter-lumefantrine tabletsin all the models when compared to reference tablets.

KEYWORDS:*Cissus populnea,* antimalarial models,in vivo, parasitemia.

Abstract: W2/2018/014

IN SEARCH OF ALTERNATIVE REMEDIES FOR ANIMAL AFRICAN TRYPANOSOMIASIS: THE POTENTIAL OF 3-AMINOSTEROIDS

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Abstract

Animal African trypanosomiasis (AAT) has remained a major threat to livestock production and food security in sub-Saharan Africa [1]. With a high mortality rate of 20-50 % within months of exposure in cattle, coupled with an absence of any vaccine, and reported resistance to currently available drugs [2], treatment based on natural products has shown interesting potential and may be a good alternative. We have recently reported on the high activity of 3-aminosteroids isolated from *Holarrhena africana* against the human pathogen, *Trypanosoma brucei rhodesiense* and their low cytotoxicity against mammalian cells (L6 cells) [3]. The in vitro activity of selected compounds of this series against *T. congolense*(Savannah-type, IL3000), *T. b. brucei* (BSF trypomastigote, *T brucei* Lister s427WT) and various resistant cell lines (ISMR, TbAT1-KO, AQP2/3-KO, AQP1-3-KO, B48, and R0.8) was performed by resazurin assay. The IC_{50} values were used to calculate the selectivity indices (S.I.) and resistance factors (RFs). All the tested compounds showed moderate to low in vitro activities and low S.I.s to *T. b. brucei.* SARs, especially against *T. congolense*, showed that an additional pyrrolidine ring represented

by a C-18-*N*-C-20 bridge on the steroid, alone or in synergy with the C-3 amino substituent, was optimum for high activity. Interestingly, holarrhetine (IC_{50}=0.045±0.03 μM) was 2 and 10 times more potent than diminazene (the most widely used AAT trypanocide) and pentamidine respectively, and displayed an S.I. of 2130. The in vitro activities against *Tb*s427-derived resistant cell lines displayed minor variations, reaching statistical significance (p<0.05) in only few cases. In most cases, however, a < 2-fold difference between IC_{50} values against resistant *Tb* s427WT in contrast to generally high levels of resistance to the controls was observed. The significantly high in vitro activity of certain 3-aminosteroids especially against the more virulent *T. congolense* and low potential for cross resistance with standard trypanocides make these compounds interesting for further development of 3-aminosteroids against AAT.

Abstract: W2/2018/015

ISOLATED COMPOUNDS FROM *MILLETTIA ABOENSIS* EXPRESSED SYNERGISTIC INHIBITION OF FREE RADICALS

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Abstract

This study evaluated the antioxidant activities of *M. aboensis* as a possible mechanism of its acclaimed ethnomedicinal uses. The ethanol extract and its fractions (n-hexane, ethyl acetate and n-butanol) were tested for their *In vitro* antioxidant activities using 2,2-diphenyl-1-picrylhydrazyl (DPPH), ferric reducing antioxidant power (FRAP) and hydrogen peroxide scavenging activity tests; while carbon tetrachloride (CCl_4)-induced liver damage and diabetes induced oxidative stress were used to evaluate their *in vivo* affects. Chromatographic purifications of the ethyl acetate fraction (EAF) led to the isolation of compounds **1** and **2** and their structures elucidated by NMR and mass spectrometry. The compounds were tested for inhibition of liver microsomal lipid peroxidation while their pharmacological interactions evaluated through DPPH scavenging assay. The extract gave EC_{50} value of

116.67 µg/ml against DPPH radical while EAF and n-butanol fraction produced EC_{50}s of 35.33 and 79.17 µg/ml, respectively. EAF (200 mg/kg) produced significant ($p<0.05$) *in vivo* inhibition of lipid peroxidation (69.3%) which was similar to that of α-tocopherol (74.9%).Structural elucidation revealed compound **1** as epicathechin-(2β→O→7, 4β→8)-cathechinand compound **2** as epicathechin-(2β→O→7, 4β→8)-epicathechin. Compounds **1**&**2** inhibited liver microsomal lipid peroxidation with EC_{50}s of 46 and 55 µg/mL, respectively. Combination of the compounds produced synergistic inhibition of DPPH radical with an EC_{50} of 7 µg/mL while an EC_{50} of 9 µg/mL was found for ascorbic acid. The extract, fractions and compounds isolated from *M. aboensis* expressed strong antioxidant properties which may explain its diverse ethnopharmacological uses.

KEYWORDS: Antioxidant; free radical, *Millettia aboensis*, oxidative stress, cathechin

Abstract: W2/2018/016

QUANTITATIVE AND QUALITATIVE DETERMINATION OF PHYTO-CONSTITUENTS IN HERBAL MEDICINES

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Abstract

The presence of chemical compound in plants is an established fact. What has been changing and expanding in details and horizon is the nature and methods of investigation of these compound, primary and secondary metabolites alike. The efficacy of herbal materials in treatment of disease has been established since long ago but there is a renewed interest in their use. Health awareness accompanying this new interest has created a need for quality assurance of herbal materials. National and international agencies have set quality control standards. This work aims at reviewing and presenting an update of the methods of qualitative and quantitative phytochemical analysis of herbal medicinal material. Standard textbooks and online search engines and databases were consulted and critically studied. Information on quantitative and qualitative methods and techniques are presented. Advances have been made in instrumentation, techniques, ease of conduct, spectrum of compounds to be identified and limit of detection. Methods have been expanded, for example TLC is no longer only qualitative but can be employed for quantitative evaluations (Densitometry), gas chromatography is no more only for volatile compounds but can be used for analysis of solids (reverse phase gas chromatography), quantitative analysis has moved from mg to µg and ng weight limits. Quantitative and qualitative methods and techniques have been upgraded and expanded.

Abstract: W2/2018/017

THE MODULATION OF DISACCHARIDASE A_2 ACTIVITY BY METHANOL EXTRACT OF *SECURIDACA LONGEPEDUNCULATA* LEAVES AND ITS FRACTIONS

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Abstract

Different mechanisms of actions have been adduced for antidiabetic pontency of different principles. Among them are insulin secretagogues, glucophages, anti-gluconeogenesis agents, alpha-glucosidase inhibitors among others. Methanol extract of *Securidaca longepedunculata* (MESL) leaves and its fractions- n-hexane, dichloromethane, ethyl acetate and aqueous-methanol were investigated for their ability to inhibit the activity of the enzyme disaccharidase A_2. Different concentrations of the crude MESL and the four fractions were used. The crude MESL and dichloromethane fraction showed a non-significant ($p > 0.05$) decrease in activity of disaccharidase A_2 at 10 µl compared to the control (0 µl). However, 20, 30 and 40 µl of the crude MESL and dichloromethane fraction showed a significant ($p < 0.05$) decrease in disaccharidase A_2 activity compared to the control. The n-hexane, ethyl acetate and aqueous-methanol fractions demonstrated that 10, 20, 30 and 40 µl had a significant ($p < 0.05$) inhibitory activity of disaccharidase A_2 compared to the control (0 µl). The overall comparison of the crude MESL and the four fractions demonstrated that aqueous-methanol fraction had the highest ability to inhibit disaccharidase A_2 activity. This study, therefore suggested that one of the possible mechanisms of actions of anti-diabetic principle (s) of *Securidaca longepedunculata* may be the inhibition of disaccharidase A_2 activity.

KEYWORDS: *Securidaca longepedunculata*, disaccharidase, anti-diabetic, inhibit, activity

Abstract: W2/2018/018

THE IMPACT OF PHARMACEUTICAL CARE INTERVENTION ON THE QUALITY OF LIFE OF NIGERIAN PATIENTS RECEIVING TREATMENT FOR TYPE 2 DIABETES

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Abstract

To evaluate the impact of pharmaceutical care (PC) intervention on health-related quality of life (HRQOL) of patients with type 2diabetes. This study was a randomized, controlled study with a 12-month patient follow-up. The study protocol was approved by the Research Ethical Committees of the institutions in which this study was conducted. A total of 110 patients were randomly assigned to each of the "intervention" (PC) and "control" (usual care [UC]) groups. Patients in the UC group received the usual/ conventional care offered by the hospitals. Patients in the PC group received UC and additional PC for 12months. The HUI23S4EN.40Q (developed by HUInc-Mark index 2&3) questionnaire was used to assess the HRQOL of the patients at baseline, 6 months, and 12 months. Two-sample comparisons were made by using Student's t tests for normally distributed variables or Mann-Whitney U tests for non-normally distributed data at baseline, 6 months, and 12 months. Comparisons of proportions were done by using the chi-square test. The overall HRQOL (0.86±0.12 vs.0.64±0.10; P=0.0001) and single attributes except "hearing" functioning of the patients were significantly improved at 12 months in the PC intervention arm when compared with the UC arm. The HRQOL utility score was highly negatively (deficit ≥10%) associated with increasing age (≥52 years), diabetes duration (44 years), emergency room visits, comorbidity of hypertension, and stroke in both PC and UC groups. Pharmaceutical care interventions improved the quality of life in patients with type 2 diabetes.

Keywords: HRQOL, patients with diabetes, pharmaceutical care intervention, quality of life, usual care

Abstract: W2/2018/019

NUTRITIONAL EVALUATION, PHYTOCHEMICAL SCREENING AND PROXIMATE ANALYSIS OF SOME MEDICINAL PLANTS

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Abstract

Phytochemical, proximate, mineral and vitamin constituents of the leaves of *Cnidoscolus aconitifolius* (Cal), *Gongronema latifolium* (Gll) and *Moringa oleifera* (Mol) were evaluated using standard methods. In addition to being good sources of nutrition, many plants have been used in the treatment of diseases. Plants are rich storehouses of biologically and pharmacologically active components. The different leaves showed the presence of cardiac glycosides, flavonoids, alkaloids, saponins, tannins, anthocyanins, anthraquinones. The proximate composition of Mol, Gll and Cal respectively are as follows. Moisture content: 11.26%, 14.05% and 15.23%; carbohydrate: 44.86%, 35.50% and 49.98%; crude protein: 17.93%, 28.5% and 10.41%; fat: 6.75%, 7.2% and 8.46%; ash: 10.20%, 10.20% and 10.00% and crude fibre: 8.83%, 4.1% and 5.24%. The composition of vitamins in *M. Oleifera* was in this order:Vit$A>D>B_{12}>C>B_3>B_1>B_2>B_9>B_6$, *G. latifolium*: Vit $A>D>B_{12}>C>B_1>B_3>B_2>B_9>B_6$ while *C.aconitifolius* contained vitamins in this order: Vit $D>A>B_{12}>B_3>C>B_1>B_2>B_9>B_6$. Mineral analysis revealed that sodium was not present in the three leaves. Mol contained in ppm 29.37 Fe, 1.06 Zn, 98.42 Ca, 8.18 Mg, 0.86 Mn and 0.08 Cu. Gll had in ppm 7.3 Fe, 1.45 Zn, 57.57 Ca, 7.80 Mg, 8.06 Mn and 0.12 Cu while Cal contained in ppm 9.09 Fe, 1.08 Zn, 61.57 Ca, 8.22 Mg, 1.51 Mn and 0.10 Cu. The consumption of these plants may be helpful in the treatment of nutrient deficiencies due to their rich vitamin and mineral contents while the phytochemicals present suggest they may serve as potential source of natural products for the management of chronic diseases.

Keywords: *Cnidoscolus aconitifolius*, *Gongronema latifolium*, Phytochemical, Nutrition , Chronic diseases.

Abstract: W2/2018/020

CIPROFLOXACILIN ENHANCES THE ANTIMALARIAL ACTIVITIES OF SOME ARTEMISININ DERIVATIVES

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Abstract

This study evaluates the effect of ciprofloxacin (CIP) on the antimalarial activity of artesunate (AS), artemether-lumefantrine (AL) and artesunate-amodiaquine using animal model. Some 120 albino mice infected with chloroquine sensitive *Plasmodium berghei* NK65 strain were used. The study was carried out in three phases. Phase 1 consisted of eleven groups treated with different doses of either AS, AL, ASAQ or CIP alone. Phase 2 consisted of nine groups treated with 7 mg/kg of CIP (CIP1) combined with different doses of AS, AL, ASAQ. Phase 3 consist of ten groups treated with 14 mg/kg of CIP (CIP2) with different doses of AS, AL, ASAQ. Thin blood films were used to assess parasitemia level daily after administration of drugs for 72 h. Results were analyzed using student t-test and analysis of variance (ANOVA). CIP alone showed antimalarial activity with 63 % parasitemia reduction. Antimalarial activities of AS and AL were significantly enhanced by both 7 and 14 mg/kg of CIP. The antimalarial effect of ASAQ was enhanced but not statistically significant. Low dose ciprofloxacin significantly enhanced the antimalarial activities of Artesunate, Artemether-Lumefanthrine and Artesunate-Amodiaquine This combination may be beneficial in the management of *Plasmodium falciparum* infection or co-infection with salmonellosis.

Keywords: Ciprofloxacillin, Antimalarial activities and Artemisinin derivatives

Abstract: W2/2018/021

TETRACYCLIC IRIDOIDS ISOLATED FROM THE LEAVES OF *MORINDA LUCIDA* MAY BE RESPONSIBLE FOR THE IMMUNOMODULATORY ACTIVITIES

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Abstract

Morinda lucida belongs to the family Rubiaceae known to have wide usage in traditional medicine and have shown many pharmacological activities. Although this plant has been investigated for immunomodulatory activity, there is yet no chemical constituent associated with this activity. The aim of this study was to isolate and determine the chemical structures of the immunomodulatory constituents of *Morinda lucida* leaves. Methanol leaf extract and fractions of the plant was invested for immunomodulatory activity using the following models;the cyclophosphamide induced myelosuppression, Total white blood count(WBC), Differential Leukocyte Count(DLC), Delayed Type Hypersensitivty(DTH) and Heamagglutination titre. The chemical investigation of the most active fraction (Ethyl acetate fraction) using VLC, Sephadex LH-20 and semi preparative HPLC led to the isolation of two major compounds. The chemical structures of the isolated compounds were elucidated using a combination of HPLC-DAD and Nuclear magnetic resonance spectroscopy (NMR). The crude extract, ethyl acetate and butanol fractions of *Morinda lucida* administered orally at different doses of 50 mg/kg/day, 100 mg/kg/day and 200 mg/kg/day exhibited significant increase in the cyclophosphamide induced

myelosuppression, the circulating antibody titre in haemagglutination test and the delayed hypersensitivity test with the ethyl acetate fraction showing the best activity in each case. 75.01% inhibition for haemagglutination test and 46.15% inhibition for delayed hypersensitivity test. Spectroscopic analysis and comparison with literature shows that the isolated compounds were two tetracyclic iridoids molucidine (**1**) and desmethyl molucidine (**2**). These two compounds are the major constituents of the ethyl acetate fraction and may be responsible for the observed immunomodulatory activity.

Keyword: *Morinda lucida*, Structure elucidation, Moluicidin, Immunomodulatory activity.

Abstract: W2/2018/022

IMMUNOMODULATORY AND IMMUNORESTORATIVE ACTIVITIES OF B-D-GLUCAN-RICH EXTRACT AND POLYSACCHARIDE FRACTION OF MUSHROOM, *PLEUROTUS TUBERREGIUM*

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Abstract

This study explored the immunomodulatory and immunorestorative properties of ahot aqueous extract (APTR) and of a β-D-glucan-enriched polysaccharide fraction (BGP) of a local oyster mushroom *Pleurotus tuberregium* (Fr.) Singer (Pleurotaceae).Immunomodulatory activities were investigated by assessing specificand none-specific immune responses in immunocompetent and immunosuppressed mice; as well as *in vitro* in culture of RAW264.7 macrophages stimulated with BGP.In a homologous prime-boost immunization schedule, oral supplementation with APTR(100, 200, or 400 mg/kg) and BGP (100 or 200 mg/kg) resulted in significantly higher titers oftotal IgG, IgG1, and IgG2a by as much as 2–4-folds compared with the levels in untreated control mice. The mean hemagglutination (HA) titer in immunized mice that were treated withdexamethasone (DEX; 5 mg/kg) was significantly ($p<0.05$) lower than the titer in groups thatdid not receive dexamethasone; however, short-term alternate day administration of APTR(200 mg/kg) to mice that had been immunosuppressed with 5mg DEX/kg produced significantincreases in secondary anti-SRBC antibody compared with the mean titer of mice immunized and treated with DEX alone. In *in vitro* studies, stimulation of RAW264.7 macrophages with BGP caused significant increases in iNO and TNF-α expression, and phagocytic functions of the cell. Taken together, the results of these studies showed that *P. tuberregium* impartsimmunostimulatory and immunorestorative effects that could be explained, in part, by theactions of its β-D-glucan constituent(s) on macrophages.

Keywords: Anti-ovalbumin, hemagglutination, immunomodulation, immunorestoration, oyster mushroom

Abstract: W2/2018/023

AN ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED IN PREGNANCY IN SOKOTO STATE, NIGERIA.

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Abstract

The use of plants during pregnancy is a common practice in Africa. In Nigeria, despite modern medical antenatal prescriptions, most women resort to traditional medicine to ensure foetus development and safe delivery. Yet, there is a scanty botanical data on the plants used. Therefore, plants used by pregnant women need to be better known in order to offer integrated antenatal care. This study was carried out to document the medicinal plants used traditionally in the treatment of pregnancy related problems within Sokoto metropolis. A semi structured questionnaire administered during several visits to Traditional healers, Traditional Birth Attendants and Herb Sellers. A total of 70 respondents were interviewed, majority of these respondents were Traditional Birth Attendants and females (77.14%) who had practiced for more than 10 years, with (51.9%) between 50-60 years of age. The study also revealed that most of the respondent's patients are people who have no formal education. A total of 25 species of medicinal plants, belonging to 16 families were recorded with the Fabaceae family having the highest (7) number of species, followed by the Combretaceae (3) and Capparaceae (2), while others were represented by one specie each. Leaf was the most common plant part used and decoction was the most common method of preparation of the medicines. Most of the herbs are administered orally (93.7%). *B. dalzeilii, C. micranthum, C. papaya, D. spiliforms, G. senegalensis, S. Americana and V. amagdalina* had the highest fidelity level (FL %) of 100%, while *C. laxa* had the highest Relative Frequency of Citation. Scientific validation of the biological properties of the surveyed plants is highly recommended.

Abstract: W2/2018/024

METABOLITE PRODUCTION FROM CELL SUSPENSION CULTURE OF *SECURIDACA LONGEPEDUNCULATA* FRESEN (A VULNERABLE MEDICINAL PLANT)

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Abstract

Securidaca longepedunculata Fresen (Violet tree) belongs to the family Polygalaceae characterised by papillionaceous purplish flowers. This plant disappears at an alarming rate due to intensified anthropopressure particularly the unregulated manner ofsubterranean plant parts' collection from natural stands. The objective of this research was to develop an alternative source of producing metabolites from *in vitro* regenerated explants of *S. longepedunculata* from seeds to reduce the dependence of its root. Dark green compact calli from seeds and yellow friable calli from root segments (obtained from seedlings) were used for cell suspension culture in MS basal medium with 30 g/L sucrose and fortified with 2,4-D (0.5 mg/L) and BAP (0.1 mg/L). On the other hand, the dark-green and yellow friable calli obtained from the induction of seed and root segment respectively were immobilized with sodium alginate beads in cell suspension culture containing MS (seed-derived dark-green calli) and B5 (root-derived yellow calli), sucrose at 30g/L fortified with 2,4-D (0.5 mg/L) and BAP (0.1 mg/L). The suitable cell line (root-derived yellow calli) cultured in B5+ 2,4-D (0.5 mg/L)+ BAP (0.1 mg/L) was selected for suspension culture based on calli with the highest dry weight, growth index, specific growth rate. Results obtained revealed that the *in vitro* produced materials showed all the features of triterpenoid saponin and volatiles similar to the *in vivo* roots. Thus, the present study revealed that *S. longepedunculata* seed and root derived materials in suspension culture can be used for the production of the bioactive compounds in place of the roots of this plant that have been exploited indiscriminately.

Keywords: Cell suspension culture, immobilization, calli, triterpenoid saponins, volatiles

Abstract: W2/2018/025

PHARMACY STUDENTS' PERCEPTION OF THE INCLUSION OF COMPLEMENTARY AND ALTERNATIVE MEDICINE INTO THE PHARMACY CURRICULUM

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Abstract

A large number of studies have reported the benefits of the inclusion of complementary and alternative medicines (CAM) into the pharmacy and medical curriculum so as to equip health professionals with the basic knowledge on its usage and monitoring. This present study evaluated the perception of pharmacy students towards CAM and its possible inclusion in their curriculum.m Penultimate and final year pharmacy students from Nnamdi Azikiwe University (NAU) and University of Nigeria (UNN) were approached to complete a standard questionnaire assessing their perception towards CAM. The questionnaire items were subjected to descriptive analysis and mean difference analysis. Exactly 504 students (NAU=192; UNN=312) completed the survey. Only about a third of the students had previously used CAM (37.7%) and thought CAM could be safely mixed with conventional medicines (30.6%). Majority of them reported being interested in learning more about CAM (82.3%) and CAM being introduced into the pharmacy curriculum (84.7%). Eight out of every ten students surveyed reported they were willing to incorporate the dispensing of CAM into their practice after graduation. Furthermore, significantly fewer final year students perceived that CAM doses were standardized (15.5% vs. 24.2%), CAM had less side effects (44.4% vs. 55.2%) and that CAM effects were just placebo-psychological effects (76.5% vs. 66.8%) when compared to perceptions of penultimate year students ($p<0.05$ in all). Pharmacy students held favorable perception towards CAM and were open to its inclusion into their training but as they progressed in pharmacy school, the favourable perceptions towards CAM dwindled.

Keywords: alternative medicines; complementary medicines; pharmacy education; questionnaire

Abstract: W2/2018/026

DEVELOPMENT OF TABLET DOSAGE FORM OF AQUEOUS *MORINGA OLEIFERA*LAM. (MORINGACEAE)LEAF EXTRACT: IMPORT OF IN-PROCESS QUALITY CONTROL

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Abstract

Despite the growing popularity of herbal medicines in the treatment of various ailments, presentation of most of the preparations in crude or barely processed forms by folkloric users and non-professionals has militated against standards, convenience and compliance of the patient as well as general acceptance for their integration in primary healthcare. This situation has persisted partly due to ignorance and conservatism on the part of some traditional healers and lack of interest for investment in herbal drug development by relevant industrialists. This work was designed to demonstrate some basic techniques involved in the development of standard tablet delivery forms of ethnomedicinally useful herbs, using *Moringa oleifera* leaf (MO) as a case study. Leaves of MO were collected, authenticated and extracted by cold maceration in distilled water. The dried extract was granulated with some additives by the wet technique and compressed into tablets using a single punch tableting machine. The uncoated tablets produced from the optimal formular were evaluated by standard methods. The qualities generally complied with the requirements for conventional tablets. The study showed that implementation of in-process quality control measures in the formulation process played vital roles in the development of robust, standard tablet dosage form of MO.

KEYWORDS: herbal medicines, *Moringa oleifera*, granulation, tablets, in-process quality control.

Abstract: W2/2018/027

HISTO-MORPHOLOGICAL AND NEUROBEHAVIORAL EFFECTS OFCRUDE EXTRACT OF *CANNABIS SATIVA* ON THE CEREBRUM OF MALE SWISS ALBINO RATS

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Abstract

Cannabis sativa is a diocious, annual, green, leafy plant of commercial,recreational and medical importance. This study was undertaken to examine the histo-morphological effects of Cannabis extracts on the cerebrum. Sixteen (16) male Swiss albino rats were randomly assigned to four groups consisting of four animals in a group. Group A was given feed and water only and served as the control. Groups B, C and D were given 200mg/kg, 500mg/kg and 800mg/kg of marijuana extract respectively, daily for two weeks. The brains were surgically removed for histological and morphological analysis. They were also subjected to neurobehavioral tests. Results showed marked reduction in volume and weight of cerebrum. Photomicrographs of sections of cerebral cortices showed microcystic space (MCS), moderate infiltration of inflammatory cells (MIIC) and severe focal area of liquefactive necrosis (WFALN). There were also changes in behavior. These indices reflected damage to the cerebrum compared with the control.

Keywords: *Cannabis sativa*, Marijuana, Cerebrum, Histology, Neurology

Abstract: W2/2018/028

MEDICINE USE AMONG UNDERGRADUATES AT THE UNIVERSITY OF NIGERIA, NSUKKA

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Abstract

High degrees of inappropriate medicine use by undergraduates have been reported for many Nigerian universities; but no such data exists for University of Nigeria. The aim is to determine the prevalence and patterns of medicine use among UNN undergraduates. UNN undergraduates were invited to complete a pre-tested and validated self-administered questionnaire in July 2017. 700 students were invited to participate in the survey, of which 418 (59.7%) returned completed questionnaires. The respondents were 51.7% female and aged mostly (78.7%) between 19 and 25 years; but were uniformly distributed with respect to year of study. All respondents reported medicine use. Among the 69 different medicines reported as commonly used, paracetamol was the most common (33.4%); followed distantly by vitamin C (7.3%) and metronidazole (5.8%). Family/friends (49.2%) and healthcare providers (40%) were the major sources of information on the medicines used. Most students (74.3%) had been using the medicines for over a year, but largely (65.1%) without adhering to any given dosage regimen. Of the 44 medicines reportedly associated with adverse effects, chloroquine was the most implicated (41 reports; 30.9%), 78% of which was body itch. The ailments most commonly treated were headaches/other aches, where about 90% used paracetamol; while the least treated were nausea/vomiting, mostly treated with promethazine (52.5%). Medicine use is prevalent among UNN students and largely unsupervised. It is associated with many adverse effects. The need for drug education among undergraduates and an effectively manned campus pharmacy cannot therefore be overemphasized.

KEYWORDS: Medicine use, undergraduates, University, Nigeria, adverse effects

Abstract: W2/2018/029

THE EFFECTS OF HONEY ON THE HISTOMORPHOLOGY OF THE TESTES OFALBINO WISTAR RATS.

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Abstract
The prevalence of male infertility is on the increase globally and this is of public interest due to its social, economic and health burden. Honey is a natural product of bees, which exerts many medical benefits such as: - hepatoprotective, antioxidant, reproductive, antihypertensive effects.The aim is evaluate the effects of honey on the testes and estimate serum testosterone levels of adult male albino wistar rats. Twenty-four (24) adult male albino wistar rats divided into four (4) groups (A - D) which comprised of six (6) rats each were used for the purpose of this study. Rats in groups A-C received 0.027ml, 0.066ml and0.132ml of honey respectively. While rats in Group D served as the control and received only food and water. On completion of honey administration on the fourth and eight weeks, blood samples for testosterone estimation were collected from the medial canthus of three rats in each group and their testes were also obtained under anesthesia respectively for histopathological studies.The results showed that the increase in the percentage body weight could be related to increased testosterone secretion of 0.84 at significance level $P<0.05$. The increase testosterone also showed relation to honey intake after four weeks with correlation coefficient of 0.96 at significance level of $P<0.05$. After eight weeks, the testosterone secretion between the control and test group were almost of the same level. The histology of the testicles of the groups that

received honey after four weeks showed; reduced spermatogenesis, decreased number of germ cells with prominent sertoli cells and reduction of leydig cells. While the histology of testes of the rats that received honey for eight weeks showed, increase in number of germ cells along with enhanced spermatogenesis and leydig cells appeared to be normal. The controls showed normal representation of testicular structure.Honey has acute positive effect on testosterone secretion and honey consumption generally leads to hyperactivity of testicular cells.

Keywords- Honey, testosterone, histomorphology, leydig cells, albino rats

Abstract: W2/2018/030

ANTIBACTERIAL ACTIVITY OF CRUDE EXTRACT OF *CHROMOLAENA ODORATA* AND THE EFFECT OF ITS COMBINATION WITH CONVENTIONAL ANTIBIOTICS ON *PSEUDOMONAS AERUGINOSA* FROM WOUND SAMPLES

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Abstract

A wound is a disruption of normal anatomic structure and function of the skin. Wound healing is delayed by infection caused by microorganisms including *Pseudomonas aeruginosa.* The emergence of antibiotic resistance has compromised effective treatment of wound infections with conventional antibiotics. This has led to the search for alternative wound healing agents from plants like *Chromolaena odorata* commonly known as Siam weed. Methanolic extraction of *C. odorata* was carried out. The crude extract was fractionated using n-hexane, ethyl acetate and methanol and then analysed for the presence of phyto-constituents. Plant extract antimicrobial testing was carried out after which its minimum inhibitory concentration (MIC) and minimum bacteriocidal concentration (MBC) were determined. The results of this study showed that the *P. aeruginosa* woundisolates were susceptible to the *C. odorata* extract. The mean values of zones of inhibition increased with concentration and ranged from 7.5mm to 15.5mm. The MIC and MBC were observed mostly at high concentrations (200mg/ml and 400mg/ml). The result of the combination therapy presented remarkable increase in bioactivity against the isolates compared to the potency recorded when the extract was tested separately. The potency of the combinations did not diminish with incubation. Methanolic crude extract of *C. odorata* contained all the phytochemicals analyzed with tannin, phenol, terpenoid and reducing sugar in abundance (+++). The n-hexane fraction did not produce any inhibitory effect unlike methanol and ethyl acetate fractions. The results of this study show that *C. odorata* can be used for treatment of *P. aeruginosa* infected wounds, supporting the folkloric use of the plant for treatment of wounds.

KEYWORDS*:* Pseudomonas aeruginosa; C. odorata: crude extracts; phytoconstituents; combination therapy.

Abstract: W2/2018/031

EFFLUX PUMP INHIBITORS FROM NATURAL SOURCES AS ENHANCERS OF FRONTLINE ANTIBIOTICS IN COMBATING MULTIDRUG RESISTANCE

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Abstract
Antibiotics discovery brought a great revolution in therapeutic medicine. It was indeed one of the most important milestones in curative medicine. Disappointingly, this therapeutic achievement is currently threatened by the rapidly increasing antimicrobial resistance among some common bacteria of medical importance resulting in the emergence of almost untreatable infections. Efflux pump mechanism is a significant contributing factor in the drug resistance mechanisms of these multidrug resistant (MDR) microorganisms. Research on MDR efflux protein regulation, mechanism of drug recognition is intensively on going. Efflux pump inhibitors from natural sources are particularly exploited as these compounds possess the potential to enhance the activity of frontline antibiotics. This article ambitions at elucidating the cutting-edge understanding on antibiotics resistance mechanisms, novel antibiotics resistant determinants specifically with appreciate to multidrug efflux pumps and their features in bacteria virulence and using efflux pump inhibitors from herbal resources.

KEYWORDS: Multidrug, Resistance, Efflux pump, Efflux pump inhibition

Abstract: W2/2018/032

COMPARING THE PHARMACOLOGICAL ACTIVITY OF *MORINGA OLIEFERA LAM(MORINGACEAE)* SEED WITH THE LEAVE IN REDUCTION OF BLOOD METAL LOAD USING ALBINO RATS

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Abstract

Moringa oleifera has been found useful in treating water and a good chelating agent. On this account assessing its ability in treating heavy metal induced diseases and reduction of blood metal load might be sustainable approach to in countering heavy metal pollution in the body. This was carried out using both seed and leave of *M. oleifera* in other to evaluate the part of the medicinal plant containing more activity. 1kg quantity of the powders of the leaves and seeds were exhaustively extracted with methanol and concentrated with rotator evaporator. Phytochemical analysis of the leaves and seeds extracts showed the presence of Alkaloids, flavonoids, saponins, resins, tannins, steroids, terpenoids, carbohydrate, proteins, oils, and reducing sugars. The result of the seed at 250mg/kg after induction of heavy metals gave 41.10ng/ml and 55ng/ml after treatment but gave 35.60ng/ml after induction and 26.63ng/ml after treatment at 500mg/kg dose. The leaves at 250mg/kg showed 35.73ng/ml after induction and 27.63ng/ml after treatment but 500mg/kg gave 36.36ng/ml and 27.10ng/ml after induction and treatment respectively. This gave the percentage different after administration of the seed extract at 250mg/kg, 500mg/kg as 6.2%, 25.77% and the same dose of leaves extract at as 22.67%, 25.47% respectively. Leaves of *Moringa oleifera* is more potent in reduction of heavy metal in the blood of white albino rats than the seed.

KEYWORDS: *Moringa oleifera*, Heavy metals, Phythochemicals, Medicinal plants

Abstract: W2/2018/033

ANTIPLASMODIAL POTENTIAL OF CARRAGEENAN AND *PROSOPIS AFRICANA* BUCCAL FILMS OF ARTEMETHER ON MALARIOGENIC RATS

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Abstract

Malaria remains a global threat with resistance to interventions and poor patient compliance. Bioadhesive buccal films innovatively adhere and hydrate at mucosal surfaces to release drug across the buccal membrane. This study characterized artemether (ART) buccal films prepared by film casting using carrageenan (CAR) and *Prosopis africana* (PRO) by size, zeta potential, texture and water content, morphology, thermal and interaction studies, *in vitro* drug release and *in vivo* antiplasmodial activity in mice. The result shows that natural polymers (CAR and PRO) can conveniently deliver ART as buccal films to treat malariogenic mice with drug films more desirably favouring PROART than CARART films; hence better drug dissolution, release and antiplasmodial activity due to more uniform (0.6) amorphous (21.63 J/g) nanoparticles (853 nm) make-up of PROART films which thickly (0.28 mm), though porously and

brittlely enclosed ART with lower moisture content (15 %) for better stabilization (-10 mV) through intramolecular hydrogen bonding of the ART and PRO molecules; than CARART films with higher water content (21 %) which increased intermolecular spaces allowing polymeric chains to easily slide past each other to expel entrapped ART affecting drug stability, release and elastic modulus of the films. Overall, the antiplasmodial efficacy was 86, 76 and 67 % corresponding to ART>PROART>CARART respectively. Since all the formulations achieved reduction in parasitaemia between 67 and 86 %, nonetheless, the improved ease of application and compliance, perhaps with elimination of vomiting and other gastrointestinal disturbances associated with conventional ART, could create hope for a clinical trial since antiplasmodial efficacy of the formulations were statistically significant.

KEYWORDS: Artemether, Carrageenan; *Prosopis africana*; Sublingual buccal films; Malaria

Abstract: W2/2018/034

DISSOLUTION ENHANCEMENT PROPERTY OF *PROSOPISAFRICANA* PEEL POWDER IN ACECLOFENAC TABLETS

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Abstract

The purpose of this study was to establish the solubilization property of *Prosopisafricana* peel powder (PAPP) and compare with standard polymer (β -Cyclodextrin) for delivery of poorly-water soluble drug (aceclofenac) formulated as tablets. PAPP was prepared by freshly boiling *Prosopisafricana* seed. The inner (A1) and outer (A2) layers were separated, dried to constant weights and ground into powders (PAPP A1 and PAPP A2). Spray-dried solid dispersions (SDSD) of aceclofenac were prepared using PAPP A1, PAPP A2 and β-cylodextrin as dissolution enhancers and compressed into tablets by direct compression. The formulations were characterized based on drug content, particle size, morphology, interaction studies through Fourier-transform infrared (FT–IR/Raman) spectroscopy, differential scanning

calorimetry and powder X-ray diffraction. The results showed that PAPP A1 recorded 6-fold dissolution enhancement of aceclofenac whereas PAPP A2 gave 4-fold improvement of dissolution superior to drug alone and β-cylodextrin. Drug content was highest (98.34%) in PAPP A2 (1:6). Hardness and weight uniformity tests of all batches of tablet complied with set standards.*Invitro* release studies of tablets showed that all the polymers enhanced solubility and dissolution with best aceclofenac release of 98.83 % from SDSDAA2 1:6 against 91% from SDSDAA1 1:4; 47% from SDSDAβCD 1:8 and 65% from Spray-dried aceclofenac (SDA). Therefore, PAPP A1 and PAPP A2 did not only exhibit better drug delivery properties (solubility and dissolution enhancement) but were superior to β-cyclodextrin. Nonetheless, availability, cost and ease of preparation were additional advantages of these natural alternative polymers in innovative drug delivery.

KEYWORDS: β-cyclodextrin; Dissolution enhancement; *Prosopisafricana* peel powder, Solubility; Spray dried solid dispersions.

Abstract: W2/2018/035

FORMULATION AND CHARACTERIZATION OF ARTEMETHER LOADED-SODIUM ALGINATE MICROCAPSULES

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Abstract

The study aims to increase solubility of artemether (ART) in Transcutol HP through microencapsulation in sodium alginate polymer to achieve sustained *in vivo* release. Graded concentrations of ART (0.00, 0.25, 0.50, 0.75 and 1.00 g) microcapsules were produced using Tween® 80 as aqueous surfactant by the cold homogenization method at 24 x 1000 rpm for 15 min. The microcapsules were characterized by % yield, encapsulation efficiency (EE), particle size, pH stability studies, differential scanning calorimetry, FTIR and *in vivo* release study using Peter's four-day suppressive protocol in Wistar mice infected with *Plasmodium beighei,* after which the growth inhibition (%) and RBC count were determined. The results showed highest yield of 96.85 % corresponding to 5.0g ART-loaded microcapsules whereas EE of 88.3 % corresponded to 0.75 ART-loaded microcapsules. There was general reduction in enthalpy in all drug-loaded microcapsules compared to the crystalline drug where as no interaction was traceable to any

functional group in the ART or ART-loaded microcapsules except in the blank microcapsules. This showed good compatibility between the drug and excipients. There was dose-dependent plasmodial growth inhibition of 88.75% (AMC0.75) over 68% (AMC0.25) and commercial oral-ART tablet (79%). The artemether loaded sodium alginate microcapsules (AMC) showed sustained release characteristics for oral delivery of artemether and therefore may reduce some of the adverse effects associated with high dose artemether therapy in the conventional oral tablets.

KEYWORDS: Malaria; Artemether; Microcapsules; Sodium alginate; Antiplasmodial activity

Abstract: W2/2018/036

PREPARATION AND CHARACTERIZATION OF ARTEMETHER-LOADED PLGA NANOPARTICLES

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Abstract

PLGA particles of antimalarial drug, artemether (ART) were produced by emulsification-diffusion method and characterized. Fresh samples, reconstituted after lyophilization as well as stored samples were studied for particle size, polydispersity index (PDI) and zeta potential; thermal property by differential scanning calorimetry (DSC), morphology by transmission electron microscopy (TEM) in addition to interaction study by Fourier transform infrared spectroscopy (FTIR) were carried out. Encapsulation efficiency and drug loading were determined by HPLC. Result shows stable monodispersed (0.01-0.21) spherical particles (201-246 nm) with molecular dispersion of ART (10 mg) while achieving encapsulation efficiency of ~13 % and drug loading of ~17 % superior to values obtained for the batch loaded with 5 mg of ART. FTIR showed interaction of OH-group of ART with C=O of PLGA resulting in shifts and/or reduction in peak intensities. The study reveals the feasibility of ART loaded PLGA nanoparticle (~246 nm) as having high potential for skin delivery since particle size is critical for tissue penetration, *in vitro* drug release, *in vivo* performances as well as degradation behavior. In an outlook, we are currently investigating the skin permeation and follicular uptake of these particles to hope for an alternative topical and/or transdermal antimalarial regimen of ART.

Keywords: Malaria; Artemether; PLGA; Emulsion diffusion; HPLC; Characterization.

Abstract: W2/2018/037

IN VITRO ANTIBACTERIAL PROPERTY OF CIPROFLOXACIN NANOSTRUCTURED LIPID CARRIER FOR TREATMENT OF BACTERIAL INFECTION

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Abstract

Though broad acting, ciprofloxacin (CIPRO) has not been listed as first line treatment (e. g. clindamycin and vancomycin) for Bacillus infections despite common isolation in severe human infections (bacteremia, endocarditis, pneumonia, food poisoning and septicaemia) especially in immuno-compromised patients. The study was to develop controlled CIPRO delivery systems based on nanostrustructured lipid carriers (NLCs) of Precirol® ATO 5/Transcutol® HP (batch A) and tallow fat/Transcutol® HP (batch B). NLCs loaded with CIPRO (0.0, 0.2, 0.5, 0.8 and 1.0 %w/w) in both batches (AC_{1-5} and BC_{1-5}) were prepared by hot homogenization; characterized by yield (%Y), encapsulation efficiency (%EE), particle size, zeta potential (ZP), polydispersity index (PDI), morphology, thermal property, interaction study and *in vitro B. subtilis* growth inhibition on seeded agar plates.Optimized samples of AC_5 achieved polydispersed particles of ~605 nm size, 86 %Y, 92 %EE and -28 mV similar to BC_5 (~789

nm, 87 %Y, 91 %EE and -31 mV). Crystallinity indices were both low and CIPRO release from AC_5 was highest (~98 %) in SGF (pH 1.2) than BC_5 (~86 %) and BC_5 in SIF (pH 6.8)was ~98 %. Lowest concentration of AC_5 (1.2µg/ml) released enough CIPRO that diffused and penetrated the endospore-surrounding DNA and other internal cell structures of *B. Subtilis,* decreasing introduction of negative supercoils into DNA with rapid cessation of DNA synthesis through interference with the propagation of DNA replication. By improving CIPRO delivery across the ordinarily hard and impermeable walls of *B. subtilis* inaccessible to extreme temperatures, chemicals, environmental factors and even some types of radiation provides hope for more tolerable oral regimen with lower dose, frequency and better compliance.

KEYWORDS: Ciprofloxacin; *Bacillus subtilis;* Nanostructured lipid carriers; Antimicrobial activity; Inhibition zone diameter

Abstract: W2/2018/038

POTENTIAL DRUG DELIVERY CHARACTERISTICS OF MODIFIED NANOSTRUCTURED LIPID CARRIERS

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Abstract

The objective of this study was to preliminarily investigate two solid homolipids from: natural *Bos indicus* (tallow fat) and semi-synthetic lipid (Precirol® ATO 5), separately structured with liquid lipid (Transcutol® HP) and/or heterolipid flakes (Phospholipon 90G) to ascertain their potentials for drug delivery.Lipid mixtures were prepared by fusion and screened by differential scanning calorimetry (DSC). Optimized lipid matrices were used to formulate nanostructured lipid carriers (NLC) by hot homogenisation method using mixed optimized surfactants concentrations (1, 2 and 3 %w/w) of Polysorbate 80, Poloxamer® 188 and Solutol® HS respectively. NLC particles were analysed for particle size, polydispersity index, surface charge, morphology, thermal properties, pH storage stability and solid state characteristics. Resultant binary lipids formed with solid lipids (Precirol ATO 5® and/or tallow fat) and liquid lipid (Trancutol P®) had better thermal properties than the individual bulk lipids or when modified with P90G. FTIR spectra showed no interactions whereas NLC production was optimum at 15 % binary lipid composition and surfactant concentrations used, at the emulsification time of 15 min. NLC particles were stable, spherically smooth and non-porous with nanometric sizes, moderate polydispersity and high negative surface charges. Since the binary lipid mixtures of tallow fat/Transcutol and/or Precirol/Transcutol had low crystallinity required for high drug encapsulation, additional to being able to form moderately polydispersed nanoparticles, it follows that the NLC formulations might serve as alternative oral delivery systems to improve solubility of some poorly soluble drugs.

KEYWORDS: Nanostructured lipid carrier; Precirol® ATO 5; Tallow fat; Transcutol® HP; Phospholipon® 90G.

Abstract: W2/2018/039

REPRODUCTIVE INDICES OF MALE ALBINO RATS TREATED WITH ETHANOLIC STEM BARK EXTRACT OF *PICRALIMA NITIDA*

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Abstract

The work was designed to evaluate the effects of graded doses of ethanolic stem bark extract of *Picralima nitida* on some serum reproductive hormones, sperm reserves and testicular histomorphology of male albino rats. Thirty male albino rats, weighing between 120 and 200 grams were randomly assigned into six groups of five rats each. Group A received 0.5 ml of distilled water (normal control). Groups B, C and D received 100, 200 and 400 mg/kg BW of the extract respectively. Group E received 2.5 mg/kg BW of CdCl2 (negative control), while Group F received 5 mg/kg BW of Sildenafil (positive control); orally every other day for six weeks. At the end of the experiment, blood samples were collected for serology, whereas testicular sections were collected for histopathology following the standards procedures. Data obtained were analyzed by One-way ANOVA.The result showed that 200 and 400 mg/kg BW of the extract, and 2.5 mg/kg BW of CdCl2 decreased ($P < 0.05$)serum testosterone and sperm counts. The normal control, 100 mg/kg BW of the extract and 5 mg/kg BW of Sildenafil had normal testicular histoarchitecture; whereas 200 and 400 mg/kg BW of the extract, and 2.5 mg/kg BW of CdCl2 had slight, moderate and severe degeneration of the germinal epithelium and interstitium, with depletion of sperm cells in the lumen of the seminiferous tubules respectively.This study revealed that treatment with ethanolic stem bark extract of *Picralima nitida* above 100 mg/kg BW adversely affected reproductive parameters in male albino rats.

KEYWORDS: Fertility, Male rats, *Picralima nitida*, Seminiferous tubules, Testosterone

Abstract: W2/2018/040

COMPARATIVE STUDY ON THE ANTIOXIDANT ACTIVITY OF THE AQUEOUS EXTRACTS OF *Daturastramonium* SEEDS AND LEAVES ON CYCLOPHOSPHAMIDE-INDUCED OXIDATIVE STRESS IN ALBINO RATS

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Abstract

The present study was conducted to compare the effects of the aqueous extracts of *Daturastramonium*l eaves and seeds on cyclophosphamide-induced oxidative stress in albino rats. Twenty four (24) Wistar albino rats were divided into 6 groups of 4 rats each. All groups, except group 1, were induced with cyclophosphamide at a dose of 150 mg/kg b.w. Group 1 was the normal control, group 2 (positive control) was left untreated, group 3 and 4 were administered 200 and 400 mg/kg b.w of the seed extract respectively, while group 5 and 6 were administered 200 and400 mg/kg b.w of the leaf extract respectively after cyclophosphamide induction. Administration of the extracts caused significant ($p < 0.05$) decreases in catalase (CAT) and glutathione peroxidase (GPx) activities, glutathione (GSH) and malondialdehyde (MDA) concentrations of the treated groups compared to group 2. The extract also led to a significant ($p < 0.05$) decrease in SOD activity of group 4but a non-significant ($p > 0.05$) decrease for groups 3, 5 and 6 compared to group 2. Vitamins C and E concentrations significantly ($p < 0.05$) increased for all the treated groups compared to group 2. Treatment with the extract also led to a non-significant ($p > 0.05$) increase in vitamin A concentration of groups 3, 4 and 6compared to group 2. This study showed that *Daturastramonium* seeds and leaves has antioxidant activity ,shown by reduced MDA concentration and increased

concentration of antioxidant vitamins, with the leaf extract possessing higher activity.

Keywords: *Daturastramonium*, antioxidant, cyclophosphamide, malondialdehyde, vitamins

Abstract: W2/2018/041

MINING MARINE MICROBES FOR NOVEL NATURAL PRODUCTS

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Abstract

The marine environment represents a rich source of novel bioactives, with marine organisms accounting for approximately half of the earth's biodiversity. Although the marine microbiome has been little explored for compound discovery, there is evidence that searches will be fruitful. Over the centuries, microbial secondary metabolites have played a significant role in the treatment of human diseases and have revolutionized the pharmaceutical industry. With the increasing number of sequenced microbial genomes revealing a plethora of novel biosynthetic genes, natural product drug discovery is entering an exciting second golden age. Excitingly genome scanning reveals that most actinomycetes have 20-30 biosynthetic clusters encoding natural products, however only a small fraction of the molecules that microbes can produce have so far been isolated, and the clear majority remain to be revealed[2]. Using a biosynthetic gene cluster targeted approach, the focus may be placed on producing and isolating only previously undiscovered bioactive natural products. The isolation of the natural metabolites involves fermentation of the microbial strains. The fermented broth will be extracted in XAD resins and the extract purified using different chromatographic techniques. Bioassay guided fractionation will allow the isolation of the biologically active natural products.

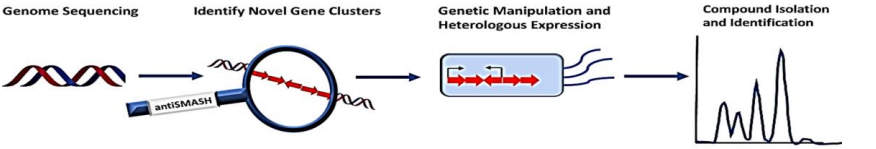

Fig. 1: Gene Cloning for natural products isolation

This study lead to the isolation of Bacillins are new cyclic peptidolipid antibiotics, from a new strain of *Bacillus 2011SOCCUF3* closely related to *Bacillus horneckiae* sp and producing bacillomycin F with minimal inhibitory concentration (MIC) of >400 μg/mL against *Staphylococcus aureus*. Also, Marinomycins, an unusual macrodiolides was isolated from *Marinispora CNQ-140* strain with significant antibiotic activities against methicillin- and vancomycin-resistant strains (MIC 0.1- 0.6 μM). In room light, marinomycin A isomerizes to its geometrical isomers marinomycins B and C ($t_{1/2}$ = 1 hour). Through genome informed approaches, we have isolated and characterized new natural products from different marine microbes.

Abstract: W2/2018/042

EFFICACY OF DETOGEN-B, METAGEN AND MALO WHOLE MEDICINAL PLANT FORMULATIONS IN NATURAL TREATMENT OF CANCERS, KIDNEY FAILURE AND LIVER DISEASES

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Abstract

Recent global statistics shows that cancers claim more than 8 million lives, while kidney diseases register up to one million cases annually, with most cases defying even the conventional orthodox medications. Hence, there is always need to explore alternative approaches to effective cures. Some cases of cancer and kidney failure that have been established in teaching hospitals or licensed diagnostic laboratories were subjected to our extemporaneous herbal preparations from already researched plants with established phytochemical properties. Histories of patients' diets were taken, and the toxicological properties of the food additives noted as possible risk factors in the disease conditions. Following our treatment protocol, patients with cancers of the liver, cervix, bone, lungs including cirrhosis, fatty liver and severe kidney diseases have recovered and are now stable. Laboratory evidences from CT scans, X-ray images, and Bence Jones protein clearance tests were obtained. Tumour markers including PSA for prostate cancers and CA - 15-3 ELISA for invasive carcinoma of the breast were used to monitor progress of treatment. The first-line drug in these treatments course is Detogen-B except in the case of breast cancers by reason of its phytoestrogen content. Metagen and Malo are other formulations used in various dosages with or without Detogen B. The herbal formulation Detogen B has passed through sub-acute and sub-chronic toxicity tests conducted by the Nigeria Natural

Medicine Development Agency (NNMDA), under the auspices of the Federal Ministry of Science and Technology, in conjunction with the Lagos University Teaching Hospital (LUTH). Animal organ tests showed a graphical increase in the mean weights of the liver, pancreas and lungs showing its activity in the regeneration of tissues. Reduction of LDL and triglycerides levels showed its detoxification and cardiovascular effects. The Haematological profile shows increase in the levels of WBC, MCH, MCHC and platelets without changes in the levels of RBC and procalcitonin. All these are indications of the effects of Detogen-B in the treatment of lesions, cancers, haemangioma and very degenerative disease conditions with immunostimulatory effects.

Abstract: W2/2018/043

GLOBAL DISEASES BURDEN: NEW PROSPECTS OF A PANACEA THROUGH LIVER-DEPENDENT IMMUNOMODULATION

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Abstract

Immunomodulation has shown good prospects but is still complex. The research proposed a theory for simple liver-dependent immunomodulation. Wesearched databases including Medline, Science direct and Researchgate for relationships between disease, cell death, redox, the immune system and the liver. The searches were done to establish that the liver significantly affects the immune system through redox and non-redox pathways. We evaluated 180 publications. The liver affects immune functions by the synthesis, storage or metabolism of acute phase proteins, galanin, neuropeptide Y, vitamin B12, vitamin A, vitamin D, vitamin E and other self molecules. It also metabolizes non-self molecules. Besides, the liver controls systemic redox viaits synthesis of glutathione and other thiol and non –thiol antioxidants. Systemic redox was implicated in the inflammatory response, antigen presentation, immune cell proliferation, helper T-cell balance, induction of tolerance to harmful molecules, the stress response and the capacity of cells to regenerate. The research defined the Liver-Redox Disease Theory thus: 'All diseases are due to disorderly cell death resulting from pro-oxidant induced aberrant redox reactions which leads to immune compromise in the absence of optimal liver function. It is possible to manipulate the immune system through the liver to treat and potentially cure all diseases. We named the process Hepato-immunotherapy (HIT). HIT can be tested by hepato-protection, optimal liver health, proper nutrition, and minimal systemic toxicity. HIT may elongate lifespan.

Abstract:W2/2018/044

PREVALENCE OF *PLASMODIUM FALCIPARUM* MALARIA AND THE ANTENATAL HEALTH CARE UTILIZATION FOR PREVENTION AMONG PREGNANT WOMEN IN A SECONDARY HEALTH FACILITY IN ENUGU STATE, NIGERIA

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Abstract

A study was conducted to determine the prevalence of *plasmodium falciparum* malaria parasite infection among pregnant women using peripheral blood sample and microscopy in Bishop Shanahan Hospital Nsukka. Also the antenatal health care utilization among pregnant women was determined. The study was a descriptive, prospective, cross-sectional survey that was carried out between May and August 2017. Questionnaire concerning demographics, gravidity, pregnancy stage and antenatal health care utilization was used. A total of 81 pregnant women participated in the study. Their blood samples were tested for malaria parasite infection using thick and thin smear. Data collected were analyzed using statistical package for social sciences (SPSS) version 16.0. Associations of variables were tested using a chi-square with level of statistical significances set at $p< 0.05$. The result showed a prevalence of 55.6%. It was found that women in their first pregnancy had the highest prevalence of 51.9%. Pregnant women aged 25-30 years had highest infection rate of 68.8 %. These women had good utilization of antenatal health care services (56.1%). Only trimester had statistical significant association with the level of antenatal health care utilization. There was statistical significant association between age group as well as haemoglobin concentration and malaria parasite test ($p<0, 05$). The study showed that the prevalence of *Plasmodium falciparum* malaria was high though there was good use of antenatal health care for prevention. The respondents' social demographics had nothing to do with the malaria parasite test except age group and hemoglobin level.

Keywords: Malaria, Prevalence, Pregnant women, *Plasmodium falciparum*, Enugu

Abstract:W2/2018/045

(Z)-2-DECYLPENT-2-ENEDIOIC ACID AND PHENOLIC ACIDS ISOLATED FROM THE LEAF OF *MILLETTIA ABOENCIS* DISPLAYED *IN VITRO* ANTIOXIDANT ACTIVITY

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Abstract

*Millettia aboencis*is used in ethnomedicine for the management of ailments associated with oxidative stress. The chemistry of this species of the genus *Millettia* has started attracting attention in the recent times. In this study, we report the isolation of three antioxidant organic acids from the methanol leaf extract. The bioactive principles were isolated from the leaf extract using a combination of different chromatographic techniques including Vacuum Liquid Chromatography, Sephadex LH-20 separation and semi-preparative HPLC. The chemical structures of the compounds were elucidated by a combination of Mass and NMR spectroscopy. The isolated compounds were tested for their antioxidant activity using 2, 2-diphenylhydrazyl (DPPH) radical scavenging model. The ethyl acetate fraction of the methanol leaf extract of *Millettia aboencis* yielded three known compounds; (Z)-2-decylpent-2-enedioic acid (**1**), protocatechuic acid (**2**) and gallic acid (**3**); which were identified on the basis of their spectroscopic data and comparison with literature. The isolated compounds showed a concentration dependent DPPH free radical scavenging activity with compound **1** having the highest activity (IC_{50} of 166 µg/ml). This is the first report on the isolation of these organic acids from the leaf of *Millettia aboencis*. While the phenolic acids (compounds **2** and **3**) are widely distributed in nature, compound **1** is very rare in nature and will serve as a useful taxonomic marker both for identification and standardization of this plant species. This compound also holds great potential for development into novel therapeutic agent.

Key words: Millettia, isolation, compounds, DPPH, antioxidant

Abstract:W2/2018/046

EFFECTS OF AQUEOUS EXTRACT OF KUDING LEAVES ON CYANIDE-INDUCED TOXICITY AND PCV

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Abstract

Cyanide poisoning occurs when a living organism is exposed to a compound that produces cyanide ions (CN^-) when dissolved in water. Kuding leaves are Chinese leaves used for weight control. Aqueous extract of kuding leaves was assessed for its effect on cyanide-induced toxicity and Packed Cell Volume (PCV) in wistar rats. Group A was administered 1% tween-80 at 5ml/kg. Group B was not induced but received 400mg/kg bw extract only, Group C received 3mg/kg cyanide without treatment, Group D received extract 200mg/kg, Group E received extract 300mg/kg, Group F received 400mg/kg of the extract. Packed Cell Volume was determined using automated haematology analyzer (Mindray-BC-28000). A significant reduction ($p>0.05$) in weight was observed for the group that received only extract at 400mg/kg bw and the group that received only cyanide 3mg/kgbw for two weeks when compared to the control group. The test groups showed a significant reduction ($p<0.05$) in weight after four weeks of administration when compared to the control group. The dose of 3mg/kg cyanide and 200mg/kg extract showed 6.4% increase in PCV. The dose of 3mg/kg cyanide and 300mg/kg bw extract showed 3.5% decrease in PCV while 3mg/kg cyanide and 400mg/kg extract showed 31.5% decrease in PCV after four weeks. The results obtained suggest that the aqueous extract of kuding leave at a dose of 200mg/kg bw is effective in healing cyanide-induced toxicity in wistar rats without reducing their PCV.

Keywords: Body weight (bwt), Cyanide-induced toxicity, Kuding leaves, Packed Cell Volume (PCV), Cyanide ion (CN^-).

Abstract W2/2018/047

FREE RADICAL SCAVENGING POTENTIALS OF *Annona muricata* LEAF IN ALLOXAN INDUCED DIABETIC WISTAR ALBINO RATS

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Abstract

The free radical scavenging potentials of the ethanolic leaf extract of *Annona muricata* were studied in diabetic rats. Thirty wistar albino rats were divided into six experimental groups of five rats per group. Diabetes mellitus was induced in Groups 2, 3, 4, and 5 rats only by intraperitoneal injection of alloxan (130mg/kg). Group 1 rats served as "Normal control" animals and received normal rat pellets and water. Group 6 rats were administered with 400mg/kg day^{-1} of the extract without induction; group 3 rats were treated with glibenclamide (5mg/kg body weight), groups 4 and 5 received 200mg/kg and 400mg/kg body weight of *A. muricata* leaf extract day^{-1} respectively throughout the duration of the experiment. Group 2 rats were induced but not treated with any drug, thus it served as the "Negative control" group. Quantitative phytochemical analysis of the leaf extract was carried out using the Association of Official Analytical Chemists (AOAC) methods. Acute toxicity test of the leaf extract of *A.muricata* was determined by Lorke's toxicity testing method. Free radical scavenging of the leaf extract was determined by means of antioxidant enzyme assays. The blood glucose levels of the animals in each group were determined using Accu-chek test strip method. The activities of the enzymes; superoxide dismutase, catalase, and glutathione peroxidase were measured by means of spectrophotometer at wavelengths 480nm, 240nm, and 340nm, respectively. Malondialdehyde was also assayed at the wavelength

of 532nm. The result of the quantitative phytochemical analysis of the leaf showed the following: phenols (74.00mg/100g), flavonoids (3.70mg/100g), tannins (2.95mg/100g), oxalate (6.48mg/100g), terpenoid (13.88mg/100g), phytates (130.00mg/100g), saponins (6800.00mg/100g), alkaloids (570.00mg/100g), cardiac glycoside (1690.00mg/100g). Acute toxicity studies showed that LD_{50} was 3807.89mg/kg body weight. The antioxidant enzyme assay in animal groups 1 to 6 for SOD activity (IU/L) were; 0.0910 ±0.0555, 0.1514 ±0.0107, 0.0596 ±0.0001, 0.0863 ±0.0971, 0.0543 ±0.0537, and 0.0572 ±0.0390 respectively, while for the CAT activity (IU/L) were; 0.5708±0.2443, 0.3867±0.2062, 0.5513±0.4768, 0.5390±0.0739, 0.5567±0.1997, and 0.6384±0.3253 respectively, while for GPx activity (IU/L) were; 1.0977±0.4761, 1.2507±1.1122, 0.7817±0.0201, 0.8907±0.2948, 0.0362±0.0475, and 1.3501±0.3152 respectively, the extract showed potency in enhancing the levels or activities of antioxidant enzymes in a dose dependent manner. The MDA levels (µmol/ml) in animal groups 1 to 6 were; 0.0005±0.0001, 0.0009±0.0006, 0.0009±0.0001, 0.0015±0.0005, 0.0010±0.0003, and 0.0011±0.0006 respectively. The findings from this study suggest that ethanolic leaf extract of *A. muricata* has notable effect in inducing antioxidant enzymes during oxidative stress more than the standard drug used. The extract is therefore suggested to have higher effect in the treatment and management of oxidative stress-related diseases than the standard drug used in the study.

Keywords: *Annona muricata*, phytochemical analysis, acute toxicity testing, antioxidant enzymes, malondialdehyde.

Abstract: W2/ 2018/048

MEMORY ENHANCING, ANTICHOLINESTERASE AND ANTIMICROBIAL ACTIVITIES OF B-PHENYLNITROETHANE AND ESSENTIAL OILS OF *DENNETTIA TRIPETALA* BAKER F.

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Abstract

Dennettia tripetala Baker f. (Annonaceae) is an important food and medicinal plant used in some local communities in Southwest Nigeria. The study determined the chemical composition of the essential oil of its different morphological parts. It also evaluated the oils for memory enhancement usingY-maze, *in-vitro*anticholinesterase activities and antimicrobial propertiesby nutrient broth method. Essential oil of the fresh fruits, dried fruits, dried seeds and fresh leaves were obtained by hydrodistillation and analysed by GC-FID and GC-MS.GC analysis identifies β-ocimene, linalool, β-phenylnitroethane(BPNE) and humulene as common constituents in all the plant parts. The predominant constituent BPNE was 87.4 % in the dried seed, followed by the dried fruit (78.1 %), fresh leaf (62.9 %) and the fresh fruit content was 61.6%. The seed oil and BPNE exhibited high memory enhancing activities. However, the seed oil mixture exhibited better inhibition against the test bacteria and the broadest spectrum of antimicrobial activity. Bioactivities demonstrated by the various essential oils were not solely due to BPNE; rather, synergistic effects of other components are quite remarkable.

The most abundant component - β-phenylnitroethane was totally responsible for its memory enhancing properties but could not account for its antimicrobial activity.

Keywords: *Dennettia tripetala,* essential oils, GC-MS, β-Phenylnitroethane, bioactivities

Abstract: W2/ 2018/049

DEVELOPMENT OF THE BURSA OF FABRICIUS IN NIGERIAN INDIGENOUS AND BROILER CHICKENS: A MORPHOLOGICAL PERSPECTIVE

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Abstract

Morphological development of the bursa of Fabricius at embryonic days 14 and 19, and post-hatch day 1 was investigated in Nigerian indigenous and broiler chicken using gross anatomical, histological and electron microscopic techniques. Morphometric data on the bursa of Fabricius were similar in both the indigenous and broiler chicken. At embryonic day 14, the bursa of Fabricius of the indigenous chicken showed tall mucosal folds (plicae) which contained numerous lymphoid follicles that increased in number with age. These mucosal folds demonstrated lamina epithelialis mucosae, whose cells exhibited apico-lateral tight junctions, scanty microvilli and thin basal lamina. The bursa of Fabricius of broiler chicken exhibited short mucosal folds of mesenchymal tissue, without definite follicular and inter-follicular areas at embryonic day 14. They also showed microfold-like cells in the lamina epithelialis mucosae. In the broiler chicken, lymphoid follicles were present at embryonic day 19 and post-hatch day 1. Follicular capsules were composed of collagen type III fibres except in broiler chicken at embryonic day 14. Lymphoblasts, embryonic macrophages and mesenchymal cells occurred in the lymphoid follicles and inter-follicular areas. Some cells contained autophagic vacuoles in the inter-follicular areas. The results suggest that the structural modifications of the bursa of Fabricius of indigenous and broiler chicken between embryonic day 14 and post-hatch day

1 are key developmental processes that are essential for the functional maturation of the organ. Physiologic mechanisms including autophagy may influence early cellular colonization, differentiation and development of the bursa of Fabricius in avians

Key words: Structural development, bursa of Fabricius, autophagy, Nigerian indigenous chicken, Marshall broiler chicken

Abstract: W2/ 2018/050

NEUROPROTECTIVE EFFECT OF *BUCHHOLZIA CORIACEA* SEED EXTRACT ON MERCURY-INDUCED CEREBRAL AND CEREBELLAR INJURY: A BIOCHEMICAL AND HISTOPATHOLOGICAL EVALUATION IN RATS

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Abstract

This work investigated the potential neuroprotective effect of *Buchholzia coriacea* seed extract on mercury-induced cerebrum and cerebellum injury on Wistar albino rats. A total of twenty five (25) rats weighing 120-140g were used. They were separated into five equal groups as follows: Group 1received feed only and served as normal control. Group 2 received extract and feed only and served as extract control. Group 3 received mercury and feed only and served as negative/untreated control while groups 4 and 5 received 200 and 400 mg/kg body weight of extract and feed respectively and were the test groups. Extract administration lasted for four (4) weeks at the end of which the animals were sacrificed and blood collected through cardiac puncture for biochemical analysis. Results showed significant ($P<0.05$) elevation of key indicators; malondialdehyde and nitric oxide levels, acetyl-cholinesterase and adenine deaminase activity in both the cerebellum and cerebrum of rats in group 2 compared to those in the other groups. The results also showed a significant ($P<0.05$) increase in the levels of reduced glutathione, glutathione peroxidase and catalase in the groups given extract compared to group (untreated control). Result of the histopathological examination concurred largely with the biochemical assay. We

conclude that seed extract of *Buchholzia coriacea* appears to possess some ameliorative effect against mercury induced brain damage.

Key Words: *Buchholzia coriacea,* Mercury, Brain, Rats, Biochemical assay.

Abstract: W2/ 2018/051

ADJUVANT EFFECT OF *VERNONIA AMYGDALINA* LEAF EXTRACT ON HOST IMMUNE RESPONSE TO HEPATITIS B SUBUNIT VACCINE

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Abstract

The compulsory 3 times dosing schedule of hepatitis B vaccination poses compliance and logistics challenges in most part of the world. Increasing the efficiency and reducing the number of required dose for hepatitis B vaccine can go a long way to increase compliance and overcome the logistics hurdles faced. The toxicity/safety margin of *V. amygdalina* was determined using Lorkes method. Immunization was carried out in two phases, phase 1 employed a 3-times vaccination schedule while phase 2 tested 2-times vaccination schedule. The humoral immune response was determined using ELISA methodology. The total white blood count, different white blood count, aspartate aminotransferase level, alanine aminotransferase level where determined and the body weight of the mice were periodically monitored. Our data demonstrate that *V. amygdalina* was not toxic up to the dose of 5000 mg/kg bw. At a concentration of 250 mg/kg bw as an adjuvant in a three times vaccination schedule, it increased IgM, IgG1 and IgA antibody responses. In a 2-times vaccination schedule, 1000 mg/kg of *V. amygdalina* as an adjuvant to hepatitis B vaccine was able to elicit effective antibody production (0.174 ± 0.002) which was significantly (P<0.05) higher than that seen in the conventional hepatitis B vaccine group (0.109 ± 0.002) which received 3-times vaccine dose. It equally enhanced innate cell-mediated immune response which was revealed by an

increase in total white blood cell, neutrophil and lymphocyte counts. In addition the adjuvant-vaccine combination did not produce a side effect as the Aspartate aminotransferase (AST) and alanine aminotransferase (ALT) levels were within the normal ranges. The liver excised from the sacrificed mice at the end of the vaccination series showed no sign of congestion, inflammation or colour change. The periodic mice body weight monitoring showed similar growth pattern between the treatment and control groups. These results suggest that *V. amygdalina* may serve as an effective adjuvant to hepatitis B vaccine thus producing better clinical outcomes.

Key words: *V. amygdalina,* adjuvant, Hepatitis B vaccine, immune response .

Abstract: W2/ 2018/052

SUPPRESSIVE EFFECT OF *GARCINIA KOLA* ON THE HUMORAL IMMUNE RESPONSE OF MICE TO HEPATITIS B VIRUS SUBUNIT VACCINE

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Abstract

Due to the health benefits of most medicinal plants, humans have resorted to their frequent and sometimes daily consumption, thus there is need to investigate the effect of medicinal plants consumption while on vaccination. This study was designed to investigate the biological interaction between *Garcinia kola* (GK) seed extract and Hepatitis B virus Surface Antigen. Fresh GK seeds were obtained, identified, dried, pulverized and stored in an air-tight container until extraction. Cold maceration technique was used for extraction. Methanol was the solvent used. Locke's method of acute toxicity testing was used to ascertain the toxicity of the extract. Afterwards, the experimental animals were grouped and vaccinated accordingly. After vaccination, sera collected from the animals were used for immunogenicity studies while the whole blood was used for total white blood cell count. During the study period, the experimental animals were monitored frequently and weighed. The percentage yield after extraction was 16.7%. The extract was non-toxic up to 5000 mg/kg. The vaccination induced antibody responses (IgM, IgG1 and IgA) in all the groups but the response in the hepatitis B vaccine group was significantly higher than that of the hepatitis B vaccine/GK extract combination group ($P<0.05$), suggesting an inhibitory/ suppressive effect of *G. kola* on immune response to the hepatitis B surface antigen. The total white blood cell count equally revealed a suppressive effect of the

extract on the hepatitis B virus surface antigen. The periodic weight monitoring reveals similar growth pattern across all other groups except the hepatitis B vaccine/GK combination group that seems not to be growing rapidly. The outcome of this present study shows that at ≥250 mg/kg body weight GK seed extract demonstrates a suppressive effect on the immunogenic responses to hepatitis B surface antigen. Therefore, cautious consumption or total abstinence from GK is advised in subjects receiving hepatitis B vaccination.

Keywords: Vaccine, hepatitis B virus, Garcinia kola, antibody responses, immunogenicity

Abstract: W2/ 2018/053

NOVEL TRANSDERMAL PATCHES OF DIAZEPAM USING HYDROXYPROPYL METHYLCELLULOSE, POLYVINYL ALCOHOL AND CASSAVA STARCH

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Abstract

Transdermal drug delivery systems are vehicles that deliver active pharmaceutical ingredients through the skin. Patches deliver drugs for systemic effects at a predetermined and controlled rate through the skin. The purpose of our research is to develop and evaluate transdermal patches for effective delivery of diazepam using hydroxypropyl methylcellulose, cassava starch and polyvinyl alcohol. Cassava starch was extracted from the tubers of *Manihot utilissima* by milling, preservation, filtration and pH adjustment. The starch was characterized by microscopic evaluation of particle size and morphology. The diazepam transdermal patches were formulated by solvent casting technique using varying parts of diazepam, hydroxypropyl methylcellulose, cassava starch, polyethylene glycol, Tween® 80, polyvinyl alcohol and distilled water. The patches were evaluated by FT-IR, thickness uniformity, folding endurance, percentage moisture uptake and loss, flatness, elongation break, swelling index and *ex vivo* skin permeation studies. The cassava starch showed average particle size of 13 ± 2 μm. Patches prepared with polyvinyl alcohol and HPMC/cassava starch at 3:2 ratio, respectively, showed relatively high folding endurance. Most of the batches showed percentage moisture uptake and loss of more than 40% at specified relative humidity conditions, with PVA batches showing up to 80% uptake and loss within the first week, whereas the

HPMC/cassava starch batch had the highest swelling index. The formulations presented with percent elongation in the range of 20-58% and were mostly 100% flat. Percentage drug permeated through the rat skin were below 20%, with most of the patches providing sustained drug permeation over time.

Keywords: Transdermal; permeation; *Manihot utilissima*; solvent casting

Abstract W1/2018/054

SUSCEPTIBILITY OF AZOLE-RESISTANT *CANDIDA ALBICANS* TO COMBINATIONS OF FLUCONAZOLE AND *ARTEMISIA ANNUA* METHANOL EXTRACT

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Abstract

The current increase in candidiasis especially among HIV patients, the infants and the elderly and recurrent resistance to azole drugs used to treat them necessitated this study. The aim of this work was to determine the susceptibility of azole- resistant *Candida albicans* to combinations of fluconazole and methanol extract of *Artemisia Annua. Candida albicans* were isolated from clinical specimens and were screened to get azole-resistant ones. Methanolic extract of *Artemisia Annua* was obtained and combined with fluconazole and the susceptibility of the azole-resistant *Candida albicans* to these herbal-antifungal combinations was determined. The interaction study was done using Agar Well Diffusion Method and Minimal Inhibitory Concentration (MIC). Studies carried out on antimicrobial effects of ethanolic and methanolic extract of *Artemisia annua* leaves reveal that the extract significantly inhibited both bacteria and fungi. In this study the MIC of *Artemisia annua* and the azoles were described. However, result showed that resistant *Candida albicans* isolates were inhibited by different concentrations (800, 400, and 200µg/ml) of methanolic extract of *Artemisia annua*.

Key words: *Artemisia Annua,* Susceptibility, Fluconazole, Candidiasis, MIC

Abstract: W2/ 2018/053

NATURO-THERAPEUTIC APPLICATIONS OF CLAY AND ITS TOXIC IMPLICATIONS: A REVIEW

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Abstract

The interaction of the natural environment on human health and living quality particularly in the use of natural products or remedies has aroused the interest of scientists and various communities all over the world. Since antiquity, the human kind has used clays externally and internally for maintaining healthy body and treatment of some diseases. Clays are eaten traditionally as a habit and for medicinal purposes in many cultures. Thus, clays have become a subject of interest due to their easy availability in nature and its wide range of biomedical applications. This paper examines the various applications of clay for human and animal health and its toxic implications, as studies have shown that clays contain heavy metals like lead, arsenic and cadmium amongst other pollutants. It also emphasizes the need for full utilization of the huge deposits of clays available in the West African sub-region for biomedical solutions but advocates a systematic in-vivo toxicological evaluation of our indigenous clays taking into account the physico-chemical profiles of the different types available.

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