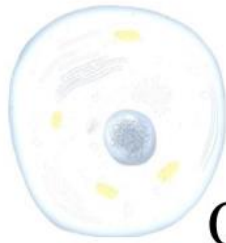




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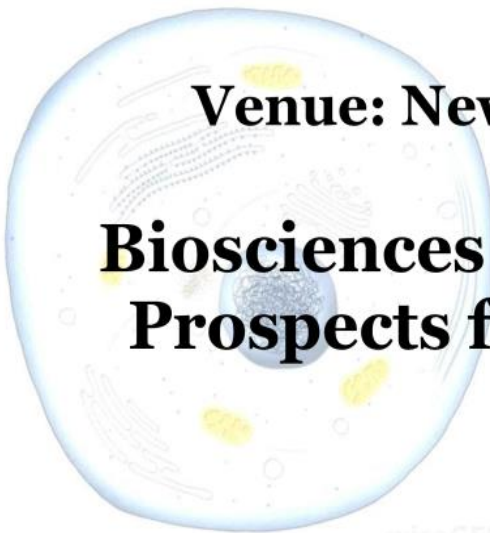


2nd International Conference on Biosciences Research



ICBR 2016
Owerri, Nigeria
24-27 November 2016

Venue: Newton Hotels, Owerri



**Biosciences and Biotechnology:
Prospects for the 21st Century**

Book of Abstracts

Edited by Ikechukwu Okoli and Joachim O. Ezeadila
on behalf of the Biosciences Research Support Foundation

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Biosciences Research**

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Organized by the Biosciences Research Support Foundation (BRSF)
in collaboration with
Hezekiah University, Umudi, Imo State, Nigeria

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Beginning in May 2015, every year BRSF will organize an International Conference on Biosciences Research (ICBR). This Conference will bring together bioscientists from all around the world in a multidisciplinary platform that will encourage interdisciplinary collaboration. The maiden ICBR was held at Awka, Nigeria in May 2015. The 2016 ICBR is being organized in collaboration with Hezekiah University, Umudi, Nigeria, and papers will be presented from areas of biological and biomedical sciences within the theme *Biosciences and Biotechnology: Prospects for the 21st Century*.

Ikechukwu Okoli, Ph.D.
President, BRSF

Book of Abstracts

The Proceedings of the 2nd International Conference on Biosciences Research with full text of papers/posters will be available in February 2017 at:
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The Book of Abstract was published without references, which can be found with the full texts in the Proceedings.

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Cardioprotective effect of Indian medicinal plants against doxorubicin toxicity – *in vitro* study

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Abstract

Doxorubicin is an important and effective anticancer drug widely used for the treatment of various types of cancer but its clinical use is limited by dose-dependent cardiotoxicity. Elevated tissue levels of cellular superoxide anion/oxidative stress are a mechanism by which doxorubicin induced cardiotoxicity. Selected medicinal plant extracts were tested for their antioxidant capacity and cardioprotective effect against doxorubicin-induced cardiotoxicity. The cardiac myoblasts H9c2 were incubated with the antioxidants ascorbic acid, trolox, N-acetylcysteine or selected medicinal plant extracts including; 1) ethanolic extracts from *Grewia hirsuta* L-EtOH *Grewia umbellifera* -EtOH, and *Gmelina arborea* Roxb-EtOH; and 2) water extracts from *Grewia umbellifera* L-H₂O and *Morus alba* L-H₂O. The cardioprotective effects of these extracts were evaluated by crystal violet cytotoxicity assay. IC₅₀s of doxorubicin were compared in the presence or absence of ascorbic acids, trolox, N-acetylcysteine or plant extracts. *Morus alba* L-H₂O showed the highest antioxidant properties evaluated by ferric reducing/antioxidant power assay. Ascorbic acid and N-acetylcysteine had modest effects on the protection of doxorubicin-induced cytotoxicity while trolox showed insignificant protective effect. All plant extracts protected cardiac toxicity at different degrees except that *Grewia umbellifera* L-EtOH had no protective effect. *Grewia umbellifera* -EtOH (100 mg/ml) showed the highest cardioprotective effect (12-fold doxorubicin IC₅₀ increase). The data demonstrate that antioxidants from natural sources may be useful in the protection of cardiotoxicity in patients who receive doxorubicin.

Keywords: cardioprotective; cardiotoxicity; doxorubicin; antioxidant; plant extracts

Biochemical iodine deficiency-a field based longitudinal study in selected schools of Aligarh, India

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Abstract

Iodine deficiency is one of the most neglected and wide spread of all nutritional deficiencies, constituting a real brake on human development. Deficiency of iodine may result in development of goitre and other Iodine Deficiency Disorders (IDD). The goitre prevalence reflects the iodine deficiency in past while UIEL gives the current states of iodine nutrition and both cannot be compared at a time. The objective of this work was to assess the status of biochemical iodine deficiency in school children. The study was conducted among school children of 1st to 5th standard (6 - 12 years) from 1st January 2009 to 31st December 2013. A total of 907 students of seven schools were included in the study using proportionate to population size (PPS) method. We took recommended 10% of urine samples from total children interviewed i.e. 90. Urine samples were tested for estimation of Urinary Iodine Excretion Levels (UIEL) using the Wet Digestion Method of the Sandell-Kolthoff reaction. Median urinary iodine concentration ($\mu\text{g/l}$) of 100-199 was taken as adequate. Statistical analysis was done using SPSS version 20. Age distribution of the study population shows that majority of the students (30.5%) belonged to 11-12 years, and most of the students (56.2%) were males. Median UIEL for all children was found to be 140 $\mu\text{g/l}$. The proportion of children having normal range ($>100 \mu\text{g/l}$) were 76.7%. Children with mild, moderate and severe grades of UIEL were 7.8%, 5.5% and 10.0% respectively. Prevalence of iodine deficiency in our study, calculated by proportion of children having UIEL of $<100 \mu\text{g/l}$, was 23.3%. UIEL of $<100 \mu\text{g/l}$, was only 23.3%. Median UIEL was found to be 140 $\mu\text{g/l}$, which was higher than the level accepted for the definition of iodine deficiency, i.e. a concentration of less than 100 $\mu\text{g/l}$. Based on these values, the area would be categorized as having "No biochemical iodine deficiency". Since facilities for urinary iodine testing are very few, efforts are to be made to establish more laboratories in districts. Political leaders and policy makers should be sensitized regarding this aspect. Sustained IEC (Information, Education and Communication) activities should be carried out to sensitize the people regarding IDD.

Keywords: iodine deficiency disorders; urinary iodine excretion level; biochemical iodine deficiency

Nephroprotective effect of *Mukia maderaspatana* on acetaminophen induced nephrotoxicity and oxidative stress in male albino rats

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Abstract

Mukia maderaspatana (MM) is a traditional medicinal plant that is commonly used for disorder of digestive system abnormalities. In ayurvedic medicine, it is used for the treatment of insomnia, melancholia, epilepsy, hysteria, loss of memory remittent fevers and neurosis. This plant extract is mainly used for various pharmacological activities like antidiabetic, antiproliferative, immunosuppressive, antidiarrhoeal and hypolipidemic activities. The main constituents of MM were found belonging to monoterpene, sesquiterpene, phenylpropanoid, flavonoid and quinone. The aim of this study was to investigate the nephroprotective and antioxidant activities of ethanol extract of MM at two dose levels of 250 and 500 mg/kg B/W on acetaminophen (APAP) induced toxicity in male albino rats. APAP significantly increased levels of serum urea, hemoglobin (Hb), total leukocyte count, packed cell volume, creatinine, DLC, and mean corpuscular volume, raised body weight, and reduced levels of neutrophils, mean corpuscular Hb content, mean corpuscular hematocrit, granulocytes, uric acid, and platelet Concentration. MM inhibited the hematological effects of APAP. MM significantly increased activities of renal superoxide dismutase, catalase, glutathione, and glutathione peroxidase and decreased malondialdehyde content of APAP-treated rats. Apart from these, histopathological changes also showed the protective nature of the MM extract against APAP induced necrotic damage of renal tissues. In conclusion it was observed that the ethanol extract of MM conferred nephroprotective and antioxidant activities by histopathological and biochemical observations against APAP induced renal damage in rats.

Keywords: Mukia maderaspatana; nephroprotective; antioxidant activities

Validity of ordinary Portland cement for mandibular surgical bone defect healing

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Abstract

Mineral trioxide aggregate (MTA) was approved for human use by the Food and Drug Administration (FDA) in 1999. This material has excellent physical, chemical and biological properties. It is considered a biomaterial, and its ability to induce mineralized tissue may be related to the presence of calcium phosphate. Recently the ordinary Portland cement (OPC) has been analyzed and compared physically, chemically and biologically to mineral trioxide aggregate MTA, and because of the similarity between OPC and MTA, the possibility of using Portland cement as a less expensive alternative to MTA for bone regeneration should be considered. This research was designed to examine validity of ordinary Portland cement as a bone substitute for MTA. Fifteen rabbits were used through this study and divided randomly into 3 groups; in each group bilateral surgical defect were designed at the lower border of the mandible, the left site defect was filled with Portland cement powder while the right one was left empty. The first group was sacrificed after one week, the second group sacrificed after 4 weeks, and the third group was sacrificed after 8 weeks, the surgical defect examined histologically, and the data was analyzed. Bone was significantly formed at Portland cement site (left) more than empty one (right). Portland cement can be used as a bone substitute for biological purposes.

Keywords: Mineral trioxide aggregate; MTA; Portland cement; bone regeneration

Sialic acid profile and sialidase activity: Possible markers of HIV disease progression?

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Abstract

Sialic Acids and sialidases have been implicated in many disease states particularly bacterial and viral infections which are common opportunist infections of HIV disease. This study was carried out to determine Sialic Acid profile and Sialidase Activity in HIV infected and Apparently Healthy individuals. Blood samples were collected from 200 subjects (150 HIV infected individuals and 50 apparently healthy individuals divided into four groups- HIV ART Naïve, HIV Stable (on ART but have been stable with no clinical episodes), HIV-OI (on ART with opportunistic infections), and Apparently Healthy). Complete Blood Count, Erythrocyte Surface Sialic Acid (ESSA), Free Serum Sialic Acid (FSSA) concentrations and Sialidase activity were determined for all 200 subjects. Analysis of variance was used to compare the results of the different groups of HIV infected individuals as well as controls. Anaemia and neutropaenia were the most common heamatological abnormalities observed in this study with highest prevalence of anaemia found in the ART naive group. There was significant difference ($p \leq 0.05$) between groups in FSSA level. The highest levels of FSSA was observed in the HIV ART naïve ($0.65 \pm 0.5 \text{mg/ml}$). The mean ESSA value for the study population was $0.54 \pm 0.35 \text{mg/ml}$ with no significant difference ($p \leq 0.05$) between groups. No significant difference ($p \leq 0.05$) was found between groups, also in gender and age. The finding in this study of higher mean sialidase activity and FSSA levels in the ART naïve HIV group compared with other groups indicate that the virus and other opportunistic pathogens may be sialidase producers in vivo which cleave off sialic acids from erythrocytes surface, leading to high levels of FSSA, anaemia and neutropaenia seen in this group. The higher ESSA concentration found in the HIV stable group along with lowest FSSA concentration in the group suggests the presence of sialyltransferases. There is perhaps a need for further work to determine sialic acid types in HIV infection and possible generation of knock-out mice with different sialic acid acetylation to check level of interaction and disease progression.

Keywords: HIV; sialic acids; sialidases; anaemia; neutropaenia

Application of *Melastomastrum capitatum* Fern. (Melastomataceae) loaded-exosome as analgesic drug carrier in acetic acid-induced Swiss albino mice

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Abstract

Exosomes are nanoparticles (carriers) that play vital role in intercellular communication of cells. This present study was aimed at investigating exosome isolated from biological fluid for their biological applications in disease treatment especially as analgesic drug carrier. Exosomes were isolated from the kidney of cattle through ultracentrifugation of blood, and characterized by inverted scanning biological microscope. It was followed by the formation of *Melastomastrum capitatum*-exosome complexes (MCEC). A total number of twenty five (25) Swiss albino mice were used divided into five groups of five mice each. MCEC was administered to the mice in dosages of group I(100 mg/kg *M. capitatum* extract), group II (200 mg/kg Ibuprofen; standard drug), group III (300 mg/kg MCEC), group IV (400 mg/kg MCEC), and group V (500 mg/kg MCEC) (i.p). Results showed that MCEC decreased mean abdominal writhing in mice in dose dependent fashion with group V having the best mean abdominal contraction value of 12.0 ± 02^b and 67% inhibition of pains in mice. This result was significantly different from the value obtained in the control group I, where the extract was delivered ordinarily at $p < 0.05$ (one-way ANOVA). This study therefore showed that delivery of drugs by nanoparticles offer more therapeutic values than when drug is administered ordinarily. It is then recommended that most resistant disease pathogens should be treated with nanoparticle-delivered drugs for effective treatment.

Keywords: Exosome; nanoparticles; analgesic; Melastomastrum capitatum

Enzymatic conversion of waste (rice husk) into fermentable sugar through diluted acid pretreatment

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Abstract

The enzymatic production of fermentable-sugar from rice husk was examined using diluted sulfuric-acid as a pretreatment medium. In this study, 10g of rice husk were separately pretreated with 0.5M, 1.0M and 1.5M sulfuric acid at different time interval of 2-24hrs prior to saccharification by cellulase-enzyme at 37°C and pH 4.5. Then the quantity of monosaccharide produced was determined spectrophotometrically. After two hours of pretreatment, the 1.5M H₂SO₄ pretreated samples yielded 88.05 mg/g (39.11%) of glucose, 1.0M H₂SO₄ pretreated samples yield 68.4mg/g (30.38%), and 0.5M H₂SO₄ pretreated samples yield 68.7mg/g (30.51%) respectively, when compared with the un-pretreated sample (20.4mg/g). However, after two hours, the production of glucose significantly reduces with increasing time, except with 1.0 and 0.5M H₂SO₄ pretreated sample which significantly increases at 4-hours (82.5 and 76.5mg/g respectively). The result suggests that sulfuric acid enhances the release of fermentable-sugar, and that the yield is dependent on the concentration of acid and the time of treatment. The reduction in glucose yield over time as shown in the results could be due to the ability of the acid to liberate sugar which may be washed off during the washing process to remove the acid prior to the hydrolysis by enzyme.

Keywords: lignocellulose; pretreatment; saccharification; rice husk; enzyme

Molecular analysis of probiotics supplementation from the gut of preterm infants

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Abstract

Probiotics are live microbial supplements that colonize the gut and potentially exert health benefit to the host. We hypothesized that probiotics strains (Infloran: containing two species of *Lactobacillus acidophilus*-NCIMB 701748 and *Bifidobacterium bifidum*-ATCC 1569 6) would successfully colonize the gut and protect the infants from developing Gastrointestinal tract (GIT) disease. We used high-throughput techniques to analyse the probiotic functional diversity and study its impact on the bacterial community in preterm infants gut monitored by analyses of stool samples with its possible effects on Necrotizing enterocolitis (NEC) and late onset sepsis (LOS). 75 stool samples were classified into groups: before, during and after (probiotic intake), matched controls, and post discharge samples from a neonatal intensive care unit. Samples underwent analyses of their bacterial community composition, utilizing 16S RNA gene profiling, quantitative PCR (qPCR), and LCMS metabolomics approached. QPCR analysis showed significant difference of *B. bifidum* in infants who received probiotic treatment compared to controls ($p < 0.01$), but no significance was observed *L. acidophilus* ($p = 0.575$). The result from 16S profiling indicated greater *Bifidobacteria* during supplementation (15.1%) compared to the control group (4.0%) and greater *Lactobacillus* during supplementation (4.2%) compared to controls (0.0%). Metabolite profiling showed each group to cluster separately, with distinct metabolites associated with probiotic administration. Probiotic strains found to colonize the gut of preterm infants with different level of abundance and they all increase with probiotic supplements. *B. bifidum* found to colonize the gut earlier before administering probiotics and *Bifidobacteria* are more prevalent in the gut of preterm infants compared to *Lactobacilli*. Our findings also suggest that probiotics have some systemic functions and play significant role in the gut microbial communities.

Keywords: gut; probiotics; preterm infants; microbial; stool and supplements

Use of molecular approaches to investigate anaerobic biodegradation of oily tank sludge by the resident methanogenic archaea

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Abstract

Methanogenic biodegradation of crude oil sludge was investigated using chemical and molecular approaches. 16S rRNA gene sequences recovered from the samples revealed significant presence of *Marinobacterium* (63%), *Pseudomonas* (3%) alongside with acetotrophic *Methanosaeta* (16%) and hydrogenotrophic *Methanobacterium* (5%). The resident microbial community was able to reduce the gravimetric weight of residual oil by 65.5% (with complete degradation of C₅-C₁₇ nAlkane fractions) in non-amended samples and 94.13% (with complete degradation of C₅-C₂₅ nAlkane fractions) in substrate amended samples during the 60-day incubation period. As biodegradation progressed, acetotrophs consume acetate at the rate of 0.41mM/day⁻¹ while hydrogenotrophs consume hydrogen at the rate of 0.59mM/day⁻¹. Our results showed that the resident methanogenic archaea that dominated the anaerobic microbial community were largely responsible for the anaerobic degradation of hydrocarbons in crude oil sludge and degradation rates were enhanced with substrate amendment. Considering the relatively high number of facultatively anaerobic *Marinobacterium* and significant presence of *Pseudomonas* in the sequenced data, we speculate that the bacteria were at least partially responsible for biodegradation of crude oil components potentially acting as syntrophic organisms with methanogens to convert crude oil to methane.

Keywords: methanogenic biodegradation; acetotrophs; hydrogenotrophs; crude oil sludge; syntrophy; anaerobic biodegradation

Assessment of heavy metal pollution in soil and mill tailing samples from Angwan Maigero gold mining sites, North Central Nigeria

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Abstract

This study was carried out to determine heavy metal accumulation and its pollution status in soil and mill tailing samples collected from Angwan Maigero Gold mining sites, North Central Nigeria in order to investigate the environmental pollution associated with gold mining activities in the area. Samples were collected from the mine and mill tailing sites, respectively and were analyzed using Flame Atomic Absorption Spectrophotometry (FAAS). Several approaches such as geo-chemical accumulation index, hazard quotient and potential ecological risk index, etc. were used in order to infer anthropogenic contributions. A total of 49 samples were collected with 32 soil and 9 mill tailing samples from target areas and 4 samples from the reference areas. Powder samples of 0.5 g were treated with hydrofluoric and perchloric acid. All the soil and mill tailing samples were analyzed for 10 heavy metals using the Unicom 969 Atomic Absorption spectrometer for analyzing metals. The area was observed to be contaminated with Pb, Fe, Mn, Cu, Zn, As, Cr, Co, Ni, and Cd. The mean concentration (ppm) of the heavy metals in mine site were observed to be 319.765, 1707.631, 181.614, 90.945, 37.413, 17.992, 93.187, 47.940, 22.282 and 3.232, respectively and the mean concentration (ppm) of the heavy metals in the mill tailing site were observed to be 846.867, 1914.993, 177.703, 739.333, 100.405, 43.519, 163.284, 53.476, 45.591 and 5.828, respectively. The obtained concentration were compared with the World Health Organization (WHO) limit for heavy metals, and it has been established that all the observed metals in the soil and mill tailing samples have concentration above the WHO limit, except for Zn and Ni. This study showed that the majority of the heavy metals contribute to soil pollution, thus have high influence in the area. Therefore, mining activities in the areas are the main cause of higher potential ecological risk as compared to the reference area. As such, there is need for remediation and mitigation measures in the study area, which may help to minimize the harmful toxicological risk involved in the mining activities of the area.

Keywords: heavy metals; ecological risk index; geo-accumulation index; hazard quotient

Functional assessments and histopathology of hepatic and renal tissues of Wistar rats fed with cocoa-containing diets

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Abstract

The liver and kidney are organs of homeostasis. The present study ascertained functional integrity of renal and hepatic tissues of Wistar rats fed with processed cocoa bean-based beverages (PCB-BB) - and raw cocoa bean products (RCBP) - containing diets using biochemical and histological methods. Thirty Wistar rats were designated on the basis of experimental diets received for 28 days. At the end of the feeding period, blood samples were drawn and renal and hepatic tissues were excised from the experimental rat groups for functional tests and histological examinations, respectively. Serum ALT activities of the experimental rat groups showed no significant difference ($p > 0.05$) and were within relatively narrow range of 32.17 ± 4.98 IU/L – 41.00 ± 10.85 IU/L whereas, serum AST activities gave wide variation within the range of 15.67 ± 2.13 IU/L – 34.83 ± 8.31 IU/L; $p < 0.05$. Serum bilirubin concentrations of experimental rat groups were < 1.0 mg/dL. Serum total protein and albumin concentrations varied within relatively narrow range. Serum creatinine concentration was significantly lower ($p < 0.05$) than serum urea concentration. Histology showed evidence of moderate disarrangement of hepatic tissues architecture and degenerated tubules and glomerular turfs. The pattern of activity of ALT $>$ AST in serum appeared to correlate with the extent of disarrangement of hepatic tissue architecture. The experimental rat groups did not exhibit hyperbilirubinemia. Also, PCB-BB - and RCBP - containing diets did not substantially interfere with the capacity of the hepatocytes to biosynthesized plasma proteins and functionality of renal tissues.

Keywords: creatinine; histopathology; kidney; serum; Theobroma cacao

Laboratory diagnosis of coccidiosis in village chicken in Maiduguri, Borno State, Nigeria

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Abstract

The study was conducted at the University of Maiduguri, Department of Veterinary Medicine. A laboratory diagnosis in village chicken using gross examination, intestinal impression smear, and faecal floatation was carried out to determine the prevalence of coccidiosis in free-range village chickens in Maiduguri. A total of 210 samples of intestines from adult free-range chickens slaughtered at three different slaughter slaps (Monday market, custom area market and Gidan-madara slaughter slaps) in Maiduguri were used for the study. The result showed that 0% prevalence rate which suggested that coccidiosis is not a common health problem among village chickens kept under extensive management particularly in dry season.

Keywords: coccidiosis; floatation; smear

HPTLC fingerprinting, antioxidant potential and antimicrobial efficacy of Indian Himalayan Lingzhi

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Abstract

Ganoderma lucidum (Fr.) Karst., known as medicinal mushroom and it contains several bioactive phytochemicals such as polysaccharides, nucleosides, alkaloids, coumarin, ergosterols, ganoderic acids, lactones, mannitol, organic germanium, triterpenoids, unsaturated fatty acids, vitamins and minerals which are well known for their pharmacological properties. In the present investigation adenine, adenosine and uracil content of the aqueous and alcoholic lyophilized extract of dried *G. lucidum* powder of Indian Himalayan Region (IHR) were determined by HPTLC. Further, phytochemical analysis (total polyphenols, total flavonoids, reducing power, antioxidant potentials), antioxidant and antimicrobial efficacy of both extracts against pathogenic strains like *Vibrio cholerae*, methicillin resistant *Staphylococcus aureus*, *Bacillus subtilis* and *Bacillus cereus* was also evaluated. The adenine, adenosine and uracil content of aqueous extract was found to be higher than the alcoholic extracts. Both extracts were identified as rich source of flavonoids, polyphenols, reducing power and antioxidants. A significant antimicrobial activity was observed in both the hydro alcoholic and aqueous extract against all the pathogenic strains tested with MIC value of 2-4 mg/ml for the hydro alcoholic extract and of 2-5 mg/ml for the aqueous extract. The present study concludes high pharmacological potential of Lingzhi.

Keywords: Lingzhi; HPTLC analysis; nucleosides; phytochemical analysis; antioxidant activity; antimicrobial activity

Infertility: Impact of female genital tuberculosis

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Abstract

Genitourinary tuberculosis (GUTB) is a disease of the genitourinary system which includes the entire urinary tract and reproductive system. It is an important cause of female infertility, especially in developing nations. GUTB in females is by no means uncommon, particularly in communities where pulmonary or other forms of extra genital TB are common. Genitourinary tuberculosis (GUTB) is typically understood as a disease of young women, with 80% to 90% of cases diagnosed in patients 20-40 years old, often during workup for infertility. The prevalence of infertility is about 10-20% among couples (with somewhat equal prevalence among men and women). There are many factors that can affect female fertility. Some, such as tubal or age factor, are completely known and some are in debate (e.g. endometriosis, cervical or immunologic factors). In the present study, a total of 234 clinical specimens comprising of endometrial tissue (85) and menstrual blood (149) were collected from patients and subjected for PCR, Culture and AFB detection. Of that 37 (15.81%) yielded positive for Tuberculosis. Age wise positivity in 15-24y, 25-34y and 35-50y showed 13(35.1%), 18(48.6%) and 6(16.3%) respectively.

Keywords: GUTB; PCR; AFB

Evaluation of minerals, phytochemicals and *in vitro* antioxidant activity of *Moringa oleifera* leaves

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Abstract

Moringa oleifera is a small, fast growing ornamental plant and a natural nutrient of tropics used for the treatment of infectious diseases, cardiovascular and gastrointestinal problems, and hepatorenal disorders, treatment of mucous membrane, curing diarrhoea, fever, eye and ear infections, bronchitis, diuretic and abortifacient. This study was aimed at assessing the nutritional, antioxidant and phytochemical constituents of *M. oleifera* leaves. Phytochemical screening was carried out using standard laboratory procedures while mineral analysis and *in vitro* antioxidant activities were determined Spectrophotometrically. The mineral analysis of dried leaf of *M. oleifera* showed that it contains calcium (602.8mg/100g), sodium (52.01mg/100g), zinc (2.21mg/100g), magnesium (186.72mg/100g), iron (94.52mg/100g), potassium (95.59mg/100g), manganese (1.21mg/100g), copper (0.89mg/100g), and chromium (0.64mg/100g) while Vitamin C, an antioxidant was found to be 142.16±2.07mg/kg. Phytochemical analysis revealed the presence of alkaloids, flavonoids, tannins and saponins. *In vitro* antioxidant activity using DPPH and reducing power showed a concentration dependent increase in scavenging potential of the leaves as the concentration increases from 0.2 to 1.0mg/kg. These findings suggest that *M. oleifera* possess potent nutritional and antioxidant property, which may be responsible for some of the reported pharmacological and biochemical actions.

Keywords: 2, 2-diphenyl-1-picrylhydrazyl; minerals; *Moringa oleifera*; phytochemicals; Vitamin C

Prevalence, clinical manifestations and risk factors associated with Rotavirus diarrhoea in children less than five years in Katsina State, Northwestern Nigeria

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Abstract

Diarrhoeal morbidity continues to be public health problem of considerable magnitude in most developing countries. Therefore, a study on the prevalence, clinical manifestations and risk factors of rotavirus infection in children aged 0-5 years old was undertaken in Katsina State, Northwestern Nigeria where there is little or no information. A total of 400 stool samples comprising of 322 diarrhoeic and 78 non-diarrhoeic were collected and screened for rotavirus antigen by ELISA. Their socio-demographic information and clinical presentations were also noted with the aid of questionnaire. Rotavirus was detected in 5.3% of the diarrhoeic and none in the non-diarrhoeic specimens. Generally, children < 2 years old were more vulnerable to rotavirus infection, with the peak of infection occurring between 7-12 months of age. The major clinical features presented by children included a combination of diarrhea, fever and vomiting. There was significant association ($p < 0.05$) between dehydration and rotavirus infection. There was a significant association between source of drinking water ($p < 0.05$) and rotavirus infection. Thus, source of drinking water was found to be risk factor of rotavirus diarrhoea. The findings of this study showed that rotaviruses are important etiologic agents of gastroenteritis in children. Therefore continued rotavirus surveillance and investigation of the most common circulating strain amongst this group is required.

Keywords: Rotavirus; prevalence; clinical manifestations; risk factors; diarrhea; Katsina

Pharmacological studies on the QURANI plants' mixture (a new pharmaceutical product)

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Abstract

QURANI plants' mixture is a new pharmaceutical product composed of some edible and medicinal plants (15 plants) mentioned in the Holy QURAN (in a certain percentage, according to that is mentioned in Patent no.1429/2013, presented to the Academy of Scientific Research and Technology, Egypt). The main aim of this work is to study hepatocurative, hepatoprotective, anti-inflammatory, anticancer, diuretic and antipyretic effects of this new pharmaceutical product, in addition to toxicological studies on this product and its side effects on many important organs of the body of all investigated rats. *In vitro* studies were carried out to check anticancer (prostate and colon cancer) effects of the product, in addition to *in vivo* studies by feeding adult female albino rats under investigation with 2, 4 and 8 g/kg of the product were carried out also to check hepatocurative, hepatoprotective, anti-inflammatory, anticancer, diuretic and antipyretic activities of this product and finally toxicological studies and investigation of histological structures of some important organs (Heart, Brain, Kidney, Intestine, Lung, Spleen, Stomach and Colon) of investigated rats were done also in order to check any bad side effects of this new pharmaceutical product. Results of both *in vivo* and *in vitro* studies showed that, all investigated doses have hepatocurative, hepatoprotective, anti-inflammatory, anticancer, diuretic and antipyretic effects, these effects have dose dependent manner. Toxicological studies and examination of all important organs of all investigated rats revealed that, this product is too safe at all the studied doses. Preliminary phytochemical screening of the crude extract of this pharmaceutical product revealed its richness of many valuable secondary metabolites such as: flavonoids, anthraquinones, alkaloids, saponins, tannins, cardiac glycosides etc., These Results will lead us to more biological and chemical investigations of this new, cheap and safe pharmaceutical natural product.

Keywords: pharmacological studies; edible and medicinal plant; QURANI plants' mixture; histological studies; toxicological studies; secondary metabolites

Assessment of anti-bacterial activity of *Jatropha curcas* Linn

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Abstract

The present study evaluates the antibacterial potentials of *Jatropha curcas* latex on *Staphylococcus aureus*, *Streptococcus pyogenes*, *Klebsiella pneumonia*, *Escherichia coli* and *Salmonella typhi*. Different extracts of *Jatropha curcas* such as aqueous, methanol and hexane were tested on different micro-organism using paper disc impregnation with *Jatropha curcas* latex. The results showed significant ($P<0.05$) inhibition of the test organisms, exception of *Salmonella typhi* which presents higher resistance as compared with the control group. The aqueous extracts displayed higher inhibition potential, which is comparable with the standard anti-microbia drug (peflacine) used. Evaluation of the phytochemical component showed the presence of saponin, tannin, steroid, alkaloid and glycoside. These phytochemical components have been reported to possess interesting biological activities, which we believed are responsible for the inhibitory potentials of *Jatropha curcas* used in this study.

Keywords: *Jatropha curcas*; antibacterial; phytochemical; inhibition

Environmental impact of charcoal production in Galambi district Bauchi Local Government Area Bauchi State

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Abstract

The forest cover in Nigeria is rapidly becoming depleted due to the ever increasing human demand for fuel wood. Unsustainable exploitation of forest resources for commercial charcoal production and fuel wood is a worrying phenomenon in Bauchi state that led to enactment of an edict to check the transportation of wood and wood product outside the state in 1990. The fast disappearance of tree cover may influence climate change which may in the long run affect crop yields, tourism activities and deepen poverty levels, of which Bauchi is not an exception. The research covered Galambi District of Bauchi Local Government Area (LGA) commercial charcoal production areas as the study area. The study assumed a descriptive design which employed reconnaissance, Review of relevant documents, Data collection, analysis and interpretation as study approaches. The study aimed at assessing the Environmental and socio-economic impacts of charcoal production in Galambi District, Bauchi LGA. The study found out that the charcoal production activities as currently practiced in Galambi District is environmentally destructive because 70% charcoal producers surveyed indicated that trees felled for the charcoal production are not replanted. The *Anageisus liocapus* trees locally known as "Marke" and *Prosopis africana* "Kirya" are vastly harvested for charcoal production making the community vulnerable to erosion and drought effects. The other tree species preferred for charcoal production include: *Khaya senegalensis* and *Afrormosia laxiflora*. This has led to forest cover reduction and environmental degradation and is a threat to biological diversity in the area.

Keywords: Anageisus liocapus; Prosopis africana; Khaya senegalensis; Afrormosia laxiflora; environmental impact; charcoal

Assessment of the biochemical methane-producing potentials of microbial consortia at four temperature regimes from a keratinolytic substrate

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Abstract

The effects of four microbial consortia at different digestion temperatures on methane production from chicken feather were assessed. The result of the physicochemical analysis of chicken feather powder showed that the carbon and nitrogen content was 55.97% and 14.0% respectively with carbon-nitrogen ratio of 4:1. Chicken feather powder was biologically-treated with mixed broth cultures of *Geobacillus stearothermophilus* and *Bacillus licheniformis* at 37°C and pH of 7.50 for 5 days under submerged fermentation to disrupt the disulphide and hydrogen bonds of α- and β-keratin proteins for easy hydrolysis prior to anaerobic digestion. Anaerobic fermentation lasted for an average of 25 days at four temperature regimes and pH of 6.8-7.20 using four microbial consortia isolated from cow dung and chicken feather dump-site soil samples. The biogas produced was purified to upgrade it to methane standard using chemical absorption and adsorption methods. The result of methane produced by the consortia under different temperature conditions show that consortium 4 which contained more of the methanogens has better methane-yielding ability than others. The optimum temperature of activity of the consortia was 55°C with the highest methane yield of 1286 cm³/200gm while the maximum was 65°C with decline in gas yield. The analysis of variance of the results on gas volumes from different treatments showed that methane yield is significantly ($0 \leq 0.05$) dependent on the microbial consortia, digestion temperatures and their pair wise interactions.

Keywords: chicken feather; microbial consortia; anaerobic digestion; temperature; keratinase; methanogens; methane

The effect of different levels of cow dung manure on the early growth of Neem (*Azadirachta indica*)

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Abstract

The response of *Azadirachta indica* seedlings to different levels of cow dung manure was examined at plant nursery, school of agricultural technology federal polytechnic Bauchi. The experiment was containerized and conducted from June to August 2016 in which 4 treatment were involved: A-2:2 (2 level of sand to 1 level of cow dung), B-2:0 (2 level of sand to 0 level of cow dung), C-2:1 (2 level of sand to 1 level of cow dung), and D-1:2 (1 level of sand to 2 level of cow dung). The parameters measured were mean plant height, mean number of leaves, mean plant girth, and mean plant root length. The data was analyzed using simple description statistic. The result indicated that treatment D has the highest value on plant height, plants girth, plant root length and number of leaves while treatment B has the least value. Therefore, the study recommends that farmers NGOs and public Nurseries should adopt the use of treatment D (1:2) as the best ratio for raising *A. indica* for Afforestation programmes.

Keywords: cow dung manure; Azadirachta indica; afforestation

Spatial variations in the concentrations of some metals in sediment of the Great Kwa River, Calabar, Nigeria

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Abstract

This study was carried out to investigate Spatial Variations in the Concentrations of Some Metals in Sediment of the Great Kwa River, Calabar, Nigeria from the month of June to September, 2014. The heavy metals investigated were Lead (Pb), Cadmium (Cd), Copper (Cu), Zinc (Zn), Nickel (Ni), Chromium (Cr), and Manganese (Mn). The sediment samples from three (3) sampling stations: station 1 (Esuk Ekpo Eyo), Station 2 (Esuk Atu), and Station 3 (Esuk Orok) were collected and analysed using Atomic Absorption Spectrophotometer Model VGP 210 after digestion of the samples. The values obtained for Pb, Cd, Cr, Zn, Cu, Ni and Mn for the three stations were not significantly different ($P>0.05$). The contaminations of Cd, Pb, Cr and Ni in the sediments were high in all the stations indicating an increase in the level of anthropogenic activities in the river locality. Cu, Zn and Mn concentrations were below WHO average levels for river sediment while the concentrations of Cd, Pb, Cr and Ni were higher than the recommended benchmark. The concentrations of heavy metals also varied between months. Pb and Ni were below detectable levels in September. Heavy metals concentrations show some form of danger posed to aquatic foods and consumers of aquatic foods and water. The possible deleterious effects of these metals after long period of accumulation in aquatic foods cannot be ruled out. Therefore, activities resulting to anthropogenic input of metals in the Great Kwa River should be prohibited in order to avoid possible deleterious effects of these metals after a long period of accumulation. This will reduce environmental risks and human health risks, as the prolonged exposure of these metals could amount to great health hazards.

Keywords: spatial; variations; concentrations; metals; sediment; Great Kwa River; Calabar

Peptides from bloodstream of the ischemic stroke patients as effectors of platelets aggregation

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Abstract

Highly concentrated peptides with molecular weight up to 5 kDa are indicators of certain disorders of the organism. One of the most critical cardiovascular disorders today is a stroke. In this research we investigated the healthy donor's platelet aggregation process under the influence of peptide pool (PP) which was formed in the bloodstream of the acute stroke patient as well as one-year post stroke patient. Blood plasma samples were taken from 35 healthy donors and 66 patients with atherothrombotic ischemic stroke (AIS) and 56 patients with cardioembolic ischemic stroke (CIS) during the acute phase; 57 patients with AIS and 57 patients with CIS one-year past acute phase. PP fractions were obtained by the Nikolaichyk V method. PP concentration measured by spectrophotometer at 254 nm was done. Concentration was measured correspondingly to calibration chart obtained after an analogical measurement of peptide with Mr 0,26 kDa. The purity of PP was controlled by 15% PAGE. Each PP fraction was freeze-dried (LyoQuest, Spain) and dissolved in the 10 ml of 0.05 M Tris-HCl, pH 7.4 containing 0.13 M NaCl. ADP-induced platelet aggregation was measured 2 hours after healthy donor's blood collection on the aggregometer AT-02 (Medtech, PF). Control platelets aggregation sample included equal volume of vehicle instead of PP fraction. Concentration of stroke PP fraction was significantly higher in the acute phase in comparison to healthy donor's index. Healthy donor's PP fraction inhibited platelets aggregation on 10% comparing to control. Acute PP fractions inhibited tested process on 12% by AIS PP and on 23% by CIS PP. One-year past acute phase PP fraction showed inhibition on 21% by AIS and for 29% by CIS. All tested PP fractions have caused inhibition of ADP-induced healthy donor's platelets aggregation. The one-year past stroke PP fractions inhibited platelets aggregation more intensively comparing to the acute stroke PP fractions. The fact is that the concentration of the PP fraction did not correlate with the reactivity of the tested fraction. It could be explained by the quality differentiation. We assume that components of PP bind to the platelet's receptors and in this way block the physiological processes. Also it is possible to bind formation between PP fractions and other proteins or molecules in plasma which could lead to prevention of the binding of right molecules.

Keywords: peptide pool; ischemic stroke; platelets aggregation

Plant biotechnologies for the production of pharmaceuticals from some wild medicinal plants of Egypt

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Abstract

The main target of this review is to discuss many successful examples of the *in vitro* production of great amounts of pharmaceuticals (such as natural phytochemicals belonging to anthraquinones, flavonoids, alkaloids, saponins, tannins, cardiac glycosides, carbohydrates, steroids and many other pharmaceutical products etc.) from some wild medicinal plants of Egypt (such as *Zygophyllum coccineum*, *Fagonia arabica*, *Rumex vesicarius* and many others). *In vitro* studies were carried out for the production of pharmaceutical products from some wild medicinal plants; these products are useful in the treatment of many dangerous diseases such as: cancer, liver diseases and also they are potent anti-inflammatory, antipyretic, diuretic, antioxidant and antimicrobial agents. Results of *in vitro* studies showed that, many important pharmaceutical products can be obtained from different *in vitro* cultures of many wild medicinal plants such as calli, roots and cell suspension cultures etc.

Keywords: pharmaceutical products; wild medicinal plants; in vitro production; phenolics; dangerous diseases

Co-production of extended spectrum and carbapenemase by colistin resistant *Klebsiella pneumoniae* from a Rural Hospital in Kano, Nigeria

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Abstract

There are increasing detections of carbapenem resistant *Klebsiella pneumoniae* (CRKP), a difficult to treat infection, in some tertiary hospitals in Nigeria recently. In these hospitals, colistins and combination therapy involving flouoroquinolones are often reserved for their treatment. In rural, where high abuse of antibiotic and poor health facility is higher, have recently recorded *invitro* colistin resistant strains of CRKP co-producing carbapenemase and ESBLs with disturbing figure in children between age 5-13. Thirty nine (39) *Klebsiella pneumoniae* isolated from urine, ear and wound samples of in-patient children were screened phenotypically for colistin resistance using 10 µg colistin discs (Oxoid, UK) according to the CLSI guidelines. Colistin resistant isolates were further screened for extended spectrum beta-lactamase (ESBL), and Metallo beta lactamase (MBL) production according to CLS1 2012 breakpoints using double disk synergy test and modified Hodge test respectively. Result shows that 11 out of 39 CRPK (28.2%) were resistant to colistin (Interpretative criteria: resistant ≤ 11mm). Eight (72.7%) of the CRPK produced ESBL while 7 (63.6%) produced MBL. Co-production of ESBL and MBL occurred in 5 of CRPK. No history of colistin usage in the hospital. Susceptibility of CRPK to commonly used antibiotics in the hospitals is low especially to amoxicillin, tetracycline, and ciprofloxacin. There is very little or no awareness of existence of CRPK and other multidrug resistant pathogen among the health care workers (HCWs) in the hospitals. Antibiotic stewardship on selected HCWs increased their awareness on prudent use of antibiotics but the impact on CRPK after 2 months spread could not be assessed yet. The study indicates that, colistin resistant CRPK strains have emerged in the rural hospital. Co-production of two or three of the beta lactamase enzymes by many of the isolates is worrisome, since it further narrow down treatment options.

Keywords: colistin; extended spectrum; carbapenemase; *Klebsiella pneumoniae*; beta lactamase

Volume reduction of maxillary and mandibular cystic lesions after marsupialization: a computerized three-dimensional computed tomographic evaluation

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Abstract

Marsupialization is the surgical technique of cutting a slit into an abscess or cyst and suturing the edges of the slit to form a continuous surface from the exterior surface to the interior surface of the cyst or abscess. Sutured in this fashion, the site remains open and can drain freely. This technique is used to treat a cyst or abscess when a single draining would not be effective and complete removal of the surrounding structure would not be desirable. This study was performed to evaluate the three-dimensional radiographic variation in mandibular and Maxillary cystic lesions after Marsupialization. Pre- and post-marsupialization computed tomography (CT) evaluations in 45 patients affected by keratocysts (n=20), dentigerous cysts (n=10), Radicular cyst (n=5) and ameloblastoma (n=10) were analysed using software designed for three-dimensional measurement of volumes; the results were correlated with treatment duration, age, sex and histological type. The mean (range) decompression time was 5.70 (3–12) months. The mean (SD) pre- and post-decompression. Volumes were 9.50 (7.74) and 4.65 (4.34)cm³, respectively (P<0.001), with a mean (SD) reduction of 49.86 % (19.34 %). The volume reduction was positively correlated with the duration of decompression and the age of the patient (P<0.001), The median monthly reduction in cyst volume was 11.34 % (mean, 13.52 %; range, 4.45–30.43 %) (P<0.001). This three-dimensional CT investigation demonstrated the effectiveness of Marsupialization in the treatment of maxillary and mandibular cystic lesions and showed a positive correlation between the duration of treatment & age and volume reduction. Marsupialization treatment, which is simple to perform and generally well-accepted by patients, is a reliable method to considerably reduce the volume of maxillary and mandibular cystic lesions before surgical removal. Extended decompression time seems to improve results of the reduction process.

Keywords: Marsupialization; 3D computed tomography

Kolaviron an extract from *Garcinia kola* reduces plasma oxidative stress and prevents 1,2-dimethylhydrazine-induced aberrant crypt foci development in rat colon carcinogenesis

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Abstract

Colon cancer is one of the major causes of cancer mortality worldwide. Several biflavonoids with antioxidant properties are reported for their chemopreventive nature. In this study, we have evaluated the chemopreventive efficacy of kolaviron on plasma lipid peroxidation, nitrite levels, glutathione and vitamin E. the colonic activity of b-glucuronidase activity, total number of aberrant crypt foci (ACF), in 1,2-dimethylhydrazine (DMH)-induced colon carcinogenesis using a rat model. Male albino wistar rats were randomly divided into four groups. Group 1 served as control, received 1mM EDTA-saline injection subcutaneous (s.c) once a week for 4 weeks. Group 2 rats served as kolaviron (KV) control received 100 mg/kg bodyweight of kolaviron per oral (p.o.) every day. Group 3 served as carcinogen control, received 30 mg/kg bodyweight of 1,2-dimethylhydrazine (DMH) subcutaneous injection once a week for 4 weeks to induce colon carcinogenesis. Group 5 rats received DMH injection and kolaviron 100 mg/kg bodyweight. At the end of 8 weeks, co-treatment with kolaviron markedly reduced the degree of ACF development and also lowered pro-oxidant markers in plasma and increased the antioxidant levels of GSH and Vit E. Our results also showed the decreased activities of colonic b-glucuronidase and glucosidase activity and myeloperoxidase in the chemopreventive groups of kolaviron. In conclusion, the results of this study suggest that kolaviron has a clear beneficial effect against chemically induced colonic pre-neoplastic progression in rats induced by DMH.

Keywords: colon cancer; aberrant crypt foci; bitter kola; reactive oxygen species; dimethylhydrazine; chemoprevention

Susceptibility of beta-haemolytic *Escherichia coli* to commonly used antibiotics in tertiary hospitals in southern Nigeria

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Abstract

Antimicrobial resistance in the treatment of urinary tract infections is a major health problem. This study evaluates the pattern of susceptibility of pathogens commonly responsible for urinary tract infections (UTIs) to commonly used antimicrobial agents. Midstream urine samples of 80 patients (30 males and 50 females) and 20 diarrhea samples from 10 males and 10 females, who were attending clinics in Eku, Sapele and Abraka general hospitals, Delta State, between September and October 2007 were examined. Susceptibility of the urine and diarrhea bacteria isolates to the commonly used antibiotics were investigated. Thirty five *Escherichia coli* isolates were obtained from the urine samples, out of which were nine hemolytic strains (25.7%), and 10 *E. coli* isolates from diarrhea, out of which was one strain (10%). All the hemolytic strains exhibited a significantly high resistance to septrin, sparfloxacin, amoxicillin, streptomycin, chloramphenicol but were either moderately or highly sensitive to the augmentin and gentamycin. I conclude that the incidence of hemolytic strains in urinary tract infection was higher than that observed from diarrhea because *Escherichia coli* strains that cause urinary tract infection typically produce hemolysins which is an important virulent factor in pathogenesis of infection, whereas those strains that are part of the gastro intestinal micro flora may not produce hemolysins and majority of the antimicrobial agents that are commonly used to treat UTI's caused by *Escherichia coli* in the hospitals are no longer effective due to hemolysin production. Therefore, the development and strict management of antimicrobial policy, and surveillance for resistant organisms should be given priority in Nigeria.

Keywords: urinary tract infections; UTIs; antimicrobial agents; bacterial isolates; haemolysin

Isolation and identification of *Fusarium oxysporum* f. sp *cucumerinum* as a causative agent of *Fusarium* wilt disease of cucumber in Malaysia

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Abstract

Cucumber (*Cucumis sativus* L.) is considered as fruit-vegetable throughout the world. It was originated from Northern part of India and brought to Malaysia because of its suitability to grow and huge demand from the consumers. However, different types of diseases are associated with cucumber, among them is *Fusarium* wilt disease. *Fusarium oxysporum* f. sp *cucumerinum* is a serious pathogen in cucumber which could significantly reduce yield. The aim of this work was to isolate and identify the causal agent of *Fusarium* wilt disease using morphological and molecular methods, as well as to study the pathogenic variability of the fungal isolates. Diseased root samples were collected randomly from two major cucumber growing farms (Lembah Bertam and Titi Gantong) in Peninsular Malaysia. A total of three fungal isolates were studied for morphological characteristics i.e. conidial shape and colour, colony colour and growth rate. Result from this study showed that *Fusarium oxysporum* was associated with *Fusarium* wilt disease. Based on the conidial shape the isolates were elongated for macrospore and oval for microspore. There was significant variation among the isolates in terms of colony growth and colour. Based on colony colour, the isolates were grouped into two viz., white and cream. Molecular identification using internal transcribed spacer (ITS) region confirmed that these isolates were found to be *Fusarium oxysporum*. Based on the pathogenic variability, isolate FO121 was found to be the most aggressive fungal isolate, while isolate FO111 was the least aggressive isolates tested. On the basis of morphology, DNA sequences and pathogenicity test, we can infer that *Fusarium oxysporum* is responsible for causing *Fusarium* wilt disease of cucumber in Malaysia. This research will serve as a baseline for future researches.

Keywords: causative agent; cucumber; Fusarium oxysporum; Fusarium wilt; identification; morphology

Effect of anti-tuberculosis drugs on some biochemical parameters in active and latent tuberculosis

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Abstract

The aim of this work was to investigate the potential effect of anti-tuberculosis drugs on some biochemical parameters in Active and Latent TB. A total of 75 volunteers attending the TB clinic at Benue State University Teaching Hospital (BSUTH) were recruited and distributed in to three groups; Active TB (25), Latent TB (25) and Normal (25). Blood samples collected (2 ml) were used to assay for Stability of erythrocytes' membrane, Methemoglobinemia level, Acid and Alkaline phosphatase. The principle for determination of Stability of erythrocytes' membrane was centered on the degree of auto-hemolysis. Methemoglobinemia was spectrophotometrically determined at standardized wavelength. Acid and Alkaline phosphatases were determined using Agape diagnostic kits. Latent TB erythrocytes showed elevated auto-hemolysis (7.08 ± 0.81) compared to Active TB (4.44 ± 1.02). Methemoglobinemia in Latent TB patients leaned towards mild Cyanosis (8.64 ± 2.09), unlike a significantly low methemoglobinemia in Active TB (3.23 ± 1.93). Acid and Alkaline phosphatases were within the normal range in Active TB (7.02 ± 2.23 , 102.44 ± 6.14 respectively), but elevated in Latent TB (16.25 ± 1.16 , 159.37 ± 7.83 respectively). Latent TB patients showed elevated instability in erythrocytes membrane, methemoglobinemia and Alkaline phosphatase. A significant variation of same parameters was observed in active TB and normal patients (> 2 Months post-TB treatment). It may therefore be suggestive that prolong intake of anti-Tb drugs may be associated with the effect seen in Latent TB.

Keywords: anti-tuberculosis drug; Mycobacterium tuberculosis; membrane stability; Methemoglobinemia; acid phosphatase; alkaline phosphatase

Green Technology: a contribution to sustainable development in Nigeria

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Abstract

In Nigeria, many established and establishing technological industries produce effluents that add to Global warming which have continuously increased during the last decades, bringing many undesired consequences to Earth and human life. Predictions suggest the consequences will continue to worsen over the years to come. One of the solutions to alleviate this problem is the adoption of green technologies. As a result, this paper examines green technology as a contribution to sustainable development in Nigeria. It aims at expediting the growth of the Green Technology industry and heightening its contribution as a driver for future economic growth, energy security, climate change mitigation and adaptation; guaranteeing sustainable development and preserve the environment for future generations, and intensifying public cognizance and education on green technology and encourages its widespread use. It also examines Policy Requirements for green technology Development in Nigeria. The methods and data employed on this paper were originated from secondary sources: previous research and analysis of scholars, government documents, newspaper/magazines as well as journals articles that are related to the subject. This study involved an extensive literature review which critically analyzed the present status, prospects of green technology as a driver for future economic growth, energy security, climate change mitigation and adaptation. It concludes by proposing some strategies that stimulate effective green technology.

Keywords: Green Technology; sustainable development; renewable; environment

Toxicological studies of aqueous extract of *Adenia cissampeloides* in *Clarias batrachus* fish

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Abstract

The effects of aqueous stem extract of *Adenia cissampeloides* on selected liver function biomarkers of fish (*Clarias batrachus*) were investigated. The aims were to determine the lethal concentration (LC₅₀) of the extract to the fish and the effects on Aspartate aminotransferase (AST), Alanine aminotransferase (ALT), Alkaline phosphatase (ALP) and Unconjugated Bilirubin (UB). A total of one hundred and sixty (160) fish of average weight of 122g were used in the study and grouped into five (A, B, C, D and E). The 24hr, 48hr and 72hr lethal concentration (LC₅₀) of the stem extract were determined. Those for the assay were exposed to 00g/l, 0.6250g/l, 1.250g/l, 2.50g/l and 5.0g/l concentrations respectively, in triplicate for a total of eight hours. Blood sample was collected from one fish picked from each group at one-hour interval and assayed. One factor completely randomized ANOVA design was adopted in the analysis. The 24hr, 48hr and 72hr, LC₅₀ were 5.00g/l, 2.50g/l and 2.50g/l respectively. There were increases in the activities of all the parameters assayed for. The results of analysis showed significant (p<0.05) increases in AST activities and concentrations of UB. However, increases in the activities of ALT and ALP were not significant (p>0.05). Large effect size (ω^2) of 0.42 and 0.52 for UB and AST, respectively, were obtained. AST/ALT ratio of 1.5 indicated damages to liver cells and disruption of vital processes that might have elicited unfavourable cytotoxic reactions in the fish. It is possible that the same effects may occur in man; therefore, it was recommended that fish killed with this plant should be avoided if not properly heat treated.

Keywords: *Adenia cissampeloides*; *Clarias batrachus*; cytotoxicity; biomarkers

Variability for drought resistance on the growth of five selected varieties of cassava (*Manihot esculenta*) in Ekiti State, Nigeria

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Abstract

Field experiments were conducted using five selected cassava varieties in 2014 and 2015 years at the Teaching and Research Farm, Federal University Oye, Ekiti State, Nigeria to determine genetic variability among the varieties through estimating heritability of yield and yield components, genetic advance, correlation coefficients of yield contributing traits. The experiments were laid out in a Randomized Complete Block Design (RCBD) with three replications. Ten competitive plants were selected from the middle row of plots for data collection. Data collected include plant height (cm), stem girth (cm), number of leaves and number of branches/plant. Slight to high differences were observed between the Phenotypic Coefficient of Variation (PCV) and Genotypic Coefficient of Variation (GCV). Phenotypic variances for the characters under study were higher than genotypic variances in the years. Understanding the genetic variability among population is an important requirement for crop improvement as it allows for the selection of character combinations and pools for genetic gain. This study revealed that indigenous cassava (*Manihot esculenta*) varieties used in this experiment showed competitive growth pattern in dry weather conditions, an indication that the varieties possess some strains in their genetic constitution that may be useful in developing improved drought resistant varieties of cassava.

Keywords: variability; drought; resistance; cassava

Corrosion inhibition properties of *Commiphora africana* (A. Rich.) Engl. gum exudates on mild steel in alkaline medium

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Abstract

The effect of *Commiphora africana* gum exudates on the corrosion of mild steel in 2.5 M Na₂CO₃ has been studied using weight loss (gravimetric) and thermometric methods at 303 and 333 K. Results obtained suggest that *Commiphora africana* acts as a good corrosion inhibitor as the inhibition efficiency increased with increase in the concentration of the inhibitor. A decrease in the %I was observed with increase in temperature from 303 to 333 K. Values of inhibition efficiency from weight loss method were found to be significantly higher ($p \leq 0.05$) than values obtained from gasometric method, even as the (I%) values from the two methods correlated strongly. Also values of ΔG_{ads} , E_a and Q_{ads} suggest physical mechanism for the adsorption of the inhibitor molecules on the surface of mild steel even as Temkin adsorption isotherm was found to best suit the adsorption mechanism within the temperature range under study.

Keywords: mild steel; adsorption isotherm; corrosion inhibition; activation energy

Assessment on the effect of environmental pollution on *Azadirachta indica* and *Calotropis procera*

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Abstract

Effects of environmental pollution on *Calotropis procera* and *Azadirachta indica* were investigated. Plant samples were collected along the roadsides and in the field (500 metres away from the roadsides). Samples were analysed for heavy metals concentration, proximate composition, and qualitative phytochemicals using standard methods of analysis. The results showed that, heavy metals such as Chromium and Iron were high in *Azadirachta indica* located along the roadside with value of $1.08 \pm 0.15 \text{ mg/kg}$ and $0.92 \pm 0.01 \text{ mg/kg}$ respectively; while the lowest concentration was observed in *Calotropis procera* found in the field with values of $0.93 \pm 0.38 \text{ mg/kg}$ and $0.22 \pm 0.02 \text{ mg/kg}$ respectively. Nickel, lead and cadmium though analysed, they were not detected in all samples. Carbohydrate value of $69.54 \pm 0.65\%$ was higher in *Calotropis procera* located in the field while the least concentration of $55.30 \pm 0.81\%$ was found in *Azadirachta indica* located by the roadside. Ash, lipid, fibre, and crude protein were high in *Azadirachta indica* located along the roadside but was found low in *Calotropis procera* located in the field. Flavonoid was found in large amount in *Azadirachta indica* located in the field but in moderate amount in both plant located along the roadside. Cardiac glycoside was found to be in large quantity in *Calotropis procera* located in the field and in traces in *Azadirachta indica* and *Calotropis procera* located along the roadsides. Saponin glycoside was found in large amount in *Azadirachta indica* and *Calotropis procera* located in the field and small amount in *Azadirachta indica* and *Calotropis procera* located along the roadside. Statistical analysis showed significant differences when the highest values were compared with the lowest values in all the results. This study infers that, plants located along the roadsides may not be a good source for human use as they could have been affected by pollution.

Keywords: *Calotropis procera*; *Azadirachta indica*; environmental pollution

***In vitro* antimalarial activity of *Gossypium hirsutum* (linn.) leaves extract (Malvaceae)**

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Abstract

Powdered plant material of *Gossypium hirsutum* was percolated with ethanol. The resultant crude extract was macerated with solvent of increasing in polarity as follows petroleum-ether < chloroform < ethylacetate < methanol. The macerated fractions were subjected to antimalarial bioassay against *Plasmodium falciparum* at varying concentration. Phytochemical analysis for the presence of secondary metabolites (alkaloid, tannins, saponins, flavonoids, terpenoids and reducing sugar) was similarly conducted according to standard procedure. The antiplasmodial analysis results show that the chloroform fraction exhibits a very high parasitic elimination of 91% and 94% at a concentration of 2000µg/ml and 5000µg/ml. The petroleum ether fractions also showed a remarkable anti-plasmodial activity of 85% and 92% for these concentrations respectively. However, The ethyl acetate fraction also shows significant activity of 90% at 5000µg/ml. And lastly the methanol fraction exhibits a remarkable activity of 86% at 5000µg/ml. The phytochemical screening result showed the distribution of secondary metabolites in the fractions and these metabolites are responsible for the activity of the plant.

Keywords: antimalarial; phytochemical analysis; Gossypium hirsutum

Trimethylamine N-oxide promoted decarbonylation reactions of molybdenum and tungsten hexacarbonyls with dimethylglyoxime

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Abstract

Preclinical evidence is now available in animals showing the beneficial effects of carbon monoxide (CO) in cardiovascular diseases, sepsis, shock, cancer, acute lung, liver and kidney injuries. The technology for production and delivery (for inhalation) of pharmaceutical grade CO is quite limited at the moment. Apart from inhalation, ingestion of CO can be achieved via administration as pro drug and as CO releasing molecules (CORMs). Of all the established classes of CORMs, appropriately substituted transition metal carbonyls have been identified as the most effective means of safe CO delivery to specific sites in biological systems. In the ongoing work, our search for hopeful candidates as useful CO-releasing molecules (CO-RMs) led to TMANO promoted decarbonylation of Mo and W hexacarbonyls. The two DMG substituted carbonyl complexes were prepared in a one pot synthesis using manipulated schlenk techniques under dinitrogen in tetrahydrofuran. The Mo complex system was successfully carried out by stirring the mixture at room temperature for 18 h. A similar procedure only afforded the starting ligand material for the W complex. However, further refluxing for 6 h gave the desired W complex. The complexes were characterized using ¹H NMR, IR, and CHN analyses. Results showed that the reactions produced dicarbonyl species; Mo(CO)₂(DMG)₂ I and W(CO)₂(DMG)₂ II where two DMG moieties were coordinated to the central metal atom through one N and O atoms respectively of each of the oxime groups. The resulting complexes with two CO ligands of decreased bond strength promises to be good candidates for CO release studies in biological system with the use of appropriate CO release activating agent, thus offering some hope for their use as CO-releasing molecules.

Keywords: hexacarbonyls; diseases; CORMs; pro-drug; CO-delivery; biological system

Isolation of *Micrococcus* species from soil for use in methionine production

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Abstract

The isolation of *Micrococcus* species from soil for use in methionine production was examined. Soil samples were collected from the surrounding of Chukwuemeka Odumegwo Ojukwu University, Uli Ihiala LGA Anambra state. Each soil sample (1g) was transferred to test tube containing 9ml normal saline solution and shaken. Aliquot of 0.1ml was taken and inoculated into *Micrococcus* medium using spread plate technique. The *Micrococcus* species isolated were screened for methionine production in submerged fermentation and the best methionine producer was selected. The isolate was subjected to UV irradiation mutagenesis and mutants generated were grown in submerged fermentation for methionine production. The mutant with the highest yield of methionine was subjected to the effect of different synthetic media, carbon and nitrogen sources. The result showed that *Micrococcus* species RH 7 produced the highest yield of methionine (8.23mg/ml) while *Micrococcus* species RC4 produced the lowest yield (0.14mg/ml). *Micrococcus* species mutant 2 was observed to produce maximum yield of methionine (8.0 mg/ml), while the lowest was recorded by mutant 3 with a yield of 3.13 mg/ml. The medium adopted by Nwachukwu and Ekwealor (2004) was found to stimulate the highest methionine production (2.46mg/ml) among all the synthetic media used. Addition of glucose(6% w/v) to the medium enhanced the production of methionine with a yield of 2.36mg/ml. Yeast extract (0.1%w/v) stimulated the maximum methionine yield of 3.26mg/ml, while NH₄Cl (4%w/v) enhanced methionine yield of 2.57mg/ml. Conclusively, the findings showed that methionine producing *Micrococcus* species were present in the soil and optimization of the fermentation parameters could greatly increase production.

Keywords: isolation; soil; Micrococcus species; methionine; fermentation; mutant

Extracellular lipase production by *Bacillus licheniformis* CR8 isolated from the soil

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Abstract

Extracellular lipase production by *Bacillus* species isolated from the soil was studied. Soil samples were collected at a depth of 4cm around the vicinity of Chukwuemeka Odumegwo Ojukwu University, Uli Ihiala LGA Anambra state. The soil was used for the isolation of *Bacillus* species in nutrient agar using standard procedures. Fifteen *Bacillus* species were isolated and screened for lipase production in submerged fermentation. The best lipase producer was selected and the effect of different substrates, carbon, phosphate and nitrogenous sources on lipase production was examined. The results showed that *Bacillus* species CR8 was found to produce the highest lipase yield (3.1units/ml) and was followed by *Bacillus* species MR4 (2.3 units/ml). The best producer *Bacillus* species CR5 was characterized and identified to species as *Bacillus licheniformis*. The substrate that stimulated maximum lipase production (3.7 units/ml) was found to be 1%v/v olive oil, while the least yield (2.8units/ml) was observed in 1%v/v groundnut oil. Maltose (1%w/v) stimulated the highest lipase production (4.7 units/ml), while glucose enhanced the lowest enzyme yield (2.5units/ml). A combined phosphate concentrations of 0.5g/l KH_2PO_4 and 1.5g/l K_2HPO_4 encouraged maximum lipase production(4.4 units/ml), while the lowest yield (1.7 units/ml) was observed with a combination of 1.5 g/l KH_2PO_4 and 4g/l K_2HPO_4 . NH_4Cl (1%w/v) stimulated maximum lipase yield (4.5units/ml), while $(\text{NH}_4)_2\text{HPO}_4$ recorded the lowest lipase yield (3.2units/ml). The findings showed that the soil is replete with lipase producing *Bacillus* species and optimization study could stimulate the hyper-production of the enzyme.

Keywords: extracellular; lipase; Bacillus species; soil; screened; submerged fermentation

Characterization, identification and antimicrobial sensitivity pattern of *Staphylococcus aureus* associated with urinary tract infection in Kano metropolis, Kano State, Nigeria

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Abstract

Staphylococcus aureus is one of the most significant pathogen causing diseases worldwide. It is the leading cause of nosocomial infections and is responsible for a wide range of human diseases, including urinary tract infection (UTI). The study was intended for isolation, characterization, identification and antimicrobial susceptibility pattern of *Staphylococcus aureus* isolated from urine sample of urinary tract infection patients. A total of 20 urine samples were collected from Murtala Muhammad specialist hospital Kano Nigeria, from September to November 2015. Using Gram staining, biochemical characterization and bacteriological method, 16 isolates were confirmed as *S. aureus* from the 20 samples. The result shows that, all the 16 isolates recovered were able to ferment Mannitol, showed Golden yellow coloration on Nutrient agar and produce β -haemolysis on blood agar. They also found to be positive for Gram staining, Catalase and Coagulase test but negative for Oxidase test. On sensitivity, the isolates were found to be resistant to Augmentin, Ofloxacin and Amoxicillin. On the other hand, the isolates were sensitive to Ciprofloxacin, Streptomycin, Erythromycin and Neomycin. This study showed that *S. aureus* is one of the most frequent etiologic agents of urinary tract infection.

Keywords: Staphylococcus aureus;, urinary tract infection; resistance; antibiotics; isolation

Characterization of dissolved organic matter from northern Nigeria wetlands

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Abstract

In this study the molecular composition of dissolved organic matter (DOM), collected from Baturiya, Nguru, Matara-Uku, Jebba and Lokoja wetlands of the Northern Nigeria were characterized using Fourier Transform Infra-Red (FTIR) and Gas Chromatography-Mass Spectrometry (GC-MS). FTIR results indicated that the Dissolved Organic Matter (DOM) of these wetlands contain the phenolic hydroxyl groups, hydroxyl group, conjugated double bond of aromatic family (C=C), amino group, amide group and free carboxyl groups. The results of the GC-MS revealed that these wetlands contain esters, alcohols, carboxylic acids, alkanes, haloalkane and alkenes. Phenol hydroxyl groups, conjugated double bonds, amino and carboxylic groups have been implicated for the formation of disinfection by-products like trihalomethane and trihaloacetic acids.

Keywords: wetlands; FTIR; dissolved organic matter; GC-MS

Antioxidant profile of Nigerian morphotypes of watermelon (*Citrullus lanatus* L.)

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Abstract

Vegetables and fruits are important sources of vitamins, minerals, fibers and antioxidants. Antioxidants help prevent or delay oxidative damage of lipids, proteins and nucleic acids by reactive oxygen species. They scavenge the free radicals that cause pathological diseases such as cancer and coronary heart diseases. Nutrient profile of hybrid cultivars of watermelon has been documented, however, information is lacking on the concentration of bioactive compounds of locally cultivated cultivars of watermelon in Nigeria. This study hence was carried out during the late season of year 2015, to evaluate the antioxidants in the four available morphotypes of Nigerian watermelon namely: Long Rothmas, Short Rothmas, Sugar-baby and Golden. The fruits were raised at the Teaching and Research farm of Osun-state University, Ejigbo Campus. Four fruits per morphotypes were selected and Freeze-dried. Methanol extraction (80%) was done and the extracts analyzed for: antioxidant activity (DPPH assay), total phenol, flavonoid, anthocyanin, proanthocyanidin, metal-chelating activity, Ferric reducing antioxidant power activity, anti-lipid peroxidation activity, hydroxyl radical scavenging activity and nitric oxide inhibition ability. The extracts exhibit potent antioxidant activities which vary among the morphotypes. No significant difference was observed in the flavonoid concentrations (16.16-12.85mgQUE/g) of the four morphotypes. However, the antioxidant activity, total phenol, metal chelating activity, ferric reducing antioxidant power activity, anti-lipid peroxidation activity and hydroxyl radical scavenging activity differed significantly across the morphotypes and ranged from 35.79-26.82%, 2.48-0.76mgGAE/g, 18.94-2.33mg/ml, 7.89-1.9mgAAE/g, 41.85-6mg/ml, 5.03-0.23mg/ml, respectively. Golden has the highest antioxidant activity (DPPH assay), total phenol, total flavonoid and nitric oxide inhibition ability. Long rothmas has the highest FRAP activity, anthocyanin content and proanthocyanidin content. Sugar baby has the highest metal chelating activity, anti-lipid peroxidation activity and hydroxyl radical scavenging activity. The morphotypes analyzed possess radical scavenging ability with potent antioxidant activity. Their consumption could bring about health benefits.

Keywords: antioxidant activity; flavonoid; radical scavenger; watermelon

Association of sul-1 genes with trimethoprim-sulfamethoxazole in clinical isolates obtained from Delta State

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Abstract

The potential threat to health caused by antimicrobial resistance is a global issue demanding the cooperation of both developed and developing countries. The study of the association of sul-1 genes with trimethoprim in clinical isolates was carried out. A total of 245 clinical isolates of *Escherichia coli* (137), *klebsiella* sp.(33), *pseudomonas aeruginosa* (66) and *proteus mirabilis* (9) obtained from two different government owned hospitals; General Hospital Agbor and Central Hospital Warri, in Delta state was used for this Study. Isolation following standard protocols were carried out. Identification was carried out by conventional microbiological technique. The isolates were tested against 10 antibiotics; amoxicillin-clavulanic acid, (A) cefixime (cx), ceftazidime (cz), cefuroxime (cr) , cefotaxime (cf), gentamycin (g), ofloxacin (o), ciprofloxacin (o), nitrofurantoin (n), and trimethoprim-sulfamethoxazole (s) using disc diffusion methods. Plasmid DNAs were analyzed. Extended Spectrum Beta-Lactamases (ESBLs) detection was carried out by double disc synergy test (DDST), a phenotypic method. Trimethoprim-Sulfamethoxazole resistance determinants were amplified with specific primers for Sul-1 genes. Of the 245 isolates, 161 were Multi drug resistant (MDR). These MDR had plasmid bands of varying sizes, ranging from 1.517kbp - 23.13kbp. Among the 161 MDR isolates 53 harboured ESBLs genes and 17 Isolates carried the sul-1 genes. All isolates carrying sul-1 gene were resistant to trimethoprim-sulfamethoxazole and harboured plasmids. The presence of antibiotic resistance genes/plasmids in patients is a threat to treatment, there is therefore the need for stringent measures to be put in place to prevent spread of resistance.

Keywords: sul-1 genes; plasmids; clinical isolates; antibiotics; resistance; phenotypic methods

Phytochemical screening, antioxidant and wound healing properties of aqueous and ethanol extract of avocado pear (*Persea americana* Mill)

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Abstract

The numerous ethno-medicinal applications of *Persea americana* have called for a high thorough-put investigation of all the parts of the plant including the seed that is usually discarded. In this study, phytochemical screening, wound healing and antioxidant potential of aqueous and ethanol extract of *Persea americana* (avocado seed) were investigated using standard methods. Nine groups of male albino rats were used with five animals per group and designated A-I. Groups B, C, D, and E received orally, 100, 200, 400 and 600 mg/kg body weight respectively of aqueous extract while groups F, G, H, and I were treated with the same order of doses of the ethanol extract for ten days. Group A was the control. The phytochemical screening revealed the presence of alkaloids, flavonoids, tannins and saponins while cardiac glycosides were absent. Plasma levels of proteinases, Vitamin C, and total protein were used to evaluate the wound healing properties while Malondialdehyde (MDA), Superoxide Dismutase (SOD), Catalase (CAT) and glutathione reductase (GR) were used to estimate the antioxidant potential of the extract. The proteinases activity and vitamin C concentrations in the treated groups were significantly higher ($p < 0.05$) and the total protein concentrations showed a significant decrease ($p < 0.05$) when compared to the control. Activities of SOD, CAT and GR increased significantly ($p < 0.05$) while MDA levels decrease significantly ($p < 0.05$) in the treated groups when compared to the control. From these findings, *Persea americana* have bioactive ingredients and antioxidant potential and as such could be useful in ethnomedicine for the treatment of wounds.

Keywords: albino rats; wound healing; plasma levels

Effect of combined dose of *Vernonia amygdalina* and *Annona muricata* leaf extracts on hematological parameters in Dimethylnitrosamine (DMN)-induced toxicity

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Abstract

This study assessed the effect of combined dose of *Vernonia amygdalina* and *Annona muricata* leaves on hematological parameters in dimethylnitrosamine (DMN)-induced liver fibrosis in rats. One group received physiological saline and served as control; Second group received 100mg/kg each of *Vernonia amygdalina* and *Annona muricata* ethanol leaf extract without DMN orally for 14 consecutive days. The third group received intra-peritoneal injection of 10mg of DMN/kg body weight thrice a week (on the first three days) for two weeks, in addition to 100mg/kg each of *Vernonia amygdalina* and *Annona muricata* which were administered for 14 days consecutively while the last group received the same dose of DMN but without any extract. After 14 days, the rats were sacrificed and blood samples were collected in EDTA containers for hematological assessment. DMN administration caused significant decrease in the levels of Hemoglobin (Hb), Red blood cells (RBC), Platelets, packed cell volume (PCV), Lymphocytes and a significant increase in monocytes and granulocytes. However a combine dose of 100mg/kg each of *Vernonia amygdalina* and *Annona muricata* leaves remarkably attenuated and modulated above DMN-induced hematological changes towards normal levels. This study suggest that combination of *Vernonia amygdalina* and *Annona muricata* leaves possess anti-anemic and protective properties against DMN-induced hepatic damage most probably due to synergistic effect of their bioactive compounds such as flavonoids.

Keywords: *Annona muricata*; *dimethylnitrosamine*; *fibrosis*, *hematology*, *Vernonia amygdalina*

Evaluation of flo-genes expression and flocculation ability at co-cultivation of yeast strains

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Abstract

Yeast flocculation is reversible aggregation or agglutinations of yeast cells. It is an important characteristic used in manufacturing of beer, wine and other alcoholic drinks. The aim of the presented research was to study and compare peculiarities of transcriptional activity of flo-genes and fatty acid desaturase gene between yeast strains with various flocculation ability. Two *Saccharomyces cerevisiae* strains from Ukrainian Collection of Microorganisms, Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine were used in the study. Yeast, each strain separately and as a combined culture, was grown in YPD medium containing 1% yeast extract, 2% peptone, 2% glucose at 28^oC for 24 hours. Yeast flocculation was measured using a microfloculation technique. Gene expression analysis was carried out by qRT-PCR using SYBR Green dye and amplification was performed with qTower 2.2 thermal cycler (Analytik Jena AG, Germany). Each strain characterized with specific transcriptional profile of three flo-genes (flo1, flo10 and flo11) and ole1 gene encoding fatty acid desaturase. The difference of flocculation ability between two *S. cerevisiae* strains made up almost two times. The strain with the higher level of flocculation ability established lower in 5 times flo11 gene expression and increased ole1 transcriptional activity in 10 times. Expression level of flo1 gene that provides cell-cell adhesion was similar for both strains. When two strains were grown together the intermediate value of flocculation ability was detected. The expression of three genes, flo1, flo11 and ole1, was significantly increased relatively to both strains after a co-cultivation of yeast strains. Results of the presented study suppose that yeast flocculation determined and depended on a combination of flo-genes expression level and the increased level of their activity observed in a combined yeast culture may not resulted in the higher flocculation ability.

Keywords: yeast; flocculation; qRT-PCR; flo-genes

Mould infections in suspected pulmonary tuberculosis (TB) patients

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Abstract

The opportunistic fungi are potential pathogens in the immunocompromised patients, those with the pre – existing disease and long history of antibiotics. The study was designed to document the prevalence of TB associated with respiratory mould infections in Dambatta Kano, Nigeria. The study included induced sputum samples from 300 patients with complaints of symptoms suggestive of Tuberculosis (TB) infections. The TB was diagnosed by sputum Ziehl – Neelsen staining technique. Identification of Mould isolates was done by direct microscopy and culture on two sets of SDA and Corn Meal Agar. Of the 300 sputum samples examined, 28(9.3%) patients were positive to AFB microscopy while fourteen different species were isolated from 26(8.7%) patients mainly caused by the genus *Aspergillus*. *A. niger* was isolated in 3(1%) of the patients, while *A. fumigatus*, *A. nidulans* and *A. terreus* were isolated from 3(1%), 1(0.3%) and 2(0.6%) patients respectively. Other fungal agents isolated include, *Penicillium viridicatum* 3(1%), *Rhizopus oryzae* 3(1%), *Rhizomucor pusillus* 1(0.3%). The genus *Fusarium* had the prevalence of 5(1.5%) comprising of *F. oxysporum* 2(0.6%), *F. nivale* 2(0.6%) and *F. tricinctum* 1(0.3%). The genus *Trichophyton* had a prevalence of 3(1%) consisting of *T. concentricum* 1(0.3%) and *T. rubrum* 2(0.6%). The least prevalence of 1(0.3%) was observed in *Malbranchea saccardo* and *Phomasaccardo* respectively. Mould and TB co – infection was 5(1.6%) with male patients having 4(1.3%) while females had 1(0.3%) ($P = 0.06145$). Co – infection of mould and TB exists and the prevalence of array of these mould species is apparently important considering the immunocompromised status and inadequate response to anti – tubercular drugs of these patients.

Keywords: mould; Rhizomucor; tuberculosis; mycoses; infection

Antiplasmodial activity of *Cymbopogon citratus* extract against *Plasmodium falciparum*

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Abstract

Dried plant material of *Cymbopogon citratus* was percolated with ethanol. The resultant crude extract was macerated with solvent of increasing in polarity as follows n-hexane < chloroform < ethylacetate < methanol. The macerated fractions were subjected to antiplasmodial bioassay against *plasmodium falciparum* at varying concentration. Phytochemical analysis for the presence of secondary metabolites (alkaloid, tannins, saponins, flavonoids, terpenoids and reducing sugar) was similarly conducted according to standard procedure. The antiplasmodial analysis results show that the ethylacetate, methanol and chloroform fractions exhibits a very high parasitic elimination of 93%, 92% and 90% respectively at a concentration of 5000µg/ml. 89% elimination was observed for the n-hexane fraction for these concentration. Phytochemical screening result showed the distribution of secondary metabolites in the fractions and these metabolites are responsible for the activity of the plant.

Keywords: antiplasmodial; phytochemical analysis; Cymbopogon citratus

Characterization of blood parameters and gut microbes of pullets reared under free-range in Lafia metropolis

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Abstract

This study was carried out to investigate the effect of locations on blood parameters and gut microbes of local/indigenous pullets under free-range in Lafia metropolis. Twenty hens of mixed strains averaging 800 to 1200 g live weight were sourced from 5 areas in Lafia metropolis namely Shabu, Ombi 2, Ombi 1, Bukan Sidi and Kwandere and tagged T₁, T₂, T₃, T₄ and T₅, respectively. Each location served as a treatment and 4 birds were randomly selected per location to serve as replicate. About 1 g of the intestinal contents were collected from each hen 2cm post duodenal and tagged foregut (FG) and 2cm pre-cloacal and tagged hind gut (HG). Pure cultures of bacteria were obtained by aseptically streaking representative colonies of different morphological types, which appear on the cultured plates onto freshly prepared nutrient agar plates from the incubator. Discrete bacteria colonies that developed were sub cultured on nutrient agar slopes and incubated at 37°C for 24 hours. The identification of isolated bacteria was based on colony morphology, microscopic examination and biochemical characteristics. Four hens per location of similar live weights were randomly selected and their blood samples were collected and emptied into sample bottles containing 1mg of dipotassium salts of ethylene diamine tetra acetic acid (EDTA-K²) to 1ml of blood for haematological studies. Another blood samples were collected without anti-coagulant to allow for clotting for serum biochemical analysis. The results showed that there was no significant variation (P>0.05) across the 5 locations on the PCV (21.50 – 27.50%), RBC (2.63 – 3.52 x10¹²/μl), haemoglobin (9.40 – 10.85 g/dl) and neutrophils (1.00 – 2.00 %). Similarly, MCV and MCHC values (99.05 – 116.20 fl and 41.10 – 50.45 g/dl) were not affected by the different location, respectively. However, there was significant variations (P<.0.05) on the values of WBC as hens on location T₃ had the highest value of 98.20 x 10⁹/μl as compared to other locations which recorded 42.35, 57.70, 64.80 and 59.55 x 10¹⁰/μl for locations T₁, T₂, T₄ and T₅ respectively. Similarly, there was no variation (P>0.05) in the serum biochemistry and microbial load of the intestinal contents of the hens due to the various locations under investigation. In conclusion, neither location nor method of rearing affected the health status of the birds and the findings of this investigation can be useful to animal health workers and poultry farmers in general especially with regards to public health and nutrition.

Keywords: characterization; locations; haematological parameters; serum biochemistry; gut microbes; pullets; free-range