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**BOOK OF ABSTRACT**

Theme

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****

**Professor Sunday Oge Elom**

**Vice-Chancellor**

**Alex Ekwueme Federal University, Ndufu-Alike**



**Professor Onyekachi Francis Akanu Ibiam**

**Dean Faculty of Biological Sciences**

**Alex Ekwueme Federal University, Ndufu-Alike**



**Dr. C. O Eleazu**

**Deputy Dean Faculty of Biological Sciences**

**Alex Ekwueme Federal University, Ndufu-Alike**

**Dr. O. A. Oje**

**HOD Biochemistry (AEFUNAI)**

**Dr. K.E. Nwagu**

**HOD Biotechnology (AEFUNAI)**

**Dr. Oke C. Oke**

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**PROGRAMME OF EVENTS**

**1. Pre-conference workshop/training Day 1: Monday 5th June, 2023.**

2. Arrival and Registration for Pre-conference workshop / training.

**3. Pre-conference workshop/training Day 2: Tuesday 6th June, 2023.**

4. 8.00 am- Registration continues.

5. 9.00 am: Pre-conference workshop/training starts.

5. 1.00-1.00pm : Short break.

7. 2.00-4.00pm pre-conference workshop/ training continues.

**8. Pre-conference workshop/training Day 3 Wednesday 7th June, 2023.**

9. 8.00am Registration for Pre-conference workshop/training continues.

10. 9.00am-1pm Pre-conference workshop/training continues.

11. 1.00pm-2.00pm Short break.

12. 2.00pm-4.00pm Pre-conference workshop/training ends.

13. 4.05pm-4-15pm Group photograph for participants.

**14. Conference**

15. Arrival of participants

**16. Conference Day 4 Thursday 7th June, 2023.**

17. 8.00 am- Registration registration starts.

18. 9.00am-9.30am Courtesy call to the VC by the Dean of the Faculty Biological Sciences, Keynote speakers, Sub-theme speakers, Professors and HODs of the Faculty,LOC Chairman and LOC Secretary .

**19. Opening Ceremony**

20. 9.35am-9.45am arrival of the participants and introduction of the Master of Ceremony.

21. 10.00 am-10.15am Introduction of invited guests by the Master of Ceremony

22. 10.15am -10.20am National Anthem/AE-FUNAI Anthem

23. 10.20 am- 10.25 am- Opening prayers/ Presentation of Cola nut

24. 10.25 am-10.30 am Welcome address by the Chairman, Local Organizing Committee-Dr. C.O. Eleazu

25. 10.30am-10.35 Welcome address by the Dean, Faculty of Biological Science, Prof. O.F.A. Ibiam

26. 10.35-10.00 45 Welcome address/ declaration of the conference open by the Chief Host- Prof. Sunday Oge Elom

27. 10.45 am- 10.50am- Reading of citation on the keynote speaker by Dr. O. C Chiama

28. 10.50 am-11.10am Presentation of the keynote lecture by Prof. Augustine A. Uwakwe

29. 11.10am-11.30 am-Comments/reactions by the guests .

30. 11.30 am- 11.35pm Presentation of the Faculty Journal by the Editor-In-Chief

31. 11.35am-12.15 pm-Launching of the Faculty Journal

32. 12.20-12.30 Presentation by Heirs Insurance and Heirs Life

33. 12.30pm-12.40.00pm Presentation by Inquaba Biotech.

34. 12.50pm-1.50pm Group photographs

**35. Plenary Session**

36. 2.00pm-2.15pm - 1st Plenary Lecture- Prof. Francis David Sikoki

37. 2.15pm-2.30pm - 2nd Plenary Lecture-Prof. Ositadinma C. Ugbogu

38 2.30pm-3.45pm - 3rd Plenary Lecture- Prof. F.C. Chilaka

39. 3.45pm-4.00pm - 4th Plenary Lecture- Prof. Benjamin Ubi

40. 4.00pm-4.03pm -Vote of Thanks by the Secretary LOC

41. 4.03pm-4.05pm closing prayer and adjournment.

**42. Conference Day 5: Friday, 9th June, 2023**

43. 9.00 am- 1.00pm First **Thematic Session**

44. 1.00 -2.00pm Lunch Break

45. 2.00-4.00 pm- Thematic Sessions continue

46. 3:30 pm- Communique by the Secretary, Local Organizing Committee- Dr. Yinka Titilawo

47. 3.40 pm. Vote of thanks by the Chairman, Local Organizing 48. Committee- Dr. C.O. Eleazu

49. 3.50 pm- Closing prayer /Departure

# **SUB-THEME 1:** ***Repositioning Bioscience Research for the Achievement of Agricultural Transformation and sustainable development in Nigeria*** **(RASD)**

# **RASD 01: Quantitative Screening of Vitamins, Minerals, And Proximate Compositions of Edible Mushroom *Hysizygus Ulmarius Cultivated On Three Wood Sawdust***

# 1Ezeibe Chidi Nwaru, Onyekachi F A Ibiam1, 2Mary Oluchi Iwuagwu, and

# 3Maryrose Uzoamaka Nwokoma

*1Department of Plant Science and Biotechnology, Abia State University, Uturu. Abia State Nigeria.*

*1Department of Biology, Faculty of Biological Sciences, Alex Ekwueme Federal University, Ndufu-Alike, Ebonyi State of Nigeria*

*2Department of Plant Science and Biotechnology, Abia State University, Uturu. Abia State Nigeria.*

*3Department of Plant Science and Biotechnology, Abia State University, Uturu. Abia State Nigeria.*

*Corresponding Author \* e-mail : [nwaru.chidi@abiastateuniversity.edu.ng](mailto:nwaru.chidi@abiastateuniversity.edu.ng)*

**Abstract**

This study was conducted to compare the effects of three distinct types of wood sawdust substrates namely; oak (OSD), mahogany (MSD), and pine (PSD) on the growth and nutritional composition of *Hysizygus* *ulmarius*. One factor completely randomized design (CRD) was used to evaluate the growth of mushrooms on the various substrates. Analysis of variance (ANOVA) was employed to test for the overall significance of data while the Duncan Multiple New Range Test (DMRT) was used to compare the difference in the various treatments. The shortest day for spawn run (10 days) was recorded on PSD whereas 15 days and 16 days were recorded on OSD and MSD respectively. Comparing the yield potential of the substrates, both OSD and MSD had 120 g/kg fresh weight and 30% biological efficiency compared to 22.50% recorded in PSD with 90g/kg fresh weight. There were no statistical differences at P ≤ 0.05 in the growth patterns of the mushrooms across all substrates. The highest ash content of 14.90% was recorded on MSD with the least, 13.05%, recorded on PSD. The highest protein content of 24.08% was recorded on PSD compared to 20.53% recorded on MSD. Crude fiber which ranged from 10.80% - 11.10% was also recorded with the highest value (11.10%) recorded on MSD substrates. Crude fat ranged from 1.6% - 2% on MSD and PSD substrates, with the highest carbohydrate content of 51.88% recorded on MSD and the least, 49.93% recorded on PSD. Vitamins B1, B2, B3, and C were recorded with the highest vitamin contents recorded in PSD substrates compared to OSD and MSD. There were statistical differences at P ≤ 0.05 across all the substrates for mineral compositions (Ca, Mg, Na, K, and P). The finding of this study revealed that OSD and MSD had great yields with efficient substrate conversion compared to PSD.

**Keywords**: *Hysizygus ulmarius,* nutritional composition, yield potential, wood sawdust, efficient substrate conversion.

# **RASD 02: Evaluation of Insecticidal Activity of *Capsicum frutescens n-hexane and methanol* Extracts Against Bean Weevil (*Sitona lineatus*) And Maize Weevil (*Sitophilus zeamais*).**

# 1\* Uchechukwu Okorie and1Francis Gideon Sopuruchukwu, Ibekwe Angela Oluchi, 1Festus Ifeanyi Eme, 1Ibiam Gift Onyinyechi

1Department of Biochemistry, Alex-Ekwueme Federal University Ndufu Alike, Abakaliki, Ebonyi State, Nigeria

\*Corresponding author: [uchechukwuc2002@yahoo.com](mailto:uchechukwuc2002@yahoo.com)

**Abstract**

This study investigated the insecticidal activity of bird's eye chili (C*apsicum frutescens*) pepper n-hexane and methanol extracts against bean weevil (S*itona lineatus*) and maize weevil (S*itophilus zeamais*). The phytochemical screening was carried out using standard methods, other bio-active ingredients were determined using the Gas Chromatography-Mass Spectroscopy (GCMS). While fourier transform infrared (FTIR) was used to identify the functional groups. The contact and repellent methods were adopted to evaluate the insecticidal activity of methanol and n-hexane extracts of dried seed and cover of Bird's Eye Chili (*Capsicum frutescens*). In each method, the mortality rate was monitored under 1hr, 2hrs, 24hrs and 14 days. The result showed the presence of phenol, flavonoid, alkaloids and tannin. Also, capsaicin (a known insecticidal agent), Dichloroacetic acid, tridecyl ester and 2-Dodecanol, (-)-cis-Isopiperitenol were identified by the gc-ms. The FTIR revealed the following functional groups: OH, NH, C-H, C-N, and C=C which conforms with the compound identified by the gc-ms. The methanol seed extract demonstrated better insecticidal activity by recording the highest mortality (100%) when compared to n-hexane extract. The findings of this research indicated that Bird's Eye Chili pepper (*Capsicum frutescens*) can be utilized as a raw material for the creation of an alternative insecticidal agent against Maize Weevil (*Sitophilus zeamais*) and Bean Weevil (*Sitona lineatus*) as well as other agricultural insect.

**Keywords:** Dichloroacetic acid, insecticidal, *Capsicum frutescens, Sitophilus zeamais,* Chili pepper

# **RASD 03: SDS-PAGE CHARACTERIZATION OF THREE CULTIVARS OF COWPEA (*Vigna unguiculata)***

# \*O.O. Adeoye1, S. E. Ebi1, E. N. Ebi2, M.C. Ukaegbu1, O.T. Mustapha3, L. A. Ogunkanmi4

1Department of Biology, Alex Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State.

2 Department of Biotechnology, Alex Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State.

3Department of Plant Biology, University of Ilorin, Ilorin

4Cell biology and genetics Department, University of Lagos, Lagos

Corresponding Author: Email: [adeoye.olatunde@yahoo.com](mailto:adeoye.olatunde@yahoo.com) Tel: +2348067902343

**Abstract**

Understanding of genetic variability and available genetic diversity is essential in any breeding and population study. This research investigates the diversity in common cultivars of cowpea within Ilorin, Kwara State. Three of the most in demand cultivars was collected from an agro store and planted in the nursery of botanical garden university of Ilorin. Young leaves of three cultivars of cowpea (*Vigna unguiculata*) namely; IT89KD-288, T-Best and Ife Brown were collected fresh at two weeks after germination, the crude leave protein was extracted and characterized using sodium dodecyl sulphate polyacrylamide gel electrophoresis. The qualitative and quantitative protein bands showing the degree of similarities and divergence between the three cultivars was studied. The degree of variations in protein bands which shows the measure of genetic divergence between the three cultivars. A total of 25 bands was revealed with relative mobility ranging from 0.357 to0.886, T-best shared four identical bands with IT-288 and a matching coefficient of 0.5. T-Best shared five bands with Ife Brown and matching coefficient of 0.5 while Ife Brown has six identical bands with IT-288 and a matching coefficient of 0.57.

**Keyword**: SDS-PAGE, Cowpea, Protein, Electrophoresis, Extraction

# **SUB THEME 2:** ***Re-invigoration of Bioscience Research in Nigeria for the enhancement of food security and nutritional well being* (RFSNW)**

# **RFSNW 04: Morphological Identification and Some Molecular Characterization of Yeast Isolates from Palm Wine in Ikwuano and Ngwa, Abia State, Nigeria.**

# Adaugo gift Ibeh and Valentine Oti

1Department of Biotechnology, Alex Ekwueme Federal University, Ndufu-Alike Ikwo, Ebonyi State, Nigeria.

2Department of Plant Science and Biotechnology, Michael Okpara University of Agriculture Umudike, Abia State, Nigeria. Email: [ibeh.gift@funai.edu.ng](mailto:ibeh.gift@funai.edu.ng).

**Abstract**

Palm-wine is an alcoholic beverage obtained from the fermentation of the sugary sap of various palm species in Nigeria. It is usually obtained from *Raphia vinifera, Raphia hookeri, and Elaeis guineensis.* This study was conducted to evaluate the physicochemical properties of oil palm wine (*Elaeis guineensis*) and Raphia palm wine (*Raphia vinifera*) and it is aimed at characterizing yeasts isolates from freshly tapped palm wine in Ikwano and Ngwa, Abia State, Nigeria. A total of 6 samples of freshly tapped palm wine were collected from Ikwuano and Isiala Ngwa local government councils both in Abia state. They were stored in a cooling jar and were analyzed in their fresh state. The yeast strains were isolated from the sap of palm wine for 24, 48 and 72 hours after harvest using the techniques of “Teramoto” with some modification. The yeast isolates were identified by molecular characterization. DNA sequence analyses was achieved through DNA extraction using CTAB procedure, amplification of regions of rRNA/Internal Transcribed Spacer sequence (ITS) and purification of the PCR products. The amplified region was done using ITS1 and ITS4 which are recommended universal primers for fungi identifications. The total yeast count from sample 2 *saccharomyces* *cerevisiae* strain A771 has the highest yeast count of 6 × 10-115 Cfu/ ml in their E- value with high quality yeast isolate of 121.6ng/µl. Gene amplification bands revealed that the molecular weight of the isolates was 650 bp. The phylogenetic placement of the 6S DNA of the isolates within the *Saccharomyces* *cerevisiae* strain BJ2 and *Saccharomyces cerevisiae* strain BJ2 18S revealed a closely relatedness to *Saccharomyces cerevisiae* strain LYY than other Saccharomyces sp. Statistical analysis using two-way ANOVA showed that the microbial quality of the palm wines is location specific. This research further suggests that oil palm wine (*Elaeis guineensis*) and Raphia palm wine (*Raphia vinifera*) can be harnessed in bioprospecting of high-throughput yeast starter in biotechnological studies because of the high qualiy of *Saccharomyces* *cerevisiae*.

**Keywords:** Palm wine, CTAB, Sugar, phylogenetic, *Saccharomyces* *cerevisiae*,

# **RFSNW 05: Comparative Evaluation of Nutritional Composition of Wild and Aquaculture African Catfish fed with foreign and local feeds**

# 

# Ogbanshi, M. E1\*and Agwu, S. C2.

**\***1Department of Biochemistry, Alex Ekwueme Federal University Ndufu Alike Ikwo (AE-FUNAI), Ebonyi State

2Nigerian Institute for Oceanography and Marine Research, Lagos.

Correspondence: agwucs@niomr.gov.ng/ samuelagwu90@gmail.com

**Abstract**

Fish, especially the African catfish, is known to be highly nutritious and contains vitamins, minerals, among others for physiological function. It is commonly available and is mostly consumed fish species in Nigeria. The study was conducted to comparatively evaluate the vitamins and minerals composition of wild catfish from Ebonyi River and farmed catfish fed with Allar-qua (foreign fish feed), farm made fish feed and locally made commercial fish feeds. A total of 60 catfish fingerlings were divided into three groups in three replicates and stocked in concrete ponds, groups 1-3 are fed with aller-qua, farm-made fish feed and locally made commercial feeds for four months. After which samples were selected randomly from them and subjected to vitamin and mineral analyses. The result of the study revealed that wild fish contained more vitamins than the fish fed with aller-qua and locally made commercial feeds with vitamin A showing the highest composition followed by vitamin E, B1, B6 and C (p<0.05). The mineral composition of wild fish is higher than foreign and the local commercial feed (p<0.05) but has a reverse effect on the fish fed with farm-made feed which is higher in Ca (252.3mg/100g), Mg(365.1mg/100g) and K(178.2mg/100g) than the wild ones with Ca(244.7mg/100g), Mg (365.1mg/100g), K(171.5mg/100g) (P<0.05) while wild catfish contain higher sodium(311.46mg/100g) respectively. From this study, wild catfish prove to be more nutritious, however, fish fed with quality farm-made feed tends to contain higher minerals but lower in vitamins. Therefore, natural (wide catfish) which showed high content of the both nutrient s is better than the farmed ones.

**Keywords:** African Catfish, Feeds, Nutrients, Vitamins, Minerals

# **RFSNW 06: The Bacteriological Quality of Raw cow milk obtained from Herdsmen in Okigwe, Imo State, Nigeria**

# \*1Uzoh C.V, 2Nworie C.O, 1Okeh C. Okeh, 2Uchendu D.O, 3Igwe P.C

1Department of Microbiology, Alex-Ekwueme Federal University Ndufu- Alike Ikwo, Abakaliki, Ebonyi State, Nigeria

2Department of Science Laboratory Technology, Akanu Ibiam Federal Polytechnic, Unwana, Ebonyi State, Nigeria

3KingDavidFederal University of Medical Sciences*,* Uburu, Ebonyi State, Nigeria

**Abstract**

This study was conducted to examine the bacteriological quality of cow’s raw milk obtained from herdsmen at Okigwe, Imo States. Standard microbiological procedure was used to carry out this research. A total number of five samples were gotten from different streets in Okigwe metropolis in sterile specimen containers. Ten fold serial dilution was carried with each of the sample with the 4th tube to 6th tube being inoculated on Nutrient agar, Salmonella- Shigella agar and MacConkey agar by spread plate method and incubated at 37oC for 24 hours. The microorganisms were identified were *Staphylococcus aureus*, *Corynebacterium* sp, *Salmonella typhi*, *Streptococcus* sp, *E.coli*, *Lactobacillus* sp and *Salmonella typhi*. The total viable count for raw cow milk ranged from 6.6 x105 CFU/ml to 1.01 x 106CFU/ml while total coliform count was from 6.2x106 CFU/ml to 1.7x106 CFU/ml. They frequency of occurrence of *Lactobacillus* sp was highest with a value 85 and the lowest frequency was *Salmonella typhi* with a value of 2. The raw cow milk was observed to harbor some pathogenic microorganisms which can cause infections when ingested.

**Keywords**: *Lactobacillus* sp, Nutritious, Digestible, inoculation

# **RFSNW 07: Reinvigoration of Bioscience Research in Nigeria for Enhancement of Food Security and Nutritional Wellbeing.**

# Professor Ositadinma Ugbogu

**Abstract**

Hunger and undernourishment are prevalent problems in sub-Saharan Africa including Nigeria. Nutrition is a critical part of health and development as it is related to improved infant, child and maternal health, safer pregnancy and childbirth, stronger immune systems, lower risks of non-communicable diseases and longevity. Food security exists when all people, at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and preferences for an active and healthy life. Basic as well as applied research in Biosciences contributes to food production by improving the use of plants, livestock, fish and microorganisms. It has played an essential role in the provision of affordable, safe and sustainable food, in promoting lifelong health and wellbeing, and in the development of bio-based technologies to support clean and sustainable industry. Although the bioscience researches conducted in our universities and research institutes in Nigeria contributes to the food security and nutritional wellbeing of the populace, there is need for new or renewed strength. Challenges often include inadequate/poor funding, corruption, lack of replication studies, lack of adequate and accurate science communication and poor career prospects and remuneration for Bioscientists. Howbeit, focus should be on bioscience for sustainable agriculture, crop and farmed animal health, waste reduction, biofortification of foods and development of food peculiar to our environment to discourage food importation. Public investment in addition to new and imaginative public-private collaboration can make the biological science revolution beneficial to Nigeria.

# **SUB THEME 3:** ***Bioscience Research; Biotechnological Perspective* (BRBP)**

# **BRBP 08: Metagenomics: A Powerful Tool to Reposition Biosciences towards National Development.**

# Okafor Collins Onyebuchi Okeke1\*, Okoroafor Ikechukwu1, Umoru Grace Ufedo3, Eromonsele Blessing Osose1, Nwachukwu Blessing Ogechi1 and Euslar Nnenna Onu2

Department of Microbiology, College of Science, Evangel University Akaeze, Ebonyi State, Nigeria.

Department of Medical Microbiology, Faculty of Basic Clinical Medicine, Alex-Ekwueme Federal University, Ndufu-Alike Ikwo, Nigeria.

Department of Microbiology, Faculty of Science, Federal University, Oye Ekiti, Ekiti State, Nigeria.

Department of Biochemistry, College of Science, Evangel University Akaeze, Ebonyi State, Nigeria.

**Corresponding Author’s e-mail:** [cofor1@yahoo.com](mailto:cofor1@yahoo.com)**;** [Microprof@evangeluniversity.edu.ng](mailto:Microprof@evangeluniversity.edu.ng)

**Abstract**

Metagenomics is a scientific technique that uses the metadata of several genomes to proffer fast and dependent information on the make-up and distribution of an interacting microbial ecosystem in the environment. It has become an emerging tool to study communities of uncultured microorganisms over the last decades. It has a wide coverage of proven applications from environmental to clinical samples using next-generation sequencing (NGS) technologies. This article tends to highlight the importance of metagenomic over traditional culturonomic techniques and how it creates a quantum leap in biological frameworks towards national development through the discovery of novel genes, products, enzymes, pathways and bioactive compounds with completely new or modified biochemical activities. Peer-reviewed literatures sourced from ScienceDirect, Pubmed and ResearchGate search on metagenomic and other omic studies were used in this study. We reviewed the prospects, potentialities, recent advances and major milestones in the field of metagenomics, its tools and approaches, applications in solving national problems. We also elaborated its challenges in Nigeria and the need to embrace the field of metagenomics analysis in biological workspace. We project that the era of metagenonic techniques will create wormholes in biological systems thus compressing workloads for faster and efficient economy. The training of all personnel involved is important to in order to prepare for the promising future it holds in biotechnological workspace. Finally, this work will help bio-scientists to explore the evolving approaches, underpinning principles, challenges and recent advances in metagenomic techniques and prospective areas for nation building.

**Keywords**: Metagenomic, Culturonomic, Economy, Biotechnology, Development, Biosciences.

# **BRBP 09:** **Indigenous Management of Plant Genetic Resources in Nigeria**

# Onwe E.N, Ibiam O.F.A, Aduo B.C, Nwosu C.M, Okoroafor I., Nwaru C.E

1. Department of Biotechnology, College of Sciences, Evangel University Akaeze, Ebonyi State. [onwe.eucharia@evangeluniversity.edu.ng](mailto:onwe.eucharia@evangeluniversity.edu.ng), [onweuk2014@gmail.com](mailto:onweuk2014@gmail.com) +2348063283520

2. Department of Biology, Faculty of Biological Sciences, Alex Ekwueme Federal University, Ndufu-Alike Ikwo Ebonyi State.

[drakanuibiamjr@yahoo.com](mailto:drakanuibiamjr@yahoo.com). +2348035423334

Department Of Biotechnology, College of Science, Evangel University Akaeze, Ebonyi State.

[brunocadua@gmail.com](mailto:brunocadua@gmail.com). +2348039371655

Department Of Biotechnology, College of Science, Evangel University Akaeze, Ebonyi State.

[chimeziemarianwosu@gmail.com](mailto:chimeziemarianwosu@gmail.com). +2348166587019

Department Of Microbiology, College of Science, Evangel University Akaeze, Ebonyi State

[ikegodswill@gmail.com](mailto:ikegodswill@gmail.com). +2347062145934

Deparment of Plant Science and Biotechnology, Abia State University, Uturu Abia State.

[nwaru.chidi@abiastateuniversity.edu.ng](mailto:nwaru.chidi@abiastateuniversity.edu.ng). +2347010266171

**Abstract**

Nigeria is rich in plant genetic resources (PGR) which exist in many forms in plant natural habitats and in diverse crop landraces/cultivars. The diversity of crops in Nigeria is reducing for the mere fact that diversity lost rate is more than collected and conserved. The participants in PGR preservation in Nigeria are Institutes of research, academic institutes, NGOs, national reserves, wildlife sanctuaries and National Centre for Genetic Resources and Biotechnology (NACGRAB). NACGRAB is the national centre of activity for PGR management in Nigeria. Nigeria, one of the gene-rich nations, faces the particular problem of preserving its natural history while developing advantageous mechanisms for exchanging germplasm with other nations. The scheme of the Centre includes exploration, collection and management of very important diversity of species. It also has the responsibility to carry out quarantine services and has linkages with international organisations of the Consultative Group of International Agricultural Research (CGIAR) to accomplish its mandate. NACGRAB holds up to 10,000 genotypes of species conserved in its limited and durable germplasm, as live collections (in-situ and ex-situ). Copies of Guinea-Corn (S. bicolor) are reserved in the sectional seed repertoire of International Crops Research Institute of Semi-Arid Tropics (ICRISAT) Sahelian Centre in Sadore, Niamey. Researchers, students and farmers from various parts of Nigeria do access this germplasm. However, there is a wide gap in the knowledge of the genetic diversity of crops owing to lack of up-to-date documentation and only a little fraction of the rich natural endowments of the nation’s genetic resource is conserved as NACGRAB and sister institute focuses on their mandate crops. The system has contributed immensely towards safeguarding the indigenous and introducing useful exotic PGR for enhancing food and nutritional security. This study focuses on PGR management strategies in Nigeria, the successes of NACGRAB and pitfalls in comparison with global standards.

**Keywords:** Plant genetic resource, NACGRAB, management, strategies, indigenous.

# **BRBP 10: Screening, Isolation and Characterization of Lipid Degrading Microbes for Enhanced Biodetergent Production.**

# \*Nwagu Kingsley Ekene, Agu Favour Chidinma, Abel Chibuchi Favour and Akumah Oluchi Ebere.

Department of Biotechnology, Alex Ekwueme Federal University Ndufu Alike Ikwo, Ebonyi State.

Corresponding Author: [kingpetit.kn@gmail.com](mailto:kingpetit.kn@gmail.com)

**Abstract**

This study is aimed at the isolation, screening and characterization of lipid degrading microbes for possible incorporation into detergents in place of harmful surfactants. For this purpose, oil-rich soil and waste water samples were collected from different locations within Ndufu Echara, Ikwo local government area in Ebonyi state and screened for lipase positive microbial strains. Bacterial and fungal isolates were obtained from Rhodamine olive oil Agar and Potatoes Dextrose Agar respectively. Isolates were further Screened on Phenol red olive oil Agar and Rhodamine olive oil Agar respectively, resulting in the selection of 4 isolates out of 13, based on their appearance on the culture media after incubation. On Phenol red olive oil Agar, these four isolates demonstrated lipolysis through the change in the colour of the media from red to yellow. Also, on Rhodamine olive oil Red Agar, florescent orange halos around microbial colonies were observed when the media plates were viewed under U.V irradiation. These 4 isolates were identified by PCR technique and DNA sequencing, the results of DNA sequencing was compared with GenBank database of NCBI by BLASTn tool. The sequences from selected isolates showed high degrees of similarity to those of the GenBank references (between 86% and 97%). Isolate X1C showed 86.2% similarity to *Bacillus thuringiensis,* Y2B and Y2C showed 93.59% and 97.2% similarity to *Aspergillus niger* respectively, finally, isolate Z3A showed 97.2% similarity to *Aspergillus flavus.* Isolated microbes can be further cultivated in bioreactors to produce crude lipase enzyme which is purified, lyophilized and introduced during the manufacturing of biodetergents to tackle lipid-based impurities.

**Keywords:** Isolation, screening, characterization, sequencing, Lipid-degrading Microbes, Biodetergents.

# **BRBP 11: Comparative Study on The Biodegradation Ability of Biosurfactancts Produced By *Alternaria* And *Penicillium***

# Munachimso Odenakachi Victor-Ekwebelem 1and Ozoeneh, I. D2.

1, 2Department of Microbiology, Alex Ekwueme Federal University Ndufu-Alike P.M.B. 1010 Abakaliki Nigeria.

\*Author for Correspondence E-mail: preciouselemba@gmail.com

**Abstract**

Biosurfactants (BS) are surface active biomolecules synthesized by microorganism. They are synthesized extracellular or as part of the cell membrane of the producing organisms. The aim of this study was to highlight the notable differences in BS produced by both *Alternaria and* Penicillium in respect to biodegradation. soil sample was collected from suspected petroleum site and standard plate count method was used to isolate the fungi later a subculture was made to get pure isolates. Out of the 12 fungi isolated only 4 (33.3%) isolates identified and designated as Penicillium SS-3, Penicillium SS-11,Alternaria *SS-4* and Alternaria SS-12 had the ability to produce BS. The four isolates were subjected to BS production and extraction using the chloroform/methanol method of extraction. The quantity of biosurfactants produced by the *Alternaria* species of SS-12 and SS-4 are 0.63g and 0.61g respectively, while the quantity of the *Penicillium* species of SS-3 and SS-11 are 0.49 and 0.60 respectively these revealed that the *Alternaria* species are more potent producers of biosurfactant than the *Penicillium* species. The BS produced by both isolates was subjected to biodegradation for four days. After day 4 *Penicillium* SS-4 achieved 34% degradation against 22% of *Penicillium* SS-11, while *Alternaria* SS-12 and *Alternaria* SS-3 achieved 25% and 26% degradation of the engine oil respectively. The result revealed that the biosurfactants of *Penicillium* SS-4 were more potent degraders and better emulsifiers than other isolates used in this study.

**Keywords**: biosurfactant, fungi, potent, biodegradation, Penicillium, Alternaria

# **BRBP 12: Production of cellulase by newly isolated fungal strain using oil palm Leaves and rice husk as substrates through solid state fermentation.**

# Ezeilo U. R. and David E. E.

Department of Biochemistry, Alex-Ekwueme Federal University Ndufu-Alike

**Abstract**

Increasing energy demands necessitate the development of sustainable alternative energy sources. Cellulases are made up of three enzymes: endoglucanase, exoglucanase, and β-glucosidase. Endoglucanase is the sub-enzyme that can effectively unwind cellulose chains into shorter oligomeric subunits, exoglucanase cleaves it to cellobiose units, while β-glucosidase cleaves the cellobiose further into glucose units. In this study, we focused on the assessment of endoglucanase and exoglucanase production, their corresponding activities and final product of catalysis (reducing sugar). Extracellular cellulases were produced through solid state fermentation (SSF) of Abakaliki-grown raw oil palm frond leaves (OPFL) and rice husks (RH). This study assessed OPFL and RH as low-cost and sustainable growth substrates for a newly isolated cellulase-producing fungal strain. The strain was identified as *Rhizopus oryzae* using 18S rRNA sequencing and phylogenetic analysis. Maximum endoglucanase and exoglucanase, activities were recorded on the 5th day as 59.21 U/g, 68.94 U/g (OPFL) and 56.64 U/g, 52.63 U/g (RH), respectively. Also, the maximum total reducing sugar (TRS) for OPL and RH were 186.53 Mg/g and 142.41 Mg/g. OPL was clearly a more suitable SSF substrate than RH, inferring that this biomass could be used as a long-term and low-cost fungal growth substrate for the production of copious cellulase titres. Significant production of reducing sugar showed strong evidence for the production of β-glucosidase enzyme by the fungus. The approach adopted in this study is noteworthy because it offers an alternative path for the re-utilization of agricultural biomass as well as providing sources of raw materials for biofuel production.

**Key words**: Cellulase, endoglucanase, exoglucanase, rice husk, oil palm frond leaves, biofuel

# **BRBP 13: The use of 16S rRNA sequencing technology to explore the diversity and composition of gut microbiomes**

# Dogonzo Ishaya Yusuf, Saidu Sani, and Ekoh Obinna Charles

Department of Biochemistry, Alex-Ekwueme Federal University Ndufu-Alike

**Abstract**

Micro-organisms play significant roles in health and diseases. Hence, the study of the composition of the vast microbes (Microbiomics) inhabiting the human gut is necessary to understand the roles they play in the maintainenance of health. Prior to now, the study of gut microbiomes was impossible due to absence of technology that could analyze the microbes present within the gut biome. Thanks to advancement in technology, a new tool known as the 16S ribosomal RNA (rRNA) gene sequencing technology has been developed. This tool has revolutionized the field of microbiomics and has made it possible to sequence the 16S rRNA gene present in the genomes of bacteria and archaea. With this technology scientist can tell the composition and kind of microbes present in the gut of humans. The information obtained has been used to characterise the complex microbial communities inhabiting the human gut into phylogenic groups. This presentation therefore will focus on the contribution of the 16S rRNA gene sequencing technology to growth and understanding of the field of microbiomics.

**Keywords:** Microbiomics, 16S rRNA sequencing, Microbiomes

# **BRBP 14: Nucleic and Amino Acid Sequence Variability of Segment of N Gene of Rabies Virus Isolated in a Dog from Benue State compared to 31 other N gene sequences from the Gene Bank.**

# Adaji, J.O.1, 3\* Kwaga, J.K.P.,1, 3 Sallau, A.B 2., and Kia, G.S.N., 1, 3

*1Department of Biochemistry, Faculty of Life Sciences, Ahmadu Bello University, Zaria, Nigeria.*

*2Department of Veterinary Public health, Ahmadu Bello University, Zaria, Nigeria*

*3African Centre of Excellence for Neglected Tropical Diseases and Forensic Biotechnology, Ahmadu Bello University Centre, Zaria, Nigeria.*

**Abstract**

Rabies is a preventable viral disease most often transmitted through the bite of a rabid animal. This research was aimed to carry out molecular studies on a segment of the N gene of rabies virus isolated in dogs from Benue State, with objectives is to study the genetic relatedness of the amplified fragment of the N gene with other rabies virus isolates and to study the evolutionary relationship of the amplified fragment of the N gene with other rabies virus isolates. The dog from which this sample was collected was showing the signs of full-blown rabies. The DFAT Florescent score of the sample was estimated to be ++++ and the sample was also positive for N gene fragment amplification by PCR. The sequenced segment of the N gene of the Rabies virus was compared with 31 other sequences from the Gen bank. Among these aligned sequences RBV J50 had a maximum similarity of 97% with isolate KR080522, Dog 2012 Bida and a minimum similarity of 93%. There was variation at 32 positions which was non serial with a nucleic acid variation rate of 8.3% among the whole group. The amino acid variation occurred in 28 positions, showing that the nucleic variations were significant, resulting in different codons for amino acid synthesis. The variation in Nucleic acid composition affects the amino acid sequence, because amino acid changes can potentially affect the folding of proteins which can have an influence on the conformational antigenic sites.

# **BRBP 15: Biofabrication of Tissues and Organs with Bioengineered scaffolds using Locally Produced Chitosan from Biological Wastes**

# Prof F C Chilaka.

Department of Biochemistry, University of Nigeria, Nsukka.

**Abstract**

Tissue Engineering constructs using Chitosan hydrogels, nanoparticles and electrospun chitosan nanofibres have been widely studied for a variety of biomedical applications in the field of advanced wound care, antimicrobials, and polymer based biosensors, drug and gene delivery systems, nanothernostics and personalized medicine (PM) for Regeneration Medicine. With the rapid progress in Hybrid 3D-printing and electrospinning, the billion dollar 3D bioprinted and electrospun polymer-based tissue scaffolds would be of great importance in the biomedical industry in the near future, in relation to fabrication of bioartificial constructs comparable to the crucial features of human tissues and organs as in heart, skin, bone, liver, etc. These bio-inspired constructs could ultimately solve the organ transplant problem in aging populations. Present day polymer-based bioinks have poor mechanical properties which limit their use. Chitosan is widely known for its nontoxicity, good biocompatibility, and biodegradability with no acidic or toxic degradation products. These properties recommend chitosan as a good candidate for adequate investigation for use in the assemblage of natural polymer-based inks for the biofabrication of human organs. Chitin and Chitosan, are natural aminopolysaccarides found in the shells of mollusks and crustaceans like crabs and snails; cuticle of insects; and mushrooms that could be grown on rice husks and other plant wastes. Animal and plant wastes are abundant in Nigeria which can be harnessed towards the production of chitin and chitosan.

# **SUB THEME 4:** ***Bioscience Research in medicine and health* (BRMH)**

# **BRMH 16: Malaria in Pregnancy among Women in Ebonyi State (A Case Study of Ikwo)**

# Anorue, Chioma Ogochukwu, 1\* Martins Chisom Calista1, Nweke Chijioke2

1 Department of Biology Alex Ekwueme Federal University Ndufu-alike Abakaliki, Nigeria.

2 Department of Statistics Alex Ekwueme Federal University Ndufu-alike Abakaliki, Nigeria

Email address: [chummyogo@gmail.com](mailto:chummyogo@gmail.com)

\*Corresponding author (Anorue, Chioma Ogochukwu)

**Abstract**

Malaria in pregnancy is a serious public health concern among pregnant woman. Pregnant woman are more susceptible to malaria infection due to changes in their immune system. This is a cross-sectional study that investigated malaria in pregnancy among pregnant women in Ikwo, Ebonyi State, Nigeria. Peripheral Blood Test and Rapid Diagnostic Test Kits were used for collection of blood samples. A well-structured questionnaire was used to collect information on demographics and their knowledge, attitude and perception towards malaria. Out of 111 pregnant women examined 61 was infected giving a prevalence of 55.0%. For the peripheral blood test, out of the 50 women examined, 29 (58.0%) was infected. In Rapid Diagnostic Test, 61 women was examined, 32 (52.5%) were infected. Among the age-groups, prevalence of malaria was very high, however 25- 28 years of age had the highest infection of 11 (61.1%) using peripheral blood test. Using the RDT, 25-28 years age-group had the highest infection of 9(52.9%). The high level of malaria infection is significant among the age groups. From the knowledge, attitude and perception, the women are aware of malaria but chose to allow themselves to be infected. It is therefore, expected that these interventions will help improve malaria knowledge among women in Ikwo. Therefore, the need for a more effective public health advocacy which aims at addressing these misconceptions as well as emphasize the true cause of malaria cannot be undermined. Pregnant women should understand the importance of using insecticide treated nets and intermittent preventive treatment.

**Keywords:** malaria, P*lasmodium,* Diagnosis, KAP, prevalence, prevention

# **BRMH 17: Quercetin mitigates cyclophosphamide-induced immunosuppressive indoleamine- 2,3‐dioxygenase in the hippocampus and cerebral cortex of male Wistar rat**

# Azubuike P. Ebokaiwe, PhD.

Toxicology and Immunotherapy Research Unit, Department of Biochemistry, Alex Ekwueme Federal University Ndufu Alike, Abakaliki, Nigeria.

Email: [petazk@yahoo.com](mailto:petazk@yahoo.com); azubuike.ebokaiwe@funai.edu.ng

**Abstract**

This study investigated the protective effect of quercetin against cyclophosphamide-induced immunosuppressive indoleamine 2,3‐dioxygenase (IDO) via the mechanism of oxidative‐inflammatory stress and behavioral indices. Cyclophosphamide (CYP) was administered to male Wister rats at a dose of 100 mg/kg with or without quercetin 50 mg/kg every day for 7 days. Experimental techniques including western blotting, immunohistochemistry analysis, and inflammatory and oxidative stress marker assays were carried out. A behavioral analyses such as open field, tail suspension, and Y‐maze tests for cognitive assessment was conducted. The results indicated that quercetin attenuated oxidative‐inflammatory stress induced by CYP in the hippocampus and cerebral cortex of male Wister rats by augmenting the activities of antioxidant enzymes and suppressing lipid peroxidation as well as inflammatory mediators such as interleukin‐6 and interferon‐γ. Concomitantly, quercetin partially prevented the alteration in brain tissue histological architecture and mitigated the activities of IDO/tryptophan 2,3‐dioxygenase (TDO) and protein expression of IDO1. This was corroborated by the IDO‐quercetin model obtained in silico, revealing a favorable inhibitory interaction between quercetin and the enzyme. Finally, the results of behavioral tests suggested that quercetin significantly prevented the depressive‐like posture of the CYP‐treated rats. Our study for the first time revealed that quercetin ameliorates the effect of CYP‐instigated IDO/TDO activities in the cerebral cortex and hippocampus via the restoration of antioxidant enzymes and prevention of oxidative‐inflammatory stress.

**Keywords:** cyclophosphamide, indoleamine 2,3‐dioxygenase, neurotoxicity, oxido-inflammatory stress, quercetin

# **BRMH 18: Hepatoprotective effects of *Psidium guajava* aqueous leaves extract in albino rats induced with cadmium chloride.**

# \*1Chima A. EKELEME, 1TamaraLayefa. H. SEMIDARA, 1Amarachi M. ENI, 2Chimaraoke ONYEABO, 1Chinecherem P. EKWUEME, 1Miracle A. EGWU, 1Joshua C. EGWUTOHA, 1Ugochukwu G. EDOZIE

\*1Department of Biochemistry, Faculty of Biological Sciences, Alex Ekwueme Federal University, Ndufu Alike, PMB 1010, Abakaliki, Ebonyi State, Nigeria

2Department of Biochemistry, College of Natural Science, Michael Okpara University of Agriculture, Umudike, PMB 7267, Umuahia Abia State, Nigeria.

\*Corresponding author: [agatha.egedigwe@funai.edu.ng](mailto:agatha.egedigwe@funai.edu.ng),

**Abstract**

This study investigated the effect of *Psidium guavaja* leaves extract on liver function parameters in rats induced with oxidative stress. Thirty-six male albino rats were randomly divided into six groups: Group 1 served as the control, group 2 was administered with CdCl2 only, group 3-6 served as test groups, the third and fourth groups were treated with co-administration of CdCl2 and aqueous extracts of *Psidium guavaja* leaves at 50mg/kg and 100mg/kg body weight (b.w) respectively. Fifth and sixth groups were administered with hot tea infusion (HTI) of guava leaves at 50mg/kg and 100mg/kg b.w respectively, concomitantly with CdCl2. Blood samples of the animals were collected via ocular puncture with a capillary tube and also from the heart into plain bottles for determination of liver function parameters - Alanine transaminase (ALT), Alkaline phosphatase (ALP), Aspartate transaminase (AST). The results of the biochemical analysis showed that cadmium chloride administration significantly (p<0.05) increased the serum levels of ALT, ALP and AST compared to the control group. While in group 4 when the aqueous extract of guava leaves was administered, there was a significant (p<0.05) decrease in AST, ALP and ALT compared to groups 3 and 5. whereas in group 6, there was a more significant (p<0.05) decrease in AST and ALT in relation to 3, 4 and 5 which could be attributed to the phenolic compounds present in the leaves. In conclusion, both guava leaves extracts (aqueous and HTI) could possess hepatoprotective properties against oxidative stress induced by cadmium chloride.

**Keywords:** Cadmium chloride, Oxidative stress, *Psidium guavaja,*Phenolic compounds, Liver function

# **BRMH 19: Herpes Simplex Virus as Co-Infection in Human Immunodeficiency Virus**

# Euslar Nnenna Onu 1 Nworie moses 2 Ekuma Uchechukwu 3 chinedu Obasi Akpa 4 Erejuwa O. Omotayo, 5 Ogbu Ogbonnaya6

1Department of Medical Microbiology, Faculty of Basic Clinical Sciences, Alex-Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State Nigeria

2Department of Microbiology, Faculty of Biological Sciences, Alex-Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State Nigeria

3Department of Microbiology, Federal University of Technology Owerri, Imo Dtate

4 Department of Haematology, Faculty of Basic Clinical Sciences, Alex-Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State Nigeria

5Department of Pharmacology, Faculty of Basic Clinical Sciences, Alex-Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State Nigeria

6Department of Applied Microbiology Ebonyi State University, Abakaliki

**Corresponding author:** [euslar.onu@funai.edu.ng](mailto:euslar.onu@funai.edu.ng)

**Abstract**

This study was conducted to determine the incidence of Herpes Simplex Virus (HSV) type-2 among Human Immunodeficiency Virus (HIV) positive individuals accessing medical care at the Federal Teaching Hospital, Abakaliki, Ebonyi State and to assess the possible risk factors associated with HSV infection in the study population. A total of 200 individuals were screened for Herpes Simplex Virus after obtaining their consent. Sera obtained from the samples were screened using commercially available Enzyme Linked Immunosorbent Assay (ELISA) kits to determine the incidence of Herpes Simplex Virus type-2. The result obtained showed that 120(60%) were seropositive to Herpes Simplex Virus type-2. Of the 100 females examined, 68 tested positive, 40 of the positive females had early exposure to sex at ages 20 and below. Out of the 100 males investigated, 52 were seropositive. The prevalence was higher in females compared to males. The Herpes Simplex Virus type-2 infection was higher in age group 41-50 having 73(60.8%) positive individuals. The married had more prevalence of 80(66.7%) compared to 40(33.3%) of the unmarried. The high positivity of HSV among the HIV individuals is a clear indication that there is a strong relationship between HIV and HSV which can be as a result of same route of transmission. Having early exposure to sex was also noted to increase the risk of acquiring HSV. Consideration should be given to making HSV test routine and treatment among HIV positive individuals as other forms of HIV care.

**Keywords:** blister; genital; ulcer; herpes; HVS.

# **BRMH 20: Aqueous leaf extract of *Persea americana******Mill* (Avocado) inhibits glucose-induced mitochondrial permeability transition pore (MPTP) alteration in isolated pancreas and liver mitochondria of *Wistar* rats**

# J. N. Ejeje1, 2, T. O. Obafemi2 and O. A. Oje1

1Department of Biochemistry, Alex Ekwueme Federal University Ndufu-Alike, Ikwo, Ebonyi State, Nigeria.

Email: [blessedjerry2016@gmail.com](mailto:blessedjerry2016@gmail.com)/ejeje.jerius@funai.edu.ng.

2Department of Chemical Sciences, Biochemistry Programme, College of Sciences, Afe Babalola University, Ado-Ekiti, Nigeria.

**Abstract**

Mitochondrial permeability transition (MPT) has been reported as a culprit of a various kinds of diseases including diabetes and neurodegenerative diseases. *Persea americana* *Mill* (Avocado) is a tropical native American fruit consumed globally for the management of symptoms of cancer, diabetes mellitus, inflammation and infection. The present study evaluated the modulatory effects of aqueous leaf extract of *Persea americana* on MMPT in pancreas and liver of *Wistar* albino rats in vitro. Five male *Wistar* rats (weighing between 150 and 250 g) were sacrificed by cervical dislocation, their pancreas and liver were excised and homogenized to obtain mitochondria pellets using a refrigerated Sigma (3-30K, Germany) centrifuge. Mitochondrial permeability transition (MPT) pore alteration was induced using 37.5 mM/L of D-glucose. Effects of different concentrations (24, 40, 56 μg/mL) of the extract were observed on pancreas and liver MMPT. Absorbance was taken at a wavelength of 540 nm in a Vis 721A spectrophotometer at every 30 seconds for 12 minutes. The results showed that the aqueous extract could not induce MPTP opening significantly. The 37.5 mmol/L D-glucose and the Ca2+ significantly elicited pore opening in both the pancreas and liver mitochondria which was reversed by the extract at a none-dose dependent order. However, 24 μg/mL *Persea americana* leaf aqueous extract in conjunction with Ca2+ (triggering agent) opened the pore more compared to the standard triggering agent only. The extract possesses significant inhibitory effects against MPT alteration in *Wistar* rats, therefore could be useful in the management of MPT-related syndromes.

**Keywords:** mitochondria, diabetes, exogenous calcium ion, absorbance, spectrophotometer.

# **BRMH 21: Metabolic profiles and antimicrobial activities of *Chrysophyllum cainito* towards two clinically strain resistant bacteria, *Pseudomonas* *aeruginosa* and *Escherichia coli*.**

# Chukwu, Chukwuma and Obaji Amuche

*Department of Chemistry,* Alex Ekwueme Federal University, Ndufu-Alike, 3Department of chemistry Ebonyi state University Abakaliki, *Nigeria.*

**Abstract**

*Chrysophyllum cainito,* commonly known as ‘‘*udara mbeke’’* in Ikwo Lanuguage in Ebonyi State has been reported to possess a varied range of therapeutic and pharmacological applications due to presence of bioactive compounds. The present study was carried out to determine the metabolic profiles of *Chrysophyllum cainito* fruit by sequential extraction approach (methanol, water, ethyl acetate and hexane) fraction using Gas chromatography coupled to mass spectrometer (GC-MS) analysis. A total of 30 phytocompounds were identified from methanol fraction while 28 compounds from aqueous fraction , 21 compounds from the ethyl acetate fraction and 19 compounds from the hexane fraction. The classes of compounds identified include; alkaloids, flavonoids, steroid, bicyclic unsaturated and saturated fatty acid. Most of the identified compounds were previously reported to possess antimicrobial, antitumor, antiseptic, preservative, and insecticidal and antioxidant activities. The bioactive compounds tentatively identified with their total percentage ion concentration ( %tic) include: cycloheptanone(1.359%), 1,3-Butadiene-1-carboxylic acid (0.704%), Tybamate(0.199%), Furanmethanol ( 4.643%), Carbamic acid ( 19.302%). Acetamide, 2-(2-thiophenyl)-N-ethyl-N-isobuty ( 6.347%), 2-Thiopheneacetamide, N-hexy ( 0.701%), Isovaleric acid, 2,3,4,6-tetrachlorophenyl ester ( 0.281%). Others are chlorinated succinic esters , Succinic acid, 2,3,4,6-tetrachlorophenyl undecyl ester 19.02%) and Preg-4-en-3-one, 17α-hydroxy-17β-cyano (0.67%), 6,7-Dihydro-[1,2-e]-5H-pyrrolotetrazole ( 1.730%), Bicyclo[10.1.0]trideca-4,8-diene-13-carboxamide, N-(3-chlorophenyl)- ( 2.403%), 1-Ethanone, 1-[5-methyl-1-(1,4,6-trimethyl-1H-pyrazolo[3,4-b]pyridin-3-yl)-1H-1,2,3-triazol-4-yl]- (4.046%), 3- (Piperidin-1-yl) - 2H, 7H, 8H, 9H, 10H -pyrimido [4,5-c]isoquinolin-1-one ( 0.721%), Sulfamethazine, N-acetyl ( 0.106%). The antimicrobial activity of the extracts was evaluated with the use of the disc diffusion technique and the minimal inhibitory concentration (MIC) assay. The results of the different extracts of *Chrysophyllum cainito* showed sizable antibacterial activity in both *p*. *aeruginosa* and *E. coli*. Ethyl acetate and n-hexane extract, showed that the extract was strongly effective on both *P. aeruginosa* and *E. coli.* at inhibitory zone of (11mm, 2mm and 7mm and 8.5mm respectively) but the methanol extract was only effective on *E.Coil* at 8mm but inhibitory in *P.* aeruginosa (0mm). This finding suggests *Chrysophyllum cainito* is a potential drug agent that could be designed for the treatment and prevention of infectious diseases caused by pathogenic microorganisms.

**Keywords**: *chrysophyllum cainito,* metabolic profile, antimicrobial activity, minimum inhibitory

# **BRMH 22: The Genotoxic Effect of Paraquat Dichloride on *Allium cepa***

# Michael Ukaegbu

*Department of Biology,* Alex Ekwueme Federal University, Ndufu-Alike,

**Abstract**

Paraquat dichloride is a broad-spectrum (non-selective) contact herbicide. It is the third most widely used herbicide in the world. It is used to control broad-leaved weeds and grasses, in a wide range of agricultural applications and for general weed control. The genotoxicity of Paraquat dichloride was investigated using both morphological and root chromosome assay. Paraquat solutions were applied to three groups of *A. cepa* bulbs at 0.125ml/L, 0.25ml/L and 0.5ml/L doses, respectively. The control group was treated with tap water throughout the experimental period. Using the physiological parameters, at the end of the treatment period the results reduced to 0.4 cm and 20 % for the root length and germination percentage respectively, compared to the control group which results are 4.7 cm and 90 % root length and germination percentage respectively. The toxic effects of Paraquat became more apparent as the dose of Paraquat was increased. The genotoxic effect of Paraquat was most severe in the 0.5ml/L dose group. In this group, the mitotic index decreased to 3.4% compared to the control group, while the chromosomal aberrations frequency was at an average of 137. The most observed aberrations where sticky chromosomes, spindle abnormality, binucleated cells, c- mitosis and micronucleus. Considering the versatile toxicity induced by Paraquat dichloride, it can be said that this chemical has the potential to cause serious damage to non-target organisms.This study will be an important reminder to limit the indiscriminate use of this highly risky agrochemical.

**Keywords:** Paraquat dichloride, *Alliumcepa*, Genotoxicity, Chromosomal aberration, Herbicide.

# **BRMH 23: Tannic Acid Ameliorates Oxidative Stress in Organs and Abnormal Serum Biochemical Profile Caused By High-Fat And Fructose Diet-Induced Obesity In Rats**

# Emmanuel Ejiofor1\*, Ernest Agwamba2, Chima Egedigwe-Ekeleme3, Sunday Oyedemi4, Francis Imeh1, Bliss Harold1, Deborah Azuh1 and Maureen Ejiofor5

1Department of Chemical Sciences, Faculty of Science, Clifford University, Owerrinta, Abia State, Nigeria. 2Department of Chemistry, College of Science and Technology, Covenant University, Ota, Ogun State, Nigeria.

3Department of Biochemistry, Faculty of Biological Sciences, Alex Ekwueme Federal University, Ndufu Alike, Ikwo, Abakiliki, Ebonyi State, Nigeria.

4School of Science and Technology, Department of Pharmacology, Nottingham Trent University, Nottingham, United Kingdom

5Department of Biochemistry, College of Natural Sciences, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

**\*Corresponding author**: Emmanuel Ejiofor; +2347036250103, Email: [ejioforemmanuelbiz@gmail.com](mailto:ejioforemmanuelbiz@gmail.com)

**Abstract**

Obesity and diabetes are considered life-threatening conditions characterized by increased oxidative stress, insulin resistance, hepatotoxicity, hyperglycemia, and hypercholesterolemia. Therefore, we studied the effects of tannic acid in a high-fat and fructose diet-induced rat model of obesity. Administration of tannic acid at doses of 200 and 400 mg/kg significantly reduced fasting blood glucose concentration, reversed a disoriented lipid profile, decreased liver enzyme activities, and inhibited oxidative stress compared to a negative control. Histopathological examination showed preserved pancreas and liver architecture in the tannic acid-administered groups. The in vitro inhibitory activity of tannic acid towards alpha-amylase, alpha-glucosidase, and pancreatic lipase showed good inhibitory potential. Molecular docking studies showed high binding affinity and more hydrogen bond interactions between tannic acid and receptor proteins (alpha-amylase, alpha-s-glucosidase, and pancreatic lipase), implicated in obesity and diabetes. In conclusion, tannic acid prevented the onset of oxidative stress, preserved the liver, and restored the disoriented lipid profile in high-fat and fructose diet-induced obesity in rats.

**Keywords:** Antioxidant, molecular docking, fasting blood sugar, polyphenols, cholesterol

# **BRMH 24: Survey and Molecular Analysis Of High Risk Human Paillomavirus Type-18 Among Hiv Positive Females In Abakaliki Ebonyi State, Nigeria****.**

# Euslar Nnenna Onu,1 Nworie moses,2 Ekuma Uchechukwu,3 Ogbu Ogbonnaya4

1Department of Medical Microbiology, Faculty of Basic Clinical Sciences, Alex-Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State Nigeria

2Department of Biological Sciences, Alex-Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State Nigeria

3Department of Microbiology, Federal University of Technology Owerri, Imo State

4 Department of Applied Microbiology Ebonyi State University, Abakaliki.

**Corresponding author:** [euslar.onu@funai.edu.ng](mailto:euslar.onu@funai.edu.ng)

**Abstract**

This study was done to survey the seroprevalence of Human Papillomavirus (HPV) high risk type-18 among Human Immunodeficiency Virus (HIV) positive females attending HIV Clinic in Abakaliki Ebonyi State. Blood samples from 160 individuals were analysed using Enzyme Linked Immunosorbent Assay test (ELISA). The positive samples were analysed using Polymerase chain reaction (PCR) with specific primer for HPV type-18. Using ELISA test, HPV antibodies were detected in 103(64.4%) of the samples out of which 19(18.4%) were positive using PCR with human papillomavirus type-18 primers. Using ELISA test HPV antibodies were highest among the age group 51-60 years 41(77.41%), among people with secondary education 51(81.0%) and those who did not state the number of sexual partners they had were 92(76.7%). Civil servants and traders were also found to have high level of HPV 29(76.3%). However using PCR with HPV type-18 primer, the infection was found to be highest among individuals between 41-50 years 11(42.3%); rural dwellers 17(22.7%); traders 11(37.9%); primary level of 17(34.7%) and those that did not state the number of sexual partners they had were 16(17.4%). From the results, there is co-infection of HPV type-18 and HIV infection. This study indicates that there is need to include human papillomavirus screening as one of the vital test since early detection of the presence of the virus helps in decreasing female mortality due to cervical cancer since human papillomavirus type-18 is a known high risk type that can cause cervical cancer.

**Keywords:** cervical; cancer; [papillomas](https://en.wikipedia.org/wiki/Papilloma" \o "Papilloma); [warts](https://en.wikipedia.org/wiki/Wart" \o "Wart); [squamous](https://en.wikipedia.org/wiki/Squamous_cell_papilloma" \o "Squamous cell papilloma) .

# **BRMH 25: Phenotypic Resistance Profile of *Candida Albicans* Isolated From Hiv-Positive And Healthy Individuals In Selected LGA of Ebonyi State.**

# 1Okata-Nwali. D.O\*., 2Nwakaeze, E.A., 1Okoye, C. F., 1Okoro E. T. and 3Okoli, I.

1Dept. of Microbiology, Alex-Ekwueme Federal university, Ndufu-Alike, Ikwo.

2Dept of Applied microbiology, Ebonyi State University, Abakaliki.

3Nnamdi Azikiwe University, Awka.

**Abstract**

One frequent opportunistic illness among HIV-positive patients is candidiasis. From asymptomatic colonization to dangerous forms, the Candida infection spectrum is broad. Concern has been raised about the gradual rise of non-albicans Candida species as a cause of mucosal and invasive Candidiasis, particularly in patients with advanced immunosuppression and the issue of azole and other antifungal drug resistance in the Candida species. Patients with AIDS were the subject of a prospective research to check for Candida infection. Following a careful clinical evaluation, pertinent samples were obtained and processed specially to identify a Candida infection. Testing for antifungal sensitivity and Candida isolate speciation was also conducted. Out of a total sample of 252 apparently healthy people and 110 HIV positive patients, candidiasis was definitively diagnosed in 143 patients. Fluconazole and itraconazole exhibited the highest levels of resistance, while amphotericin B and voriconazole exhibited the lowest levels of resistance. The most typical yeast found in isolation was *Candida albicans.* The most prevalent opportunistic fungal infection in HIV-positive patients is candidiasis, which mostly affects the mucocutaneous system but can also be invasive. There is concern over Candida species' azole and other antifungal drug resistance.

**Keywords**: HIV, Antifungi, Candida albicans, Healthy individuals.

# **BRMH 26: An Overview of Staphylococcus Aureus and Methicillin-Resistant Staphylococcus Aureus**

# Nnabugwu, Charity Chinyere

Department of Microbiology, Alex-Ekwueme Federal University Ndufu Alike, P.M.B 1010, Abakaliki, Ebonyi State, Nigeria.

Correspondence: [nnabugwu27@gmaill.com](mailto:nnabugwu27@gmaill.com) (+234 (0) 8037441824)

**Abstract**

*Staphylococcus aureus* is the major contagious pathogen in health care and communities. This organism was first described in 1881 by a Scottish surgeon Alexander Ogaston in surgical abscess. *S. aureus* causes various infections ranging from simple to life threating infections. Possession of potent toxins and other virulence factors enables the bacteria to be very virulent in nature. Moreso, acquisition of antimicrobial resistant genes increased the challenge in treating this infections caused by the bacteria especially methicillin resistant *S. aureus* strains (MRSA) that are often multidrug resistant strains. The spread of MRSA between healthcare settings and communities resulted in changing even the genetic map for the strains in both places. Vancomycin was used for years and still acts as the drug of choice for treating MRSA infections but recently the resistance to vancomycin has so much raised thereby causing vancomycin resistant to *S. aureus* to be recorded. Accordingly, different administrations were used like combination of antibiotics to reduce the resistance rate to antibiotics if they were used as a single drug and practiced the control measures at health settings to reduce the spread of MRSA strains. Finally, global health organizations call for further research in finding new antibiotics agents with little or no resistant property to MRSA.

**Key word**s: *Staphylococcus aureu*s; MRSA; Vancomycin; virulence factors; antimicrobial Resistance

# **BRMH 27: Antimicrobial Efficacy Of *Zingiber Officinale* (Ginger) And *Allium Sativa* (Garlic) Extract Against *Staphylococcus* *Aureus* Isolated From Urine Samples Of Female Students Of Alex-Ekwueme Federal University Ndufu-Alike Ebonyi State Nigeria**

# Nnabugwu, C. C.\*. & Egwu-Ikechukwu, M.M.

Department of Microbiology, Alex-Ekwueme Federal University Ndufu Alike, P.M.B 1010, Abakaliki, Ebonyi State, Nigeria.

Correspondence: [nnabugwu27@gmaill.com](mailto:nnabugwu27@gmaill.com) (+234 (0) 8037441824)

**Abstract**

Methanol and ethanol extracts of garlic (*Allium sativa*) and ginger (*Zingiber officinale*) was investigated for its antimicrobial activities against *Staphylococcus aureus.* The organism was isolated from urine samples of female students of Alex Ekwueme Federal University Ebonyi State using standard microbiology procedures. Out of fifty-four Urine samples analyzed, thirty-two showed positive growth for *Staphylococcus aureus* (64%).The antimicrobial activity of garlic plant extract was evaluated by the agar well diffusion method. The result from this study shows that ethanol extract of garlic and ginger plants were effective against *Staphylococcus aureus.* The inhibitory effect exerted by garlic extract was highest at the concentration of 100μg/ml with mean zone inhibition of 18 ± 0.00mm which was statistically significant (p<0.05) from the control 20.0 ± 1.00mm. Also the inhibitory effect exerted by garlic was least at the concentration of 25μg/ml with zone of inhibition of 10±0.0mm which was statistically significant (p<0.05) from the control 20.0 ± 1.00mm. The activity of the methanol and ethanol extract was very minimal at low concentration (25 μg/ml), but at higher concentration (50-100 μg/ml), marked activity was observed. The minimum bactericidal concentration of both extracts was also determined and ranged from 25-100 μg/ml in both ethanol and methanol plant extract. The sensitivity of multiple drug resistant organisms to this plant extracts implies an alternative or substitution for existing antibiotics. Therefore, garlic and ginger extracts can be used as a source of antibiotic substances for possible treatment of S*taphylococcus aureus* infection still not preventing the use of antibiotics.

**Keywords:** Antimicrobial activity. Ginger, Garlic, Ethanol, Methanol, S*taphylococcus aureus,* Zone of Inhibition.

# **BRMH 28: Effect of ethanol extract of *Solanum torvum* leaves on sperm parameters of streptozotocin induced diabetic wistar rats**

# Saidu Sani1., Obinna Osuji2., Anthony Ikechukwu1., Ekpa Faith Uzoman1., Yusuf Ishaya Dogonzo1, Amarachi Mary Eni1 And Ekoh Obinna Charles1

1. Department of Biochemistry and Molecular Biology, Faculty of Science, Federal University Ndufu-Alike Ikwo, P.M. 1010, Abakaliki, Ebonyi State, Nigeria

2. Department of Chemistry, Faculty of Physical Sciences, Alex-Ekwueme Federal University Ndufu-Alike, Ebonyi State, Nigeria.

**Abstract**

Diabetes, a metabolic disease characterized by chronic hyperglycemia has been associated with defects in male reproductive functions. We evaluated the effect of ethanol extracts of *S. torvum* leaves (EESTL) on sperm parameters of streptozotocin (STZ) induced diabetic rats. Rats with STZ (40 mg/kg intraperitoneally (i.p.))-induced diabetes were divided into five groups (n = 5) and treated with (i) normal saline, (ii) 150 mg/kg body weight (BW) of EESTL, (iii) 300 mg/kg BW EESTL, (iv) 100 mg/kg BW metformin, and (v) 50 m/kg BW metformin + 100 mg/kg BW EESTL orally for 21 days and the animals were euthanized. The testis and epididymis were dissected, and sperm parameters were analyzed. Our results demonstrated that sperm count, motility, viability and normal sperm morphology were significantly decreased in the diabetic control group when compared to the normal control group. Interestingly, diabetic rats treated with EEST and metformin each alone or in combination showed a significantly increased sperm count, motility, viability and normal sperm morphology when compared with untreated diabetic rats. Taken together, our results showed that EEST improved sperm parameters in STZ-induced diabetic rats and may serve as a potential source of lead compounds for the development of drugs for diabetic related male infertility.

**Keywords**: Diabetes, hyperglycemia, sperm parameters, *solanum torvum,* infertility.

# **BRMH 29: Variation in Facial Anthropometric Parameters Among Age Groups**

# Obaje Godwin Sunday1, Bernard Eze Orji2, Ihotu James1

Department of Anatomy, Faculty of Basic Medical Sciences1

Department of Theatre Arts2 Alex Ekwueme Federal University Ndufu Alike Ikwo, Nigeria.[godwin.sunday@funai.edu.ng](mailto:godwin.sunday@funai.edu.ng),

**Abstract**

This study investigated the variation in facial indices and other anthropometric parameters among three age groups of a population in Nigeria. A total of 503 participants were recruited, with 169 (33.2%) in the 19-20 year age group, 215 (42.8%) in the 21-22 year age group, and 120 (24%) in the 23-25 year age group. Anthropometric measurements were taken of head length, head width, upper facial length, lower facial length, total facial length, face width, weight, height, and body mass index (BMI). The facial indices were calculated as the ratio of head length to head width (cephalic index) and the ratio of upper facial length to total facial length (prosopic index). The results showed that there were significant differences in all anthropometric parameters between the three age groups. The mean head length, head width, upper facial length, lower facial length, total facial length, face width, weight, height, and BMI were all significantly greater in the 23–25 year age group than in the 19–20 year age group. The mean cephalic index was significantly lower in the 23–25 year age group than in the 19–20-year age group. The mean prosopic index was significantly higher in the 23–25 year age group than in the 19–20-year age group. **Conclusion:** This study suggests that there is a significant variation in facial indices and other anthropometric parameters among different age groups. The findings of this study may be useful for understanding the normal variation in facial morphology and for identifying individuals with abnormal facial morphology.

# **BRMH 30: Antibiogram characteristic of PCR-confirmed *Escherichia coli* isolated from cloaca of chickens in poultry farms in Abakaliki Metropolis, Ebonyi State.**

# \*Ali C.M.1, Udechukwu A.F. 1, Akindele K.I.1, Titilawo O.Y.1,2,

1Department of Microbiology, Alex Ekwueme Federal University, Ndufu-Alike Ikwo, Ebonyi State

2Water and Public Health Research Group, University of Nigeria, Nsukka, Enugu State

**\*Corresponding author** **email:** [ali.chyoma@gmail.com](mailto:ali.chyoma@gmail.com)

**Abstract**

The demand for poultry products has increased in the recent years especially as more people realize the nutritional and economic value of chicken and their products. However, bacterial diseases associated with the consumption of poultry products remain a public health threat to the poultry industry. The present study aimed at investigating the antibiotics susceptibility profiles of polymerase chain reaction (PCR)- confirmed *Escherichia* *coli* isolated from chicken cloacal swabs in three poultry farms in Abakaliki metropolis. A total of nine (9) samples were collected over a period of a 3-month sampling regime (January-March 2023), and investigated for the presence of *E. coSli* using the streak plate method. Polymerase chain reaction (PCR) technique was used to confirm the identity of the isolates. Susceptibility of the isolates was determined using the standardized Kirby-Bauer disc diffusion assay. Exactly 26 *E*. *coli* isolates were selected for the antibiotic susceptibility testing, from which MARP and MARI were determined. Counts of *E. coli* obtained across the sampling locations ranged from 150-517CFU/g. The findings of this study showed that all 26 isolates were resistant to cefuroxime (100%) and doripenem (100%). All 26 isolates tested were resistant to cefuroxime and doripenem, indicating a complete lack of susceptibility to these antibiotics. Surprisingly, meropenem showed an approximate resistance rate of 54%, with a susceptibility rate of 19%. The isolates also exhibited resistance to other antibiotics in the order: chloramphenicol (97%), sulfamethoxazole-trimethoprim (96%), tetracycline (96%), an 73% each for ciprofloxacin and gentamycin. Multiple antibiotic resistant phenotype (MARP) ranged from 10 drugs (CXM / MRP / AK / SXT / CIP / C / CN / TE / DOR / NOR) to 4 drugs (CXM / MRP / TE / NOR). All the *E*. *coli* isolates had MARI ranging from 0.4-1.0. The findings of this study indicate a high prevalence of multiple drug-resistant *E*. *coli* in the cloacae of chickens, necessitating the need for better surveillance, improved hygiene practices, alternative therapy and monitoring of antibiotic resistance patterns in animal husbandry.

**Keywords:** Poultry products, Bacterial diseases, *Escherichia coli,* Antibiotic susceptibility and Multiple drug resistance

# **BRMH 31: Mating Interactions between *Schistasom abovis* and *S. mansoni* and Compatibility of Their F1 Progeny with *Biomphalari aglabrata* and *Bulinus truncatus.***

# Amos Onyekwere

**Abstract**

Background: Schistosomiasis is a major poverty-related disease caused by dioecious parasitic flatworms of the genus *Schistosoma* with health impact on both humans and animals. Contrary to the majority of other Trematoda, *Schistosoma* species are gonochoric. Consequently, in endemic areas where several schistosome species overlap and can co-infect the same definitive host, there may be frequent opportunities for interspecific pairing. Hybrids of human urogenital schistosome and bovine intestinal schistosome have been reported in humans in several parts of West African countries. Here, we used laboratory experimental study to investigate the mating interactions between two traditional intestinal schistosome species: the human (*S* *mansoni*) and bovine (*S*. *bovis*). Our experimental study provides novel insight on the pairing behavior between *Schistosoma* *bovis* and *S*. *mansoni* in mixed infections in mice. We used six mate choice experiments to assess mating interactions between the two schistosome species. We show that mating between the two Schistosoma species is not random and that *S*. *mansoni* exhibits greater mate recognition compared to *S*. *bovis*. We also performed reciprocal crosses (male *S*. *mansoni* × female *S*. *bovis*) and (female *S*. *mansoni* × male *S*. *bovis*) that produce active swimming miracidia. These miracidia were genotyped by ITS2 sequencing and proposed for mollusc infection. Molecular analyses show that all the miracidia are parthenogenetically produced (i.e., they harbor the mother ITS2 genotype) and as a consequence can only infect the mollusc of the maternal species. Offspring produced by male *S*. *mansoni* × female *S*. *bovis* pairing can only infect *Bulinus* *truncatus* whereas offspring produced by female *S*. *mansoni* × male *S*. *bovis* can only infect *Biomphalaria* *glabrata* snails. Evolutionary and epidemiological consequences are discussed.

**Keywords**: *Schistosoma* *bovis*; *Schistosoma* *mansoni*; mating interactions; F1 progeny; *Bulinus* *truncatus*; *Biomphalaria* *glabrata*.

# **BRMH 32: The Effect of Ethanolic Extract of *G. Latifolium* Leave on Haematological Studies of Castor Oil-Induced Diarrhea in Rats**

# Ezennaya Chidinma Felicia1\*, Ezeigwe Obiajulu Christian2, Ogunwa Shedrach Chinedu1, Nweke Chisom Gift1

*1Department of Biochemistry, Alex Ekwueme Federal University Ndufu Alike Ikwo, Abakaliki*

*2Department of Applied Biochemistry, Nnamdi Azikiwe University, Awka*

*Corresponding Author’s email: [felicia.ezennaya@funai.edu.ng](mailto:felicia.ezennaya@funai.edu.ng), [chidinmaezennaya@gmail.com](mailto:chidinmaezennaya@gmail.com)*

**Abstract**

*Gongronema latifolium* locally called ‘Utazi’ by the Igbos is an herbaceous shrub with yellow flowers and the stem that yields characteristic milky exudates when cut. Studies have shown that *G. latifolium* extracts are used in medicine in the treatment some diseases such as diarrhea. The study investigated the effect of ethanolic extract of *G. latifolium* leave on haematological studies of castor oil-induced diarrhea in rats. The study employed seven groups of rats: a normal control (Group A), negative control (Group B), positive control (Group C) treated with 5mg/kg loperamide, 100 mg/kg pre-treatment with extract (Group D), 200mg/kg pre-treatment with extract (Group E), 100mg/kg post-treatment group (Group F) and 200mg/kg post-treatment group (Group G). The number of wet faeces, total weight of wet faeces, time of diarrhea onset, percentage inhibition was observed. The haematological parameters such as red blood cell count, platelets count, haemoglobin concentration, and packed cell volume were determined using standard procedures. It was observed that *G. latifolium* has anti-diarrhea properties and 200mg/kg post-treatment significantly increased the pack cell volume, the haemoglobin levels and the platelets compared to other treatment groups. These results shows that ethanolic extract of *G. latifolium* leave has a therapeutic potential in the management of anemia caused by diarrhea and other hematological disorders.

**Keywords:** *Gongronema latifolium,* Haematological studies, Diarrhea, Anaemia.

# **BRMH 33: *Bacillus cereus* with *nheA* and *cytk*** **enterotoxin genes is associated with the incidences of acute childhood gastroenteritis in Nigeria**

# \*David, E E1., Igwenyi, I.O2., Iroha, I. R3.,Emumwen,E.L4

1Department of Biochemistry, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo, Nigeria; [david.ebuka@funai.edu.ng](mailto:david.ebuka@funai.edu.ng)

2Department of Biochemistry, Ebonyi State University, Ebonyi State, Nigeria;igwenyike@yahoo.com

3Department of Microbiology, Ebonyi State University, Ebonyi State, Nigeria;iriroha@yahoo.com

4Department of Pediatrics, Mile 4 Hospital Abakaliki, Ebonyi State, Nigeria; [eghosa64@gmail.com](mailto:eghosa64@gmail.com) \*Correspondence: [ebuka@funai.edu.ng](mailto:ebuka@funai.edu.ng)

**Abstract**

**Background:** *Bacillus cereus* is rarely implicated when diarrheal cases in children are diagnosed in developing countries due to lack of required molecular method to identify its enterotoxigenic genes. **Aim:** This study aimed to profile the enterotoxigenic genes of *Bacillus cereus* group isolated from stools of children with acute gastroenteritis. **Method**: The stool samples of children diagnosed with acute gastroenteritis and hospitalized at the pediatric ward of Mile 4 Hospital, Abakaliki, Ebonyi State, Nigeria were collected. The stool samples were collected within the period of high yearly incidence (January-March) of acute childhood gastroenteritis in Nigeria. *Bacillus cereus* were identified through the amplification and sequencing of the bacteria 16S rRNA. Specific primers for five different *B. cereus* enterotoxins associated with diarrhea and emesis were amplified and sequenced. Multiple sequence alignments were performed using ClustalW while Biopython pipeline was used to build a concatenated Tree. *De novo* whole genome sequencing of selected *B. cereus* isolates were performed using Illumina MiSeq. **Results:** Out of the 62 isolated enteropathogens, 38.7% [24] were identified as *B. cereus*. The three-component non-hemolytic enterotoxin gene, *nheA* was detected in 95.8% [23] out of the 24 *B. cereus* strains while the hemolytic gene, *hblC* was seen in 79.1% [19]. The single component enterotoxin *entFM* and cytotoxin, *cytK* were seen in 100% [24] and 95.8% [23] respectively. Single component toxin, *bceT* and *B. cereus* emetic gene, *cerA* were not detected. In addition to *bceT* and *cer* which were not detected in any of the isolates, *hblC* was not seen in five while additional *nheA* was not seen in one. Genomic antibiotics profiling revealed that most of the isolates haboured beta-lactam gene clusters, *bla1* and *bla2,* with penicillinase, cephalosporinase and carbapenem hydrolyzing activities.**Conclusion:** *B. cereus* with *nheA*, *hblC* enterotoxigenic and *cytK* cytotoxic genes may be responsible for the yearly incidence of acute childhood gastroenteritis in Nigeria that goes unreported.

**Keywords:** *Bacillus cereus* gastroenteritis, enterotoxigenic, whole genome sequencing

# **BRMH 34: Toxicological Evaluation of Methanol Extract o*f Plectranthus Esculentus N.E.Br* Tuber On Biochemical Markers Of Renal And Hepatic Function of Wistar Rats.**

# \*Kanu, Shedrach C., Ejezie, Fidelis E.1& Eleazu, Chinedum O.2

1 Department of Medical Biochemistry, University of Nigeria, Enugu Campus (UNEC) Nigeria.

2 Department of Biochemistry, Alex-Ekwueme Federal University, Ndufu-Alike,Ebonyi State, Nigeria

\*Corresponding author: Kanu, Shedrach C.

Department of Biochemistry, Alex Ekwueme Federal University, Ndufu-alike, Ebonyi State, Nigeria.

Email: kanu.shedrach@funai.edu.ng

**Abstract**

*Plectranthus esculentus NEBr* commonly known as livigstone potato (rizga) has been used in ethnonomedicine for treatment of digestive problems as well as treatment of stomach ache, cancer and abdominal pain. This study evaluated the possible sub-chronic toxic effects of methanol extract of *Plectranthus esculentus* tuber (MEPET) after 28 days oral administration on liver and renal functions of wistar rats. A total of 24 wistar rats weighing between 180-190 g were divided into four groups of six each (n=6). The first group which served as the control was given distilled water orally. The second, third, and fourth groups were given MEPET daily at doses of 500 mg/kg b.w, (low dose), 2000 mg/kg b.w, (mid dose), and 4000 mg/kg b.w (high dose) respectively for 28 days. Based on the results obtained, 28 days administration of MEPET(500, 2000 and 4000 mg/kg *bw*) did not cause any significant (p<0.05) changes in mean body weight and relative organ weight when compared to the control group. Also, there was no significant (P>0.05) difference in mean serum aspertate amino transferase (AST), alanine amino transferase (ALT), alkaline phosphatase (ALP), serum total bilirubin, sodium, potassium, chloride, urea and creatinine of the MEPET-treated group at the various doses compared with the normal control groups. In conclusion, sub-chronic (28 days) oral administration of MEPET at a dose up to 4000 mg/kg exhibited no adverse effects on liver and kidney functions in wistar rats.

**Keywords:** oral toxicity, creatinine, bilirubin, sub-chronic, ethnomedicine

# **BRMH 35: In vitro antioxidant potentials of various fractions of the crude methanol extract of *Alstonia boonei* (stem bark) using DPPH. (1,1-diphenyl-2-picrylhydrazyl radical) and TBARS (Thiobarbituric Acid-Reactive Species) assay**

# Onyemuche, Tochukwu Nnamdi1, Atubowe, Esther Chioma1 and Charles, Rachael Ini1.

1Department of Biochemistry, Faculty of Biological Sciences, Alex-Ekwueme Federal University Ndufu-Alike.

Email: toskyonyemuche@gmail.com

**Abstract**

There is an increasing demand for medicinal plants and plant products with antioxidant potentials as an alternative to orthodox medicines. This study was carried out to investigate the in vitro antioxidant potentials of various fractions of the crude methanol extract of *Alstonia boonei* (stem bark) using DPPH. (1,1-diphenyl-2-picrylhydrazyl radical) and TBARS (Thiobarbituric Acid-Reactive Species) assay. Fresh stem bark of *Alstonia boonei* was obtained from the environment of the University of Nigeria Nsukka. It was air dried and grounded into powder. The crude extract was obtained using 80% methanol. Fractionation of the crude extract was carried out using column chromatography to obtain dichloromethane, ethyl acetate, aqueous and methanol fractions. The in vitro radical scavenging potential was determined by colorimetric method. The fractions and the crude methanol extract scavenged DPPH radical in a concentration dependent manner. There was a significant (P<0.05) increase in the DPPH radical scavenging potential of all the fractions and crude at every increment in concentration. The ethyl acetate fraction showed the highest percentage inhibition at each concentration when compared to others and recorded the highest value of 94.78% inhibition at 500µg/ml. At all concentrations, there was a significant increase (P<0.05) in DPPH radical scavenging potential of the ethyl acetate fraction when compared with that of ascorbic acid standard. The TBARS scavenging potential of the fraction and crude is not concentration dependent. The fractions have varying degrees of TBARS scavenging potential which is significantly (P<0.05) less than the butyl hydroxyl toluene standard. The results showed that the various fractions of the methanol extract of *Alstonia boonei* has antioxidant potential and can ameliorate diseases caused by oxidative stress.

**Keywords:** 1,1-diphenyl-2-picrylhydrazyl, thiobarbituric acid-reactive species, antioxidant, *Alstonia boonei*, fractions

# **BRMH 36: Porphine acid isolated from pawpaw seed oil in the control of *Anopheles gambiae* mosquito**

# Ogbonna Confidence U., Thomas Chiamaka, Onyeze Miriam, Okeke Chiemerie Endurance, Adejo Roseline

**Abstract**

The study aimed to evaluate the larvicidal, adulticidal, and ovicidal activities of porphine, a natural compound derived from the plant *Carica papaya*, against the malaria vector *Anopheles gambiae*. Isolation method used was column chromatography. In the larvicidal bioassay, porphine showed significant activity against the mosquito larvae with LD50 and LD90 values of 0.0068 mg/ml and 0.0144 mg/ml, respectively. In the adulticidal bioassay, porphine was found to be effective against the adult mosquitoes, causing mortality rates of up to 100% at a concentration of 0.032 mg/ml. The LD50 and LD90 values for porphine in the adulticidal bioassay were 0.0058 mg/ml and 0.0116 mg/ml, respectively. In the ovicidal bioassay, porphine demonstrated strong activity against the mosquito eggs, inhibiting hatching of 80.20% at concentrations as low as 0.032 mg/ml. These results suggest that porphine could be a useful tool for controlling the spread of malaria by preventing the hatching of mosquito eggs. In conclusion, the results of this study suggest that porphine has strong larvicidal, adulticidal, and ovicidal properties against *Anopheles gambiae*, making it a promising candidate for the development of new insecticides for malaria control. Further studies are needed to evaluate its efficacy under field conditions and to determine its mechanism of action.

**Keywords:** Bioinsecticide, Porphine, *Anopheles gambiae,* Larvicidal, Ovicidal, Adulticidal

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# **BRMH 37: Preliminary Studies on Microbial Assessment Implication and Antibiogram of Pathogens Isolated From Locally Made Zobo And Palm Wine Sold In Reusable Bottles In Abakaliki**

# \*Isirue, A.M.C1., Uche, Jessica E1., Isirue, P. N2., Aniagor, Ebele N3., Edoga, Chioma .I4., and Odo, Anastecia E5 Isirue, Joy I2

1Department of Microbiology, Alex Ekwueme Federal University, Ndufu–Alike, Ikwo.

2Department of Food Science and Technology, Institute of Management and Technology, Enugu.

3Department of Food Science and Technology, University of Nigeria, Nsukka

4Department of Chemical Pathology, University of Nigeria Teaching Hospital, Ituku Ozalla

5Department of science laboratory technology, Enugu State polytechnic, Iwollo.\*Corresponding author’s e-mail: [Ujujessica2@gmail.com](mailto:Ujujessica2@gmail.com)

**Abstract**

Microbial assessment implication and antibiogram of pathogens isolated from locally produced zobo and palm wine sold in reusable bottles were studied in three major markets in Abakaliki. A total of six (6) samples were collected, labelled and transported to Alex Ekwueme Federal University microbiology laboratory, Ikwo for analysis. Standard microbiological procedures were strictly observed, and 105 diluents were used for inoculation. Incubation at 370C for 24 hours, and 3 – 5 days were observed for isolation of bacteria and fungi respectively in appropriate media. Characterization, antimicrobial susceptibility tests were done, and multiple antibiotics resistance index (MARI) were calculated. The results revealed the bacteria counts of 4.8x104, 7.2x104 and 6.4x104cfu/ml for zobo; 8.0x104, 2.5x103 and 8.8x104cfu/ml for palm wine. The fungal counts were 1.6x103 and 8.0x105cfu/ml for zobo; 2.6x103, 3.5x103 and 2.6x103cfu/ml for palm wine drink. *Escherichia coli*, *Salmonella, Shigella, Klebsiella, Aspergilus, Mold, Pennicillium,* and *Yeast* were isolated from the samples. *Escherichia coli* had the highest bacteria count occurrences, followed by *Salmonella, Shigella* then *Klebsiella.* This showed strong indication of sewage or animal waste contamination, and consumption of these contaminated beverages can pose strong public health challenges in Abakaliki. Antimicrobial susceptibility tests revealed that most of the isolates were resistant to gentamycin, ciprofloxacin, chloramphenicol, pefloxacin, cefrtiaxone, amoxicillin and streptomycin. The high MARI values above 0.2 obtained in this study may suggest the exposure of the isolate to antibiotic pressure thus increasing multidrug resistance in the environment. Therefore, the consumption of locally processed beverages sold in reusable bottles in Abakaliki is very unsafe, and there should be awareness of regulation and food safety standards to safeguard the public health in the environs.

**Keywords:** Preliminary Studies, Microbial Assessment, Implication, Antibiogram, Pathogens, Reusable Bottles

# **BRMH 38: Antioxidant and Nephroprotective properties of *Psidium guajava* leaves extract in albino rats induced with cadmium chloride.**

# \*1Chima A. Ekeleme, 1 Tamaralayefa. H. Semidara 2Uchenna O. Egedigwe, 3Chimaraoke Onyeabo, 1Izuchukwu M. Edeoji, 1Christaiana N. Ekweoba 1Ejikeme F. Ukpai

\*1Department of Biochemistry, Faculty of Biological Sciences, Alex Ekwueme Federal University, Ndufu Alike, Ikwo, PMB 1010, Abakaliki, Ebonyi State, Nigeria

2Department of Plant Science and Biotechnology, Faculty of Biological Sciences, University of Nigeria, Nsukka, Enugu State, Nigeria

3Department of Biochemistry, College of Natural Science, Michael Okpara University of Agriculture, Umudike, PMB 7267, Umuahia Abia State.

\*Corresponding author: [agatha.egedigwe@funai.edu.ng](mailto:agatha.egedigwe@funai.edu.ng),

**Abstract**

**Background**: The present study investigated the effect of *Psidium guajava* leaves on some antioxidant and kidney function enzymes in albino rats induced with oxidative stress using cadmium chloride (CdCl2). **Methodology:** Thirty-six male albino rats were randomly divided into six groups: Group 1 served as the control, group 2 was administered with CdCl2 only, group 3-6 served as test groups, the third and fourth groups were treated with co-administration of CdCl2 and aqueous leaves extracts at 50mg/kg and 100mg/kg body weight(b.w) respectively. Fifth and sixth groups were treated with hot tea infusion (HTI) of guava leaves at 50mg/kg and 100mg/kg b.w respectively. After 28days of concomitant administration of extracts and CdCl2, the animals were sacrificed, the serum was obtained for biochemical analysis. Serum samples were analyzed for antioxidant enzymes- Superoxide Dismutase (SOD), catalase (CAT), Glutathione (GSH), Glutathione peroxidase (GPx) and malondialdehyde (MDA). Urea and creatinine concentrations were also analyzed and the values obtained was subjected for statistical analysis. **Results**: The results showed that the CdCl2 treated group showed a significant (p<0.05) increase in urea and creatinine concentrations which could be attributed to the oxidative stress induced by CdCl2. However, the groups treated with aqueous extracts and hot tea infusion of these guava leaves showed a significant (p<0.05) decrease in urea and creatinine concentrations and this could be attributed to some of the phenolic compounds present in the leaves. For the antioxidant parameters, the results showed that there is a significant (p<0.05) decrease in the concentrations of the antioxidant enzymes (SOD, GPx, GSH, CAT) in albino rats exposed to the CdCl2 (Group 2). Administration of 50mg/kg and 100mg/kg of HTI and aqueous extract of guava leaves shows a significant (p<0.05) increase in the concentrations of GPx, GSH, CAT, and SOD in the albino rats relative to group two (CdCl2 only). **Conclusion**: From our study, oxidative stress induced by CdCl2 administration was significantly reversed by both aqueous extracts and hot tea infusion of *Psidium guajava* leaves and therefore this plant could possess both antioxidant and nephroprotective properties against cadmium chloride induced stress.

**Keywords:** Oxidative stress; Cadmium chloride; *Psidium guavaja*; Antioxidant; Nephroprotective

# **BRMH 39: Tetrapyrroles isolated from pawpaw seed oil in the control of *Anopheles* *gambiae* mosquito**

# Ogbonna Confidence U., Adejo Roseline, Thomas Chiamaka, Onyeze Miriam, Okeke Chiemerie Endurance,

**Abstract**

The study aimed to investigate the potential of tetrapyrroles isolated from pawpaw seeds oil in the control of Anopheles mosquitoes, which are major vectors of malaria. Isolation method used was column chromatography. Three bioassays were conducted to evaluate the insecticidal properties of tetrapyrroles against *Anopheles gambiae*. These are: larvicidal, ovicidal, and adulticidal tests. The larvicidal activity of the extract was evaluated by exposing the fourth instar larvae to varying concentrations (0.032, 0.016, 0.008, 0.004 and 0.002 mg/ml) of the extract for 24 minutes. The ovicidal activity was evaluated by exposing *An. gambiae* eggs to the extract for 24 hours. The results showed that tetrapyrroles had significant larvicidal, ovicidal, and adulticidal activities against *Anopheles gambiae*. The highest larval mortality (98.02%) was observed at the highest concentration of 0.032 mg/ml after 24 minutes of exposure. The ovicidal activity was concentration-dependent, with 91.87% of the eggs inhibited from hatching at the highest concentration (0.032 mg/ml). The adulticidal activity was also concentration-dependent and exposure time-dependent, with the highest mortality (100%) observed at the highest concentration (0.032 mg/ml) after 30 minutes of exposure time. The LD50 and LD90 value for adulticidal activity were 0.019 and 0.088 mg/ml respectively while that of larvae were 0.0068 and 0.0144 mg/ml respectively. In conclusion, tetrapyrroles has potential as a natural source of mosquito larvicides, ovicides, and adulticides against *Anopheles gambiae*. Therefore, further studies are needed to evaluate their efficacy and safety under field conditions.

**Keywords:** Bioinsecticide, tetrapyrroles, *Anopheles gambiae,* Larvicidal, Ovicidal, Adulticidal

# **BRMH 40: Protective effect of methanol extract of Stinging Nettle (*Urtica dioica*) against cyclophospamide instigated testicular toxicity in Male Wistar Rats.**

# 1\*Kalu, W.O., 2Nwauche, K.T., 1Duru, M.K.C., 3Ighorodje-Monago, C.C., 3Belonwu, D.C., 4Agonmuo, E.N. and 1David. N.

1Department of Chemical Sciences (Biochemistry Unit), Rhema University, Aba, Abia State, Nigeria.

2Department of Biochemistry, Faculty of Science, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt.

3Department of Biochemistry, Faculty of Science, University Of Port Harcourt, Choba, Rivers State.

4Department of Biochemistry, Faculty of Science, Imo State University, Owerri.

**Corresponding email:** winnerkalu@gmail.com

**Tel: +2348060236617**

**Abstract**

Cyclophosphamide is an anticancer agent widely used for the treatment of various cancers, it is also an immunosuppressive agent. However, the clinical utility of cyclophosphamide (CYP) is restrained because of several adverse effects associated with reproductive toxicity. This study investigated the effect of *Urtica dioca* leaf methanolic extract on cyclophosphamide induced testicular toxicity in male wistar rats. Phytochemical analysis was carried out on the leaf extract of Urtica dioca. Twenty (25) male wistar rats which were randomly divided into five groups of five animals each were used for the study. Testricular toxicity was induced by intraperitoneal administration of 50 mg/kg of cyclophophamide for 21 days. The animals were sacrificed on the 21stday. Group 1 (Normal control) received oral body weight equivalent of normal saline, Group 2 (disease control) received intraperitoneal body weight equivalent of cyclophospamide, Group 3 received oral body weight equivalent of *Urtica dioica* extract only, Group 4 and 5 received intraperitoneal body body weight equivalent of cyclophosphamide and concomitant oral body weight equivalent of *Urtica dioica* extract. Biochemical markers of testicular oxidative stress were carried out on collected samples. Phytochemical evaluation of *Urtica dioica* leaf extract showed the presence of tannins, flavonoids, saponins, terpenoids, alkaloids, phenols, steroids and cardiac glycosides in various quantities. CYP induced prominent depression in testicular activities of superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), and reduced glutathione (GSH) level, whereas levels of malondialdehyde (MDA) markedly increased and confirmed by histopathological alterations. Serum levels of testosterone, FSH and LH were considerably reduced. The findings suggest *Urtica dioca* may be beneficial to male cancer patients undergoing CYP chemotherapy.

**Keywords:** *Urtica dioca*, cyclophosphamide, testis, phytochemicals, supplementation.

# **BRMH 41: Evaluation of Toxicity Profile of *Persea amaricana* (AVOCADO PEAR) Seed Oil in Wistar Rats**

# Finian Uchenna Okore, Benedict Chukwuebuka Okoro, Amadike Eziuche Ugbogu

Author’s Affiliation: Abia State University

Corresponding Author: Benedict Chukwuebuka Okoro

([benedict.okoro@abiastateuniversity.edu.ng](mailto:benedict.okoro@abiastateuniversity.edu.ng))

**Abstract**

This present study evaluated the toxicity profile of *Persea americana* seed oil (PASO) in Wistar rats. In the acute toxicity test, the PASO was orally administered up to 30 mL/kg in a single dose and thereafter toxicity signs and mortality rates were observed in the rats within 24 h. In the subacute toxicity study, the experimental rats were placed into four (4) groups. Group I served as normal control, while groups II, III and IV received daily 1, 2, and 4 mL/kg of PASO respectively for 14 days. The liver, renal, cardiac, proinflammatory markers and antioxidant enzymes were assessed. In the acute toxicity test, mortality was observed in the second phase of the acute toxicity test in the cohort of experimental animals administered with 20 mL/kg and 30 mL/kg of PASO extract, respectively. In the subacute toxicity test, PASO extract significantly increased (p<0.05) aminotransferase, alanine aminotransferase, alkaline phosphatase, bilirubin, urea, creatinine, uric acid, creatinine phosphokinase (CPK), malondialdehyde, cardiac troponin, interleukin 1-beta (IL-1b) and tumor necrosis factor (TNF-α) and significantly decreased glutathione, superoxide, and catalase. The results of the present study suggest that the oral administration of *PASO in Wistar rats*may induce oxidative damage, decrease cholinesterase activity, and increase the predisposition of rats to hepato- and cardio-toxicity.

**Keywords:** *Persea americana* seed oil*,* avocado pear, toxicity, seed oil, wistar rats

# **BRMH 42:** Pr**evalence of Uropathogens among Pregnant Women Attending Antenatal Care at Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Ebonyi State, Nigeria.**

# Okoro S. Chukwu1, Ilang, D.C1. Imade Mercy Upright1, Ugwu, B1, Ugwuocha, C.S1, Iheanacho, S.B1.

Department of Microbiology, Alex Ekwueme Federal University Ndufu Alike, Ebonyi State, Nigeria.

**Correspondingemail:cokorosamuel@gmail.com, [okoro.samuel@funai.edu.ng](mailto:okoro.samuel@funai.edu.ng)**

**Abstract**

Urinary tract infection (UTI) are common among pregnant women and women in the periand postmenopausal. The study aimed to determine the prevalence of UTIs among pregnant women and characterize the uropathogenic bacterial isolates associated with symptomatic and asymptomatic bacteruria among pregnant women attending antenatal care at Alex Ekwueme Federal University Teaching Hospital Abakaliki, EbonyiState, between February to April, 2023. Mid stream urine samples were obtained from 100 pregnant women with in the age of 16-45 years at various trimesters and different socioeconomic status. The isolates were phenotypically identified and evaluated for multiple drug resistance (MDR) patterns against various antibiotics in use. Of the 100 pregnant women, 28 (28%) were significantly positive, while 72 (72%) were non-significant (negative). The studyshowedthat*Escherichiacoli*has33% prevalence, *Staphylococcus*s pp (27%), *Kelebsiella* spp (23%) then *Proteus spp* (17%). All isolates were found to be 95% susceptible to ciprofloxacin and gentamycin, with 66.7% forofloxacin. Ampicillin, Augmentin, Chloramphenicol and Spectinomycinheard10-15.0%susceptibilityand85-90% resistance. Women in their third trimester were mostly infected from the study. Therefore, early screening and treatment should be encourage for the safety of the fetus and pregnant women.

**Keyword:** Prevalence, UTI, Uropathogens, Pregnant women, Antenatal Care

# **BRMH 43: Assessment of the Efficacy of *Ocimum gratissimum* Synthesized AgNPs against *Klebsiellae Pneumoniae.***

# Egwu-Ikechukwu, M. M1., Egwu, I. H2. Nnabugwu, C. C1

1Department of Microbiology, Alex Ekwueme-Federal University Ndufu-Alike Ikwo, P.M.B. 1010, Abakaliki, Ebonyi State, Nigeria.

2Department of Applied Microbiology, Ebonyi State University, P.M.B. 53, Abakaliki, Ebonyi State, Nigeria

**Correspondence**: *[agwu.modesta@yahoo.com](mailto:agwu.modesta@yahoo.com)* (+234 (0) 9037210270)

**Abstract**

Antibiotic resistance is a global problem and a threat to overall patients’ health. Microorganisms that are resistant to convectional antibiotics are increasing in their numbers globally. Researchers therefore are focusing on the development of new antibacterial agents which can overcome such overwhelming bacterial resistance. Interestingly, biosynthesis of silver nanoparticles are the promising key to eliminate these resistant microbes. Hence, green synthesis of *O. gratissimum* synthesized silver nanoparticles (AgNPs) proves to be an important step in this direction. This study is aimed at assessing the efficacy of *O. gratissimum* synthesized AgNPs against clinical isolates of *K. Pneumoniae.* The green synthesis and characterization of AgNPs was carried out by mixing the aqueous leaf extract of *O. gratissimum* with AgNO3 solution in the ratio of 1, 4 followed by incubation at room temperature in shaker under dark condition for about 24 hours and confirmed using UV-VIS-spectrophotometry techniques. Antibacterial activities of the synthesized *O. gratissimum* AgNPs was carried out by agar well diffusion. The result revealed that *O. gratissimum* AgNPs was synthesized which was evidenced as the colour of the reaction mixture changed from yellow to thick brown and was subsequently confirmed by monitoring the optical density of the solution in a UV-VIS spectrophotometer with peak absorption at 450 nm. Also, the synthesized *O. gratissimum* AgNPs showed considerable antimicrobial activity against clinical isolate of *K. Pneumoniae* with inhibition zone diameter of 23 mm while the ethanol leaf extract of *O. gratissimum* inhibited *K. Pneumoniae* isolate with inhibition zone diameter of 18 mm. Therefore, *O. gratissimum* is capable of producing AgNPs and the green synthesis using *O. gratissimum* silver nanoparticles showed excellent antimicrobial activity against the clinical isolate of *K. Pneumoniae.*

**Keywords:** Antibiotic resistance, *O. gratissimum,* silver nanoparticles (AgNPs), *K. Pneumoniae*

# **SUB THEME 5*: Bioscience Research in our environment*** **(BRE)**

# **BRE 44: Remediation of Congo red using Eucalyptus leaf powder**

# Obianuju L. Nwanji\*1,2, Chukwunonso P. Okoli1, Chris U. Sonde1, Emmanuella C. Obia1

1Department of Chemistry, Alex Ekwueme Federal University Ndufu-Alike

2Department of Chemistry, University of Ibadan, Nigeria. Email: [letobianuju@gmail.com](mailto:letobianuju@gmail.com)

**Abstract**

Dyes are regarded as water pollutants as they are harmful to humans and aquatic organisms. Agricultural waste such as Eucalyptus leaves are regarded as low-cost adsorbents which can be used for the removal of dyes from aqueous solution. In this research, Eucalyptus leaf-powder was employed for the removal of Congo red from aqueous solution and its adsorption capacity was evaluated. The prepared adsorbent was characterized using pH of point of zero charge and FTIR spectroscopy. The effects of various parameters, including initial dye concentration, contact time, pH, dosage and temperature were investigated to optimize the removal efficiency. Langmuir and Freundlich isotherm models were used to analyse the experimental data. Pseudo-first order and pseudo-second order kinetic models were employed to describe the adsorption mechanism and thermodynamic parameters were evaluated at three different temperatures. Freundlich model gave a better fit to experimental data which shows that multilayer coverage of the adsorbent was favoured. Langmuir maximum monolayer adsorption capacity was 59.171 mg g-1. The adsorption process followed pseudo-second-order kinetics, indicating a chemical adsorption mechanism. Enthalpy, entropy, and Gibb’s free energy values obtained from thermodynamic analysis showed that the adsorption process was endothermic, random and spontaneous/favourable respectively. Eucalyptus powder was successfully used for the adsorption of Congo red from aqueous solution.

**Keywords:** Adsorption, Eucalyptus leaf, kinetics, isotherm, thermodynamics

# **BRE 45: Determination of Heavy Metal Concentration In Muscle Tissue Of Silver Catfish (*Chrysichthys Nigrodigitatus*) From Qua Iboe River Estuary, Southeastern Nigeria.**

# Abiaobo, N. O and Akpan, I. I.

Zoology Department, Akwa Ibom State University, Mkpat Enin.

(Corresponding Author E-mail: [nsikakabia@yahoo.com](mailto:nsikakabia@yahoo.com): +2348060001613)

**Abstract**

Heavy metals are intrinsic, natural constituents of our environment and are generally present in small quantities in natural aquatic habitat. They get into the water bodies through run offs from agricultural fields, effluents from industries, dumping of domestic and municipal waste and oil spills. Fish accumulate heavy metals by drinking the polluted water and consumption of the aquatic flora and fauna. Humans may be contaminated by heavy metals associated with aquatic ecosystem by consumption of contaminated aquatic foods from the environment. Fish is a promising bio-indicator that abound in the Niger Delta waters and are available for collection. Qua Iboe River estuary is one of the popular coastal areas of Nigeria where anthropogenic activities of agricultural, industrial, oil exploration and exploitation take place. The concentration of five heavy metals namely, cadmium (Cd), Chromium (Cr), Copper (Cu), Iron (Fe) and Zinc (Zn) in the muscle tissue of silver catfish *(Chrysichtys nigrodigitatus)* from the Qua Iboe River estuary, Southeastern, Nigeria was determined using UNICAM 969 Atomic Absorption Spectrophotometer (AAS) for six months. The results showed that Cadmium varied from BDL to 0.08 mg/kg with a mean value of 0.03 0.041 mg/kg. Chromium ranged between 0.04 mg/kg and 0.2 mg/kg with a mean concentration of 0.11 0.07 mg/kg. Copper varied between 0.28 mg/kg and 8.36 mg/kg (mean = 3.25 3.62 mg/kg). Iron ranged from 2.32 to 24.96 mg/kg with a mean of 15.27 9.13 mg/kg whereas zinc varied between 2.52 and 11.72 mg/kg (mean = 8.01 3.66 mg/kg). The rank profile of mean heavy metal concentration in decreasing order was; Fe>Zn>Cu>Cr>Cd was observed. Except for Cadmium, the mean concentration of the metals were above the Maximum Permissible Limits (MPL) recommended by relevant bodies and organizations. Hence, there is need for regular monitoring of heavy metal concentration in this aquatic ecosystem and fauna inhabitants because of long term effects.

**Keywords:** Heavy metal; *Chrysichthys nigrodigitatus*, atomic absorption spectrophotometer, concentration; Qua Iboe River Estuary, Nigeria.

# **BRE 46: Comparative Analysis of Disinfection Efficiencies of Sodium Hypochlorite and ZnCl2 - Activated Coconut Shell Carbon on River Water Sample**

# D. O. Igwe\* and L. Abacha

Department of Chemistry, Alex Ekwueme Federal University, Ndufu-Alike

email:[firstauthor\_digwe53@yahoo.com](mailto:firstauthor_digwe53@yahoo.com),second[author\_lukeabacha12@gmail.com](mailto:author_lukeabacha12@gmail.com),

Corresponding Author: [firstauthor\_digwe53@yahoo.com](mailto:firstauthor_digwe53@yahoo.com) Tel: +2348037467489

**Abstract**

This project work was carried out to compare the disinfection efficiencies of ZnCl2-activated coconut shell carbon and sodium hypochlorite on river water sample. The coconut shell was carbonized using a muffle furnace at temperature range of 450 – 650 oC and thereafter was activated with 0.1 M ZnCl2 solution at different impregnation ratios. Characterization of the granulated activated coconut shell carbon (GACSC) was carried to assess the morphology and pore structures, elemental composition as well as the development of pores using scanning electron microscope, energy dispersive X-ray and iodine value test respectively. A 250 ml of the water sample was separately disinfected in 250 ml conical flasks with the equal masses of both GACSC and NaOCl. Results obtained showed that there were increase in the pore volume and pore distribution after activation, while the percentage composition of oxygen decreased and that of carbon increased. The optimum value obtained for the iodine value test was 0.056 mg/g at 1:2 impregnation ratio. The values obtained after the disinfection indicated that both the GACSC and NaOCl were able to remove some microbes from the untreated water samples. However, 0.4 g of GACSC gave a higher disinfection efficiency of 90 % than 0.4 g of NaOCl which gave 30 % efficiency of removal. *Bacillus spp.*was removed from the samples by both GACSC and NaOCl, but were not able to remove completely all the *Escherichia coli* in the water samples.

**Keywords:** Microorganism, granulated activated coconut shell, sodium hypochlorite, disinfection efficiency, byproduct of disinfection

# **BRE 47: Molecular Identification of Biosurfactant- Producing Bacteria Isolated From Waste Oil Contaminated Soil In Abakaliki, Ebonyi State Nigeria**

# Nwachi, A. C. Okpo, B. O. Elom, E. E.

Department of Applied Microbiology, Ebonyi State University, Abakaliki.

Corresponding authors Email: [anthonia.nwachi@ebsu.edu.ng](mailto:anthonia.nwachi@ebsu.edu.ng) Phone number: +234 8034384719\*

**Abstract**

Several human activities have led to the pollution of the environment with crude oil and other related substances. In view of the present concern of protection of the environment, there is a renewed interest in the use of biological agents to remove contaminants from the environment. Six different waste oil contaminated soil samples were collected from mechanic site and generator repair workshops within Abakaliki metropolis and taken to the laboratory for analyses. Nine bacterial isolates were obtained from the waste oil contaminated soil samples using standard microbiological and biochemical routine tests, and were suspected to be *Pseudomonas* *aeruginosa*, *Bacillus* *subtilis* and *Staphylococcus* *aureus*. Molecular identification of the biosurfactant - producing isolates was also carried out using PCR and the genes responsible for biosurfactant production targeted. The isolates were then screened for their biosurfactant- production ability using oil displacement activity (ODA), emulsification index (E24) and haemolysis test. *Pseudomonas* *aeruginosa* had the highest ODA of 28.1 cmwhile *Staphylococcus* *aureus* had the least ODA of 5 cm. The highest E24 value was observed with *Pseudomonas* *aeruginosa* (70.1 %), followed by *Bacillus* *subtilis* (53.33 %) while *S*. *aureus* had a poor E24 value of 32.5 %. On the other hand, haemolysis test result showed that *P*. *aeruginosa* and *B*. *subtilis* exhibited alpha and gamma haemolysis respectively with *S*. *aureus* exhibiting beta haemolysis. Hence, *Pseudomonas* and *Bacillus* have good potentials for biosurfactant production and can be harnessed and utilized in the cleanup of oil contaminated environment.

**Keywords:** Biosurfactants, *Pseudomonas*, *Bacillus*, Oil displacement Activity, Emulsification Index, Haemolysis

# **BRE 48: Synthesis and Characterisation of Microcrystalline Cellulose from Lignocellulosic Material of Rice Husk Waste Biomass**

# Christopher U. Sonde\*1, Chukwunonso P. Okoli1, Adachukwu N. Nkwor1, Obianuju L. Nwanji1, Kosiso Johnbosco Nwakaeze1

Department of Chemistry, Alex Ekwueme Federal University Ndufu-Alike,

P. M. B. 1010, Abakaliki, Ebonyi State, Nigeria.

E-mail: [christopher.sonde@funai.edu.ng](mailto:christopher.sonde@funai.edu.ng); [xtopheraries@yahoo.co.uk](mailto:xtopheraries@yahoo.co.uk) ;

Tel: +2348037564050

**Abstract**

In this study, microcrystalline cellulose (MCC) was synthesized from a lignocellulosic material of rice husk waste biomass origin. Bioconversion of the rice husk waste biomass into cellulose was achieved by delignification with sodium hydroxide and bleaching with sodium hypochlorite and hydrogen peroxide, which actually led to the extraction of the purified microcrystalline cellulose. The percentage yield of the synthesized microcrystalline cellulose was calculated to be 22 %. Characterization by Fourier transform infrared spectroscopy (FTIR) revealed the presence of O-H, C-H and C-Cl bending vibration in both rice husk and the derived microcrystalline cellulose. The present research reveals the mitigation of pollution caused by rice husk waste biomass by conversion of the wastes into very useful material (microcrystalline cellulose) for industrial applications and as an alternative to carboxymethylcellulose.

**Keywords:** Cellulose, lignocellulose, microcrystalline cellulose, rice husk, synthesis, characterisation.

# **BRE 49: Microbiological Assessment for Potential Pathogenic Fungi in Alex Ekwueme Federal University Playgrounds**

# Aroh, K.E.1\*, Yusuf, I. 1, Nworie, O. 1, Emeaghara, J.N.1

1Department of Microbiology, Alex Ekwueme Federal University, Ndufu-Alike, Ebonyi State, Nigeria.

**Correspondence to:** Aroh, K. E., Email:arohemeka82@yahoo.com

**Abstract**

Soil fungi may spread into human through inhalation, direct contact and other possible means during recreational activities. This study was to microbiologically asses for the presence of potential pathogenic fungi in Alex Ekwueme Federal University (AE-FUNAI) playgrounds. Ten soil samples collected from 10 AE - FUNAI playgrounds in Ikwo were examined. Soil samples were collected from four different spots (four sub-samples) in each site and well homogenized into one composite sample of 300g before analyses. Ten gram each of the homogenized soil samples were weighed out into a 250ml conical flask containing 100ml of distilled water and stirred gently until readily dissolved. Ten-fold serial dilution was carried out. PDA and chromogenic candida agar used to grow the fungi were prepared following the manufacturer’s instruction. Pour plate and slide culture techniques were used to grow the fungi in their natural state. Fungal isolates were identified by macroscopic and microscopic features with reference to standard mycology manual and pantone colour chart. Viable fungi count average range was 0.63 – 5.58 x 104 cfu/g. Fungi isolated and identified include Rhizopus spp (14.29%), Microsporum spp (10.71%), Candida spp (14.29%), Geotrichum spp (14.29%), Penicillium spp (14.29%), Aspergillus spp (17.86%), and Mucor spp (14.29%). Aspergillus spp was the isolate with the highest frequency (17.86%) from all the 10 samples. The presence and high load of these fungi from all the studied sites point to the health risks faced by the students’ population and the other users of the playgrounds.

**Keywords**: Fungi, serial dilution, slide culture.

# **BRE 50: Occurrence of multiple drug-resistant *Escherichia coli* phenotypes in well waters from Ikwo rural setting of Ebonyi state**

# \*Yinka Titilawo1, Adanna Igwe1, Chioma Ali1, Kayode Akindele1, Favour Nwankpa2, Munachi Victor- Ekwebelem1

1Department of Microbiology, Alex Ekwueme Federal University, Ndufu-Alike Ikwo, Ebonyi State.

2Equitable Health Access Initiatives, Ikeja, Lagos State.

**\*Corresponding author** **email:** [olayinkatemi@yahoo.co.uk](mailto:olayinkatemi@yahoo.co.uk)

**Abstract**

Water of good drinking quality is of basic importance to human physiology and man’s continued existence largely depends on its availability, and the widespread of antibiotic-resistant bacteria (ARB) in diverse aquatic milieus have greatly contributed to the decreased efficacy of antibiotics used in healthcare worldwide. This study investigated the antibiotics susceptibility profile of *Escherichia coli* isolated from well waters in Ikwo. Triplicate water samples were collected from selected wells over a 3-month sampling regime (January-March, 2023). The membrane filtration technique was employed for sample processing and isolation of *E*. *coli.* Polymerase chain reaction (PCR) technique was used to confirm the identity of the isolates. Susceptibility of the isolates was determined by the standardized Kirby-Bauer disc diffusion assay. Overall, *E*. *coli* counts ranged from 16-64 CFU/100mL. Antibiotic susceptibility test indicates high resistance by the isolates in the order trimethoprim-sulfamethoxazole (94%), doripenem (88%) and tetracycline (83%) and meropenem (77%), and low susceptibility to norfloxacin (27%) and gentamicin (22%). While multiple antibiotic resistant phenotype (MARP) ranged from 10 drugs (CXM / NOR / CN / C / CIP / TE / AK / MRP / DOR / SXT) to 3 drugs (MRP/DOR/NOR), multiple antibiotic resistance index (MARI) was from 0.3-1.0. The study reveals the presence of *E. coli* in the well water samples, being the major source of drinking water and other domestic activities for the rural dwellers. Provision of adequate potable water, improved sanitation and restricting the indiscriminate use of drugs is advocated to combat the challenge of multi-drug resistance.

**Keywords**: Well water; *Escherichia coli*; antibiotics; multi-drug resistance; public health.

# **BRE 51: Effects of Herbal Sex Enhancers on Sperm Parameters and Testicular Histology in Normal Rats**

# Oje, O.A\*, Chukwumezie, C.F. Okorie, Uchechukwu C. Ejeje, J. N.

Department of Biochemistry, Alex Ekwueme Federal University Ndufu -Alike.

**Abstract:**

The aim of this study was to analyze the impact of three herbal sex enhancers coded (HC-1, HC-2, and HC-3) sold in the open market on sperm parameters and testicular histology in normal rats. After acclimatization for 7 days, Adult albino rats weighing between 100g to 190g were randomly divided into the different herbal sex enhancer groups HC – 1 to HC – 3 and water was given to the control group. Water and food were given *ad bilitum.* The herbal sex enhancers were administered to the normal rats based on manufacturers prescription for 28 days after which rats were sacrificed, dissected and the testes collected for the determination of the sperm parameter and testicular histology. The results showed that HC-1 showed an increase in sperm count while significantly increasing the percentage of actively motile cells (p<0.05) when compared to the control group. The compound also lowered the percentage of sluggishly motile cells and maintained the lowest percentage of non-motile cells. Furthermore, no significant changes in sperm head shape or structure were observed with HC-1 administration. HC-1 led to mild interstitial fibrosis with active seminiferous tubules and well-enhanced spermatogenesis observed in testicular histology. Administration of HC-2 and HC-3 resulted in a decrease in sperm count, increased the percentage of sluggishly motile cells and non-motile cells. Both compounds HC-2 and HC-3 also showed an increase in the number pin head sperm structure, with HC-2 demonstrating the highest number of rats with this abnormality. Testicular histology reveals a moderate level of degeneration, moderate interstitial fibrosis, and moderate spermatogenic arrest. For HC-3, it showed moderate degeneration with focal areas of hemorrhage and necrotic testicular cells, but no spermatogenic arrest. In conclusion, HC-1 manifested positive effects on sperm parameters and testicular histology, while HC-2 and HC-3 exhibited harmful effects on sperm quality and testicular tissue. I will suggest that more studies are necessary to elucidate the mechanisms behind these effects and to ascertain the safety and efficacy of these herbal sex enhancers.

**Key words:** Herbal sex enhancers, Sperm parameters, Testicular histology

and Efficacy.

# **BRE 52. Isolation and identification of probiotics from fermented corn (Zea mays) waste water for Enhanced poultry production.**

# Adeolu A. I.1, Akindele K. I.2, Isaac, U. C.3 Otuu-Okpara, B. U.4 Nwose, R. N.1

1Department of Agriculture (Animal Science programme), Faculty of Agriculture, Alex Ekwueme Federal University Ndufu-Alike, Ikwo, Ebonyi State.

2Department of Microbiology, Faculty of Biological Sciences. Alex-Ekwueme Federal University Ndufu-Alike, Ikwo, Ebonyi State.

3Department of Animal Science and Technology, Faculty of Agriculture, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

4Department of Biotechnology, Faculty of Biological Sciences. Alex-Ekwueme Federal University Ndufu-Alike, Ikwo, Ebonyi State.

Corresponding e-mail: [adeolufunai2012@gmail.com](mailto:adeolufunai2012@gmail.com)

ABSTRACT

Probiotics are live microorganisms that when consumed in adequate amount confer a health benefit on the host. This research work aimed to isolate and identify probiotics from fermented corn (Zea mays) waste water for enhanced poultry production. Locally fermented corn water was collected and inoculated on MRS agar for isolation and maintenance of Lactobacillus species. Pure cultures were obtained and their presumptive identification was based on phenotypic, grams staining and biochemical reactions using standard methods. Identity of two screened isolates was confirmed by molecular method using 16SrRNA primer. Probiotic properties of the isolates were investigated in terms of their resistance to acidic pH (3 and 4), ability to survive in alcoholic environment (10 % and 15 %), and ability to inhibit the growth of pathogenic organisms (Escherichia coli and Vibrio spp). The results of this study showed that, the potential probiotic isolates were Lactobacillus pentosus, and Lactiplantibacillus plantarum and they were highly resistant to 10 % and 15 % ethanol concentration. All Isolates were able to survive at lower pH of 3 and 4 and exhibited antimicrobial potential by creating zones of inhibition ranging from 6 to 24 mm against Escherichia coli and 8 to 14 mm against Vibrio spp. The survival and proliferation of probiotic isolates at low pH, alcoholic conditions, and their antibacterial property against some pathogens confirmed the presence of probiotics bacteria in the corn waste water, which is a potential supplement for fortifying Poultry feeds and water source, in other to the enhance production of poultry products.

**Keywords:** Probiotics, Poultry production, *Lactobacillus species,* Molecular identification and Antibacterial potential