Designed by TOLULANGUY
+2348062911270

Faculty of Basic Medical Sciences
University of Medical Sciences, Ondo City

2025 INTERNATIONAL CONFERENCE & SYMPOSIUMS

THEME

INNOVATING BIOMEDICAL RESEARCH FOR TRANSFORMATIVE NATIONAL POLICIES

DATE:
Wednesday, June 4 - Friday, June 6, 2025

VENUE:
TETFUND Building, Laje Campus,
University of Medical Sciences, Ondo State,
Nigeria

NATIONAL ANTHEM

Nigeria we hail thee,
Our own dear native land,
Though tribe and tongue may differ,
In brotherhood we stand,
Nigerians all, and proud to serve
Our sovereign Motherland.

Our flag shall be a symbol
That truth and justice reign,
In peace or battle honour'd,
And this we count as gain,
To hand on to our children
A banner without stain.

O God of all creation,
Grant this our one request,
Help us to build a nation
Where no man is oppressed,
And so with peace and plenty
Nigeria may be blessed.

Ondo STATE
IṢẸ LOỌGÚN IṢẸ

Isẹ wa fun'le wa
Fún ilẹ ibi wa
Ka gbega (2x)
Ka gbega f'ayé rí

Igbagbọ wa ni pe
B'a ti b'ẹrú
La b'ọmọ
K'a sise (3x)
K'a jọla

Isọkan At'ominira
Ni K'eje
K'ama lepa Itẹsiwaju
F'opo ire
A t'oun To dara

Omo Oodua dide
Bosi ipo etọ rẹ
Iwọ ni Imọlẹ
Gbogbo adulawọ

UNIVERSITY ANTHEM

Creating room to pursue excellence
For research and with care to all
To achieve our best in health sciences
Build our nation change the world

Refrain
Touching lives and making impact
in the nation is our goal
Touching lives and making impact
is how we will grow
Unimeds Unimeds giving al for a better
tomorrow
Unimeds Unimeds better health
for a greater nation

Pathway to a healthy nation
Frontiers in medical innovation
and a benchmark in health education
Step by Step in one accord

Refrain
Touching lives and making impact
in the nation is our goal
Touching lives and making impact
is how we will grow
Unimeds Unimeds giving al for a better
tomorrow
Unimeds Unimeds better health
for a greater nation

Hail UNIMEDS.....

LIST OF SPONSORS

The Physiological Society, United Kingdom

Company of Biologist, United Kingdom

Laboratory for Experimental and Translational Neurobiology (LetNeu), UNIMED, Ondo

The Physiological Society

The Company of Biologists

LETNeu
Laboratory for Experimental and Translational Neurobiology

LIST OF CONFERENCE ORGANIZING COMMITTEE MEMBERS

Dr. Ijomone Omamuyovwi	- Chair, Conference Organizing Committee
Dr. Adeyomoye Olorunsola Israel	- Subchair, Scientific Subcommittee
Dr. Akinola Adeniran Oluwadamilare	- Subchair, Students' Career Talk Subcommittee
Dr. Eunice Ogunwole	- Subchair, Welfare Subcommittee
Dr. Uwejigho Eguono Raphael	- Subchair, Publicity and Digital Subcommittee

Other Members

Mr. Olokungboye Abeeb Wole	Mrs. Kikelomo Ifeoluwa Akinyosoye
Dr. Bankole Leko	Dr. Omotoyinbo O. V.
Prof. Ayannuga Olugbenga	Mrs. Funmi Ayanbade
Dr. Adeniran Adeoti Gbemisola	Dr. Emojevwe Victor
Dr. Iteire Kingsley Afoke	Dr. Salemcity Aanuolwapo
Dr. Olowe Gideon	Dr. Omolaso Blessing
Mr. Oladele Tolulope	Miss Happiness Ochi Inyang
Mr. Falekulo Olamide	Becky Evbuomwan

NOTE

Professor Adolphus O. Loto
Acting Vice-Chancellor

Professor Nwuba I. Roseangela
DVC (Academics)

Adeniran I. Ezekiel
Registrar

Mr. S. O. Shittu
Bursar

Dr. Adewale Adebambo Oduwole
University Librarian

Professor I. O. Adewale
Dean,
Faculty of Basic Medical Sciences

Professor Samuel O. Oluwafemi
Guest Speaker

"The wonder of NANO World in the MICRO World: Synthesis and Application of Nano Dots for sustainable life on Land"

Prof Samuel Oluwatobi Oluwafemi (FRSC, FCSN) is a full Professor at the Department of Chemical Sciences at the Faculty of Science, University of Johannesburg (UJ), South Africa, and a National Research Foundation (NRF), South Africa-rated researcher. He is the leader of the Nanotechnology for Biological, Energy, and Water (CHEM-NANOBEW) Laboratory Research group. His research involves the synthesis and application of nanomaterials, especially quantum dots (QDs) of different forms and addresses many of the United Nations (UN) Sustainable Development Goals (SDGs) for societal impact. He has published over 200 papers in leading international journals in his field, 20 book chapters and 13 books. Since 2011, Prof Oluwafemi has attracted over fourty million rands (R40,000,000) three billion Naira (3,566,752,400.00) in research grants, received from both local and international funding bodies. He has graduated many postgraduate students and he has received numerous international and local accolades for research excellence as a seasoned researcher among his peers. These include the CV Raman Fellowship for African researchers, Erudite Visiting Professor by Higher Education Council of Govt. Kerala, India, Tohoku University, Japan special measure research award, American Marquis Who's Who in the World 28th Edition (Science category), UJ Vice-Chancellor Outstanding Researcher of the Year, 2023, According to the February 2023 edition of the World Scientist and University Rankings, Prof Oluwafemi was ranked #1 in UJ, South Africa, Africa and the World under the Nanoscience and Nanotechnology category as well as the Engineering and Technology category. He was also awarded, University of Johannesburg, Faculty of Science, Most Productive Researcher 2020, 2021, 2022&2024. Furthermore, he is listed in Stanford University and Elsevier's Top 2 % scientists in the world 2021,2022,2023 & 2024 editions. He has collaborations with Erudite researchers on six continents and has fostered the establishment of Memorandum of Understanding (MoUs) with many institutions of high reputation and world ranking. He is a member of several reputable professional bodies and serves as a reviewer for internationally recognised journals with high impact factors. He is a lover of God and his family.

Professor Olumide A. T. Ogundahunsi

Guest Speaker

Olumide Ogundahunsi's professional career spans 4 decades in academia, research, public health and international diplomacy. Between 1983 and 2000 he was at various times Assistant lecturer, lecturer, senior lecturer and head of Department at The Obafemi Awolowo University, Ile Ife, The Olabisi Onabanjo University, Ago Iwoye, and The University of Ibadan. In 2000, he left the University of Ibadan as a Senior Lecturer and was appointed a Scientist in the Special Programme for Research and Training in Tropical Diseases (TDR) at the World Health Organization Headquarters in Geneva.

Professor Ogundahunsi pursued research interests in Receptor Pharmacology, Malaria Chemotherapy, Antimalaria Drug Resistance and Drug Development in the academia from 1983 to 2004. From 2000 to 2020, Professor Ogundahunsi was responsible for negotiating and managing partnerships with global research organizations, national governments, and United Nations agencies as a senior staff in the diplomatic cadre of the World Health Organization headquarters in Geneva.

In 2018 he joined UNIMED as Adjunct Staff and Professor in the Department of Pharmacology & Therapeutics. He opted for early retirement from the WHO in June 2020 to return to Nigeria and fully commit to the University of Medical Sciences Ondo in August 2020 as the Director in the Central Office for Research and Development and Professor in the Department of Pharmacology and Therapeutics. He was later appointed Director of Strategy and Programme Development in the Office of the Vice Chancellor and served from 2023 to 2025. In April 2025, he resigned his appointment with the University of Medical Sciences, Ondo to allow him better focus on national and continental activities aligned with his current altruistic aspirations.

Professor Ogundahunsi serves on several Boards of Trustees including the Olu Akinkugbe Pharmacy Education Trust (OAPET); Population Services International (PSI) Nigeria and The Feet of Grace Foundation. He is also member of the management and scientific advisory boards of several international research consortia including SAVING (an EU funded consortium addressing on sustainable access to vaccines in Ghana) and the Malaria Research and Capacity Development Consortium (a consortium funded by the Welcome Trust (DELTAS) and covering west and central Africa) and the Pan African Malaria Genetic Epidemiology Network (a Welcome Trust DELTA consortium examining human, parasite and vector genomic data from 7 locations distributed across the continent.

Order of Program

Day 1 - Wednesday, 4th June, 2025

Arrival & Networking

Day 2 - Thursday, 5th June, 2025

09:00 - 10:00	Registration	PG Students
10:00 - 10:15	Anthems (National & UNIMED)	PRO Unit
10:15 - 10:25	Opening Remarks	Dr. Ijomone LOC Chairman
10:25 - 10:35	Welcome Address	Dean, FBMS
10:35 - 10:50	Vice-Chancellor's remark and opening declaration	Vice Chancellor
10:50 - 11:05	Group Photograph	PRO Unit
11:10 - 12:10	Plenary Lecture 1	Prof. Samuel O. Oluwafemi
12:10 - 13:10	School Outreach	Dr. A. O. Akinola
13:10 - 14:00	Lunch Break	Welfare Team
14:00 - 15:00	Symposium/Oral Sessions – 1	Chairman: Dr. E.S. Uhunmwangho Rapporteur: Dr. A.O. Akinola
15:00 - 15:45	Poster Presentation 1	Chairman: Dr. Omotoyinbo

Day 3 - Friday, 6th June, 2025

09:30 - 10:00	Registration continues	PG Students
10:00 - 11:00	Plenary Lecture 2	Prof. Olumide A. T. Ogundahunsi
11:00 - 12:00	Symposium/Oral Sessions – 2	Chairman: Dr. Bankole Leko Rapporteur: Dr. Bayo Ogunboye
12:00 - 12:40	Poster Presentation 2	Chairman: Dr A.J. Salemcity
12:40 - 13:00	Closing Remark	Dean, FBMS
13:00	Refreshment & Departure	Welfare Team

Ameliorative Prowess of Quercetin on the Cytoarchitecture of Testes in Sprague-Dawley Rat Exposed to Formaldehyde

Authors: Adebajo AO1*, Adebajo KP1, Ojo JH1, Akpan UU1, Ayoade OH1, Adebajo OO2, Oladipo JO1 and Okegbemi GI1.
Affiliations: 1Anatomy Programme, College of Health Sciences, Bowen University, Iwo Campus, Nigeria; 2Department of Computer Engineering, Bells University, Ota, Nigeria
Corresponding emails: - oluwaseye.adebajo@bowen.edu.ng; adebajoseye@gmail.com

ABSTRACT: Formaldehyde is a product of methanol that further breaks down into formic acid. The long-term exposure has been reported to have detrimental long-term health impacts, this study was started to ascertain whether quercetin may lessen the harm that formalin causes to reproductive organs. 40 rats were used and grouped into 4. Group A served as control and were not exposed to Formaldehyde, Groups B-D served as treatment groups and were exposed to 40% formaldehyde for a period of 1, 2 and 3 hours respectively. Upon completion, 5 animals from groups A-D were randomly selected and euthanized. The remaining 5 animals in each group received 100mg/kg of Quercetin to ascertain the potential ameliorative property for a period of 4 weeks upon which they were euthanized. Result showed that decrease in body weight and hormonal parameters when contrasting the treatment groups with the control. Seminiferous tubules were distorted and there were no spermatozoa in the lumen of the animals that had been subjected to formaldehyde and quercetin. In conclusion, both hormonal analysis and histological studies showed to a great extent that formaldehyde has an adverse effect on the histoarchitectecture of the testes and Quercetin could not ameliorate the toxicity caused by formaldehyde.

Elucidating The Alleviative Properties Of Xylopia Aetopica Against Dss-Induced Ulcerative Colitis In Mice Model

Blessing Oluwagbamila Omolaso1, Adeoti Gbemisola Adeniran1, Ebenezer Oluwafunbi1, Julius Kolawole Adesanwo2, Oluwadamilola Victor Ajayi1, Kingsley Afoke Iteire3
1Department of Human Physiology, University of Medical Sciences. Ondo, Ondo State; 2Department of Chemistry, Obafemi Awolowo University, Ile-Ife, Osun State; 3Department of Human Anatomy, University of Medical Sciences. Ondo, Ondo State.
Corresponding Author: Blessing Oluwagbamila Omolaso; bomolaso@unimed.edu.ng

ABSTRACT: Ulcerative colitis is a chronic inflammatory bowel disease that causes inflammation and ulcers in the lining of the large intestine (colon) and rectum. UC as at today remain complex conditions with no available treatment medicines that effectively modulate both inflammatory immune response and oxidative stress simultaneously, Hence, the need for the continuous search for more potent pharmacological agents. The methanolic extract of Xylopia aethiopica pod contains several bioactive compounds thas been reported to exhibit various pharmacological properties including antioxidant and anti-inflammatory properties. This study was conducted to examine the mechanistic effect of Xylopia aethiopica on dextran sulphate sodium (DSS)-induced ulcerative colitis in mice. Twenty five male mice were randomly selected into 5 equal groups, (1) control group with no treatments, (2) Dextran sulphate sodium (DSS)-induced group with vehicle, treated with corn oil and (3) Dextran sulphate sodium induced group treated with xylopia aethiopica 200mg/kg, (4) Dextran sulphate sodium induced group treated with xylopia aethiopica 400mg/kg, and (5) Dextran sulphate sodium induced group treated with 400mg/kg of sulfasalazine. Disease activity index (DAI) was assessed. At the end of the experiment, the colon samples were collected for biochemical assays and immunohistochemical staining. The result of this study revealed that xylopia aethiopica potentiate great remedy in mitigating the progression of UC with reduced DAI, lipid peroxidation (MDA). inflammatory markers (nitrite, TNF-a, IL-6, arginase, MPO). XA also significantly increased the colonic antioxidant (GSH, GST, SOD, catalase) levels and increased acetylcholinesterase activity with marked improvement in the colonic immuno-histoarchitecture.
Conclusively, XA holds potential as an alternative therapeutic agent for UC, offering antioxidant, anti-inflammatory effects and mucosal protective effects

Modulation of Porcine Lung Glutathione Transferase by Extracts and Solvent Fractions of African Medicinal Plants

Authors: Oluwatayo M. Olorunnisola*, Oladoyin G. Famutimi and Isaac O. Adewale* Department of Biochemistry and Molecular Biology, Obafemi Awolowo University, Ile-Ife, Nigeria.
*Corresponding Authors: OMO: omolorunnisola@student.oauife.edu.ng; IOA: olusanjo2002@yahoo.co.uk

ABSTRACT: Overexpression or dysregulation of glutathione transferases (GSTs) is associated with disease progression, including cancer and inflammatory conditions. Owing to their roles in detoxication and multidrug resistance, GSTs are promising targets for therapeutic intervention. This study examined the modulatory effects of extracts from Momordica charantia, Xylopia aethiopica, Lawsonia inermis, and Hymenocardia acida, medicinal plants traditionally used in disease management, on porcine lung GST activity. Crude GST was extracted from the lungs of four healthy local-breed pigs using established protocols. The enzyme's ability to conjugate glutathione (GSH) with electrophilic substrates was assessed by measuring its specific activity. The effects of methanolic plant extracts on GST activity were then evaluated, followed by a detailed analysis of solvent-partitioned fractions from the most active extract. Inhibition was determined by comparing enzyme activity in the presence and absence of extracts, and IC_{50} values were calculated using nonlinear regression. The specific activity of GST in crude porcine lung extract was 0.12 ± 0.01 μmol/min/mg protein. The crude enzyme catalysed the conjugation of GSH with 1-chloro-2,4-dinitrobenzene (CDNB), paranitrophenylacetate (pNPA), and 7-chloro-4-nitrobenzooxa-1,3-diazole (NBDCl), with CDNB showing the highest activity. Among the plant extracts tested, the methanolic crude extract of L. inermis exhibited the strongest inhibitory effect on GST activity (IC_{50} = 0.12 ± 0.002 mg/ml), while M. charantia leaf extract showed the weakest (IC_{50} = 0.46 ± 0.07 mg/ml). Fractionation of L. inermis identified the dichloromethane fraction as the most potent inhibitor, with an IC_{50} of 0.07 ± 0.003 mg/ml, approximately three times more potent than the ethyl acetate and butanol fractions. While these solvent fractions inhibited GST activity up to 99% at 0.4mg/ml, the n-hexane fraction notably enhanced GST activity by nearly two-fold. These findings highlight the presence of bioactive GST modulators in L. inermis, particularly in its dichloromethane-soluble fraction, supporting its therapeutic potential in conditions involving aberrant activity of GST.

Immunodynamics of Synaptophysin and NRXN/NLGN complex following long-term metal exposures in the Thalamus of Rats

Authors: Victor E. Anadu1,2, Ronke Y. Akintunde2, Samuel A. Ayodele2, Sharon S. Andrews2, Victoria A. Akerele2, Clara A. Ajibola2, Olayemi K. Ijomone1,2, Omamuyovwi M. Ijomone1,2,3
1Laboratory for Experimental and Translational Neurobiology, University of Medical Sciences, Ondo, Nigeria. 2Department of Anatomy, Faculty of Basic Medical Sciences, University of Medical Sciences, Ondo, Nigeria. 3Department of Molecular Pharmacology, Albert Einstein College of Medicine, Bronx, New York, USA; Presenting Author: Victor Ebube Anadu. Email: ve.anadu@gmail.com

Abstract: Metal toxicity is a global health concern and has been shown to have detrimental effects on various organs, especially the brain. The brain comprises synapses whose functions depend on specific proteins called synaptic adhesion molecules (SAMs—neurexin, neuroligin, and synaptophysin). Understanding how metals impact SAMs is important due to these proteins' crucial role in synaptic function and overall neurological health. Hence, this study investigated the impact of long-term exposures to selected metals on immunoexpression levels of key SAMs in the thalamus of rats. Adult Wistar rats were orally administered vehicle (control), 25 mg/kg of manganese (Mn), 20 mg/kg of Nickel (Ni), 60 mg/kg of iron (Fe), and 40 mg/kg of cobalt (Co) for 90 days. Following treatments, rats were subjected to several behavioral tests including open field test, light-dark box, and Y-maze to assess locomotion and exploration, anxiety, and cognition respectively. Biochemical markers of oxidative stress were also evaluated after which immunoexpression patterns of the SAMs were evaluated. Our results showed impaired cognition, behavioral deficits, and anxiety following metal exposures in all treatment groups when compared to the control. Biochemical analysis revealed that Mn exposure caused oxidative stress which was marked by increased catalase and MDA levels when compared to control. Furthermore, decreased immunoexpression of NRXN, NLGN, and synaptophysin was observed on Mn, Co, and Fe exposures only when compared to control. Overall, our results demonstrate that long-term exposure to heavy metals causes behavioral deficits and perturbed neurological functioning in the rats.

ALLSA Mitigates Ketamine-induced Social Deficits Via 5-HT (Serotonergic) Modulation in Young BALB/c Mice's Emotion Processing Center

Kingsley A. Iteire1, Tolulope S. Oladele1, Tobiloba B. Awi1, Tolulope J. Gbayisomore1, Omamuyovwi M. Ijomone1,2.
1Department of Anatomy, University of Medical Sciences, Ondo State, Nigeria
2Laboratory for Experimental and Translational Neurobiology (LETNeu), University of Medical Sciences, Ondo State, Nigeria.
Presenting and Corresponding Author: Tolulope Judah Gbayisomore (tolulolopegbayisomore@gmail.com)

ABSTRACT: Social deficits are core features of many psychoneurological disorders, including schizophrenia, autism spectrum disorder (ASD), and social anxiety disorder. In this study, we investigated the potential of Allium sativum (ALLSA) to mitigate ketamine-induced social deficits in mice and to identify bioactive compounds within ALLSA as possible therapeutic agents for managing these disorders. We focused on the serotonergic pathway as a key modulator of social behavior. Gas chromatography-mass spectrometry (GC-MS) phytochemical analysis was used to identify the bioactive compounds in ALLSA. We then used molecular docking to predict the docking interactions of these compounds with the 5-HT1A receptor. Thereafter, forty (40) young male BALB/c mice (8 – 10 weeks) were divided into five groups (n=8): Control, Ketamine (KE)- (25 mg/kg), KE + ALLSA (15 mg/kg), KE + ALLSA (60 mg/kg), and KE + Chlorpromazine (CPZ, 5 mg/kg). We then performed social interaction tests, and measured serotonin and nitric oxide levels in mice's amygdala tissues. The GC-MS analysis identified fourteen compounds in ALLSA, while molecular docking revealed that cypermethrin exhibited the greatest binding affinity for the 5-HT1A receptor (-7.1 kcal/mol), followed by chlorpromazine (-7.0 kcal/mol), and sclareolide (-6.8 kcal/mol). Sclareolide, with a more favorable safety profile compared to cypermethrin demonstrated a binding affinity close to CPZ and thus a promising compound within ALLSA for further investigation. Also, Oleic acid exhibited the lowest binding affinity (-4.4 kcal/mol). In the social interaction test, KE-treated mice had reduced social avoidance time, however, ALLSA (15 mg/kg and 60 mg/kg), and CPZ attenuated these symptoms. ALLSA treatments were also associated with a significant increase in serotonin levels and a significant decrease in nitric oxide levels.

Region- and sex-specific differences of brain parvalbumin distribution and expression in rats.

Olayemi K. Ijomone1,2, Omamuyovwi M. Ijomone1,2
1Laboratory for Experimental and Translational Neurobiology, University of Medical Sciences, Ondo, Nigeria.
2Department of Anatomy, Faculty of Basic Medical Sciences, University of Medical Sciences, Ondo, Nigeria.
Presenting author: Dr. OK Ijomone (oolaibi@unimed.edu.ng)

ABSTRACT: Parvalbumin-expressing interneurons in the brain play key roles in the modulation of various neuronal communications and their dysfunction is implicated in multiple neurological disorders. Understanding their anatomical distribution across the brain and potential sex-specific differences holds significance in neuroscience. Here we used immunohistochemistry methods and digital image analysis to evaluate parvalbumin distribution and expression across selected brain regions. Adult Sprague Dawley rats of both sexes (n = 6/sex; average weight: males = 339 ± 4.84 g, females = 215 ± 4.59 g) were used for the study. Different brain regions were excised, fixed and stained with Parv, quantification of immunostained images were performed using the Image Analysis and Processing for Java (ImageJ). The study showed a higher number of parvalbumin-positive cells in the cortex (frontal and parietal) compared to subcortical regions (midbrain, thalamus, hippocampus, striatum). However, parvalbumin immunoreactivity was similar across regions examined except the striatum. Furthermore, we observed a significant sex-specific difference in the number of parvalbumin-positive only in the parietal cortex. The study thus suggests strong parvalbumin expressions across the brain even in regions with a smaller number of parvalbumin-positive cells, indicative of extensive parvalbumin neuronal connections. Additionally, the study notes the potential effect of sexual dimorphism in parvalbumin distribution.

Citrus Paradisi Seed Extract Restored Cotton Seed oil (CSO) and Isolated Gossypol (IsoG.) Induced Pre-Frontal Cortex (Pfc) Damage in Wistar Rats

Dare B Joseph1, Oguah .L.I2. Olaniyan T Olugbemi3*, Okotie E Gloria4 Adeyomoye I Olorunsola5 , Emojevwe, V. Oghenekparobo6, Aanuoluwa J. Salemcity 7,
1Department of Anatomy, Osun State University, Osogbo, Nigeria; 2Department of Anatomy, Bingham University, Karu Nigeria; 3*Laboratory for Reproductive Biology and Developmental Programming, Department of Physiology, Kwara State, Nigeria; 4Department of Physiology, University of Ilorin, Ilorin, Nigeria; 5,6Department of Physiology,University of Medical Sciences, Ondo State, Nigeria.
7Department of Biochemistry, University of Medical Sciences, Ondo State, Nigeria.
Correspondence: Dr Adeyomoye Olorunsola Israel: oadeyomoye@unimed.edu.ng +2348038701628

ABSTRACT: Gossypol is a bioactive constituent in cotton seed oil known to cause the production of reactive oxygen species. On the other hand, Citrus paradisi has been shown to have antioxidant properties; therefore, this study was designed to investigate the effects of Ethanol Seed Extract of Citrus paradisi on cotton seed oil (CSO) and isolated gossypol (IsoG.) induced prefrontal cortex damage in Wistar rats. Fifty (50) Wistar rats with average weight of 180±20 g were divided into two groups (n=25); Cotton seed oil and Isolated gossypol induced prefrontal cortex damage groups. Each groups was further subdivided into 5 sub-groups (n=5) as follows; (Group A1; Control, Group B1; 15 mg/bw Cotton seed oil, Group C1; 15 mg/bw Cotton seed oil+ 15 mg/bw Citrus paradisi, Group D1; 15 mg/bw Cotton seed oil + 15 mg/bw Vitamin E, Group E1; 15 mg/bw Vitamin E) and (Group A2; 15 mg/bw gossypol, Group B2; 30 mg/bw gossypol, Group C2; 15 mg/bw gossypol+ 15mg/bw Citrus paradisi, Group D2; 15 mg/bw gossypol+15 mg/bw Vitamin E, Group E2; 15 mg/bw Citrus paradisi). Body weights (BW), Malondialdehyde (MDA), Superoxide dismutase (SOD), were determined using standard procedures. Glial fibrillary acidic protein (GFAP) expression was determined using immunostaining procedure. Data were analysed using ANOVA with $p<0.05$ taken to be statistically significant. Body weights increased while MDA significantly decreased across subgroups treated with Citrus paradisi compared to those treated with Cotton seed oil and Isolated gossypol respectively. Superoxide dismutase (SOD) increased significantly in Citrus paradisi groups treated animals compared to Cotton seed oil and Isolated gossypol groups respectively, however, Glial fibrillary acidic proteins were expressed more in Citrus paradisi treated compared to Cotton seed oil and gossypol groups respectively. The ethanol extract of Citrus paradisi exhibits its anti-oxidative effects by enhancing the antioxidant enzymes characteristics/activities and proteins that invariably maintained the histoarchitecture of the prefrontal cortex of animals treated with cotton seed oil and gossypol in adult Wistar rats.

Extract Of Ripe Banana Peel Provides Natural Protection Against Oxidative Stress-Induced Testicular Damage In Experimental Models

Darlington Kenechukwu Ezeagu1, Uzozie Chikere Ofoego1*, Onyeka Chukwudi Okonkwo2, Somadina Nnamdi Okeke1
1Department of Anatomy, Faculty of Basic Medical Sciences, Nnamdi Azikiwe University, Nnewi Campus, Anambra State, Nigeria; 2Department of Human Physiology, Faculty of Basic Medical Sciences, Nnamdi Azikiwe University, Nnewi Campus, Anambra State, Nigeria.
*Corresponding Author: Uzozie Chikere Ofoego; uc.ofoego@unizik.edu.ng

ABSTRACT: Spermatogenesis is highly vulnerable to oxidative stress, which can be intensified by environmental toxins like paraquat (PQ), a herbicide known for its potent toxicity, particularly in inducing reactive oxygen species (ROS). Musa sapientum (banana), has garnered attention for its antioxidant properties, particularly in its peel, which contains bioactive compounds such as flavonoids and phenols. This study investigated the protective effects of the ethanolic extract of ripe banana peel on male reproductive health in Wistar rats exposed to paraquat-induced testicular dysfunction. After acclimatization and toxicity tests, 25 rats were divided into 5 groups. Group A served as the control, receiving rat feed and distilled water. Group B received 20mg/kg of paraquat. Group C received 1000mg/kg of ethanolic banana peel extract. Groups D and E both received 20mg/kg of paraquat followed by 500mg/kg and 1000mg/kg of banana peel extract respectively for three weeks. Sperm quality and testicular histoarchitecture were assessed, with semen samples collected from the epididymis and testes processed for histological evaluation. Paraquat exposure significantly reduced sperm motility, count, and testicular weight, while increasing sperm abnormalities and histological damage. These effects were likely due to ROS-induced lipid peroxidation and DNA fragmentation. Treatment with banana peel extract significantly improved sperm motility, count, and testicular histoarchitecture, indicating its antioxidant properties. This study suggests that banana peel extract has potent antioxidant effects and could alleviate paraquat-induced male infertility.

Hazardous impact of acute sodium valproate exposure on female reproductive hormones and antioxidant defense system in Wistar rats

Olugbemi T. Olaniyan1*, Olorunsola I. Adeyomoye 2, Charles O. Adetunji3, Gloria E Okotie4, Femi Adebayo5, Abayomi J. Abiola6, Onoja S. Uyo-Ojo6 Akingbolabo Daniel Ogunlakin7, Olumorin Idowu Owemidu8

1*Laboratory for Reproductive Biology and Developmental Programming, Department of Physiology, Kwara State University, Malete, Nigeria; 2Department of Physiology, University of Medical Sciences, Ondo City, Nigeria; 3Applied Microbiology, Biotechnology and Nanotechnology Laboratory, Department of Microbiology, Edo University Iyamho, Edo State, Nigeria; 4Department of Physiology, University of Ilorin, Ilorin, Nigeria.; 5, 6Department of Physiology, Bingham University Karu, Nasarawa State, Nigeria; 7Phytomedicine, Molecular Toxicology, and Computational Biochemistry Research Laboratory, Department of Biochemistry, Bowen University, Iwo, Nigeria; 8 Department of Physiology, Kogi State University, Anyigba, Nigeria.

ABSTRACT: Sodium valproate (SV), commonly used in the treatment of neurological disorders, has unclear effects on reproductive functions. This study aimed to investigate the impact of SV on reproductive parameters in female Wistar rats. Twenty female Wistar rats (120–140 g) were divided into four groups: Control, SV 100 mg/kg, SV 200 mg/kg, and SV 400 mg/kg body weight. Treatments were administered daily via oral gavage for 21 days. Parameters assessed included body weight changes, malondialdehyde (MDA) levels, antioxidant activities (SOD and TAC), reproductive hormone concentrations (FSH, LH, estradiol, and progesterone), estrous cycle stages, and histological alterations. Data were analyzed using ANOVA and expressed as Mean ± SEM, with $p<0.05$ considered statistically significant. Results indicated a significant increase in MDA levels, alongside a significant reduction in TAC, SOD, and reproductive hormone levels in SV-treated groups compared to controls. Additionally, the frequency of the estrus phase significantly decreased in all SV-treated groups post-treatment compared to pre-treatment values. A notable increase in final body weight was observed in all treated groups relative to their initial weights. Histological analysis revealed ovarian follicle degeneration, reduced endometrial lining, and uterine perforation in SV-treated groups compared to controls. In conclusion, data suggest that oral administration of SV impairs reproductive hormone production, disrupts the estrous cycle, and induces ovarian follicular degeneration and uterine damage, suggesting that it has adverse effects on female reproductive health.

Antioxidant Efficacy Of Phytol Against Diabetic Hepato-Pancreatic Dysfunction In Rats Via In Vivo And In Silico Investigations

Authors: Adeyemi Ikeoluwa Opeoluwa1.: Aanuoluwa James Salemcity1.
adeyemiikeoluwa5@gmail.com
1: Department of Biochemistry. University of Medical Sciences Ondo, Ondo. Nigeria.

ABSTRACT: Diabetes mellitus is a chronic, heterogeneous metabolic disorder characterized by persistent hyperglycemia resulting from impaired insulin secretion, insulin action, or both. Oxidative stress has been implicated in the pathogenesis of Diabetes mellitus. Various therapeutic interventions have been limited due to associated side effect hence, the need to search for alternative therapy from plant biomass with little or no side effect. Although phytol a naturally diaterpene alcohol which has been shown to exhibit antioxidant potential. However, there is dearth of information on its ability to ameliorate oxidative stress in Diabetes mellitus. Therefore, this study investigates the antioxidant effect of phytol on hepato-pancreatic function in diabetic rats, supported by in-silico docking studies (glucose-6-phosphatase, α-glucosidase, and apoptotic markers (Bax) using Vina wizard. Twenty- five adult male Wistar rats weighing 90-100g were obtained and allowed to acclimatized for one week and were divided into five groups (n=5) as follows: normal control, Diabetes was induced in male Wistar rats using alloxan (100 mg/kg), after which animals were treated with phytol (50 mg/kg and 100 mg/kg) and glibenclamide (5 mg/kg). Following confirmation of diabetes (glucose > 200 mg/dL), treatment was administered for 28 days. Biochemical analysis of liver and pancreas tissues by spectrophotometric method revealed that phytol significantly enhanced antioxidant enzyme activities (SOD, CAT, GST, GPx) and GSH levels, while reducing MDA levels compared to diabetic controls. In-silico results showed strong binding affinities of phytol to glucose-6-phosphatase, α-glucosidase, and apoptotic marker (Bax), comparable to standard drug (Glibenclimide). These findings could suggest that phytol could ameliorate diabetes mellitus in rats via its antioxidant, normoglycemic and antiapoptotic potentials.

Extraction, Partial Purification, and Characterization of Polyphenol Oxidase and Peroxidase from Morinda citrifolia (Noni) Fruit

Omotoyinbo O.V.1, Abolarin J.1, Daramola T.1 and Sanni D.M.2
1Department of Biochemistry, University of Medical Sciences, Ondo, Nigeria.
2Department of Biochemistry, Federal University of Technology, Akure, Nigeria.
e-mail: oomotoyinbo@unimed.edu.ng

ABSTRACT: Polyphenol oxidase (PPO) and peroxidase (POD) are key enzymes responsible for oxidative browning in fruits and vegetables, a major factor affecting visual quality and shelf life during postharvest handling and processing. This study aimed to extract, partially purify, and characterize PPO and POD from Morinda citrifolia (Noni) fruit, focusing on their biochemical properties and potential applications in browning control. Enzymes were extracted using phosphate buffer (pH 6.8), precipitated with ammonium sulfate, and dialyzed for partial purification. PPO activity, assayed with catechol as substrate, was optimal at pH 10 and 30°C, and stimulated by low concentrations of Cu^{2+} and K^{+}, while strongly inhibited by EDTA, Tween-20, sodium azide, and urea. PPO exhibited a Km of 0.126 mM and Vmax of 0.837 U/mL, indicating high substrate affinity. POD, assayed with guaiacol, showed optimal activity at pH 5.0 and 50°C, retaining significant activity up to 70°C, demonstrating notable thermal resilience. POD was inhibited by Na^{+}, EDTA, SDS, and Triton X-100, with EDTA exerting the strongest effect. Its kinetic parameters were Km = 3.883 mM and Vmax = 0.0818 U/mL. The distinct pH and temperature optima, thermal stability of POD, and inhibitor sensitivities of both enzymes provide critical insights for designing targeted pre-processing strategies to mitigate enzymatic browning in Noni-based products. These findings suggest valuable guidance to industrial and nutraceutical manufacturers for optimizing the use of Noni extracts as additives or functional food ingredients, enhancing product quality and consumer acceptance.

Quercetin and Rhamnetin from Spondias mombin demonstrated high binding affinities and ADMET properties against α-amylase.

Mary D. Agoi
Department of Bioscience and Biotechnology, University of Medical Sciences, Ondo city, Ondo State.
Corresponding Author: agoimary326@gmail.com

ABSTRACT: α-amylase enzyme, involved in the digestion of carbohydrate, when inhibited causes a significant reduction in the post-prandial increase of blood glucose, which makes it an important strategy in the management of type 2 diabetes. Literatures have revealed series of compounds from Spondias mombin that exhibited antidiabetes activity. Therefore, this study sought to evaluate the antidiabetic potential of some Spondias mombin compounds using molecular docking and ADMET profiling. Molecular docking analysis was carried out to study the binding interaction of some phytocompounds; Chlorogenic acid, Zeinoxanthin, Lutein, Isoquercetin, Quercetin, Rutin, Rhamnetin and Rutinose from Spondias mombin against α-amylase via Maestro 2017. Following the selection of the top five molecules, their bioavailability, drug-likeness, pharmacokinetic properties and toxicity were evaluated using the swissadme and protox iii webserver. Results revealed that rhamnetin (-8.0 kcal/mol), quercetin (-7.8 kcal/mol), rutin (-7.9 kcal/mol), isoquercetin (-8.4 kcal/mol) and chlorogenic acid (-7.8 kcal/mol) gave higher docking score against α-amylase than the standard drug, acarbose (-7.2 kcal/mol). Quercetin and Rhamnetin also demonstrated high bioavailability, drug-likeness, pharmacokinetic properties and less toxicity. This study therefore uncovers potential α-amylase inhibitors in Spondias mombin with better binding affinities than acarbose and good ADMET properties, which may then serve as potential drug candidates for the management of diabetes. However, pharmacophore modelling is proposed in furtherance of this findings to identify possible variations of binding affinities with modification in their properties.

Evodiamine Modulates Reproductive Oxidative Status and Potentially Interacts with Hormone Receptors in Female Wistar Rats

Hannah Boluwatife Shittu1*, Eunice Ogunwole1, Victor Oghenekparobo Emojevwe1
*Corresponding Author: shittuboluwatife1@gmail.com
Reproductive Physiology and Developmental Programming Research Group, Department of Physiology, University of Medical Sciences, Ondo City, Nigeria.

ABSTRACT: Environmental factors and lifestyle influence reproductive health. Evodiamine, a compound from Evodia rutaecarpa, has various pharmacological effects, but its impact on reproduction is unexplored. This study investigates evodiamine's influence on reproductive functions and oxidative stress in female rats. Twenty-five (25) female Wistar rats were divided into five groups (n=5): control (water), vehicle-DMSO 0.3 mL/Kg, and evodiamine (5, 10, 20 mg/Kg/day) for 21 days. Estrous cycle was monitored for 21 days, and all the rats were sacrificed afterwards by cervical dislocation. The uteri and ovaries were removed after laparotomy, while blood was collected via cardiac puncture for biochemical, reproductive hormones, and histological parameters after sacrifice. Hormonal profile was measured in serum alongside oxidative stress markers (MDA, GSH, SOD, catalase) in reproductive tissues using ELISA. Statistical analysis employed ANOVA with significance at $p<0.05$. An in silico study was conducted where evodiamine was docked against reproductive hormone receptors. Evodiamine modulated antioxidant enzyme activity in a dose-dependent manner. The MDA level was significantly increased in 10 mg/Kg/day and 20 mg/Kg/day, GSH increased in 20mg/Kg/day, and catalase activity decreased in 20 mg/Kg/day-treated groups relative to the control. A significant increase in follicle-stimulating hormone (FSH) levels was observed in the 5 mg/Kg/day and 20 mg/Kg/day treated groups compared to the control. Luteinizing hormone (LH) levels were also significantly elevated in all treated groups (5, 10, and 20 mg/Kg/day) relative to the control. Additionally, estrogen levels significantly increased in the 5 mg/Kg/day and 10 mg/Kg/day groups compared to the control group. The in silico docking analysis revealed strong binding affinities of evodiamine to key reproductive hormone receptors, including estrogen and gonadotropin-releasing hormone (GnRH) receptors, suggesting possible endocrine interactions. Evodiamine impacts reproductive oxidative balance and potentially improves hormone-related pathways.

Solanum lycopersicum exerts cardioprotective effects via reduced creatinine kinase myocardial band and ATPase activities in Wistar rats exposed to lead acetate

Adeyomoye Olorunsola Israel1*, Olaniyan Tope Olugbemi2, Adetunji Juliana Bunmi3, Adetunji Charles Oluwaseun4 Uwejigho Eguono Raphael5, Enemali U. Felix6, Adeniran Adeoti Gbemisola 7
1,7 Department of Physiology, University of Medical Sciences, Ondo State, Nigeria 2Department of Physiology, Kwara State University, Malete, Nigeria 3Department of Biochemistry, Osun State University, Osogbo, Nigeria 4Department of Microbiology, Edo State University, Uzairue, Nigeria, 5,6Department of Anatomy, Faculty of Basic Medical Sciences. University of Medical Sciences, Ondo State, Nigeria.
Presenting/Corresponding Author: Dr. Adeyomoye Olorunsola Israel, oadeyomoye@unimed.edu.ng

ABSTRACT: Lead exposure is a known risk factor for cardiovascular diseases, yet effective cardioprotective interventions remain inadequately explored. Despite existing research, there is limited clarity on potential natural therapies that can mitigate lead-induced cardiac damage. This study investigates the cardioprotective effects of ethyl acetate extract of Solanum lycopersicum (EESL) in lead-exposed Wistar rats, providing insights into its therapeutic potential and relevance. Fresh fruits of Solanum lycopersicum (tomatoes) were air-dried, ground, concentrated, and extracted using ethyl acetate. A portion of EESL was analyzed using GC-MS. Fifteen (15) male Wistar rats were randomly assigned to three groups (n = 5/group): control (distilled water), lead acetate (0.5 mg.mL-1), and lead acetate + EESL (5 mg.kg-1). Lead acetate and EESL were administered via drinking water and oral gavage, respectively, for four weeks. Body weight and lead concentration were measured using a weighing scale and flame atomic absorption spectrometry, respectively. Antioxidants and cardiac biomarkers were assessed using spectrophotometry. Data were analyzed using ANOVA at a significance level of $p < 0.05$. Gas chromatography mass spectrometry identified 56 constituents, with 6-dehydroprogesterone (-9.3 kcal/mol) showing the highest docking affinity for the beta-adrenergic receptor. There was a significant increase in body weight in the lead acetate + EESL group compared to the lead acetate group. Lead concentration was significantly higher in the lead acetate group compared to the lead acetate + EESL group. SOD activity significantly increased in the lead acetate + EESL group, while CK-MB, Na⁺/K⁺ ATPase, and Ca^{2+} ATPase activities significantly decreased compared to the lead acetate group. Solanum lycopersicum ethyl acetate extract demonstrated cardioprotective effects by enhancing antioxidant activity and reducing cardiac injury markers in lead-exposed rats. However, the associated increase in body weight raises concerns about potential metabolic risks, warranting further investigation

Effect of Oophorectomy on Uterine Architecture and Function in Adult Female Wistar Rats

1*Uwejigho Eguono Raphael, 1Odia-Agbonifo Osaretin, 1Otegbeye Leah Ifeoluwa, 1Ojiako David, 1Akinnodi Benedicta, 2Emojevwe Victor Oghenekparobo, 2Ogunwole Eunice, 1Iteire Kingsley Afoke, 1Enemali U. Felix, 2Adeyomoye Olorunsola Israel
1 Department of Anatomy, Faculty of Basic Medical Sciences. University of Medical Sciences, Ondo State, Nigeria.
2 Department of Physiology, Faculty of Basic Medical Sciences. University of Medical Sciences, Ondo State, Nigeria.
*Corresponding Author: Uwejigho Raphael Eguono; ruwejigho@unimed.edu.ng

ABSTRACT: Oophorectomy, the surgical removal of the ovaries, is a common procedure performed for various medical reasons, including cancer prevention and gynecological disorders. Despite its benefits, oophorectomy results in a rapid depletion of estrogen and progesterone, hormones critical for maintaining uterine structure and function. This study investigated the effects of oophorectomy on uterine architecture, hormonal levels, and oxidative stress in adult female Wistar rats. Twenty nulliparous female rats (200±20g) were divided into four groups (n=5): Group A (control, sham operation), Group B (oophorectomy), Group C (anesthesia only), and Group D (antibiotics only). After a 30-day post-treatment period, the animals were sacrificed, blood and uterine tissues were analyzed for hormonal and oxidative stress markers, and histological evaluations were conducted. Results were analyzed using one-way ANOVA (GraphPad Prism, version 10) with $p<0.05$ considered significant. The results revealed a significant increase in GnRH ($P=0.0123$), FSH ($P=0.0088$), LH ($P=0.0460$) and MDA ($P=0.0107$) levels, coupled with a significant decline in progesterone ($P=0.0433$), estrogen ($P=0.0494$) and NO ($P=0.0211$) levels in Group B compared to group A. No significant change was observed in Groups C and D compared with group A. Histological analysis revealed significant structural damage, including endometrial thinning and glandular atrophy in Group B, whereas Groups A, C, and D showed normal uterine architecture. These findings indicate that oophorectomy significantly disrupts uterine structure and function, primarily due to hormone depletion and oxidative stress. This study underscores the potential risks of oophorectomy on uterine health, highlighting the need for therapeutic strategies to mitigate its adverse effects.

Cinnamic acid abrogates bisphenol A-induced hepatotoxicity via suppression of pro-inflammatory cytokine and modulation of gene expressions of antioxidant enzymes in rats

Anne Adebukola Adeyanjua,*, Emmanuel Ayomitide Akinwunmia, Mojisola Esther Karigidia, Olubukola Oyebimpe Agboolab, Olusola Olalekan Elekofehintic
aDepartment of Biological Sciences, Faculty of Applied Sciences, KolaDaisi University, Km 18, Oyo Express Road, Ibadan, Oyo, Nigeria
bDepartment of Biological Sciences, McPherson University, Seriki Sotayo, Ogun, Nigeria
cDepartment of Biochemistry, Federal University of Technology, Akure, Ondo, Nigeria

ABSTRACT: Bisphenol A (BPA) is regularly used to produce plastic products. Its hepatotoxicity has been unveiled. The effects of cinnamic acid on BPA exposure have not been comprehensively studied, and the key mechanism of action is yet to be unraveled. Rats were allocated into 5 groups. Group 1 (control) was given corn oil. Group 2 received BPA for 14 consecutive days. Group 3 received cinnamic acid at 50 mg/kg in co-administration with BPA while group 4 received cinnamic acid at 100 mg/kg, in co-administration with BPA. Cinnamic acid (CA) only (100 mg/kg) was given to group 5. BPA exposure significantly decreased catalase, glutathione-S-transferase, and superoxide dismutase activities and non-significantly diminished glutathione level. A reduction in the gene expression of catalase accompanied this. Our result showed significant gene elevation at the mRNA level of tumor necrosis factor-α and elevated malondialdehyde by BPA. The significantly elevated alanine transaminase and aspartate transaminase activities in addition to increased levels of total cholesterol, triglycerides, and very low-density lipoprotein with reduced high-density lipoprotein reflected the detrimental effect of BPA in the liver. Our results revealed that cinnamic acid could alleviate the increased pro-inflammatory cytokine level and oxidative stress by downregulating tumor necrosis factor-α gene. The histopathological evaluation confirmed the biochemical results. Hepatic alterations were ameliorated when cinnamic acid was co-administered with BPA. These findings suggest that downregulation of the TNF-α gene induced by cinnamic acid may participate in suppressing the BPA-induced oxidative stress. This offers a new idea to unmask the mechanism underlying cinnamic acid's interference with BPA-induced hepatic damage.

Caffeine Consumption Impacts Lipid Profile, Hematology, and Estrous Cycle of Female Wistar Rats.

Eunice Ogunwole*, Oluwafunmbi Ebenezer Ogunmiluyi*, Adedayo Oluwadamilola Adesida, Praise Oluwaseyi Akinwa, Atinuke Oseyemi Akinya, Oluwaseun Alexander Fakeye, Beloved Oyetola Oyetoyan
Department of Physiology, University of Medical Sciences, Ondo City, Nigeria
* Address for correspondence: eogunwole@unimed.edu.ng Phone: +2347059545637

ABSTRACT: Caffeine-containing beverage consumption has become deeply ingrained in modern society, with coffee, tea, and energy drinks being among the most commonly consumed sources of caffeine. Its physiological effects on the cardio-metabolic system have been reported in males. Hematological parameters on lipid profiling are crucial in the diagnosis of cardio-metabolic disorders. Given the growing prevalence of cardiovascular diseases among women and the potential role of caffeine consumption in modulating lipid profiles and hematopoiesis, a comprehensive investigation into this relationship was warranted using a female animal model. The phase of recovery from the effects of caffeine was also considered in this study. Thirty-five adult female rats were obtained from the animal house of the University of Medical Science and used for this study. The rats were randomly divided into seven groups (n=5). Group I was the control and received distilled water (0.2ml/kg). Groups II-IV received daily oral doses of caffeine (10, 20, and 40 mg/Kg/day, respectively) for 21 days. Groups V–VII received similar caffeine doses for 21 days, followed by a 21-day withdrawal period. The estrous cycle was assessed using unstained and staining techniques, and full blood indices were evaluated using a hematology analyzer. Serum lipid profile, hormonal profiles, and Tumor Necrotic Factor-alpha (TNF-α) were determined using ELISA techniques. Statistical analysis employed ANOVA with significance at $p<0.05$. Findings revealed that caffeine reduced kidney and liver weights. It irreversibly altered some hematological parameters upon caffeine withdrawal, with no significant alteration in the lipid profile. The highest dose of caffeine increased TNF-alpha but reduced GnRH levels and irreversibly reduced progesterone levels in all groups. It, however, reversibly altered the estrous cycle upon caffeine withdrawal. This study highlights the need for caution in taking caffeinated substances, particularly among females, given the potential implications for metabolic health, immune function, and cardiovascular and reproductive risk.

Ameliorative activities of clomiphene citrate on cadmium-induced reproductive functions and morphological impairments in male Wistar rats

Adeniran Oluwadamilare Akinola a,*, Adekunle Wahab Oyeyemi b, Dayo Rotimi Omotoso c, Oore-Oluwapo Ololade Daramola d, Victor Emojevwe a, Eunice Ogunwole a, Miracle Michael Aremu a, Olalekan Blessing Oladipupo a, Adesewa Grace Abegunde a, Osaigbovo Benedicta Osazuwa a
a Department of Physiology, University of Medical Sciences, Ondo City, Ondo State, Nigeria.
b Department of Physiology, Osun State University Osogbo, Osun State, Nigeria.
c Department of Anatomy, Redeemer's University, Ede, Osun State, Nigeria.
d Department of Physiology, Redeemer's University, Ede, Osun State, Nigeria
Correspondence: aakinola@unimed.edu.ng

ABSTRACT: Current research evaluated the ameliorative activities of clomiphene citrate (Clomid) on cadmium (Cd)-induced toxicity of male Wistar rats. Twenty adult male Wistar rats (150-170 g) grouped into four (n=5) received 1.0 mL/kg/day distilled water (control), 0.35 mg/kg/day Clomid, 0.35 and 2 mg/kg/day Clomid and Cd, 2 mg/kg/day cadmium. Cd and/or Clomid were administered orally once daily for 35 days. Serum levels of follicle stimulating hormone (FSH), luteinizing hormone (LH), testosterone, 3-β hydroxysteroid dehydrogenase (3-β HSD) activity were measured using enzyme-linked immunosorbent assay, catalase, superoxide dismutase (SOD) activities, malondialdehyde (MDA) concentration, alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP) were assayed using spectrophotometry, sperm motility, viability, counts, morphology and histology of tissues were assessed microscopically. Data were analyzed using analysis of variance at $p<0.05$. Cadmium significantly reduced ($p<0.03$) sperm motility, viability, count, normal sperm morphology, SOD and CAT activities, serum levels of LH, FSH, testosterone and 3-β HSD activity when compared with control. MDA concentration, abnormal sperm morphology, ALT, AST and ALP activities were significantly increased ($p<0.03$) in Cd group compared to control. Co-administration of Clomid with Cd significantly elevated ($p<0.03$) sperm motility, viability, count, normal sperm morphology, CAT activities, serum levels of LH, FSH, testosterone and 3-β HSD activity when compared with Cd. Also, co-administration of clomid with Cd significantly reduced ($p<0.03$) abnormal sperm morphology, ALT, AST and ALP activities when compared to Cd. This study shows that clomiphene citrate attenuated cadmium-induced spermatogenic and steroidogenic alterations via antioxidant mechanism.

Antitumor and anticancer activities of the ethanol extract of Gladiolus dalenii bulb. An in-vivo and in-vitro study

1*Akinsomisoye, O.S., 2Owolabi, A.R., 1Ariyo, O.M., 1Akano, O. P., 3Odukoya, S.O.A.
1Department of Physiological Sciences, Obafemi Awolowo University, Ile Ife.
2Department of Medical Pharmacology and Therapeutics, Obafemi Awolowo University, Ile-Ife.
3Department of Anatomy and Cell Biology, Obafemi Awolowo University, Ile-Ife.
*Corresponding Author; oakin@oauife.edu.ng

ABSTRACT: Benign Prostatic Hyperplasia (BPH) and Prostate Cancer (PC) have been affecting the well-being of men globally. Various drugs have been used to combat this scourge but with unpleasant side effects. Gladiolus dalenii bulb has been reported in folkloric medicine for managing some male reproductive disorders especially those with prostate enlargement. Thirty male rats (200-250 g) divided into six equal groups were used for the in-vivo study. Group I (control group) received distilled water (2 ml/kg) while group II was given corn oil (vehicle) (2 ml/kg) orally. Groups III, IV, V and VI received testosterone propionate subcutaneously (3 mg/kg B.W.). Thereafter, groups IV and V were administered ethanol extract of Gladiolus dalenii (EEGD) (100 and 200 mg/kg B.W.) while group VI received finasteride (1 mg/kg B.W.) orally. All administrations were done for 28 days. Twenty-four hours after the last administration, the rats were sacrificed and serum was obtained for Prostate Specific Antigen (PSA), and reduced glutathione (GSH) measurements. The prostate gland was excised, weighed and processed for histological analysis. For the in-vitro studies, cultured DU145 and PC3 prostate cancer cell lines were treated with different doses of EEGD and 5-fluorouracil (5FU). The viability of the prostate cancer cells was determined using the MTT assay technique. In this study, the relative weight of prostate gland and PSA levels were significantly increased, however these significantly decreased with EEGD administration. Histology of the prostate gland showed hyperplasia and involution which was reversed with administration of EEGD in a dose dependent manner. MTT [3-(4,5-dimethylthiazol- 2-yl)-2,5-diphenyl tetrazolium bromide] assay showed a dose dependent decrease in the viability the prostate cancer cells administered EEGD and had a better potency than 5FU. The in-vivo and in-vitro studies have shown that EEGD may be a potential agent in the management of benign prostatic hyperplasia and prostate cancer.

Ciprofloxacin-Induced Reproductive Toxicity: Disruption of Hormones, Steroidogenesis and Receptor Binding Pathways - In Vivo and In Silico Evidence.

*Emojevwe, Victor Oghenekparobo1, Ogunmiluyi, Ebenezer1, Ogunwole, Eunice1, Akinola, Adeniran Oluwadamilare1, Oyovwi, Mega obukohwo2
1 Department of Physiology, University of Medical Sciences, Ondo City, Ondo State, Nigeria
2 Department of Physiology, Delta State University of Science & Technology, Ozoro, Delta State, Nigeria
*Corresponding Author: EMOJEVWE Victor1, E-mail: vemojevwe@unimed.edu.ng

ABSTRACT: Ciprofloxacin is a commonly used fluoroquinolone antibiotic that has been associated to reproductive toxicity, although not much is known about how it affects fertility. This study investigated how ciprofloxacin affects male reproductive health by using both in vivo studies and in silico molecular docking methods. Fourteen (14) Adult male Wistar rats were divided into control and ciprofloxacin-treated groups (12.5 mg/kg b.w/p.o for 28 days) (n = 7) based on previous studies.. At the end of the experiment, the animals were euthanized by cervical dislocation. Blood sample was collected via retro-orbital sinus for hormonal assays. While the testes were used for biochemical assays, epididymis was used for sperm analysis (using computer-aided sperm analyzer). Molecular docking simulations were performed using AutoDock Vina, with protein structures obtained from the Protein Data Bank. The in vivo results demonstrated that ciprofloxacin significantly reduced sperm count, motility, viability, and levels of testosterone, luteinizing hormone, and follicle-stimulating hormone ($p < 0.05$), and Concurrently decreased antioxidant enzyme (Superoxide Dismutase & Catalase) activities and increased levels of malondialdehyde, tumor necrosis factor-alpha, and Caspase-3. The in silico investigation shown that ciprofloxacin displayed strong binding affinities for crucial steroidogenic enzymessuch, including α-Reductase, Carboxypeptidase, 3β-HSD, 17β-HSD, RNA Polymerase, and CYP17. Remarkably, ciprofloxacin displayed higher binding affinities for the testosterone and GnRH receptors compared to their natural ligands. Furthermore, it demonstrated substantial binding affinity to LH and Kisspeptin receptors. Our findings suggest that ciprofloxacin may disrupts male reproductive functions by direct binding to hormone receptors, interfering with steroid hormone biosynthesis, inducing oxidative stress and inflammation, thus, promoting apoptotic cell death. This study sheds light on the detrimental effects of ciprofloxacin on male reproductive health, highlighting the necessity of cautious use and additional research to reduce any potential dangers to reproduction related with fluoroquinolone antibiotics

Abstract - Poster Presentation

Some Physicochemical Properties of Rhodanese (Cyanide Detoxifying Enzyme) in Pawpaw (Carica papaya): A Preliminary Study

A.H. OlajideX and R. E. Okonji
Department of Biochemistry and Molecular Biology
Faculty of Science, Obafemi Awolowo University, Ile-Ife, Nigeria
X Corresponding Author: ajibolaolajide65@gmail.com

ABSTRACT: Rhodanese is a ubiquitous enzyme that detoxify cyanide to less toxic thiocyanate compound. This study investigates the presence of rhodanese in the mesocarp of ripe pawpaw (Carica papaya).
The plant samples were taken to the laboratory and washed to remove dirt. The mesocarp of the pawpaw was collected and homogenized and centrifuged to collect the supernatant. Rhodanese was partially purified using standard methods. The enzyme assay and protein concentration were also determined using standard methods. Kinetic parameters (Km and Vmax), substrate specificity, optimum pH and temperature, stability and effect of various metal ions (Mn2+, Hg2+, K+, and Fe2+) and other compounds were determined. The results showed Km values of 0.22 mM and 0.19 mM for both sodium thiosulphate and potassium cyanide respectively for mesocarp rhodanese. The substrate specificity study showed that Carica papaya can use other sulphur containing compounds for its detoxification. The optimum activity was found at pH 6 and the optimum temperature was found at 50°C. The effect of temperature stability on the enzyme activity showed that the enzyme was stable at 30 °C and 40°C while at 50°C and 60°C, the activity decreased after 20 minutes. Beyond 70°C the enzyme had lost most of its activities. The effect of metal ions (Mn2+, Hg2+, K+, and Fe2+) on the activity of rhodanese showed that at 1.0 and 10 mM, the enzyme was not affected by the metal ions. In conclusion, this study showed the presence of rhodanese activity in the mesocarp of pawpaw (Carica papaya). Rhodanese could also serve other function such as metabolism of iron-sulphur compounds.

Inhibitors of Proprotein Convertase Furin and TMPRSS2 from Momordica charantia L. as Potential Therapeutic Agents Against Viral Diseases

Oladoyin Grace Famutimi1*, Isaac Olusanjo Adewale1*, Mutalib Adeniran Aderogba2, Sharmeen Fayyaz3, Daniel Sauter3
1 Department of Biochemistry and Molecular Biology, Obafemi Awolowo University, Ile-Ife, Nigeria.
2 Department of Chemistry, Obafemi Awolowo University, Ile-Ife, Nigeria. 3 Institute for Medical Virology and Epidemiology of Viral Diseases, University Hospital Tübingen, Tübingen, Germany
*Corresponding authors: OGF, Email: ofamutimi@oauife.edu.ng, Tel: +2348163749198; IOA, Email: olusanjo2002@yahoo.co.uk, Tel: +2348038271013

ABSTRACT: This study identified and characterized bioactive compounds from Momordica charantia leaves that modulate proprotein convertase 3 (furin) and transmembrane serine protease 2 (TMPRSS2)-host proteases whose aberrant activities are implicated in various pathophysiological processes, including the activation of viral proteins such as those of SARS-CoV-2.
Methanolic crude extract of M. charantia leaves at 12.5 ng/µl of the assay mixture, completely abolished furin activity but activated TMPRSS2 activity nearly two-fold indicating divergent modulatory effects. Among solvent-partitioned fractions, the n-hexane fraction demonstrated the strongest inhibition, inhibiting furin and TMPRSS2 activities by 74% and 98%, respectively, suggesting that key inhibitors are predominantly nonpolar. Chromatographic separation yielded seven subfractions, with MC VIC and MC VIB demonstrating the most potent inhibition against furin (IC_{50}=0.044±0.005µg/µl) and TMPRSS2 (IC_{50}=0.018±0.001µg/µl), respectively. Enzyme kinetics in the absence of inhibitors revealed Km values of 100.6M or furin and 37.4µM for TMPRSS2, indicating a higher substrate affinity for TMPRSS2. TMPRSS2 also displayed greater catalytic efficiency (Kcat/Km = 1.07×10^4 Ms^1), which is about 3-orders of magnitude higher than that of furin (2.9×10^3 M^1s^1). 1H NMR analysis of three compounds were tentatively identified within these subfractions as terpinen-4-ol, borneol/isoborneol, and lupeol. Cytotoxicity assessment in CaCo-2 cells showed moderate toxicity, with CC_{50} values ranging from 21 to 200µg/ml. Antiviral assays in CaCo-2-infected cell line demonstrated that the compounds inhibited SARS-CoV-2 replication in a concentration-dependent manner, with IC_{50} values ranging from 17 to 36ng/µl and selectivity indices exceeding 2.0. Notably, MC II exhibited the highest antiviral activity, with an IC_{50} of 17ng/µl and a selectivity index of 7, indicating effective viral inhibition at low concentrations with acceptable cytotoxicity. Our findings indicate that M. charantia leaves contain inhibitors of furin and TMPRSS2, supporting their potential as therapeutic candidates for viral diseases such as SARS-CoV-2 infection, which involves proteolytic activation by these enzymes.

Evaluation Of The In Vitro Anti-Diabetic Potential Of Piper Guineense (Uziza Leaf)

Beloved I. Oloyede (Presenting Author, email: bioloyede@student.oauife.edu.ng), Toluwani E. Idowu-Agida, Mayowa R. Jimoh, Kemi F. Akinwunmi.

ABSTRACT: Piper guineense, commonly known as Uziza leaf, is a traditional spice used in West African cuisine with recognized ethnomedicinal applications, particularly in managing diabetes. This study investigates its in vitro antioxidant and alpha-amylase inhibitory activity to support its potential as a natural antidiabetic agent. Air-dried leaves of Piper guineense (Uziza Leaf, 150g) were methanol-extracted and subjected to various antioxidant assays, including total phenolic content (TPC), total flavonoid content (TFC), DPPH radical scavenging activity, ferric reducing antioxidant power (FRAP), total antioxidant capacity (TAC), and hydroxyl radical scavenging activity (HRSA). In addition, alpha-amylase inhibitory activity was assessed using the microplate method, with acarbose as a standard inhibitor. The extract showed significant antioxidant activity and notable inhibition of alpha-amylase, both of which are important for reducing oxidative stress and regulating postprandial blood glucose levels indicated in diabetes. These preliminary results suggests the therapeutic relevance of Piper guineense in diabetes management. Further studies—including alpha-glucosidase inhibition and anti-glycation assays—are ongoing to provide a broader understanding of its antidiabetic profile. This research reinforces the value of medicinal plants as alternative or complementary therapies in metabolic disorders like diabetes.

Effect Of The Stem Bark Of Piptadeniastrum Africanum (Hook.F) Methanol Extract And Its Fractions On Mitochondrial-Mediated Cell Death In Rat Liver (In Vitro)

FO Olojo1, AJ Salemcity2, and JO Olanlokun3
1Department of Chemical Sciences, Faculty of Computing and Applied sciences, Dominion University, Ibadan
Corresponding Author: Dr. Folake Olayinka Olojo; f.olojo@dominionuniversity.edu.ng

ABSTRACT: Apoptosis is a normal component of the development and health of multicellular organisms in which cells die in response to a variety of stimuli. They do so in a controlled and regulated fashion where mitochondria play a major role. In ethnomedicine, the stem bark of Piptadeniastrum africanum (PA) is used in the treatment of malaria, headache and as an abortifacient agent. This study aimed at assessing the effect of methanol extract (MEPA) and its fractions (aqueous fraction AFPA, Chloroform fraction-CFPA) of the stem bark of PA on Mitochondrial membrane permeability transition (mPT) pore opening in rat liver. Mitochondrial-ATPase activity, mPT and Lipid Peroxidation (LPO) were measured spectrophotometrically. All statistical analyses were carried out using descriptive statistics and ANOVA at α0.05. Qualitative and quantitative phytochemical screening of the MEPA revealed the presence of flavonoids (0.251±0.05), tannins (1.196±0.08), saponins (2.310±1.12), phenols (0.736±0.08) %, respectively. The results indicated that AFPA induced mPT pore opening maximally at 100µg/ml by 7.64 folds while CFPA had no effect on mPT pore. All the solvent fractions inhibited membrane lipid peroxidation, with AFPA having the highest effect (89.4%), MEPA (76.5%) and CFPA (10.3%). Also, AFPA had the highest mitochondrial ATPase activity at 275µg/ml (1.8 folds). MEPA and CFPA enhanced ATPase activity by 1.4 and 1.3 folds respectively, at the same concentration. These findings suggest that certain bioactive agents, which can modulate the intrinsic pathway of apoptosis through induction of mPT pore, are present in the stem bark of PA and may be useful for further studies on drug development in diseases where apoptosis is downregulated.

Exploring The Ethnomedicinal Uses, Phytochemical Constituents And Biological Activities Of Caladium Bicolor: A Review

Mary D. Agoi
Department of Biosciences and Biotechnology, University of Medical Sciences, Ondo city, Ondo State, Nigeria.
Corresponding E-mail: agoimary326@gmail.com

ABSTRACT: Caladium bicolor belongs to the Araceae family of flowering plants. Various parts of the plant have been used in folklore medicine to treat a variety of diseases, including convulsions in children, facial paralysis, tumors, sore throats, toothaches, constipation, wounds, flu-like symptoms, and as an insecticide. This review sought to summarize botanical description, ecology, geographic distribution, ethnomedicinal uses, phytochemical screening, biological activity, and toxicity of Caladium bicolor. The information contained in this review, being the first article that addresses the ethnomedicinal, phytochemical and biological importance of Caladium bicolor, came from online databases and published literatures on its traditional uses and various research studies conducted on Caladium bicolor in various countries from 1985-2021. Various Caladium bicolor extracts have been found to contain tannins, flavonoids, alkaloids, saponins, and cardiac glycosides in its leaves, tubers, stems, and roots. The absence of calcium oxalate, a poisonous constituent that is present in Caladium bicolor was discovered in the methanolic extract of its leaf. Its antimicrobial, antibacterial, neuropharmacological, antioxidant, antidiarrheal, antiproliferative, antiangiogenic, membrane stabilizing, antidiuretic, mitogenic, antiinflammatory, cytotoxic, and thrombolytic properties have been uncovered in numerous investigations. Caladium bicolor is a plant with a wide range of intriguing potentials, as shown by the numerous studies on it. The antibacterial and antioxidant activity has been the subject of much investigation, although there are other putative effects, particularly in its unstudied vermifugal and purgatorial uses, as well as the treatment of wounds and inflammation. As a result, more studies are required in order to uncover its therapeutic benefits.

Evaluation of Sub-acute and Sub-chronic administration of Capolobia alba (G. Don) on Histoarchitecture and Reproductive functions of Hypothalamic-Pituitary-Testicular Axis of Wistar Rat

Gideon O. Oluwatunase1,2*, Olatoye J. Otulana2, Odubela O. Olusola2, Patrick G. Okwute3, Kayode Adebisi1, Ogunmiluyi Oluwafunbi4, Felix U. Enemali1
1Department of Anatomy, University of Medical Sciences, Ondo state, Nigeria; 2Department of Anatomy, Olabisi Onabanjo University, Ago-Iwoye, Ogun state, Nigeria; 3Department of Physiology, Babcock University, Ilisan-Remo, Ogun state, Nigeria; 4Department of Physiology, University of Medical Sciences, Ondo state, Nigeria. *Presenting author: Gideon O. Oluwatunase; goluwatunase@unimed.edu.ng

ABSTRACT: Over 80% of the populations in some Asian and African countries depend on traditional medicine for primary health care. For centuries men and women have attempted to enhance their sexual performances by using substances derived from plant-based natural sources known as aphrodisiacs. Carpolobia alba G.Don is a popular natural recreational aphrodisiac plants commonly used in Nigeria. In this study, we assessed the effects of sub-acute and sub-chronic administration of methanol root extract of Carpolobia alba on the hypothalamic-pituitary-testicular axis of adult Wistar rat. Forty adult male rats (weighing 200g-250g) were randomized into four groups consisting of ten animals each. Each group was treated daily with distilled water, 100, 200 and 400mg/kg body weight respectively of methanol root extract Carpolobia alba G.Don. Five animals were sacrificed from each group after 30 and 60 days. The animals were anesthetized using Isoflurane via an induction chamber. Histological examination (Hematoxylin and Eosin stain) of the hypothalamus, pituitary gland and testes; testicular B-Cell lymphoma-2 (Bcl-2)and Proliferating Cell Nuclear Antigen (PCNA) Immunoexpression; hormonal profile [Testosterone (T), Leutinizing hormone (LH), follicle stimulating hormone (FSH)]; Oxidative stress biomarkers (MDA, SOD, CAT) and sperm analysis were done. Daily administration of the extract resulted in marked degeneration and shrinkage of hypothalamic neurons in the prepoptic area, Acidophilic, Basophilic and Chromophilic cells of the anterior pituitary gland seminiferous tubules, degeneration and vacuolization of germinal epithelium, reduction in spermatogenic cells population, absence of late stage germ cells, weak expression of Bcl-2 and intense expression of PCNA, significant reduction (<0.05) in T, LH, FSH, sperm parameters(sperm count, motility and morphology) and induction of oxidative stress in a dose-dependent and duration-dependent manner. This result indicate anti-fertility potential of sub-acute and sub-chronic consumption of methanol root extract of Carpolobia alba G.Don in male Wistar rat.

Vanillic Acid Mitigates Lead Acetate Induced Learning And Memory Impairments, Neuro-Inflammation, Neuronal Degeneration Via Gfap/Nrf-2 Pathways In Male Wistar Rats

Institution: Behavioral and Aging Lab. Human Anatomy Department, Federal University of Technology Akure, Ondo State.
Olawale M. A.1, Ogunlade B.1, Iteire K. A.2, Gbayisomore T. J.3
1Human Anatomy Department, Federal University of Technology Akure, Ondo State. mojisolaolawale0405@gmail.com
2Anatomy Department, University of Medical Sciences, Ondo, Ondo State
3Elizade University, Ilara-Mokin, Ondo State.
*Correspondence author: Ogunlade B.; bogunlade@futa.edu.ng

ABSTRACT: Heavy metals found abundantly in our environment poses systemic toxicant capable of activating neurotoxic pathways in exposed individuals. This study aimed at unravelling the therapeutic potential of Vanillic Acid (VA) of Lead Acetate (LA)-induced cortico-hippocampal neurodegeneration in adult male Wistar rat. A total of Forty (40) adult male Wistar rats were used for this experiment. The animals were divided into four groups (A-D) (n=10). LA and VA dosage were prepared freshly each day for administration. The groups were as follows: Group A received normal saline as placebo; Group B received 200mg/kg BW of LA only; Group C received 200mg/kg BW of VA and 100mg/kg BW of LA, Group D received 200mg/kg BW of VA only. LA and VA administration was done via oral gavage once daily and the experiment spanned for 45 days. At the end of the experiment, animals were sacrificed through cervical dislocation. The brains were excised, cleaned, and washed with saline (0.9% sodium chloride). There were neurobehavioral impairments, and neuropathological disorders evident by decrease in neuronal cell size, disorganization of neuronal network within the cortex and hippocampus among LA induced rats only compared with the control. However, VA + LA rats showed restoration of cortico-hippocampal morphology, ameliorated cognition and preserved reorientation of pyramidal cells and astrocytes compared with LA only induced rats. VA preserves the cytoarchitecture of the cortex and hippocampus, associated neurobehavioral changes, neuronal networks induced by lead acetate exposure via GFAP/NRF-2 pathways.

Kinetics and Inhibition of Bulinus globosus Acetylcholinesterase by Theobroma cacao Leaf Extract as a Novel Molluscicide

Oluwadare Joel Agunbiade*1, Oladoyin Grace Famutimi 2, and Isaac Olusanjo Adewale2.
1 Department of Medical Biochemistry, Obafemi Awolowo University, Ile-Ife, Nigeria
2Department of Biochemistry and Molecular Biology, Obafemi Awolowo university, Ile-Ife, Nigeria
*Corresponding author's email addresses: dareagunbiade@gmail.com; oj.agunbiade@oauife.edu.ng

ABSTRACT: Schistosomiasis remains a major public health concern, particularly in endemic regions where freshwater snails such as Bulinus globosus serve as intermediate hosts. With increasing resistance to synthetic molluscicides, there is an urgent need for eco-friendly, plant-based alternatives. This study investigates the molluscicidal potential of Theobroma cacao leaf extract via inhibition of acetylcholinesterase (AChE), a key enzyme involved in neuromuscular transmission in snails. AChE was extracted from the hepatopancreas, visceral mass, and foot muscle of B. globosus using established protocols. Partial purification was carried out using CM-Sephadex C-50 and DEAE-Trisacryl ion-exchange resins. The enzyme's kinetic and physicochemical properties were characterized, and the inhibitory effect of methanolic crude leaf extract of T. cacao on AChE activity was assessed. The half-maximal inhibitory concentration (IC_{50}) was determined by measuring reaction rates in the absence and presence of increasing extract concentrations. Among the tissues analyzed, the hepatopancreas exhibited the highest AChE specific activity (0.59 ± 0.013 units/mg protein), followed by the foot muscle (0.20 ± 0.014 units/mg protein) and the visceral mass (0.19 ± 0.011 units/mg protein). The optimal pH for AChE activity was 8.0 in the hepatopancreas and visceral mass, and 7.0 in the foot muscle. Km values were 0.72 ± 0.13, 0.18 ± 0.01, and 0.18 ± 0.014 mM for the hepatopancreas, foot muscle, and visceral mass, respectively, indicating higher substrate affinity in the latter two tissues. The methanolic extract of T. cacao significantly inhibited AChE activity in a concentration-dependent manner, with IC_{50} values of 0.45, 0.55, and 0.74 mg/ml for the hepatopancreas, foot muscle, and visceral mass, respectively. These findings highlight the tissue-specific expression and kinetics of AChE in B. globosus, supporting its relevance as a molluscicidal target. The inhibitory effect of T. cacao extract positions it as a viable, eco-friendly alternative in schistosomiasis vector control strategies.

Fungal Cellulase from Archachatina marginata Gut Microbiota: A Tool for Sustainable Agro-Waste Management

Omotoyinbo B.I.ab, Uhunmwhangho E.S.b, Oluwafemi D.Y.c and Omotoyinbo O.V.b
aDepartment of Basic Science, Federal College of Agriculture, Akure, Nigeria.
bDepartment of Biochemistry, University of Medical Sciences, Ondo, Nigeria.
cDepartment of Microbiology, University of Medical Sciences, Ondo, Nigeria.
e-mail: bcn1234314@unimed.edu.ng

ABSTRACT: Cellulose, the most abundant plant polysaccharide, presents a viable feedstock for biofuel and biomaterial production, but its conversion to glucose via enzymatic hydrolysis remains a key bottleneck. This study aimed to isolate, identify, and characterize a potent cellulase-producing fungus from the gut of the African Giant Snail (Archachatina marginata) and evaluate its efficiency in degrading various bioagro wastes. Fungi were isolated using pour plate technique from gut samples, cultured on Potato Dextrose Agar, and screened for cellulolytic activity using carboxymethylcellulose (CMC) as the sole carbon source with Congo red staining. Three isolates namely: Aspergillus niger, Aspergillus flavus, and Lasiodiplodia theobromae were identified, with L. theobromae emerging as the most potent based on hydrolysis zones. Solid-state fermentation was employed using cassava peels, corn cobs, cocoa pods, and fruit peels to assess substrate-specific cellulase activity. Peak enzyme activity occurred at 96 hours (100%) before declining, suggesting substrate exhaustion or enzyme instability, with cocoa pods supporting the most prolonged activity (102% at 168 hours). CMC served as a control, peaking at 100% at 168 hours, validating its use for comparative assessment. Molecular identification via PCR and sequencing confirmed 92.61% similarity to L. theobromae (Accession No. GQ502453.1). Optimal cellulase production was achieved at pH 6 and 30□°C, with enzyme activity peaking at 100% under these conditions. These results demonstrate the feasibility of harnessing gut-derived L. theobromae for low-cost, effective bioconversion of agricultural wastes into value-added products. This study therefore highlights the potential of native fungal isolates in sustainable enzyme production and provides a foundation for future biotechnological applications in waste valorization

Investigating Metal Neurotoxicity, Stress-Induced Neurodegeneration, and Behavioral Alterations: Insights from the C. elegans Model

Authors: Toheeb O. Oyerinde 1,2, David A. Oyeniran1,2, Victor E. Anadu1,2, Tobiloba S. Olajide1, Olayemi K. Ijomone1,2, Omamuyovwi M. Ijomone1,2.
1. Laboratory for Experimental and Translational neurobiology, University of Medical sciences, Ondo.
2. Department of Anatomy, Faculty of Basic Medical Sciences, University of Medical Sciences, Ondo

ABSTRACT: Although relatively new to Nigeria's biomedical research landscape, Caenorhabditis elegans (C. elegans) has been a widely established model organism for several decades, particularly in studies on neurotoxicity, stress biology, and behavior. Stress is a major contributor to a wide range of neurological and psychiatric disorders, and understanding its effects on the nervous system is critical for developing effective therapeutic interventions. Exposure to environmental metals—even at sub-toxic concentrations—can lead to long-term neurological impairments, especially during critical developmental windows. Due to its optical transparency, cost-effectiveness, short lifespan, and amenability to genetic manipulation, including the ease of generating reporter gene fusions (e.g., GFP-tagged proteins) enabling in vivo visualization of cellular structures and protein expression patterns with high precision, C. elegans is exceptionally well-suited for investigating stress- and metal-induced changes in neuronal morphology and behavior. Behavioral endpoints such as the basal slowing response (a proxy for dopaminergic function) and general locomotion (linked to cholinergic activity) can be readily assessed following metal or stress exposure using fluorescent and bright-field microscopy. In this methodological study, we draw on insights from our ongoing research investigating metal-induced neurotoxicity and chronic stress responses in C. elegans. We detail the experimental approaches used to assess alterations in neuronal morphology and behavioral phenotypes, and we highlight the practical advantages of this model system. Finally, we advocate for its broader integration into Nigeria's biomedical research ecosystem, particularly in the fields of neurobiology and toxicology.

Transfluthrin-based insecticide toxicity: assessment of cognitive impairment and anxiety like behavior in rodent models

David Anuoluwapo Oyeniran1,2*; Tobiloba Samuel Olajide1,3, Abel Yashim Solomon4; Ajagbe, Abayomi Oyeyemi Ajagbe4; Praise Olamide Oyejide5.
1Laboratory for Experimental and Translational Neurobiology, Ondo, Ondo State, Nigeria
2 Department of Anatomy, University of Medical Sciences, Laje Road, Ondo, Ondo State, Nigeria
3 Department of Physiology, University of Medical Sciences, Laje Road, Ondo, Ondo State, Nigeria
4Department of Anatomy, College of Health Sciences, Nile University of Nigeria, Abuja.
5Deparmet of Anatomy, Lagos State University College of Medicine, Ikeja, Lagos

ABSTRACT: The central nervous system is highly sensitive to environmental toxicants, including synthetic pyrethroid insecticides, which are widely used for domestic and agricultural pest control. Transfluthrin, a fast-acting pyrethroid, is commonly incorporated into insecticide papers for indoor use. However, concerns regarding its potential neurotoxic effects persist. This study evaluated the impact of transfluthrin-based insecticide paper (TBIP) smoke on cognitive function and anxiety-like behavior in adult male Wistar rats. Thirty rats were randomly assigned into three groups (n=10 per group): Group A (control) was exposed to clean ambient air; Group B was exposed to smoke from 6□g of TBIP for 4□hours daily; and Group C to smoke from 12□g of TBIP for 8□hours daily, both for a duration of 4 weeks using a whole-body inhalation chamber. Behavioral assessments were conducted using the Elevated Plus Maze (EPM) to evaluate learning and memory during weeks 1, 2, and 4, and to assess anxiety-like behavior in week 4. At the end of the exposure period, rats were sacrificed, and their brains harvested to isolate the hippocampi for biochemical analysis of acetylcholinesterase (AChE) activity. Rats exposed to TBIP exhibited significant reductions in learning and memory performance, increased anxiety-like behaviors, reduced body and brain weights, and altered hippocampal AChE activity compared to controls. These findings suggest that prolonged exposure to transfluthrin-based insecticides can impair neurobehavioral function, possibly via disruption of cholinergic signaling pathways highlighting the need for cautious use and regulatory review of household insecticides containing transfluthrin.

D-ribose-L-cysteine attenuates manganese-induced oxidative stress, neuromorphological deficits, Bax/Bcl-2 response, and TNF-α/ERK signaling in male rats.

Happiness O. Inyang1,2,3, Uchenna K. Ezemagu3, Stephen O. Okori2, Olayemi K. Ijomone1,4, Omamuyovwi M. Ijomone1,4
1Laboratory for Experimental and Translational Neurobiology, University of Medical Sciences, Ondo, Nigeria. 2Department of Anatomy, Faculty of Basic Medical Sciences, University of Cross River, Cross River, Nigeria. 3Department of Anatomy, Faculty of Basic Medical Sciences, Alex Ekwueme Federal University, Ndufu-Alike, Ikwo, Ebonyi, Nigeria. 4Department of Anatomy, Faculty of Basic Medical Sciences, University of Medical Sciences, Ondo, Nigeria.
Presenting Author: Happiness Ochi Inyang; Email: happinessinyang22@gmail.com

ABSTRACT: Manganese (Mn), though an essential trace element, can be neurotoxic after overexposure. Established mechanisms of Mn neurotoxicity include oxidative stress, as well as apoptotic and inflammatory responses. D-ribose-L-cysteine (RibCys), a cysteine derivative, is reported to mitigate oxidative damage by enhancing cellular antioxidant capacity. In this study, we investigated its effects on B-cell lymphoma 2-associated X protein (Bax)/B-cell lymphoma 2 (Bcl-2) apoptotic signaling, tumor necrosis factor-alpha (TNF-α) inflammatory response, and extracellular signal-regulated kinase (ERK) pathway across various brain regions. Adult albino strain male Wistar rats were exposed to either saline (control), Mn (25 mg/kg i.p. for 2 weeks, at a 48-hour interval in 8 doses), RibCys (200 mg/kg, orally for 2 weeks), and Mn and RibCys co-administration. Thereafter, biochemical assays of oxidative stress markers and antioxidant activity, Golgi staining for neuronal dendrites, and immunohistochemical protocols for relevant protein markers were performed. Results revealed that RibCys mitigated Mn-induced distortions of neuronal architecture and dendritic morphology. Further, results showed that Mn exposure increased lipid peroxidation, myeloperoxidase, and nitric oxide levels along with a marked decrease in glutathione peroxidase and sulfhydryl levels; interventions with RibCys attenuated these Mn-induced effects. Mn caused alterations in dendritic arborization, which was attenuated with RibCys treatment. Similarly, Mn exposure induced increased Bax/Bcl-2, TNF-α, and ERK 1/2 expression in some brain regions. However, RibCys treatment attenuated these deficits and caused downregulation of Bax/Bcl-/2, TNF-α, and ERK signaling pathways. Overall, our findings suggest that RibCys is a promising therapeutic agent against Mn-induced neurotoxicity, highlighting its potential application.