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Comparative analysis of dietary interventions on hypertension: a focus on red palm oil and pumpkin seed oil in male Wistar rats

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Hypertension is a prevalent cardiovascular disease with global health implications. Dietary interventions with local Nigerian food items offer promise in hypertension management, but the comparative effects of Red Palm Oil (RPO) and Pumpkin Seed Oil (PSO) are underexplored. This study investigated the impact of RPO and PSO supplementation on hypertension in male Wistar rats, focusing on the onset of action and effectiveness. Thirty-six male adult Wistar rats were divided into six groups: control, RPO without hypertension induction, PSO without hypertension induction, RPO after hypertension induction, PSO after hypertension induction, and hypertension induction without supplementation. Hypertension was induced using Nω-Nitro-L-arginine methyl ester over three weeks, followed by five weeks of intervention. Blood pressure and weight were monitored weekly, with heart weight and histological examinations conducted post-experiment. RPO and PSO supplementation in normotensive rats showed no significant body weight changes. By week 4, hypertensive groups showed a substantial weight reduction compared to normotensive groups. Both RPO and PSO reduced systolic blood pressure compared to hypertensive controls. RPO showed earlier efficacy by week 5, while PSO's effect was significant by week 7. Both oils reduced diastolic blood pressure by week 6 and lowered mean arterial pressure. Histological examination revealed normal myocardial layers in the control and PSO groups but degenerated myocytes in the RPO group. In hypertensive rats, RPO and PSO moderated inflammatory processes in the myocardial layers and showed distinct effects on vascular remodeling, with PSO displaying a potential protective effect. None influenced the heart weight index. These findings suggest RPO and PSO are promising for hypertension management, warranting further research into their mechanisms and long-term effects.

Keywords: hypertension, red palm oil, pumpkin seed oil, blood pressure, cardiovascular health

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Anthropometric study of the facial and ear dimensions among the migrated Dadin Kowa people and the indigenes of Oke-Ero LGA Kwara State, Nigeria

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Anthropometry involves measuring human body dimensions to comprehend physical variation, contributing significantly to areas like plastic surgery and prosthetics through data collection. This study was conducted among the migrated Dadin Kowa people and the indigenes of Oke-Ero Local Government Area in Kwara State, Nigeria, to determine and compare the predominant face and ear shapes between these two groups and assess the potential relationship between facial and ear anthropometry. A total of 440 subjects contributed to the study which comprises 220 males and 220 females equally distributed across the two groups. Various facial and ear features were measured such as facial height, facial width, facial index, ear height, ear width, lobule height, lobule width, ear index, and lobule index using a digital vernier caliper. The indices were calculated from the parameters and the results were subjected to statistical analysis using SPSS version 27. The study showed that the hyper-leptoprosopic facial type was the most dominant in males and females of both groups with no significance to gender dimorphism and the Oval Ear type was the predominant among the Oke-Ero population and the Round Ear type was the predominant Ear type among the Dadin-Kowa population. The similarities in the dominant facial types of both groups show that they are from the same ancestral origin, highlighting the influence of genetic, marital, and environmental factors on morphology, having lived together over the years. However, the variation in the dominant ear types shows there are some distinct features between the two groups.

Keywords: anthropometry, facial dimension, ear dimension, plastic surgery

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Chronic Inhalation of Nitrocellulose on the Prefrontal Cortex of Swiss Mice: Role of Dexamethasone

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Nitrocellulose is a chemical used to dilute oil-based paints whose constituents include aromatic and halogenated hydrocarbons such as toluene amongst others. Adolescents use thinners as inhalants regularly which is associated with brain damage and learning deficits. This study looked at the effects of subchronic thinner inhalation in adult male mice and the anti-inflammatory effects of dexamethasone on the histomorphological changes in pyramidal neurons and glia for learning and memory assessment. Forty mice were used: group one served as control; group two was exposed to 1800 ppm nitrocellulose in a whole-body inhalation chamber for 42 days; group three was injected with 2.5 mg/kg dexamethasone twice weekly; and group four received 1800 ppm nitrocellulose inhalation in an inhalation chamber for 42 days and 2.5 mg/kg dexamethasone twice weekly. A neurobehavioral study (Morris water maze) for learning and memory was conducted before sacrifice. Brains were harvested and processed for histology using Hematoxylin & Eosin stain for neuronal viability and glia density. Biochemical activities of MDA and IL-6 were assessed as markers of oxidative stress. Analysis of data was done using Graphpad Prism 8.4.3 with the level of significance at $P < 0.05$. There was reduced escape latency and duration spent in the quadrant in the nitrocellulose groups but not in the control or dexamethasone group. The MDA and IL-6 levels were higher in the nitrocellulose group compared to the control and dexamethasone groups indicative of oxidative stress. The density of pyramidal neurons in layers 5 and 6 was significantly lower in the nitrocellulose-treated groups compared to control and dexamethasone showing neuronal loss which led to the observed learning and memory deficit. The anti-inflammatory effects of dexamethasone prevented increased neuronal and glial cell damage in the pre-frontal cortex, thus allowing spatial learning and memory improvement.

Keywords: inhalation, inflammation, IL-6, malondialdehyde, learning, memory

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Chronic Inhalation of Nitrocellulose on the Prefrontal Cortex of Swiss Mice: Role of Dexamethasone

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Heat stress is experienced by an organism when it is exposed to temperatures outside of its optimal range and it is one of the major stressors of the species *Drosophila melanogaster*. Severe heat stress can disrupt normal cellular functions, leading to potential damage or death if the organism is unable to effectively mitigate the stress. This research aims to investigate the sex-specific responses to acute heat stress exposure in *Drosophila melanogaster* by assessing oxidative stress biomarkers, evaluating climbing performance, and conducting histological study. Harwich wild-type strain of *Drosophila melanogaster*, dry oven, timer, plastic vials, and form plugs. 90 male and female flies were divided into Control, 5mins, and 10mins 40^{o}C heat stress exposure. Malondialdehyde (MDA), superoxide dismutase (SOD), and reduced glutathione (GSH) were quantified from whole body homogenate of flies. The motor activity of flies was assessed using the rapid iterative negative geotaxis (RING) assay. A histological study was conducted on the brains of the flies using the H and E staining technique. Results observed in both male and female flies exhibited a non-significant decrease (p>0.05) in MDA and GSH levels in the 5mins and 10mins heat exposure groups compared to the control. However, SOD levels in females showed a non-significant increase in the 10mins exposure group compared to the 5mins group.

Heat stress significantly decreased (p>0.05) the climbing performance of male flies. The histoarchitecture of the optic lobes and central brain complex of the *Drosophila* brains observed were similar to the control group of the flies. Male flies exhibited a more pronounced decline in climbing performance with increased heat exposure duration. The findings underscore the importance of considering sex as a biological variable in studies of stress responses and suggest that males may be more susceptible to the detrimental effects of acute heat stress than females.

Keywords: *Drosophila melanogaster*, heat stress, oxidative stress biomarkers, RING assay

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Impact of Omega-3 Fatty Acids on Heat Shock Stress-induced Oxidative Stress and Other Parameters in *Drosophila Melanogaster*

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Omega-3 fatty acids may play a role in promoting longevity as well as several significant potentials in promoting brain health. Heat stress has extreme effects on *Drosophila melanogaster*, leading to a range of physiological, biochemical, and behavioural changes. The study aims to assess the impact of omega-3 fatty acids on heat shock stress-induced oxidative stress and other parameters in *Drosophila melanogaster*. Harwich wild-type strain of *Drosophila melanogaster*, dry oven, timer, Nutricost omega-3 fatty acids, plastic vials, and form plugs. The effects of omega-3 fatty acids were assessed on the climbing performance, oxidative stress biomarkers-malondialdehyde, superoxide dismutase and reduced glutathione, dopamine and calcium levels in 200 flies with each group consisting of 50 flies per vial and 4 replicates each grouped as control, heat shock group, omega-3 fatty acids group, 2mg/ml and 4mg/ml omega-3 fatty acids with exposure to heat shock stress at a temperature of 34.5^{o}C for 30mins within the duration of 14 days. The results showed alterations in oxidative stress biomarkers by significantly increasing lipid peroxidation and also decreasing the levels of reduced glutathione in turn affecting calcium and dopamine with exposure to heat shock stress and also ameliorative effects on some of the oxidative stress biomarkers of cellular damage, calcium, dopamine and climbing performance of experimental flies were also observed.

This study concludes heat shock stress can induce oxidative stress and then lead to an interplay with calcium. Omega-3 fatty acids have anti-oxidant potential at a low dose of 2 mg/ml and have ameliorative effects on some of the parameters.

Keywords: *Drosophila melanogaster*, heat stress, omega-3 fatty acids, climbing performance, oxidative stress

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Latent fingerprint development and matching accuracy using Monochrome Toner Powder

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Dermatoglyphics is an essential component of physical anthropology. It has a wide range of applications such as criminology, population studies, and phenotypic genetic studies, and plays a crucial role in forensic science. This study aimed to assess the matching accuracy of latent fingerprints with a pre-recorded database of patent fingerprints of a given population. Fingerprints were obtained using the fingerprint scanner Dermalog LF10, Hamburg, Germany. One hundred and forty-six (95 patent and 52 latent) medical and dental students of the College of Medicine, University of Ibadan were recruited using the convenience sampling method (Ethical approval, IRB number – 24/0051). The above fingerprints were made up of 650 male and 290 female patent fingerprints and 520 latent prints. Monochrome toner powder was used as a developer of latent fingerprints deposited on glass slides. Four hundred and twenty-two latent prints were well developed and admitted for qualitative and quantitative analysis. GraphPad Prism 7.0 was used for the test of the mean of variables. Ulnar and radial loop patterns were the most common types in both patent and latent prints among males and females. There was no significant difference in the occurrence of pattern types in both patent and latent prints. Ten matching minutiae were used as the prerequisite for matching between patent and latent fingerprints.

The calculation of matching accuracy, precision, specificity, and sensitivity showed 87.4%, 86.7%, 62.4%, and 96.5% respectively. The result for sensitivity is inversely related to specificity showing a reliable outcome. The results of matching demonstrate the reliability and efficacy of monochrome toner powder as a tool for latent fingerprint development and are thus recommended for the forensic identification of individuals.

Keywords: latent fingerprints, monochrome toner powder, matching accuracy, forensic science

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Dermatoglyphics Characteristics and Patterns in Children with Down Syndrome in Kaduna State, Nigeria.

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Down syndrome (DS) or Trisomy 21 is the most prevalent human chromosomal disorder and the most common cause of intellectual impairment. DS has been reported to cause a range of phenotypic effects such as altered physical characteristics. This study aimed to determine the dermatoglyphic patterns of children with Down syndrome in tertiary health institutions in Kaduna State, Nigeria**.** Sixty (60) participants (children) between the ages of 2 - 18 years were recruited for the study. The study consists of two groups: Group A participants: Thirty (30) DS cases recruited from four Tertiary Health Institutions in Kaduna State. Group B Participants: Thirty (30) healthy participants were recruited to the study as a control group. Participants' ages were divided into three categories: 2 to 5 years, 6 to 10 years, and greater than 10 years. A variety of dermatoglyphic characteristics of the palm and fingerprint patterns were obtained from the participants. The dermatoglyphics characteristics considered include: right and left ATD and DAT angles for all participants and fingerprint patterns for all the participants including the percentage and frequency of this pattern in both DS and control participants. Measured dermatoglyphics characteristics and patterns were compared to the control group. The right and left ATD angles were observed to be significantly ($p<0.05$) lower in DS compared to the control participants. The modal dermatoglyphic pattern for Down syndrome was loop (71%) and no arch pattern was found.

There exist remarkable differences in the dermatoglyphics characteristics and patterns in Down syndrome participants when compared to normal participants (non-DS). These recognizable dermatoglyphics deviations from the normal could be beneficial in the discrimination and identification of DS individuals in Northern Nigeria.

Keywords: Down syndrome, dermatoglyphics, atd, fingerprint, discrimination

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Nigella sativa Oil (NSO) Mitigated Thalamic and Subicular Dysfunctions in Pentylenetetrazole (PTZ)-Induced BALB/c Mice Models of Epileptogenesis

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Epileptogenesis, the process leading to epilepsy, poses a significant global health challenge, affecting over 50 million people worldwide. Despite extensive research, effective treatments with minimal side effects remain elusive. This study explores the effects of *Nigella sativa* oil (NSO) on the thalamus and subiculum—key brain regions involved in the development and propagation of epilepsy through their roles in information processing, oscillatory activity, and synaptic plasticity—in pentylenetetrazole (PTZ)-induced BALB/c mouse models of epileptogenesis. Forty-four male and forty-four female BALB/c mice were randomly allocated into four experimental groups: (1) PTZ only (PTZ), (2) PTZ and NSO concurrently (PTZNS), (3) NSO before PTZ (NSPTZ), and (4) NSO before PTZ and NSO concurrently (NSCPTZ). PTZ was administered at 35 mg/kg, and NSO at 12 ml/kg, alternately every 24 hours for 20 days. Seizure dynamics were assessed using the Racine scale, and behavioural manifestations were inspected from videotaped surveillance. Spatial memory and motor coordination were evaluated using object location and grip strength tests respectively. Histological analysis was performed using Hematoxylin and Eosin (H&E) staining for histoarchitectural integrity, and Cresyl Fast Violet (CFV) staining to quantify Nissl substance.

The photomicrographs were analyzed using Image J software and graph pad prism for statistical comparison ($P<0.05$). NSO treatment significantly mitigated seizures through the reduction of seizure latency, frequency, duration, and intensity. It also enhanced motor function, reduced neuronal damage, and improved cellular integrity, particularly in the NSO-pretreated groups. However, NSO and PTZ did not impact spatial memory. Compared to NSPTZ and NSCPTZ groups, PTZ and PTZNS groups expressed more neuronal Nissl positivity. In conclusion, NSO demonstrates neuroprotective properties by reducing the adverse effects of PTZ, suggesting its potential to complement current treatments for epilepsy.

Keywords: *Nigella sativa* oil, pentylenetetrazol, epileptogenesis, thalamus, subiculum

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Assessing Neurodevelopmental Indices, Cerebellar Morphology, and Placenta Morphometry in Response to Late Prenatal Cannabidiol Ingestion

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With each passing day, health reports indicate that the use of marijuana and its components to alleviate pregnancy symptoms and discomforts is skyrocketing. The placenta, a primary site for maternal-fetal exchange, is directly influenced by substances crossing the placental barrier, including cannabinoids such as cannabidiol (CBD). Marijuana and its derivatives can disrupt normal placental function, potentially altering fetal brain development. This makes the placenta a critical focus for studying cannabinoid-induced neurodevelopmental changes. This study investigates the impact of late prenatal cannabidiol exposure on neurodevelopmental indices, cerebellar morphology, and placental morphometry in female Wistar rats. Twelve pregnant Wistar rats were divided into two groups experimental group (n=6) and control group (n=6). Dams in the experimental group were administered controlled doses (150 mg/kg) of CBD orally. They also had their feed and water ad libitum throughout the late gestational phase (GD15) until birth, while the control group received feed and water *ad libitum* throughout the experiment. Neurodevelopmental indices were assessed in the offspring through standardized reflex tests, and morphometric parameters of the placenta were evaluated using advanced measurement techniques.

Histological analyses were conducted on the pups to evaluate morphological changes in the harvested cerebellum of both the control and experimental groups using hematoxylin and eosin (H&E) staining. The experimental group exhibited significant decreases in birth weight and developmental milestones compared to the controls. Behavioural assessments revealed heightened anxiety-like behaviours. Placental analysis showed increased weight but reduced thickness in the CBD group, indicating potential placental disruption. Histological analysis of the cerebellum revealed neurodegeneration, including vacuolation and pyknosis in the molecular layer. Late prenatal CBD exposure significantly affects fetal growth, placental development, and neurodevelopmental outcomes.

Keywords: Cannabidiol, late gestation, placental morphometry, neurodevelopmental indices, cerebellum

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Evaluation of Gestational Intake of Aqueous Extract of *Cannabis sativa* Leaves on the Testes of the First Filial Generation of Adult Wistar Rats

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Cannabis consumption is increasing globally, particularly among pregnant women, raising concerns about its potential for abuse and fetal toxicity. Cannabis crosses the placental barrier and has been associated with abnormal sperm morphology, reduced sperm count, motility, and follicle-stimulating hormone (FSH). However, limited research exists on the generational effects of gestational cannabis intake on offspring's reproductive function. This study assesses the impact of gestational cannabis intake on the structural and functional integrity of the testes in the first filial generation of adult male rats. Twelve pregnant rats were divided into 4 groups; Group A (control) received normal saline, while Group B, C, and D received 200 mg/kg, 400 mg/kg, and 800 mg/kg of aqueous extract of *Cannabis sativa* leaves respectively for 40 days during gestation and lactation. Offspring were sacrificed on postnatal day 77. Gross examination, anogenital distance (AGD), hormonal, semen, histological, and immunohistochemistry analysis were conducted. Results showed high mortality rates, reduced birth weight, retarded growth, and preterm delivery across cannabis-treated groups. A reduction in AGD in groups C and D was observed respectively. Hormonal assessments indicated decreases in FSH and Luteinizing hormone, with serum testosterone levels decreasing in groups B and D but increasing in group C. Semen analysis revealed a decrease in sperm count and sperm morphology across cannabis-administered groups, an increase in sperm motility and vitality in group B respectively, and a decrease in group D. Histological evaluation showed seminiferous tubule abnormalities, distorted interstitial mass, reduced Leydig cell count, and apoptosis as indicated by Caspase 3 immunohistochemistry in cannabis-administered groups. These results suggest that in-utero exposure to *Cannabis sativa* negatively affects male reproductive functions in the offspring, indicating potential long-term generational effects on reproductive health.

Keywords: cannabis, gestation, testes, hormone, semen, apoptosis

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Assessment of Plantar Arch Index and Prevalence of Pes Planus with Respect to Gender Among Ijesa People of Osun State

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The plantar arch is a crucial structure in the foot, providing support and stability during weight-bearing activities. The arch index quantitatively measures the plantar arch, acting as an early indicator of potential structural and functional foot defects. This study aimed to assess the plantar arch index (PAI) and the prevalence of pes planus (flat feet) concerning gender among the Ijesa people of Osun State. The study included 380 participants (183 males and 197 females). The PAI was calculated using the relationship between the central arch width and heel width, obtained from footprints collected via the ink method. Staheli's method was used for PAI calculation. Statistical analyses, including t-tests, chi-square tests, and Pearson correlation, were performed to interpret the data. Participants with open foot wounds, traumatic lower limb fractures, or orthopedic surgeries were excluded. Descriptive statistics revealed significant gender differences in foot measurements, such as right foot length, right heel width, left foot length, left central width, and left heel width. However, no significant differences were observed in right central width, right PAI, or left PAI. Chi-square tests indicated that females had a higher prevalence of pes planus in both individual and combined feet compared to males. Pearson correlation showed non-significant correlations between foot length and pes planus.

The study highlights significant gender differences in foot measurements and the prevalence of pes planus, with foot length not serving as a reliable predictor of pes planus.

Keywords: Plantar arch index, pes planus, gender, foot measurements, correlation

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Sub-acute administration of Methanolic extract of *Carpolobia alba G.Don* alters reproductive functions in adult male Wistar rat

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Over 80% of the population 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 experiences by using substances derived from plant-based natural sources known as aphrodisiacs. *Carpolobia alba G.Don* is a popular natural recreational aphrodisiac plant commonly used in Nigeria. In this study, we assessed the effects of sub-acute administration of methanolic extract of *Carpolobia alba* on the reproductive functions of male Wistar rats. Twenty rats were randomized into four groups consisting of five animals each. The animals were treated daily with distilled water, 100, 200, and 400mg/kg of methanol root extract *Carpolobia alba G.Don* for 30 days. The animals were sacrificed via cervical dislocation. Histological examination (Hematoxylin and Eosin stain), hormonal profile [Testosterone (T), Leutinizing hormone (LH), follicle-stimulating hormone (FSH)], Oxidative stress biomarkers (malondialdehyde, catalase, superoxide dismutase) and sperm analysis were done. Daily administration of the extract resulted in marked degeneration and shrunken seminiferous tubules, degeneration and vacuolization of germinal epithelium, reduction in spermatogenic cells population, absence of late stage germ cells and significant reduction (<0.05) in T, LH, FSH, sperm parameters (sperm count, motility and morphology) and induction of oxidative stress. This result indicates the anti-fertility potential of sub-acute consumption of methanol root extract of *Carpolobia alba G.Don* in male Wistar rats.

Keywords: *Carpolobia alba*, sub-acute, aphrodisiacs, anti-fertility, histoarchitecture

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Comparative Microanatomy of Term Placenta: Human vs. Wistar Rat

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Placentation involves sequential steps with both embryonic and maternal cell lineages playing important roles. Wistar rat models are commonly used in biomedical research, to study human biological responses. There is a need to improve the existing literature on the placenta and do a comprehensive histological comparison of the Wistar rat and human placenta. This will provide valuable insights for biomedical researchers using rat models to study placental function and developmental diseases, enhancing the relevance and accuracy of their findings. Young adult male and nulliparous female Wistar rats were obtained, acclimatized, and allowed to mate overnight. On the 20th day of gestation, the pregnant rats were euthanized, and their placentas were collected and fixed in 10% neutral buffered formalin. Human placenta were sampled from patients who had normal vaginal deliveries. All samples were processed for hematoxylin-eosin, Masson trichrome, periodic acid-Schiff(PAS), reticulin, and Verhoeff-van Gieson staining. Human and Wistar rat placentas were hemochorial; the trophoblasts in both species were in direct contact with maternal blood. The differences between rats and humans were in the fetal-maternal interface and the presence of the yolk sac. In the highly vascularized labyrinth of the rat placenta, maternal and embryonic blood spaces were separated by a trilaminar trophoblast layer and embryonic endothelial cells. In contrast, human-term placental villi consist of thin-walled capillaries lined by endothelial cells, surrounded by a syncytiotrophoblast layer and an inconspicuous cytotrophoblastic layer. The basal plate and chorion, in human and Wistar rat placenta, were similar in terms of their anatomical position, but their morphology was different. The distribution of PAS positivity, collagen, and reticulin fibres was also different. Extrapolation findings from toxicological studies in rat placenta to humans should be done with caution.

Keywords: placenta, microanatomy, human, Wistar rat

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Immunological and Reproductive Outcomes of *Vernonia amygdalina* in Immunosuppressed Adult Male Wistar Rats

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Prednisolone is a widely used glucocorticoid effective in the management of acute inflammatory disease. Immunosuppression can affect fertility by disrupting the secretion and regulation of reproductive hormones along the hypothalamic-pituitary-gonadal axis. *Vernonia amygdalina* (VA), a widely consumed vegetable in Africa, has anti-oxidative, and sperm-improvement properties. This study aimed to determine the effects of bitter leaf on reproductive parameters in immunosuppressed Wistar rats. Animals were randomly assigned to 6 groups, which included control, prednisolone group (2 mg/kg), and varying doses of VA (250 mg/kg and 375 mg/kg). Administration was done orally and animals were euthanized after ensuring at least fifty-six days of spermatogenesis. Blood was obtained for haematological assay. The oxidative stress parameters and sperm parameters were analyzed. Also, testicular and hypothalamic-pituitary tissues were collected for BCL2 and IBA-1 staining respectively. Decreased CD4 count and white blood cells, as well as reduced SOD level in animals administered prednisolone only was noted. A significant decrease in sperm progressive motility, normal morphology, and sperm count was also observed in the immunosuppressed animals. Low-dose VA increased the level of SOD and sperm parameters compared to the prednisolone-only group. Also, staining of BCL2 showed increased while IBA-1 showed decreased positively-stained cells on administering VA to prednisolone-induced-immunosuppressed animals. Low-dose BL had significant reversal effects on CD4 cell count, level of SOD, and sperm parameters altered by prednisolone administration, as well as improvement in cell density in the hypothalamic-pituitary tissues.

Keywords: *Vernonia amygdalina*, immunosuppression, infertility, prednisolone, Wistar rats

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Effect of *Magnifera Indica* Leaf Extract (Mle) on Cadmium-induced Neurotoxicity in Adult Wistar Rats

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Cadmium (Cd) is an environmental pollutant of significant interest worldwide and potentially a neurotoxicant**.** The study aimed to investigate the ameliorative effect of *Magnifera indica* leaf extract (MLE) on cadmium-induced neurotoxicity in adult Wistar rats. 35 adult Wistar rats were divided into five groups of 7 rats per group. Group A served as a control; Group B received 20mg/kg of Cd for 14 days and served as untreated; Groups C, D, and E received 20mg/kg of Cd for 14 days and then treated with MLE (500, 1000 and 2000 mg/kg), respectively for 14 days. All administrations were oral. Three days before sacrifice, animals were subjected to daily neurobehavioral tests: negative geotaxis, grip strength, and tail suspension. The following biomarkers were determined using ELISA kits: glutathione peroxidase (GPx), tumour necrosis factor (TNF-α), interleukins (IL-6 and IL-10), acetylcholinesterase (AChE) and adenosine deaminase (ADA) activities using cerebellum homogenate. Histological alterations to the cerebellum were evaluated. The results indicated that cadmium exposure reduced body and brain weights, induced oxidative stress through increased TNF-α and decreased IL-6, IL-10, and GPx activities as well as decreased AChE and ADA activities; shorter drop-off time in the grip strength test, increased negative geotaxis and several alterations in the cerebella histo-architecture with marked depletion and degeneration of Purkinje cells. However, MLE significantly ameliorated oxidative stress by restoring antioxidant homeostasis and inhibiting increased pro-inflammatory cytokines, and cholinergic and monoaminergic transmissions in the cerebellum. MLE also restored neurobehavioral deficits and body weight loss and restored alterations of the cerebella histo-architecture to almost normal. These findings highlight the potential neuroprotective effects of MLE against cadmium-induced neurotoxicity.

Keywords: *Magnifera indica*; cerebellum; neurotoxicity; cadmium

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Decline while Extending Lifespan in a D-Galactose-Induced Aging Model of *Drosophila melanogaster*

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Ageing results in a decline in physiological functions and an increased susceptibility to neurodegenerative disorders. While minocycline hydrochloride has shown anti-ageing and neuroprotective effects in normal ageing models, its impact on accelerated or induced ageing remains unclear. This study investigated the anti-ageing and neuroprotective potential of minocycline hydrochloride in a D-galactose-induced ageing model of *Drosophila melanogaster*. Flies of both sexes, aged 1-3 days, were distributed into five groups: a control group that received distilled water, a D-galactose group (25 mg/g), a minocycline group (0.10 mM), a D-galactose + minocycline (0.10 mM) group, and a D-galactose + minocycline (0.20 mM) group, with 250 flies per group in five replicates. Lifespan was determined by recording the number of deaths per vial until all the flies were dead. Motor activity was assayed using RING assay. Total thiol (TSH), non-protein thiol (NPSH), hydrogen peroxide (H_2O_2) and nitric oxide (NO) (nitrate/nitrite) levels were measured after flies were anaesthetized with CO_2, homogenized in PBS, centrifuged, and analyzed via colourimetry. Results showed significant reductions ($p<0.05$) in lifespan, motor activity, and TSH levels in the D-galactose group compared to the control, minocycline alone, and minocycline-treated D-galactose groups. H_2O_2 levels were significantly decreased ($p<0.05$) in flies in the D-gal only group in comparison to flies in the control, minocycline group and D-galactose + minocycline (0.20 mM) group. However, NO decreased slightly in comparison to the D-galactose + minocycline (0.20 mM) group. Overall, minocycline extended life span and attenuated oxidative stress and motor decline in a D-galactose-induced ageing model of *D. melanogaster*.

Keywords: ageing, behaviour, D-galactose, *D. melanogaster*, oxidative stress

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Minocycline Extends Lifespan by Enhancing NAD+ Synthesis, Reducing Oxidative Damage, and Regulating Gut Microbiome Dynamics in *Drosophila melanogaster.*

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Ageing is a gradual process marked by the accumulation of biological changes that lead to a decline in functional abilities over time. Persistent DNA damage, oxidative stress, and inflammation contribute to the depletion of NAD+—a crucial cofactor for DNA repair, mitophagy, sirtuins, and mitochondrial health—which in turn promotes cellular senescence and exacerbates age-related diseases. Recent evidence suggests that minocycline may offer benefits in combating ageing and related declines by targeting the FOXO and kynurenine (KYN) pathways. However, its impact on NAD+ levels, the gut microbiome, and redox balance remains largely unexplored. This study evaluated the anti-ageing effect of minocycline in adult *Drosophila melanogaster*. Male and female flies, aged 1-3 days, were divided into four groups of 250 each, with 50 flies per vial, in five replicates. Group I, the control, received food with distilled water, while groups II, III, and IV received food with 0.05 mM, 0.10 mM, and 0.20 mM of minocycline, respectively, until days 20 and 40 of adult life. Lifespan was determined by recording the number of deaths per vial until all the flies were dead. Markers of oxidative stress (TSH, NPSH, H_2O_2, MDA, and PCO) were measured after flies were anaesthetized with CO_2, homogenized in PBS, centrifuged, and analyzed via colourimetry. NAD+ was assayed using the NAD/NADH ELISA kit. Smurf assay was done to assay intestinal barrier integrity and gut pH, while the gut microbial load was determined by counting CFUs per fly gut. Minocycline significantly ($p<0.05$) increased lifespan and NAD+ levels and significantly reduced oxidative stress, gut microbiota load and percentage barrier dysfunction in flies of both sexes in comparison to the control group. Consequently, minocycline may extend a healthy lifespan by preventing declines in NAD+, modulating the gut environment and maintaining redox status.

Keywords: ageing, gut microbiota, metabolism, NAD+, oxidative stress.

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Assessing the Neuroprotective and Therapeutic Potential of Caffeine at the A2a Receptors in the Striatum of Rotenone-induced Rat Model Parkinson's Disease

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Parkinson's disease (PD) is a prevalent neurodegenerative disorder, primarily affecting dopaminergic neurons in the substantia nigra. Given the rising global incidence, effective therapeutic strategies are urgently needed. This study investigates the potential of caffeine as a neuroprotective and therapeutic agent targeting A2A receptors in the striatum of a rotenone-induced PD rat model. Fifty adult male Wistar rats (110-220 g) were divided into five groups (n=10): Control (fed ad libitum for 30 days), Rotenone-only (3 mg/kg, ip. for 30 days), Preventive (Caffeine+Rotenone; 30 mg/kg+3mg/kg, ip. after 1 hour for 30 days), Curative (Rotenone+Caffeine; 3 mg/kg+30 mg/kg, ip. after 1 hour for 30 days), and Caffeine-only (30 mg/kg, ip. for 30 days). Body and brain weights were monitored, and neurobehavioral assessments (open field and elevated plus maze tests) were conducted. Histological analyses (Hematoxylin & Eosin, Bielschowsky's Silver, Nissl, and Luxol fast blue stains) were performed to evaluate neuronal integrity. Rotenone administration induced PD-like symptoms, including significant body and brain weight reduction, and histological abnormalities such as neuronal structural derangement, degenerated striatal fibres, and loss of myelinated neurons and Nissl substance. Caffeine treatment demonstrated both protective and therapeutic effects, evident from improved neuronal density, preservation of striatal neurons, and restoration of cellular populations in caffeine-treated groups compared to rotenone-only groups. This study confirms the neuroprotective and therapeutic efficacy of caffeine in a rotenone-induced PD model. Caffeine administration, both preemptively and post-induction of PD, ameliorates rotenone-induced neurodegeneration, suggesting its potential as a promising therapeutic agent for PD. The findings advocate for further research into caffeine's role in mitigating both motor and non-motor symptoms of PD.

Keywords: Parkinson's disease, caffeine, neuroprotection, rotenone, striatum, adenosine A2A receptor

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Exploring the Role of the External Nose in Facial Aesthetics: An Anatomical Approach Towards Understanding Beauty Standards

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The external nose, as a central anatomical feature of the face, carries significant aesthetic
weight in the perception of facial harmony. The external structure of the nose, which is divided into nine aesthetic nasal subunits and six aesthetic nasal segments, presents a complex interplay of shapes and proportions that are critical to the overall appearance of the
Face. Given the significant role that the nose plays in facial aesthetics, it is important to understand how variations in nasal anatomy influence perceptions of beauty. The anatomical
complexity of the nose is highlighted by the division into upper bony, middle, and lower cartilaginous vaults, each supplied by the facial artery and contributing uniquely to its appearance. In the clinical or cosmetic evaluation of the external nose, palpation serves as a critical component, providing insight into underlying structural integrity and abnormalities that may not be immediately apparent through visual inspection alone. This tactile examination commences with an assessment of tip support, where the surgeon carefully applies pressure to determine the resilience and strength of the nasal tip, which plays a pivotal role in the overall appearance and function of the nose. In the meticulous analysis of the external nose, particularly when assessing the functional aspect, computer-assisted rhinomanometry has emerged as a critical tool. This paper aims to explore the anatomical features of the external nose and their relationship to beauty standards, with a particular focus on understanding how variations in nasal shape and size influence perceptions of beauty. By examining the key anatomical structures of the external nose, we can gain a deeper understanding of the factors that contribute to facial aesthetics and how these standards vary across different cultures.

Keywords: facial aesthetics, external nose, nasal aesthetics, rhinomanometry, augmentation rhinoplasty

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Anthropometric, Microscopic and Neuroimaging Markers of Somatization in Psychogenic Non-Epileptic Seizures

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Psychogenic non-epileptic seizures (PNES) are a complex condition, often associated with somatization and stress-related disorders. Understanding markers that characterize somatization in PNES may help in better diagnosis and management. This literature review aims to consolidate current knowledge regarding anthropometric, microscopic, and neuroimaging markers associated with somatization in PNES. The objective is to identify patterns that consistently occur across studies and guide future clinical practices and research. A systematic review of available literature was conducted, focusing on studies related to anthropometric indicators such as Body Mass Index (BMR) and Waist-Hip Ratio (WHR), microscopic findings including histopathological changes, and neuroimaging techniques such as functional Magnetic Resonance Imaging (fMRI) in PNES. Databases like PubMed, ScienceDirect, and Google Scholar were thoroughly searched for relevant articles published recently. Significant findings were highlighted across these domains. Anthropometric markers, such as elevated BMI and abnormal WHR, frequently appear in PNES patients. Microscopic studies also identified significant changes, although the findings vary.

Neuroimaging consistently shows altered activity in the prefrontal cortex and limbic system, areas implicated in emotion regulation. Integrating these markers provides a multidimensional understanding of somatization in PNES. Further research should focus on larger cohort studies to confirm these findings and explore their potential in personalized treatment strategies.

Keywords: PNES, somatization, anthropometric, microscopic, neuroimaging.

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Investigation on the Impact of Levonorgestrel Oral Administration on Adult Male Sprague-Dawley Rats

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Levonorgestrel, also known as the morning-after pill, is a first-line oral emergency contraceptive pill with approval from the World Health Organization to prevent pregnancy. It is FDA-approved to be used within 72 hours of unprotected sexual intercourse or when a presumed contraceptive failure has occurred. This study was carried out to determine the effect of levonorgestrel on the male reproductive system in adult Sprague-Dawley rat testes. A total of twenty adult male Sprague-Dawley rats (150 ± 30 g) divided into four groups (N = 5; A-D) were used. Group A, served as control, and Group B-D received 1, 2 and 4 ml of 1.5 mg/100ml of levonorgestrel orally respectively for 4 weeks. After this study, the animals were sacrificed, and their testes were harvested for histological observation. Blood samples were also taken for oxidative stress markers. There was a very slight significant increase in the mean levels of MDA and a significant decrease in the mean levels of CAT and SOD in the observed animals. The significant decrease in the hormonal milieu (FSH, LH, Testosterone) levels in all observed groups of levonorgestrel, strongly relates with the histological reports as seen in the photomicrographs in which a dose-dependent decline in spermatozoa content was observed in the seminiferous tubules. Based on the observation carried out in this study, levonorgestrel has an effect on the male reproductive system.

Keywords: levonorgestrel, infecundity, oxidative stress markers, reproductive hormones

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Oxidative and Neuroinflammatory Effects of Aqueous Extract of Soursop Seed on the Hypothalamo-Pancreatic Axis in an Aluminum Chloride-induced Alzheimer's Disease Wistar Rat Model

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Soursop (Annona muricata) is known for its medicinal properties, including antioxidant, anti-inflammatory, and neuroprotective effects. Soursop seed extract shows promise as a potential therapeutic agent for neurodegenerative disorders. Dysfunction of the pancreatic islet cells and impaired insulin signalling have been observed in individuals with AD, suggesting a link between metabolic disturbances and neurodegeneration. This study aimed to examine the effect of aqueous extract of soursop seed extract on the hypothalamo-pancreatic axis in an aluminium chloride-induced Alzheimer's disease rat model. Twenty adult Wistar rats, (180-220 g) were divided into five groups (n=5). Control (distilled water only), T1 (100mg/kg AlCl2/IP), T2 (200mg/kg Soursop extract only), T3 (100mg/kg AlCl2/p + 200mg/kg of soursop extract/orally), T4 (100mg/kg AlCl2/IP + 100mg/kg Donepezil). All administration lasted for 21 days. Analysis of inflammatory markers revealed a significant ($P < 0.05$) increase in TNF-α levels of animals in the T1 group compared to the Control group. There was a significant ($P<0.05$) increase in the MDA level of animals in T1 compared to the Control group. However, the SOD level of animals in the T1 group was significantly ($P < 0.05$) lower than the Control. The intervention groups; T3 and T4 show no significant change compared to the control group in TNF-α levels, MDA and SOD levels. Histological evaluations showed in the T1 group; cellular impairment in the islet of Langerhans of the pancreas, vacuolation and degeneration in the hypothalamic neurons but intervention groups T3 and T4 show normal histoarchitecture of these tissues. These findings suggest that soursop seed extract has significant therapeutic potential for Alzheimer's disease, modulating the hypothalamo-pancreatic axis, reducing inflammation, and alleviating oxidative stress.

Keywords: hypothalamo-pancreatic axis, soursop, aluminium chloride, Alzheimer’s disease, oxidative stress.

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Oxidative and Neuroinflammatory Effects of Aqueous Extract of Soursop Seed on the Hypothalamo-Pancreatic Axis in an Aluminum Chloride-induced Alzheimer's Disease Wistar Rat Model

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Increased Sperm DNA Damage in Sprague-Dawley Rats Exposed to Dextromethorphan as an Antitussive

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Male reproductive functions have been observed to be negatively impacted by the antitussive dextromethorphan (DM). It was also discovered that DM has an impact on micronutrients (such as zinc, calcium, and selenium) which are crucial for both capacitation and the acrosome reaction, which can result in infertility. Using Sprague-Dawley rats as models, we investigated the effects of quercetin and rutin on DM-induced toxicity in males about testicular DNA damage and apoptotic protein markers. For a period of 8 weeks, 80 male rats, weighing 150 ± 30 g, were utilized and split into four groups (A-D). Twenty animals were employed in each group. Group A served as control and received 1 ml of distilled water (DW), Groups B-D received 20, 40 and 80 mg/kg 0f DM respectively. Five animals were randomly selected and euthanized and their testes were harvested to measure DNA fragmentation using comet assay. To ascertain the rate of recovery, the remaining animals were then further subdivided into three groups (E–G). Group E received 1 ml of DW, Group F was given rutin (25 mg/kg), and Group G was given quercetin (50 mg/kg) for 8 weeks. Comparing DM-treated groups to control revealed a significant dose-dependent decrease in DNA fragmentation. When DM-treated and recovery-alone groups were contrasted with rutin and quercetin groups, an improvement in DNA was seen. Significant improvements in the parameters were observed when rutin and quercetin supplements were used, which may lessen the harmful effects of DM and enhance male fertility.

Keywords: **d**extromethorphan, DNA fragmentation, fertility, quercetin, rutin

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The Impact of Dextromethorphan on Pregnancy and its Outcomes in Experimental Models

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Over 125 over-the-counter cough and cold syrups include dextromethorphan, an antitussive. Numerous publications discuss how young individuals abuse and misuse antitussives. Using Sprague-Dawley rats as models we investigated the impact of dextromethorphan on pregnancy and its results. Our earlier study revealed the detrimental effects of dextromethorphan on the female reproductive system, which has led to this investigation. Twenty female Sprague-Dawley rats (155±20g) were used and split into four (A-D; N=5). As control group, Group A received 1 mL of distilled water. For a period of four weeks, groups B, C, and D were administered 20,40 and 80 mg/kg of Dextromethorphan. To determine fertility indices, animals from each group were exposed to proven males who were fertile at the conclusion of the treatment period. The 19th day of pregnancy was the day the female rats were euthanized. For histology and oxidative stress indicators, uteri and ovaries were removed. The obtained blood was kept in a hormonal environment. The comparison of the treatment groups with the control group revealed a noteworthy reduction in FSH, LH, Estrogen, and Progesterone. Levels of SOD, GSH, and CAT were significantly lower in treatment groups, but MDA levels in their ovaries and uteri were significantly higher. Pelvic congestion syndrome was indicated by histological plates that showed vascular congestion in the ovaries and congestion in the uterine lumen. Dextromethorphan may harm female ovaries and uteri in addition to having a deleterious impact on reproductive hormones.

Keywords: ovaries, dextromethorphan, uteri, reproduction, pregnancy

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Evaluation of the Effect of Orally Administered Piroxicam on the Hippocampus of Adult Sprague-Dawley Rats

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Studies have shown that some non-steroidal anti-inflammatory drugs (NSAIDs) can affect the hippocampus, a brain region crucial for memory and learning. Piroxicam is a widely used NSAID for providing relief from menstrual pain and associated symptoms in women with dysmenorrhea. Its potential effect on the hippocampus requires investigation. The objective was to determine the potential neurotoxic effect of piroxicam on the hippocampus of female rats using the Sprague–Dawley rats as models. A total of twenty adult female Wistar rats weighing 110 ± 20 g (n=20, A-D) were used. Group A was control, and B-D received 10, 20 and 40 mg/kg of Piroxicam orally respectively for 2 weeks. After this study, the rats were euthanized and their brain was harvested for histological observations. Blood samples were also taken for the analysis of the oxidative stress markers i.e. Superoxide Dismutase (SOD), Catalase (CAT) and malondialdehyde (MDA). The photomicrographs of the hippocampus of Group A-D showed a normal hippocampus with normal neuronal cells, the structural organization of the CA1- CA4 (sub-regions of the hippocampus) also appeared normal and the dentate gyrus appeared normal. There was a significant increase in MDA values in the hippocampus of piroxicam-treated rats compared to the control group ($p < 0.05$) and no significant decrease in SOD and CAT values. The study showed that piroxicam did not damage the structure of the hippocampus despite the induction of oxidative stress in the rats. These findings suggest a potential neuroprotective role for piroxicam in memory impairment scenarios.

Keywords: piroxicam, hippocampus, superoxide dismutase, malondialdehyde, catalase

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Chronic Stress-induced Neurodegenerative Changes in Wistar Rats: Hippocampal Evidence and the Mitigating Effects of *Allium sativum*

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Stress triggers a biological response perceiving a threat, chemicals and hormones surge throughout the body, after long-term exposure, stress accelerates cell ageing, immune senescence, and some age-related diseases such as neurodegenerative disorders and osteoporosis. This study investigated the possible effects of *Allium sativum* ethanolic extract on the hippocampus of chronic stress-induced neurodegenerative changes in male Wistar rats. Forty Wistar rats were grouped into eight of five (n=5). Group A - control group (no stress and treatment), Group B – 100 mg/kg of *Allium sativum* (No stress), Group C – 250 mg/kg of *Allium sativum* (No stress), Group D - 500 mg/kg *Allium sativum* (No stress), Group E - Stress alone + No treatment, Group F – 100 mg/kg of *Allium sativum (*Stressed), Group G – 250 mg/kg of *Allium sativum* 500 mg/kg of *Allium sativum* (stressed), all for 14 days. Animals were euthanized humanely and the (Stressed) and Group H - hippocampus was excised and fixed in 10% formalin solution for histological processing while the part used for biochemical assay (MDA, Glutamate, Acetylcholine, and Nitric Oxide) was homogenized in phosphate buffer before centrifugation. While Open Field Test and Forced Swimming Test was done before euthanized.

Chronic exposure of rats to stress elicited reduced body and brain weights, altered neurotransmitter levels and overall neurobehavioural functions, while also resulting in marked histomorphological distortions in the hippocampus pyramidal cells neuron. Interestingly, supplementation with *Allium sativum* significantly ($p<0.05$) mitigated biochemical (malondialdehyde, glutamate, acetylcholine, and nitric oxide), neurobehavioural, and aberrations. Notably, data obtained from this study showed that *Allium sativum* may be a very effective adaptogen in curtailing the deleterious neurodegenerative changes associated with chronic stress in rats.

Keywords: chronic stress, *Allium sativum*, hippocampus, neurodegeneration, adaptogen

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FMRFamide Mitigates MDMA/Tramadol-Induced Testicular Toxicity in Wistar Rat

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MDMA (3,4-methylenedioxymethamphetamine) and tramadol are central nervous system stimulants known for psychoactive effects. FMRFamide, an RFamide peptide isolated from molluscs, plays diverse roles in physiological processes. Mounting evidence has shown that drug abuse generates neural problems as well as impaired reproductive functions. This study aimed to evaluate FMRFamide's impact on testicular pathology induced by MDMA/tramadol toxicity in Wistar rats. Thirty male Wistar rats were divided into six groups (n=5). Group A served as the control while Group B received 2 mg/kg FMRFamide for two consecutive days. Groups C, D, and E received MDMA/tramadol (20 mg/kg) for ten days, while Group F received the same dosage along with FMRFamide. Sperm analysis, biochemical, and histological assessments were carried out to evaluate the impact of the treatments on reproductive health. The results revealed significant body weight loss, decreased sperm count and motility, and increased abnormal sperm formation. Additionally, there was reduced serum LH, FSH, and Testosterone levels. Inducible Nitric Oxide Synthase (iNOS) expression was intensified in Groups A, B, D, and F. Notably, FMRFamide administration attenuated the adverse effects of MDMA/tramadol-induced testicular toxicity, suggesting a potential therapeutic role in safeguarding male reproductive health. These findings highlight the importance of further exploring FMRFamide's protective mechanisms and its potential application in mitigating drug-induced reproductive toxicity.

Keywords: MDMA, tramadol, FMRFamide, testicular toxicity, sperm cells, reproductive health

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Relationship Between Upper Extremities Indices and Hand Grip Strength Among Students of College of Health Sciences, University of Ilorin

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Everyday activity constantly requires the use of hand muscles for tasks like holding, picking things up, and gripping. The ability to flex all finger joints vigorously while maintaining normal bio-mechanical capabilities is known as hand grip strength. This strength is not just a representation of physical capability; it serves as a versatile indicator that can be used to evaluate a range of health conditions and disorders. The study sought to explore the relationship between various upper extremity measurements and hand grip strength. The research was conducted at the College of Health Sciences, University of Ilorin, Nigeria involving 200 undergraduate students as research participants. The upper extremity indices: hand length (R/LHL), hand breadth (R/LHB), hand circumference (R/LHC), and mid-upper arm circumference (R/LMC), were measured using a measuring tape. Grip strength was assessed using an electronic dynamometer. The data was analyzed using the Statistical Package for Social Sciences (SPSS) version 25, the results were presented in tables, with continuous variables represented as mean, standard deviation, minimum, and maximum value. Regression analyses alongside Pearson's correlation coefficients were additionally conducted. The study identified a positive statistically significant correlation between upper extremity measurements and grip strength.

The correlation coefficients were as follows: RHL = 0.469, LHL= 0.508, RHB = 0.390, LHB = 0.353, RHC= 0.662, LHC = 0.625, RMC = 0.398, LMC = 0.286. These results suggest that measurements of the upper extremity are reliable predictors of hand grip strength.

Keywords: hand length, hand breadth, hand circumference, mid-upper arm circumference, hand grip.

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Effects of Vitamin D3 Supplementation on Ovarian Histomorphology, Hormonal Profile and Hypothalamic Inflammation in Letrozole-Induced PCOS in rats

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Polycystic ovarian syndrome (PCOS) is an endocrine disorder causing infertility in women of reproductive age, characterized by hyperandrogenemia and persistent anovulation. Most women with PCOS exhibit metabolic issues, though the underlying mechanisms remain unclear. Vitamin D deficiency, common in PCOS, may contribute to its pathology. Thus we investigated the effects of vitamin D3 supplementation on ovarian histomorphology, hormonal profile, and hypothalamic inflammation in a letrozole-induced PCOS rat model. Twenty Post Pubertal female Wistar rats weighing 75-135 g were randomly divided into four groups (n=5); Control, PCOS, PCOS+D3 (500 IU) and PCOS+D3 (1000 IU). The control group received drinking water. The PCOS rats model was developed through oral administration of 1.25 mg/kg of letrozole and 20% high-fructose drink for 30 days. PCOS +D3 group at 500IU received 1.25 mg/kg of letrozole, 20% high-fructose drink and 0.5mls/kg of vitamin D3 dissolved in 6.2 ml of DMSO, whereas the PCOS +D3 group at 1000IU received 1.25 mg/kg of letrozole, 20% high-fructose drink and 0.5mls/kg of vitamin D3 dissolved in 3.1 ml of DMSO. Hence, the treatment phase was done for 14 days. After 44 days, the animals were euthanized; blood samples were collected, and ovarian and brain tissues were collected for hormonal, histological and immunohistochemical analysis. The letrozole-induced PCOS group showed increased body weight and elevated testosterone, luteinizing hormone, and LH/FSH ratio compared to the control. Vitamin D3 supplementation at both 500 IU and 1000 IU reduced these levels and decreased the number of atretic and cystic follicles, while improving ovarian histomorphology, displaying distinct corpus luteum and antral follicles. Additionally, vitamin D3 enhanced hypothalamic Nissl body integrity, reduced IBA-1 expression, and improved parvalbumin-positive cells in the arcuate nucleus. Vitamin D3 supplementation, particularly at 500IU, was effective in mitigating the deleterious effects of PCOS, suggesting its potential benefits for human subjects with PCOS.

Keywords: PCOS, Vitamin D3, letrozole, arcuate nucleus.

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Relationship of Anthropometric Parameters and Menstrual Pattern Characteristics Among University of Ilorin Female Students

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Infertility is a life crisis affecting patients around the world and it is a major public health problem with major consequences. The menstrual cycle plays a crucial role in a woman's reproductive life as it may affect fertility. Menarche and menstrual pattern variations are frequent, therefore physical anthropometry offers metrics for tracking and assessing changes in development and maturation caused by hormones which affect the fertility of a woman. This study aimed to evaluate the relationship between some anthropometric parameters and menstrual pattern characteristics among University of Ilorin Female students. The study design was a cross-sectional study carried out on 530 University of Ilorin female students aged between 16 and 27 years by measuring their Height, Weight, Waist to Hip ratio, Chest circumference, Wrist circumference with standard instruments and information about their menstrual flow, colour of blood, volume of blood and age at menarche. Each readings were taken twice by the research assistant and researcher to ensure accuracy. Data were collected using a questionnaire containing Anthropometric parameters and Menstrual characteristics. Validity of data was done by double entry and random checks for errors and outlier values. Descriptive statistics, ANOVA and Chi-square analysis were used to analyse the data. $p<0.05$ was considered significant.

Available results showed that the BMI was inversely related to menarche, blood volume was directly related to BMI while menarche was inversely related to height. Anthropometric parameters affect the menstrual health and fertility of women within their reproductive age. Anthropometry can thus be used as a cheap way of explaining menstrual irregularity and ultimately fertility.

Keywords: anthropometric parameters, menstrual pattern, University students

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Investigating the studies of Saponin Rich Fraction from *Dioscorea Bubifera* Bulbis on the Doxorubicin Induced-Cardiotoxicity in Adult Male Wistar Rats

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This study was designed to investigate the effects of saponin-rich fraction (SRF) from *Dioscorea bulbifera* bulbis on doxorubicin-induced-cardiotoxicity in adult male Wistar rats. Forty-eight healthy adult male Wistar rats were used for this research. The rats were randomly assigned into 8 groups (n=6). Rats in group A were administered distilled water for 14 days, group B received doxorubicin (10 mg/kg/b.w, *i.p.* daily) for 14 days to induce cardiotoxicity while, groups C and D were administered 50 mg kg^{-1} and 100 mg kg^{-1} of SRF, respectively for 14 days. Groups E and F rats were administered concomitantly 10 mg/kg of doxorubicin and SRF with doses of 50 mg kg^{-1} and 100 mg kg^{-1}, respectively for 14 days. Rats in groups G and H were administered 50 mg kg^{-1} and 100 mg kg^{-1}, respectively for 14 days before the administration of doxorubicin on day 15 and were allowed a recovery period of 14 days. The rats were sacrificed and the heart tissue was harvested and stored in sample bottles containing 10% neutral buffered formalin for histological and immunohistochemical studies. Statistical differences were examined by one-way ANOVA, followed by the student Newan-Keuls (SNK) test for multiple comparisons.

The percentage weight change of rats in group B (-20.33 ± 0.58 g) was significantly lower ($F = 212.1$; $p < 0.0001$) than the control group (18.13 ± 0.95 g), groups C and D (14.57 ± 0.37 g and 15.21 ± 0.22 g, respectively). The control rats showed normal regular arrangement with clear striations of myocardial fibres. Myocardial lesions and immunoreactivities were significantly high in group B when compared with the control and across the groups. The study concluded that *Dioscorea Bulbifera* was able to reverse doxorubicin-induced cardiotoxicity in rats.

Keywords: saponin, doxorubicin, bulbis, microanatomical, *Dioscorea bulbifera*, rich fraction

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Lesser Trochanter Morphometry: A Novel Morphological Classification System

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The desired goal of every orthopaedic procedure is restoration of normal limb anatomy, limb function and prevention of rotational mal-alignment and this can be predicted using the lesser trochanter (LT) on the femur. LT morphology has attracted the attention of anthropologists as it shows geographical and racial variations. There is no unified morphological classification system for LT in literature and information on LT morphology in Nigerians is scanty. This study aimed to fill this gap. We also aimed to develop a morphological classification system with groups I, II, III, and IV representing oval, round, triangular, shield-like and irregular LT shapes respectively and Subgroups a, b, c representing absent groove, shallow groove and deep groove. Using 100 dry adult femurs, the lesser trochanter height (LTH), lesser trochanter width (LTW), LT-Fovea distance (LT-F) and "Greater to lesser trochanter (GT-LT) distance" were measured with digital Vernier calliper. The LT shape and the presence of a retrotrochanteric groove were noted. The Mean LTH, LTW, LT-F and GT-LT were 1.42 ± 0.32 cm, 2.15±0.39 cm, 7.2 ± 0.75cm and 6.03 ± 0.76 cm respectively. We observed a groove behind the LT in 85 femurs (85%): shallow in 63 and deep in 22 specimens. The LT shapes observed were oval (54%), round (19%) triangular (5%), shield-like (21%) and irregular (1%). Following our novel classification system, class Ib was the most frequent (35%), followed by class IVb (16%) while classes IIIa, IIb, Vb & Vc were absent. The various LT shapes are a reflection of varying patterns, force and direction of pull exerted by ligaments in the course of pre- and post-natal development, which depends on human occupational activities. The introduction of a unified morphological classification system provides a common standard for comparing the LT morphology in different populations.

Keywords: Lesser-trochanter, classification, morphometry, femur.

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Evaluation of the Effects of 3, 4 – Methylenedioxymethamphetamine (MDMA) on Body/Organ Weight and Reproductive Hormones in Adult Female Wistar Rats

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Reproductive health, influenced by hormones, is crucial for offspring production. While substance abuse has been traditionally associated with males, its effects on females, particularly through drugs like MDMA (a synthetic psychoactive), remain underexplored. This study aimed to evaluate the effects of MDMA on body/organ weight and reproductive hormones in adult female Wistar rats. Thirty healthy female Wistar rats were divided into three groups: Group A (control), Group B (80 mg/kg), and Group C (160 mg/kg), each with 10 rats. Statistical analysis was performed using SPSS ($p < 0.05$ considered significant). Group C showed severe body weight loss, while Group B had a significant reduction in ovarian weight. No significant changes in uterine weight were observed. Group B showed a significant decrease in the ovarian-somatic index, but no changes in the uterine-somatic index. Hormonal analysis revealed a significant decrease in LH in both groups B and C. Group B had elevated progesterone, while Group C showed increased estradiol. Testosterone levels decreased significantly in Group B but increased in Group C. Pregnancy success was 100% in Group A, 20% in Group B, and 0% in Group C. MDMA negatively affects body and ovarian weight, alters LH and sex hormones (progesterone, estradiol, and testosterone), and impairs fertility in female Wistar rats.

Keywords: MDMA, female fertility, reproductive hormones, Wistar rats

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Protective Effects of Alpha-Tocopherol Against Propoxur-induced Hepatotoxicity via Xanthine Oxidase-mediated Oxidative Stress in Adult Male Wistar Rats

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The widespread use of pesticides like propoxur has raised concerns over its potential toxic effects, particularly on the liver. It is known to induce hepatotoxicity through oxidative stress mechanisms involving the enzyme xanthine oxidase, leading to increased reactive oxygen species (ROS). Alpha-tocopherol; a well-established antioxidant may offer protective effects against oxidative stress. This study investigates the potential of alpha-tocopherol to mitigate propoxur-induced hepatotoxicity by targeting XO-mediated oxidative stress in adult male Wistar rats. **T**wenty adult male Wistar rats were randomly divided into four groups: a control group receiving no treatment, a propoxur-only group administered propoxur (3 ppm propoxur), an alpha-tocopherol-only group receiving alpha-tocopherol (100 mg/kg/BW) and a propoxur plus alpha-tocopherol group receiving propoxur (3 ppm propoxur) and alpha-tocopherol (100 mg/kg/BW). Hepatotoxicity was assessed through serum biomarkers (alanine aminotransferase (ALT) and aspartate aminotransferase (AST), alkaline phosphate (ALP) and liver tissue analysis. XO activity, oxidative stress markers; malondialdehyde, superoxide dismutase, reactive oxygen species (ROS) and histological changes were also evaluated. Propoxur exposure caused increased serum ALT and AST levels, indicating liver damage. Histopathological examination revealed necrosis and inflammation. Elevated oxidative stress markers were observed in the propoxur-only group. Co-treatment with alpha-tocopherol reduced ALT and AST levels, decreased oxidative stress markers, and improved liver histology. Alpha-tocopherol demonstrates substantial protective effects against propoxur-induced hepatotoxicity in adult male Wistar rats. These effects are likely due to the inhibition of XO activity and the consequent reduction in oxidative stress. This study underscores the potential of alpha-tocopherol as a therapeutic agent for mitigating pesticide-induced liver damage and highlights the importance of antioxidant strategies in protecting against environmental toxins.

Keywords: **propoxur, carbamate, oxidative stress, Vitamin E, antioxidant, pesticide toxicity.**

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Assessment of Sexual Risk Profile of Adolescents and Young Persons in an Urban Community in Edo State, Nigeria

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HIV/AIDS remains a critical global health issue, especially for adolescents and young people. In Nigeria, the HIV prevalence among adults aged 15 to 49 was 1.4% in 2019, highlighting the need for effective youth-focused prevention strategies. This study evaluates the risky sexual profiles of adolescents in Edo State to inform better policies and educational programs. The study aimed to assess the sexual risk profile of adolescents and young persons in an urban community, in Edo State. A cross-sectional survey with 792 adolescents from Edo State was conducted using multi-stage and stratified sampling. Data were collected through a structured, pre-tested questionnaire and analyzed with SPSS version 22.0, applying a 95% confidence interval and a 5% margin of error. With a 93.2% response rate, the study found high HIV/AIDS awareness but significant gaps in prevention knowledge. Many sexually active adolescents did not use condoms consistently, were inconsistent in refusing sex without condoms, and had multiple partners. Despite 96.0% awareness, 76.5% had never been tested for HIV, with 1.4% of tested individuals showing reactive results. While adolescents in Edo State have general HIV/AIDS awareness, there are critical gaps in prevention knowledge and risky behaviours. Targeted educational programs and policy reforms are needed to address these issues and reduce HIV risk.

Keywords: HIV/AIDS, adolescents, young persons, risky sexual behaviours

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Investigating *the Effects of Chasmanthera dependens on Liver and Blood* in a Simulated Iron Overload Model

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Natural iron-chelating agents from plants offer a promising alternative to synthetic chelators with potentially fewer side effects. Phytochemical analysis of methanol leaf extract of *Chasmanthera dependens* (MLECD) confirmed the presence of antioxidants with metal-chelating properties, but its use as a plant-based iron-chelating agent had not been explored. This study investigated the effects of *Chasmanthera dependens* on the liver and blood in an iron overload model. Twenty-five adult Wistar rats were randomly assigned into five groups (A-E). Group A received distilled water, Group B was administered 2 mg/kg of iron chloride ($FeCl_2$), and Groups C, D, and E were given 2 mg/kg of $FeCl_2$ along with 200, 400, or 800mg/kg of MLECD, respectively, for twenty-eight days. After the experiment, blood was analyzed for full blood count, liver function, and ferritin levels, while liver tissues were examined histologically via H&E staining techniques. Results showed that serum ferritin levels were elevated, and liver weight decreased in the iron-overloaded group. Histological analysis revealed perivascular inflammatory infiltrates, portal vascular congestion, ulceration, and Kupffer cell activation in iron overloaded group with restored liver histoarchitecture in the 800 mg/kg MLECD group. In comparison to the FeCl2-only group, MLECD-supplemented groups had significantly higher alkaline phosphatase (ALP) levels, especially at 200 mg/kg (533.0 ± 66.48) and 400 mg/kg (430.7 ± 91.85), suggesting increased liver activity. Aspartate aminotransferase (AST) and alanine aminotransferase (ALT) levels were generally lower in the MLECD groups, with AST decreasing significantly at 800 mg/kg (142.0 ± 9.01) compared to the FeCl2-only group (163.7 ± 6.89), indicating improved liver health. In blood count tests, MLECD supplementation at 800mg/kg significantly increased white blood cell count (11.95 ± 0.97) and improved haemoglobin and hematocrit levels compared to the FeCl2-only group. Ferritin concentrations also increased at higher MLECD doses, indicating enhanced iron storage. The study concludes that MLECD prevented excessive iron deposits in hepatic and haematological tissues.

Keywords: Iron Overload, *Chasmanthera dependens*, Liver Protection, Wistar Rats

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Dominant Traits of the Cheek and Tongue in North Central Nigeria

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Cheek dimples (small indentations on the cheeks) and tongue rolling (the ability to fold the tongue) are dominant genetic traits observed in humans. Investigating these traits provides valuable insights into genetic inheritance patterns and their cultural significance across various populations. This study aimed to assess the prevalence and ecological implications of dominant traits like cheek dimples and tongue rolling in individuals across Kwara, Kogi, and Niger states. A simple random sampling technique was used to select 348 North-Central Nigerians, including 231 males and 117 females aged 16 to 30. Data were collected on the presence or absence of cheek dimples, tongue rolling, and tongue-twisting, and analyzed using Statistical Package for Social Science (SPSS). A chi-square test was carried out with a confidence interval of ±0.5 at a 95% confidence level. Results indicated that 33% of participants had dimples, with 57% having dimples on both cheeks, 15% on the right cheek, and 35% on the left. Additionally, 48.3% of participants had parents with dimples. For tongue rolling, 66.7% of participants could roll their tongues, with 52.6%, 46.6%, 41.4%, and 53.7% able to twist their tongues to the right, left, and both directions and shape their tongues into a U, respectively. These findings offer insights into the prevalence and variability of these traits within the population.

Keywords: cheek dimples, tongue rolling, dominant genetic traits, prevalence, ecological implication

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Effects of Methanolic Extract of *Persea Americana* Pulp (Avocado Pear) in the Ovary and Ovarian Cycle of Mature Female Albino Wistar Rats

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Persea americana may be useful in the management of female reproductive hormonal-related health issues thereby causing a positive alteration in the female hormonal profile. The purpose of this study was to determine the effect of the methanolic extract of *Persea americana* pulp on the ovaries and ovarian cycle of adult female albino Wistar rats. 20 mature female albino rats with regular ovarian cycle, weighing 150-250 g were divided into 4 groups of 5 animals, each group received; Group 1 (control) received 5mg/kg body weight of distilled water, while Group 2, Group 3 and Group 4 received 380mg/kg, 760 mg/kg and 1,140 mg/kg body weight of methanolic extract of *P. americana* pulp respectively. Administration was intraperitoneally beginning at the proestrous phase for 12 days with concomitant examination of the estrous cycle which continued for 12 days post administration of the extract, followed by sacrifice. Blood was collected for analyses of estradiol, LH, FSH and progesterone levels while ovarian, liver and kidney weights were measured and subsequently histological analysis of the ovary. Dosages were obtained from the acute toxicity studies performed according to the Up and Down method. There was a gradual decrease in weight gain with increasing dosages. The increase in kidney, lung, liver, and heart weight was not significant. The concentrations of estradiol, LH and FSH increased while that of progesterone reduced. The frequency of the proestrus and metaestrus phases reduced while the estrous and diaestrus phases were increased though not significant. Histologic analysis revealed normal histo-architecture across all groups with folliculogenesis in middle and high-dose groups. Methanolic extract of *P. americana* pulp could enhance folliculogenesis and ovulation.

Keywords: estrous cycle, fertility, ovulation, *Persea americana*, reproductive hormones

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Effect of Methanolic Extract of Garlic (*Allium Sativum)* on Fertility of Stress-induced Female Wistar Rats

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Garlic may be useful in the management of stress-related health issues and it is also suggested to have beneficial effects on the female reproductive system. The purpose of this study was to determine the effect of the methanolic extract of *Allium sativum* on the fertility and ovarian profile of stressed and non-stressed mature female albino Wistar rats. A total of 36 adult female albino rats with regular ovarian cycles, weighing 150-250g were divided into 6 groups of 6 animals. Stress was induced using restrain and confirmed with changes in cortisol concentrations. Group 1 (control) received distilled water. Group 2 was subjected to stress and given distilled water daily for 21 days (RS + distilled water). Group 3 was subjected to stress daily for 21 days before the administration of 200 mg/kg of the extract (RS + 200 mg/kg). Groups 4, 5 and 6 were not stressed but received the extract at graded doses of 200 mg/kg, 400 mg/kg and 600 mg/kg respectively. Administrations were done orally beginning at the proestrus phase for 21 days. At the end of the administration, 3 rats from each group were sacrificed through the perfusion method. The ovaries were harvested, processed and stained with hematoxylin and eosin while blood was collected for analyses of estradiol, LH, FSH, progesterone and cortisol. The other 3 rats from each group were mated with a proven fertile male rat; two females to one male. Microscopy of the ovary showed normal histo-architecture in the control group and a haemorrhagic vacuolated ovarian stroma with reduced mature follicles across the experimental groups. Concentrations of LH, and FSH, in all experimental groups significantly increased while progesterone decreased in all. Estrogen decreased except in groups 5 and 6. The number of pups delivered was not significant. Although the marker of stress in the experimental animals was reduced, there was no change in fertility.

Keywords: stress, fertility, garlic, cortisol, reproductive hormones, *Allium sativum*

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Evaluation of Femoral Parameters in Nigerian Population Sample

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Femoral parameters exhibit geographic variability; hence, population-specific analyses are important. This study aimed to estimate standard femur parameters for the Nigerian population.

Fifty-three dried human femurs (26 right femurs, 27 left femurs) were obtained from the skeletal archive of the Department of Anatomy, University of Ibadan. Each parameter; Maximal Length of the Femur (MLF), Length of the Subtrochanteric Apical Axis (LSAA), Latero-Medial Diameter of the Femoral Head (LMDF), Sub-Capital Diameter from the Superior-Inferior Diameter of the Femur (SCi), Mid-Cervical Diameter from the Superior-Inferior Diameter of the Femur (MCi), Basilar Diameter from the Superior-Inferior Diameter of the Femur (BSi), Sub-Capital Diameter from the Anterior-Posterior Diameter of the Femur (SCii), Mid-Cervical Diameter from the Anterior-Posterior Diameter of the Femur (MCii), Basilar Diameter from Anterior-Posterior Diameter of the Femur (BSii), Angle of Inclination (AOI), Angle of declination (AOD), Epicondyle Breadth (EB), Depth of Lateral Condyle (DLC), Depth of Medial Condyle (DMC), Intertrochanteric Crest Length (ICL), Femoral Neck Length (FNL), and Femoral Neck Circumference (FNC) were measured with a digital sliding Vernier caliper and a goniometer.

Descriptive analysis was calculated, paired Student's t-test was used to compare the mean right and left values, and Pearson correlation was used to test the relationship between the variables. Analysis was done with GraphPad Prism 8, and statistical significance was considered at $p \leq 0.05$.

The right femur parameters have overall higher mean values except in MLF, SCii, and AOD. MLF, SCii, AOD, LMDF, SCi, MCii, and DMC were statistically significant. A strong positive correlation exists between the MLF, LSAA, SCii, and ICL on the left femur. The understanding of the variation pattern of these parameters may aid in the treatment outcomes in the use of implants, limb lengthening procedures and femoral fractures in the Nigerian population.

Keywords: femur, bilateral parameter comparison, identity, Nigerian population

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Aqueous Extract of *Terminalia catappa* (linn) leaves Ameliorates Paracetamol-induced Oxidative Stress and Histological Alteration in the Liver of Adult Male Wistar Rat

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Paracetamol, the most commonly sold over-the-counter antipyretic and analgesic, is generally considered harmless at therapeutic doses. However, its overdose causes oxidative stress and inflammation that results in severe and sometimes fatal hepatic damage. The leaves of *Terminalia catappa* have been reported to possess vital antioxidant and anti-inflammatory properties that may offer hepatoprotective effects. The study aimed to investigate the ameliorative effect of aqueous extract of *Terminalia catappa* leaves on paracetamol-induced oxidative stress and histological alteration in the liver of adult male Wistar rats. Twenty-five Wistar rats (150 g) were randomly divided into four groups of five rats each. Group 1 received 2 ml/kg of distilled water while groups II, III and IV received 2 mg/kg of paracetamol on day 1. Group II received (25 mg/kg) Silymarin for 14 days while groups III and IV received 50 mg/kg and 100 mg/kg of aqueous extract of *Terminalia catappa* respectively for 14 days. At the end of the experiment, the animals were euthanized using 75 mg/kg Ketamine injection intraperitoneally and blood samples were collected via cardiac puncture. The liver tissues were harvested, fixed and processed for demonstration of the histoarchitectural evaluation of the liver using hematoxylin and Eosin stain, periodic acid-Schiff stain and Masson's trichrome stain Blood samples were collected for liver function test The results showed a significant decrease in ALT, ALP, and AST levels in Groups II, III and IV compared to Group I. Histological findings showed disorientation of the histoarchitecture of the liver evident by distortion in the hepatocytes, congestion in the central vein and vacuolation in group IV when compared to group I, II and III with group II and III appearing relatively normal compared to group I. The aqueous extract of *Terminalia catappa* leaves confers an ameliorative effect on paracetamol-induced oxidative stress and histological alterations in the liver of male Wistar rats.

Keywords: phytochemicals, paracetamol, histoarchitecture, ameliorate

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Ameliorative Effect of Vitamin A on The Histomophology of Kidney of Cadmuim Chloride-exposed Male Albino Rats

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Cadmium chloride is a non-essential element with no known physiological function. When released into the environment it is extremely toxic to both plants and animals. Vitamin A is an effective antioxidant, being a fat-soluble vitamin involved in toxins and free radicals removal from the body, acceleration of physical development, and inflammation reduction by fighting the free radicals. This study aims to investigate the ameliorative effect of vitamin A on the histomorphology of the kidney of cadmium chloride-exposed male albino rats. Twenty rats were randomly divided into four groups with five animals in each group. The animals weighing 120-150 g were used for the experiment. Group 1 (control) was fed with feed and water *ad libitum* for 28 days. Group 2 received 10 mg/kg b.w. of cadmium chloride, group 3 received 357.14 iu/kg b.w of vitamin A and Group 4 received 10 mg/kg b.w of cadmium salt plus 357.14 iu/kg b.w of vitamin A all for 28 days, orally using an orogastric tube. At the termination of the experiment, animals were sacrificed by chloroform inhalation and the kidney was dissected out, fixed in 10% buffered formalin, processed and stained with Haematoxylin and Eosin. Histologically, the control group showed normal cyto-architecture. Rats in group 2 had enlarged Bowman's space, degenerating and eroded glomeruli. Rats in group 3 showed normal renal tubules and glomeruli with capsular space. Rats from group 4 had eroded and recovered glomeruli and normal Bowman's capsule and space. In the haematological analysis, there was a significant change in the concentration of haemoglobin only when compared to those of control. The findings of this study reveal that cadmium chloride exposure has an adverse effect on the kidney of the experimental animals, but no significant effect on the weight of the kidney.

Keywords: cadmium chloride, kidney, vitamin A, glomeruli, antioxidant

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Assessing the Hepatotoxic Effects of Prolonged Artemether-Lumefantrine (Amatem Forte) Use: A Histological and Biochemical Study on Adult Wistar Rats

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Artemisinin-based Combination Therapy (ACT) is the current standard treatment for uncomplicated malaria caused by *Plasmodium falciparum*. This study reports the histological and biochemical effects of Amatem Forte tablets on the liver of adult Wistar rats. Twenty (24) adult male Wistar rats were randomly selected into a control group (group A), and three treatment groups (B, C and D) each containing six (6) rats. Group A, received normal rat feed and water. Group B and C received 0.8 mg/kg and 1.6 mg/kg body weight of the drug respectively three days a week while group D received 5 mg of normal saline as a vehicle group. The experimental period was for 6 weeks and the body weight of animals was taken weekly. At the end of the experiment, the rats were sacrificed under chloroform anaesthesia. Blood samples and liver organs were collected from the left ventricle for Liver Function Test and histological processing respectively. The results of the study recorded no significant change ($P>0.05$) in the body weight of experimental groups compared to control. There was also no significant difference in AST and ALT levels in the treatment groups compared to control. Elevated ALP level was observed in both groups that were administered with Amatem Forte but none showed a significant increase in ALP levels compared to control. Histological reports on the Liver showed marked dilatation of the portal vein, thinness and rupture of the vasculature, periportal haemorrhage, sinusoidal congestion and activation of Kupffer cells which were worse with the high-dose treatment. The results showed that high-dose use of Amatem Forte could be toxic to the Liver, hence its indiscriminate use should be discouraged, but with strict compliance to doctor's prescription.

Keywords: *Plasmodium falciparum*, antimalaria, artemether-lumefantrine, liver toxicity

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Neuroprotective Effect of Omega-3 fish oil on Sleep Deprivation- Induced Biochemical and Histological alteration in the CA1 region of the Hippocampus of Male Wistar Rats

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Sleep deprivation leads to an increase in oxidative stress and inflammatory activities in the brain potentially resulting in neurodegenerative diseases such as Alzheimer's and dementia which places a financial burden on our economy and healthcare system. Omega-3 fish oil has been reported to elicit vital antioxidant and anti-inflammatory activities. This study evaluated the neuroprotective effect of omega-3 fish oil on sleep deprivation-induced biochemical and histological alteration in the CA1 region of the hippocampus of male Wistar rats. Thirty male Wistar rats were randomly divided into five groups of six rats each. Group I received 2 ml/kg distilled water, and Group II, III IV, and V were sleep-deprived for 18 hours daily for 21 days using a modified multiple-platform method. Additionally, groups III, IV, and V received 100 mg/kg, 200 mg/kg, and 400 mg/kg of omega-3 fish oil orally. On day 22, the animals were euthanised using 75 mg/kg of ketamine hydrochloride intraperitoneally and blood was obtained via cardiac puncture. The hippocampus tissues were processed to demonstrate the general histoarchitecture of the CA1 and Nissl substance expression using Hematoxylin and Eosin and Cresyl Fast Violet stains respectively. Blood serum was used for the assessment of corticosterone using an assay kit. The result revealed increased serum corticosterone level, decreased Nissl substance staining intensity and histopathological changes such as pyknosis, karyorrhexis and cytoplasmic vacuolation in the CA1 region of Wistar rats in group II when compared to group I and group IV. Whereas, no significant difference was observed in group IV when compared to group I. A notable improvement in histoarchitecture of the CA1 region was observed in groups III, IV and V when compared to group II. Omega-3 fish oil possesses neuroprotective potentials against sleep deprivation-induced biochemical and histological alteration in the CA1 region of Wistar rats.

Keywords: hippocampus, omega-3, sleep deprivation, neuroprotective

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Double Femoral Artery in the Right Lower Limb of Cadaveric Specimen: Anatomical Case Report

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In a single male cadaver, an anatomical variation was found in the femoral artery of the lower limb during routine gross anatomy dissection of 200-level undergraduate students in the Department of Nursing, McPherson University Nigeria in June 2022. In the right lower limb of the cadaver, there were double femoral arteries, arising from the external iliac artery which are 2 cm apart at their point of origin. They continue down the anterior part of the thigh run through the adductor canal and terminate at the adductor magnus called the adductor hiatus. The two femoral arteries give separate branches and their branches are not doubled, the profunda femoris artery is anteriorly then the medial and lateral circumflex femoral arteries posteriorly. However, the two femoral arteries appear lateral and medial to the femoral vein i.e. the femoral vein in the middle all found within the femoral sheath. The femoral nerve runs through the psoas major muscle and then traverses laterally to the distal part of the psoas major muscle, moreover, the profunda femoris artery, medial and lateral circumflex femoral arteries arose directly from the femoral artery and wrap around the anterior, lateral side of the femur, supplying some of the muscles on the lateral aspect of the thigh with the medial circumflex femoral artery to supply the head and neck of the femur. This is a rare case report among the previously reported vessel variations seen in the human cadaveric specimen because only one femoral artery is present in every individual which arises directly from the external iliac artery. This case report will augment our knowledge of gross and surgical anatomy and physical medicine because of the role the femoral artery plays in the lower extremities.

Keywords: double femoral artery, cadaver, external iliac

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Modulatory Effects of Vitamin E Intervention on Seizure Severity and Motor Cortex Integrity in Cypermetrine-Pentylenetetrazole-Induced Epilepsy Rats

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Epilepsy is a neurological disorder characterized by recurrent seizures, often associated with neurotoxicity from environmental contaminants including agricultural pesticides. Affecting around 50 million people globally, epilepsy remains a major health burden despite the availability of numerous antiepileptic drugs (AEDs), with management outcomes still unsatisfactory. Exposure to Pentylenetetrazole (PTZ) and cypermethrin has been shown to cause neuroinflammation, oxidative stress, and seizures, leading to impaired motor function. This study aimed to evaluate the potential benefits of vitamin E supplementation as an adjunct therapy in rats exposed to PTZ and cypermethrin. Eighty adult male Wistar rats were divided into eight groups. The control group (Group 1) received normal saline orally; Group 2 animals were given Pentylenetrazole (PTZ) intraperitoneally; Group 3 animals received Cypermethrin (CPM) intraperitoneally; Group 4 received PTZ+CPM intraperitoneally; Group 5 received PTZ+CPM+Valproate (VAP) orally and intraperitoneally; Group 6 received PTZ+CPM+Vitamin-E (VIT. E) orally and intraperitoneally; Group 7 received PTZ+CPM+VAP+VIT. E orally and intraperitoneally, and Group 8 received PTZ+VIT. E orally and intraperitoneally. After 10 days of treatment, seizure severity, locomotor, and exploratory behaviour were assessed. The brains were then analyzed using immunohistochemistry and biochemical markers for neuroinflammation and oxidative stress. Results indicated that PTZ and cypermethrin exposure significantly increased the expression of GFAP and IbA1, markers of neuroinflammation, while decreasing glutathione (GSH) and parvalbumin levels, suggesting oxidative stress and neuronal damage. Seizure activity and motor impairment were also observed. However, vitamin E and sodium valproate supplementation reduced neuroinflammatory markers (IL-1β, Nrf-2, and IbA1), increased GSH and parvalbumin, decreased seizure activity, and improved motor function. This research finds that vitamin E supplementation (in combination with standard anti-epileptic drugs) could be a potential therapeutic strategy for mitigating the harmful effects of PTZ and cypermetrine exposure, and possibly other seizure disorders.

Keywords: pentylenetetrazole, cypermetrine, neuroinflammation, oxidative stress, vitamin E

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Reversal of Phenylhydrazine-induced Anaemia in Wistar Rats by *Telfairia occidentalis* Leaf

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Anaemia is a medical condition characterized by a decrease in the number of red blood cells or the amount of haemoglobin in the blood, leading to inadequate oxygen delivery to tissues and organs. *Telfairia occidentalis* leaf is widely cultivated and known to have medicinal properties that could impact positively on the management of anaemia. The ameliorative effect of the leaves of *Telfairia occidentalis* leaf in Phenylhydrazine-induced anaemia in Wistar rats was investigated in the pancreas. Thirty female Wistar rats were used for this study they were divided into five equal groups. Group A was the control, Group B had phenylhydrazine only, Group C had the 100 mg/kg B.W dose of the extract only, Group D had phenylhydrazine and 100 mg/kg B.W dose of the extract and Group E received phenylhydrazine with 200 mg/kg B.W dose of extract for 28 days. Subsequently, blood samples were collected via intraocular venous plexus puncture for haematological analysis (complete blood count). The results revealed a significant decrease in red blood cell count, haemoglobin, and packed cell volume (PCV) levels in group B compared to A, while groups C, D and E had a significant increase in the red blood cell, haemoglobin and PCV levels compared to group B. Also, a significant decrease in the mean corpuscular volume (MCV) and mean corpuscular haemoglobin (MCH) levels in group B compared to A, while groups C, D and E had significantly higher levels compared to group B. The mean corpuscular haemoglobin concentration (MCHC) result indicated a significant increase in group B compared to A, while groups C, D and E had a significant decrease compared to group B. The haematological profile showed *Telfairia occidentalis* reversed the phenylhydrazine-induced anaemia in Wistar rats.

Keywords: pancreas, *Telfairia occidentalis*, Wistar rats, phenylhydrazine, anaemia

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Neuroprotective effects of Ginkgo biloba Extract on Bilateral Common Carotid Artery Ischaemic Stroke Induced in Wistar Rat

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Stroke is one of the most prevalent vascular diseases in the world and has persistently ranked as the third leading cause of death globally over the past few decades (WHO). Ginkgo biloba extract (GBE) contains flavonoids and ginkgolides making it a promising anti-oxidative natural product. The aim was to evaluate the neuroprotective effects of GBE on the hippocampus and cerebrum of Wistar rats with acute ischaemia induced by the bilateral common carotid artery occlusion (BCCAO). Thirty adult male Wistar rats were randomly assigned to 5 study groups (n=6) and acclimatized in clean cages for a week. Group A, received Normal saline, Group B received GBE only, Group C had BCCAO only, Group D received GBE presurgery, and Group E received GBE postsurgery. The safe oral GBE daily dose of 100 mg/kg/day was administered for 14 days. 2 rats shared 1 capsule per day at an average weight of 200 g. Giloba, the soft gel capsule used, was manufactured by Mega Life Sciences Nigeria Ltd.: NAFDAC Reg. No. A7-0404L. After adequate anaesthesia at 80-100 mg/kg of intraperitoneal Ketamine, BCCAO was performed with 3/o silk suture ligation. Reperfusion was allowed after 30 minutes. Analgesia and antibiotic prophylaxis were with intramuscular paracetamol injection and topical penicillin cream. Neurobehavioral changes in spatial exploration were assessed using the Y-Maze toolkit. On day 21, from the onset of acclimatization, the rats were sacrificed by gentle cervical dislocation under mild anaesthesia and the whole brain was harvested for histomorphological studies. GBE offered neuroprotection as evidenced by remarkably fewer pyknotic cells and perineuronal vacuolations in the brain tissue with prophylactic effect being more pronounced than therapeutic action. It also boosted spatial working memory in the rats.

Keywords: stroke, ischaemia, neuroprotection, ginkgo, carotid, Wistar

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Colour Deconvolution of Immunohistochemical Adrenocorticotropic Hormone Antibody-stained Adrenal Tissue of One-humped Camel Subjected to Pre-Slaughter Stress

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Quantitative histological imaging integrates microscopy and computational techniques to analyse biomedical and diagnostic pathology specimens. This study investigates the application of colour deconvolution to immunohistochemically (IHC) stained adrenal tissues of twenty (20) one-humped camels (*Camelus dromedarius*), divided into stressed and non-stressed groups sourced from camels transported 320 km from Garin Alkali, International Cattle Market in Yobe State via Hadejia Road to Kano Main Abattoir, Nigeria, between March 28, 2022, and May 23, 2022. The camels were transported via truck with a stocking density of 200–400 kg/m² and induced physical stress through food and water restriction, forceful loading, and overcrowding. Twelve (12) camels, as the stressed group, were slaughtered immediately upon arrival in the morning, while eight (8) were allowed to rest for more than three days before slaughter, as the rested group. All camels were healthy. Adrenal glands (both left and right) were collected for analysis. Image analysis was performed using Fiji (also known as ImageJ2), a new version of the widely-used ImageJ software. Both visual observation and quantitative analysis using the colour deconvolution plugin in Fiji were employed to analyse the ACTH antibody-stained adrenal tissue. Visual observation revealed that the stressed camels exhibited more intense 3,3′-diaminobenzidine (DAB) chromogen reactions than the rested group. Quantitatively, ANOVA was used to compare the mean area concentrations of DAB, hematoxylin, and eosin (H&E) stains, showing that DAB had the highest concentration and most prominent area coverage. Additionally, an independent Student's t-test demonstrated that the stressed camels had a significantly higher mean percentage area of DAB staining (75.57 ± 2.17) than the rested camels (63.02 ± 4.90). This objective analysis using colour deconvolution provides greater precision and reproducibility than traditional visual assessments, highlighting its potential for broader histology and biomedical research applications.

Keywords: colour deconvolution, one-humped camel, pre-slaughter stress, ACTH, Adrenal

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Ameliorative Effects of Aqueous Extract of *Bryophyllum pinnatum* in Lead Acetate-induced Neurotoxicity on the Cerebellum of Adult Wistar Rats

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Bryophyllum pinnatum (BP) reported several biological activities some of which could authenticate the plant's traditional uses including, immunomodulatory, CNS depressant, analgesic, anti-inflammatory, antimicrobial, antitumor, antiulcer, insecticidal, antidiabetic, anticonvulsant, antioxidant, and antihypertensive properties. This study aimed to investigate the effects of lead acetate-induced neuronal toxicity of the cerebellar cortex of adult Wistar rats and the protective potentials of aqueous extract of *Bryophyllum pinnatum*. Sixteen adult male Wistar rats, (180-220 g) were divided into five groups (n=5): control (distilled water only), T1(0.075 mg/kg lead acetate + Distilled water/orally), T2 (100 mg/kg BP/orally), T3 (0.075 mg/kg lead acetate + 100 mg/kg BP/orally). All treatment lasted for 2 weeks. Following the treatment period, the animals were weighed, recorded, and sacrificed by perfusion method. The brains were removed and processed for light microscopy examination. The result showed a significant reduction ($P < 0.05$) in the mean weight of animals in the T1 group compared to the T3 group. Light microscopic examination showed shrunken Purkinje cells with ill-defined nuclei with ratified cytoplasm. The granular cells also showed vacuolated cytoplasm of animals in the T1 group. Animals in the T3 group demonstrated normal neuronal histoarchitecture of the cerebellum compared to animals in the T1 group. Lead administration caused morphological alteration in the neuronal cells in the cerebellum, but co-administration of Pb and B. *pinnatum* resulted in amelioration of these effects to a great extent.

Keywords: *Bryophylum pinnatum*, lead acetate, cerebellum, neurotoxicity

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Biological Impact of Mobile Communication Radio-Frequency Signal Exposure on Murine Model

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Mobile phones have become an integral part of our daily lives in recent years and they are now an important means of communication. The radio-frequency (RF) signal from the mobile communication could be absorbed by human body depending on the intensity, wavelength, polarization and duration of exposure. Therefore, this necessitates the need to study the effects of RF signal exposure from a telecommunication mast harboring multiple telecommunication networks. Three groups of rats were exposed to varying distances of 15 m, 25 m and 50 m with corresponding RF signal strength of 51.58 mw/m^2, 22.71 mw/m^2 and 4.52 mw/m^2 respectively. Six rats were sacrificed from each cage at the interval of 2 weeks, 1 month, 2 months, 3 months and 4 months. One group containing six rats was kept at the animal house with near zero (o) RF signal intensity and served as an experimental control. Histoarchitecture of selected tissues such as testes, thyroid and the ovaries were mildly affected when the rats were exposed to various distances at different time-points, suggesting some degree of infertility and hyperactivity among the rats. TM radiation emitted by various telecommunication mast and the RF signal intensity was found to be a function of different distances. The study indicated altered levels of antioxidant enzymes activity, thus generating considerable level of oxidative stress in rats resulting in prolong and persistent stress that may lead to organ damage. There was no observable DNA damage across all the samples at different time points. We recommend quantitative DNA fragmentation assay using flow-cytometry for effective analysis.

Keywords: electromagnetic radiation, radio-frequency, histopathology, oxidative stress, DNA damage

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