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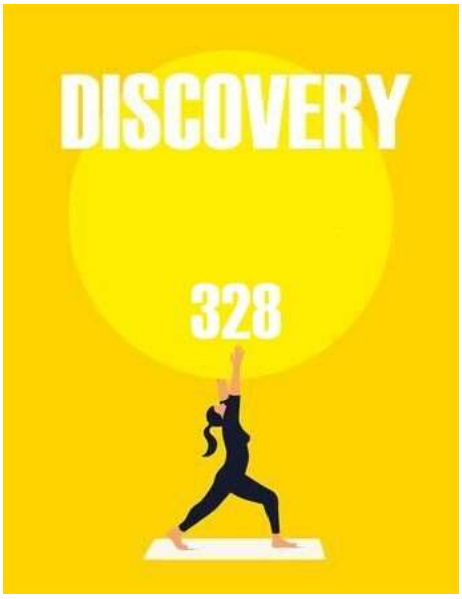
DISCOVERY

About the Cover



Ayurveda, the science of life is being practiced in India for thousands of years is the world's first well organized health science that has sound scientific and philosophical basis. The scientific-spiritual discipline of yoga is an effective and time-tested method for improving our health as well as prevention and management of diseases. Obesity is a common but serious health problem in the present scenario. The prevalence of obesity is rising to epidemic proportions at an alarming rate in both developed and developing countries. In this intervention study it was observed that there was a strong effect of Surya anuloma viloma pranayama on body mass index. 2 groups A & B are randomly selected and group A practices both surya anuloma villoma pranayama and 2 yoga asanas (Vajrasana and pavanamuktasana). Group B practices only the mentioned yoga asanas. By doing surya anuloma viloma pranayama the breathing occurs only through the right nostril and only the pingala nadi is activated. The pingala nadi stimulation increases the sympathetic activity in the body which in turn increases the basal metabolic rate. On the basis of analysis, it was seen that the body mass index decreased in both the groups and the change in BMI is more significant in the group A; the group which was subjected to the surya anuloma viloma pranayama. The Change in respiratory rate was also significant and the respiratory rate increased in Group A and decreased in group B. In this study the added-on effect of surya anuloma villoma pranayama on BMI is compared with other conventional yoga asanas. The relevance of the study is that by this simple pranayama technique we can control our body weight even in the office room during the busy schedule. (Ref: Krishna Kumar V, Anoop AK, Nithya AK, Visakh V. An intervention study to assess the effect of Surya anuloma viloma pranayama on Body Mass Index (BMI). Discovery 2023; 59: e49d1047).

Semen characteristics of rabbits fed camel's foot (Piliostigma thonningii) essential oil supplemented diet

Anaso EU, Olafadehan OA, Chibuogwu IC

This study aimed to investigate whether the inclusive administration of *Piliostigma thonningii* essential oil (PEO) in rabbit's diet was beneficial to their general reproductive traits. Forty-five clinically healthy weaned male Dutch rabbits of about five weeks of age were used for the experiment. The rabbits were divided into three treatment groups (T1, T2 and T3), with fifteen rabbits per group and balanced for their BW such that rabbits in each group had similar average initial BW of 0.27 ± 0.02. The experimental rabbits were administered PEO at 0, 2 and 4 mL/kg for treatments 1, 2 and 3 respectively. The semen colour was same (creamy) and semen pH was 7.00 for T1, T2 and T3. The values for ejaculatory volume varied from 0.53 to 1.03 ml with T3 having the highest value and T1 with the lowest value ($P < 0.05$). Values for semen concentration varied between 128.53 to 219.66 (x 10_6/ml) having the lowest value in T3 ($P < 0.05$) and T2 and T3 having similar values ($P > 0.05$). Values for sperm motility varied between 68.33 to 90.00% with T3 having the highest value and T1 with the lowest value ($P < 0.05$).

Discovery, 2023, 59, e36d1037

Morphological effect of surface modified, nanoflower and nanotube zinc oxide catalysts for biodiesel production

Kamaluddeen Suleiman Kabo, Abdul Rahim Yacob, Muhammad Suleiman Darma, Bello Oluwasesan Michael, Ikechukwu Ogadimma Alisi, Abdu Muhammad Bello

Biodiesel is an alternative biofuel that could help to reduce the use of fossil fuels and protect the environment. However, its production is still challenged by catalyst development, evaluation and process optimization. In this research, surface modified nanoparticles (SM-ZnO), nanoflowers (NF-ZnO) and nanotubes (NT-ZnO) Zinc oxide catalysts were developed and used in the methanolysis production of biodiesel from rice bran oil (RBO) without any doping at catalyst loading of 3.7%, methanol to oil ratio 1:9, temperature of 65oC and reaction time 180 mins. Catalysts were characterized by field emission scanning microscopy (FESEM), X-ray powder diffraction (XRD), Fourier transform Infra-red (FTIR) and basic concentration back titration analyses and biodiesel yield was calculated using NMR analysis. Results obtained show that the nanoparticles were successfully prepared from direct precipitation, nanoflowers and nanotubes through hydrothermal method without the use of any surfactant or templating agent. Moreover, the results of transesterification activity of the nano structured compounds showed that commercially available ZnO has biodiesel yield of 8.37%, nanoparticles 35.34%, nanoflowers 34.27% and nanotubes 42.35%. Thus, the above structure modifications helped in the preparation of new transesterification catalysts with increased activity in comparison to commercial one, the best being nanotubes which demonstrated highest biodiesel conversion and suitability for use at lower reaction conditions.

Discovery, 2023, 59, e37d1036

Effect of Hyptis suaveolens prevalence on pasture availability for cattle production in the selected derived and rainforest agro-ecological zones of Nigeria

Eniola PO, Jimoh AR, Babatunde KM, Ayandele Bukola

Availability of adequate feeds for Cattle production results in increased income and reduce disease infections. Thus, the study examined the effect of Hyptis suaveolens on feed availability for Cattle production in the selected derived savannah and rainforest agro-ecological zones of Nigeria. Multi-stage sampling procedure was used to select 20% of Cattle herders from the population of 950 (190) from the derived savannah and 413 (83) from the rainforest zone to give 273 as sample size. The findings reveal that the mean age of the respondents were 42 years, mostly male and married. Majority (87.9%) of them had free range as source of feeding their Cattle while, Hyptis suaveolens greatly prevented proliferation of pastures, increased the cost of keeping Cattle and forced their Cattle to eat the tender parts of Hyptis spp as reported in the derived savannah zone by 74.7%, 73.7% & 86.3% respectively. Burning of bush (86.3%) and use of herbicides (86.3%) were used as coping strategies by Cattle herders to suppress proliferation of Hyptis spp. Average proportion of respondents in the rainforest zone affirmed that pastures were adequately available for Cattle production while 70.0% in the derived savannah zone stated that pastures were not adequately available for Cattle. Significant differences existed between the effect of Hyptis spp on Cattle production in the two zones examined ($P < 0.05$) and adequacy of pastures availability for Cattle in the two zones ($P < 0.05$). Campaign against bush burning should be encouraged while pasture seeds should be adequately provided for the Cattle herders until intensive system of keeping Cattle are embraced.

Discovery, 2023, 59, e38d1038

Urban flooding and waste disposal nexus: Challenges and implication for property ownership in third world nations

Peres Ofori

The study examined the indiscriminate disposal of waste in Ghana relative to the flooding and devaluation of properties in urban Kumasi and Tamale. Adopting the waste management theory coupled with survey design, the study investigated the types of waste produced in these cities. Using SPSS, the regression was utilized to analyse the relationship between proximity to flooding and flood prone areas and residential rental values. In both Kumasi and Tamale no tenant was willing to pay higher rent for a house located at a flooding or flood prone area irrespective of the architectural designs. An R of 0.54 and a P value 0.0000 at 0.5 significant level indicating a fairly strong relationship between the two variables tested. The study found it dangerous for an

emerging city like Ghana to have higher percentage (82%) of households practicing open dumping as the favourite method of waste disposal and treatment.

Discovery, 2023, 59, e39d1039

Modified novel family of log exponential estimators utilizing auxiliary attributes

Mojeed Abiodun Yunusa, Awwal Adejumobi, Ahmed Audu

In this paper, we implied a modified novel family of log-exponential ratio estimators for the estimation of the population mean of the variable of interest in the presence of auxiliary attribute. We acquire the biases and mean square errors (MSEs) of the suggested estimators as well as the efficiency conditions for which the proposed estimators are more efficient theoretically. Empirical study was conducted using two datasets and the results revealed that the proposed estimators are more efficient.

Discovery, 2023, 59, e40d1041

An enhanced variance estimator with power transformation

Awwal Djambi, Mojeed Abiodun Yunusa

In this study, we propose an enhanced variance estimator with power transformation to estimate the population variance of the study variable. The properties (Bias and Mean Square Error) of the proposed estimator were derived up to the first order of approximation using the Taylor series technique. The conditions for the proposed estimator to be better than existing related estimators are established. The empirical study was conducted using two natural populations and the result revealed that the proposed estimator is more efficient.

Discovery, 2023, 59, e41d1042

Assessment of the nutritional compositions of selected commercial fish feeds in Nigeria

Jibrin Mohammed, Jibrin Isah, Kabiru SM, Ahmed AO, Usman A

Manufactured feeds are an important part of modern commercial fish farming which provide the balanced nutrition needed by the fish. However, this study assessed the proximate and mineral compositions of three different selected commercial fish feeds (Top, Aqua boom and Sirsigwe feeds). Proximate analysis was carried out using standard analytical procedures. The mineral compositions were determined using Atomic Absorption Spectrophotometer (AAS) and Flame Photometer. Results for the proximate analysis revealed that Aqua boom feed recorded highest percent moisture (9.52%), crude protein (23.78%) and fiber contents (1.076%) among the feed samples while Sirsigwe feed sample was found to be highest in ash (5.67%) and crude fat contents (6.35%). The results for the mineral compositions showed that Sirsigwe feed recorded the highest content of essential minerals such as K (1.62 mg/kg), Mg (1.02 mg/kg) and Ca (5.11 mg/kg) while concentration of Na (1.91 mg/kg) was highest in Aqua boom feed among the feed samples. From the results obtained, the feed samples could as serve good sources of nutrients for fishes and therefore suitable for commercial fish farming.

Discovery, 2023, 59, e42d1044

Control of Fusarium wilt disease of tomato (Solanum lycopersicum. L) using magnesium oxide nanoparticles

Shittu HO, Igiehon E

Fusarium wilt is one of the most damaging fungal diseases of plants in the world, causing significant yield loss. Control measures such as cultural, biological, physical and chemical methods have their limitations. Hence, there is a need to explore nanotechnology, a field of science concerned with the manipulation of nanoparticles (NPs), which has found widespread application in different fields. The in vivo study results revealed that the tomato plants treated with magnesium oxide (MgO) nanoparticles had better growth performance with higher chlorophyll content (4.63 mg/L) compared to the control (0.67 mg/L) after 30 days of post-inoculation (DPI). Compared to the untreated control, tomato plants treated with magnesium oxide nanoparticles had a significant decrease in the percentage disease incidence, with 10% in tomato plants treated with MgO nanoparticles and 100% in the untreated control, respectively, after 30 days of post-inoculation. The research has demonstrated that the Fusarium wilt disease of tomato plants can be controlled using MgO nanoparticles.

Discovery, 2023, 59, e43d1045

Microbiological safety assessment of two types of locally made cheese sold in Malete, Kwara State

Adedayo Majekodunmi Racheal, Shittu Bushola Rukayya, Hammed Bukola C

Cheese is a protein rich food with high nutritional benefits. Fulani cheese is a dairy product derived from milk that is produced in a wide range of flavors, textures and forms by coagulation of the milk protein while soy cheese is derived from the coagulation of soya beans milk. The study assesses the microbiological safety of Fulani and soy cheese sold in Malete, Kwara State. The cheese samples were purchased from local sellers in Malete village. Microbial isolation was done through serial dilution and pour plate technique; colonies obtained were identified morphologically and biochemically. The identified bacterial isolates were *Salmonella*, *Enterobacter*, *Serratia*, *Klebsiella*, *Citrobacter*, *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas* and *Proteus* sp while the fungal isolates were *Penicillium*, *Rhodotorula*, *Aspergillus* and *Fusarium* spp. *Staphylococcus aureus* had the highest percentage of occurrence in both cheese samples, followed by *Salmonella* and *Klebsiella* species. Most of the bacterial isolates are human pathogenic organisms. The

fungal isolated are known food spoilage agents with potential of releasing mycotoxins in food. It was concluded that both Fulani and Soy bean cheese sold in Malete village are contaminated heavily and could pose health threat to consumer.

Discovery, 2023, 59, e44d1046

Geo-electrical mapping of contaminant plume in some open dumpsites using electrical resistivity tomography in Maiduguri metropolis, Northeastern Nigeria

Shuwa ZA, Kamale HI, Ibrahim Y

Groundwater has been the main source of water for domestic and other uses, these uses are under threat as a result of anthropogenic activities that is poor waste disposal practice. Contamination of groundwater under and near waste disposal sites happens as a result of infiltration of contaminants through the soil. Pollutants are aqueous liquid called leachate. Leachates are formed when rain falls on dump, sinks into the waste and picks up contaminants as it seeps downwards. Some wastes dumped at the dumpsite over the years are expected to have biodegraded and generated leachate which could have become a point source of pollutant into the soil and groundwater. 2D resistivity imaging survey (tomography survey) was used in the 8 dumpsites to map out the leachate plumes. Three zones of varying resistivity contrast were delineated, the zone of low resistivity interpreted as leachate plumes and decaying waste materials, the zone of moderate resistivity interpreted as sand and clay and high resistivity zone representing dry sand.

Discovery, 2023, 59, e45d1049

SOCIAL SCIENCE

Victory through the ballots or violence to victory? An assessment of electoral violence in post-independence Nigeria

Egobueze Anthony

This paper investigated electoral violence in post-independence Nigeria and held that the most accepted means of changing government is through elections. The importance attached to elections globally suggests that its successful conduct is critical to the advancement of democracy. However, in Nigeria and many advancing democracies, elections rather being won through the ballots have been manipulated by some political elites and their cronies, leading to violence of all sorts. This paper therefore assesses the historicity of electoral violence in Nigeria from independence to date. Methodologically, data was sourced through secondary sources and analyzed through content analysis. The paper observed weak institution, desire of the elites to control the polity for economic advantage and mass poverty as the reasons for electoral violence in Nigeria and recommended the implementation of Justice Uwais Electoral Panel Report, amongst others as key panacea to curbing the violence.

Discovery, 2023, 59, e46d1040

Post pandemic recovery and demographic transformation in Nigeria: A review of policy and alternatives

James Ege Agena, Efeurhobo Davis Ochuko

We conducted a multilevel review of most recent data from Nigeria's Center for Diseases and Control (NCDC) (2021) and Nigeria's Demographic and Health Surveys (NDHS) data from the 2003, 2008, 2013, 2018, 2020 and 2021 in relation to the question regarding post pandemic recovery. Findings suggest that trends in demographic transformation have been a missing policy agenda in post pandemic recovery. To fill this gap, the study made policy recommendations and proposes a demographic transformation model as alternative policy frame for post pandemic recovery and possible mitigation of new wave of COVID-19 outbreak.

Discovery, 2023, 59, e47d1048

MEDICINE

Vitamin C and E protect against brain and liver injury caused by a high dose aspartame in mice

Omar ME Abdel Salam, Nermeen Shaffie

Aspartame is a widely used artificial sweetener that was shown to increase brain lipid peroxidation in mice. In the present study the effect administering a high dose of aspartame either alone or in conjunction with vitamin C (Vit. C) or vitamin E (Vit. E) on mouse brain and liver tissue was examined using biochemical and histological methods. Aspartame was given intraperitoneally (i.p.) at the dose 80 mg/kg, alone or in combination with Vit. C (25 mg/kg) or Vit. E (25 mg/kg) once daily for four weeks. Nitric oxide, reduced glutathione and malondialdehyde (lipid peroxidation) were assessed as oxidative stress biomarkers. Haematoxylin and eosin staining was utilised for histological examinations and immunostaining for cleaved caspase-3 was performed to detect signs of cellular apoptosis. Results showed that malondialdehyde and nitric oxide levels in brain and liver tissue significantly increased whilst reduced glutathione levels decreased when aspartame was given at a dose of 40 mg/kg. Histopathological examinations showed cellular infiltration, darkened neuronal nuclei and enhanced caspase-3 immunostaining, all of which indicated that these cells were undergoing apoptosis. Many hepatocytes in the liver displayed apoptosis and vacuolar degeneration and numerous cells had positive caspase-3 immunostaining. Giving vitamins C and E to aspartame-treated mice significantly reduced oxidative stress, histopathological abnormalities and apoptosis in the brain and liver. These results imply that high dosages

of the artificial sweetener aspartame may be linked to oxidative stress-mediated brain and liver cell injury, which is treatable with antioxidant vitamins C and E.

Discovery, 2023, 59, e48d1043

An intervention study to assess the effect of Surya anuloma viloma pranayama on Body Mass Index (BMI)

Krishna Kumar V, Anoop AK, Nithya AK, Visakh V

Ayurveda, the science of life is being practiced in India for thousands of years is the world's first well organized health science that has sound scientific and philosophical basis. The scientific-spiritual discipline of yoga is an effective and time-tested method for improving our health as well as prevention and management of diseases. Obesity is a common but serious health problem in the present scenario. The prevalence of obesity is rising to epidemic proportions at an alarming rate in both developed and developing countries. In this intervention study it was observed that there was a strong effect of Surya anuloma viloma pranayama on body mass index. 2 groups A & B are randomly selected and group A practices both surya anuloma villoma pranayama and 2 yoga asanas (Vajrasana and pavanamuktasana). Group B practices only the mentioned yoga asanas. By doing surya anuloma viloma pranayama the breathing occurs only through the right nostril and only the pingala nadi is activated. The pingala nadi stimulation increases the sympathetic activity in the body which in turn increases the basal metabolic rate. On the basis of analysis, it was seen that the body mass index decreased in both the groups and the change in BMI is more significant in the group A; the group which was subjected to the surya anuloma viloma pranayama. The Change in respiratory rate was also significant and the respiratory rate increased in Group A and decreased in group B. In this study the added-on effect of surya anuloma villoma pranayama on BMI is compared with other conventional yoga asanas. The relevance of the study is that by this simple pranayama technique we can control our body weight even in the office room during the busy schedule.

Discovery, 2023, 59, e49d1047

Problems of teenage pregnancy among Magar and Dalit community

Lalmani Acharya

This study is conducted on teenage pregnancy and its effects on their health status. The major focus of this research is to determine the causes of teenage pregnancy among the Magar and Dalit communities in Tribeni Rural Municipality Ward No. 7, Rukum, as well as its effects and socioeconomic aspects. This study is based on descriptive research design. This study was based on primary and secondary source of data. The population of this study was the total number of married women of Tribeni Rural Municipality. Only 50 Magar and 50 Dalit married pregnant women were selected by using the purposive sampling method. In this study information had been collected with the help of interview schedule. After collection of data the quantitative information presented in the form of table percentage and figure. The major findings of this study were the main factors of teenage pregnancy were said that Magar respondents 42 percent to help household work and 38 percent were said Dalit respondents. Similarly, Magar women are 28 percent traditional concept 18 percent lack of education, 12 percent poverty and in Dalit 26 percent traditional concept, 2 percent lack of education 14 percent poverty cause of teenage pregnancy. 20 percent Magar respondents they had got a problem of early birth, 30 percent still both, 8 percent death after birth and among Dalit respondents they had got a problem of 16 percent early still birth 24 death after birth.

Discovery, 2023, 59, e50d1050