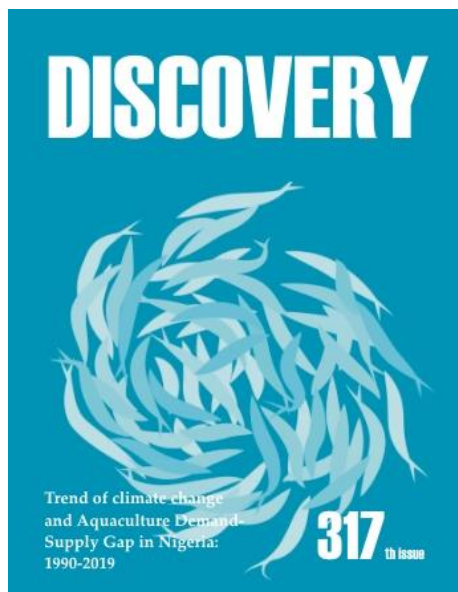


# DISCOVERY

## About the Cover



The study considered the trend of climate change and demand-supply gap of aquaculture in Nigeria and the role of climate change. The specific objectives were to: describe the trend of demand-supply gap and climate change (humidity, rainfall and temperature) in Nigeria; the study used time series data spanning from 1990-2019. Data on aquaculture demand and supply were collected from the Federal Department of Fisheries. Data on rainfall and temperature were collected from FAO. Humidity data were collected from NiMet. Data for this study were analysed using descriptive statistics such as mean, percentages and trend graphs. The result revealed that the demand-supply gap ranged between 862,653 and 1,892,944 with a mean of 1,427,795 tonnes. The latter represents a demand-supply gap of 92.53 percent on the average. Rainfall ranged between 1046mm and 1596 mm with a mean of 1273.95mm Humidity ranged between 78.4 and 85.00 percent with a mean of 81.27 percent while temperature ranged between 26.18°C and 27.85°C with a mean of 27.30°C during the time period. The KPSS test for unit root indicated that all the variables are integrated of order one and can be stationary at first difference (Ref: Adaji DU. Trend of climate change and Aquaculture Demand-Supply Gap in Nigeria: 1990-2019. *Discovery*, 2022, 58(317), 378-384).

### Trend of climate change and Aquaculture Demand-Supply Gap in Nigeria: 1990-2019

Adaji Daniel Unekwuajo

The study considered the trend of climate change and demand-supply gap of aquaculture in Nigeria and the role of climate change. The specific objectives were to: describe the trend of demand-supply gap and climate change (humidity, rainfall and temperature) in Nigeria; the study used time series data spanning from 1990-2019. Data on aquaculture demand and supply were collected from the Federal Department of Fisheries. Data on rainfall and temperature were collected from FAO. Humidity data were collected from NiMet. Data for this study were analysed using descriptive statistics such as mean, percentages and trend graphs. The result revealed that the demand-supply gap ranged between 862,653 and 1,892,944 with a mean of 1,427,795 tonnes. The latter represents a demand-supply gap of 92.53 percent on the average. Rainfall ranged between 1046mm and 1596 mm with a mean of 1273.95mm. Humidity ranged between 78.4 and 85.00 percent with a mean of 81.27 percent while temperature ranged between 26.18°C and 27.85°C with a mean of 27.30°C during the time period. The KPSS test for unit root indicated that all the variables are integrated of order one and can be stationary at first difference.

*Discovery*, 2022, 58(317), 378-384

### Zoogeography and Diversity of Endemic Pill-Millipedes in the Southern Hemisphere (Sphaerotheriida: Diplopoda)

Cheviri N. Ambarish, Kandikere R. Sridhar

Millipedes are globally distributed most diversified soil fauna on the earth. Currently estimated species richness of Diplopoda is over 80,000, they are mainly confined to the tropical and subtropical regions. Pill-millipedes are of Gondwanan origin with large-bodied detritus feeders feeding on a variety of litter and surviving up to 12 years. There is little recent study on their phylogeny even though research on pill-millipedes is centenary old. The phylogenetic analysis revealed that pill-millipedes originated in the Pre-Jurassic era and they are microendemic in distribution. It is suggested that the richness of the litter strata in tropical or subtropical habitats helped the succession of pill-millipedes since Pre-Jurassic periods. Their microendemic nature and slow-moving nature severely hindered their distribution. They are under threat owing to human activities like deforestation and unconventional agricultural practices. Faunistic records showed many species are extinct and more emphasis should be focused on their conservation. Conservation of pill-millipedes is the need of the hour and connecting patchy forests, agricultural lands and reserve forests for conservation. The present review encompasses a general account of millipedes with diversity, phylogeny, distribution, endemism and conservation of pill-millipedes.

*Discovery*, 2022, 58(317), 385-398

### Bee-pollination in *Crotalaria laburnifolia*, *Crotalaria medicaginea*, *Crotalaria retusa* and *Crotalaria verrucosa* and *C. retusa* as a source of alkaloids for nymphalid butterflies

Sravan Kumar S, Lakshminarayana G, Umamaheswara Rao G, Solomon Raju AJ, Ch. Prasada Rao, Venkata Ramana K

*Crotalaria laburnifolia*, *C. medicaginea*, *C. retusa* and *C. verrucosa* species occur throughout the year in wet habitats but prolific growth occurs during wet season only. *C. laburnifolia*, *C. retusa* and *C. verrucosa* are large-flowered while *C. medicaginea* is small-flowered. The flowers of all species are bisexual with typical papilionaceous corolla which is golden-yellow in *C. laburnifolia*, *C. medicaginea* and *C. retusa*, and bluish-white with dark purple lines in the center of the standard petal in *C. verrucosa*. The ovary has a single carpel in *C. laburnifolia*, *C. medicaginea* and *C. retusa* but in *C. verrucosa*, the ovary has 2 or 3 apocarpous ovaries. In all four *Crotalaria* species, the flowers are protandrous, nectariferous with brush type pollination mechanism and bee-pollinated. *C. retusa* is used as alkaloid source by nymphalid butterflies, *Tirumala limniace* and *Danaus chrysippus*, the former collects alkaloids from the stem and leaf petioles while the latter from the sepals. These butterflies use alkaloids for protection against their predators and for the biosynthesis of pheromones to attract mates. The alkaloid collection activity by nymphalids indirectly controls the proliferation of *C. retusa* in natural or disturbed habitats.

*Discovery*, 2022, 58(317), 399-408

### Social perceptions on the problems and impacts of exotic tree plantation in private land at Sakhipur, Tangail, Bangladesh

Md. Mijanur Rahman, Saleh Ahammad Khan

This study was carried out to investigate the social impacts of monoculture of exotic tree species *Acacia auriculiformis*, *Eucalyptus camadulensis* and *Swietenia macrophylla* of the local people in Sakhipur area of Tangail district. Data were collected from thirty woodlots plots of exotic tree species which were located in private land at Sakhipur through rigorous field visits. Local peoples were found to be interested to plant fast growing exotic timber species to meet their immediate financial demand within a short period. In order to meet the immediate financial demand within a short period, the local peoples were found to be interested to plant fast growing exotic timber species in the study area. In Sakhipur and its adjacent areas, the monoculture of exotic species have a promising prospect and also seems financially profitable for the short-term projects, but if the long-term perspectives are considered then ultimately it is not economically viable and not so appropriate to ensure conservation of biodiversity and ecosystem. It is reported during the questionnaire survey that, the villagers and tree growers depicted some problems of the exotic species, such as the trees of exotic species had a low number of twigs and leaves that not decompose after falling on the ground, they absorb more ground water than other trees hardly grow under them; they allow minimum collection of fuel wood; and growth

of crops is slow under the exotic trees plots etc. It is concluded by the study that, the monoculture of exotic tree species should be discouraged for afforestation or reforestation but might be operational in some fellow, degraded or specified lands. Sakhipur of Tangail district is one of the areas that harbor massive plantations of exotic tree species. Therefore, Sakhipur of Tangail district is an appropriate area for conducting a social study on exotic tree plantation. Considering the facts mentioned above and other resources limitation, it is evident that still there is a large scope of studying social impacts exotic tree species plantation in the study areas.

*Discovery*, 2022, 58(317), 409-422

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#### **A Review on Soil Nutrients Monitoring with IoT**

Ghaniya Rashid, Abdillahi Salim

In today's world, food scarcity is exacerbated not only by rising population, but also by soil infertility, which results in crop failure. Soil fertility declines after harvesting, necessitating the use of fertilizers to enhance soil fertility and increase nutrients. However, most farmers apply it by hand, resulting in over- or under-fertilization, which alters the soil because it must be used in moderation. We offer a suggestion of using an Internet of Things (IoT) for monitoring and checking the nutrients level in the study because soil nutrients boost productivity, yields, and crop health. Macro and micronutrients, soil PH, temperature, humidity, soil wetness, and sensors for insect repellent and deficiency detection will all be monitored by the system.

*Discovery*, 2022, 58(317), 423-427

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#### **Bioactive Potential of Cow Urine from two Indigenous Cattle Breeds of Southern India**

Kodandoor Sharathchandra, Devadiga G. Anitha, Shirankallu Soumya, Kandikere R. Sridhar

Cow urine is one of the important components of ancient ethnic medicine in the Indian subcontinent. Native cow urine is highly valuable owing to its diet consisting of wild plant species. The composition of urine depends on the cow breed as well as its diet. In Ayurveda, cow urine is used in three forms (raw, sterile and photo-activated urine). All these urine types are endowed with a variety of biochemical components with potent bioactivities. Among the urine of two cow breeds tested (Kasargod Dwarf and Deoni), all types of urine of Deoni possess a higher quantity of total phenolics and tannins, while flavonoid content was higher in Kasargod Dwarf. The ferrous ion-chelation capacity and DPPH radical scavenging activity were higher in all urine samples of Deoni, while the total antioxidant activity was higher in Kasargod Dwarf. Photo-activated urine samples showed the highest antibacterial as well as antifungal activity with minimum inhibition concentration. This study contributes toward the validation of cow urine as a potential source of bioactive compounds and opens up new ways for its applications in human medicine.

*Discovery*, 2022, 58(317), 428-440

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#### **Variation in water quality indices of sachet water brands consumed in Kaduna State: consumers' perceptions**

Udeme Udeme Udokpoh, Zuwaira Salihu Abubakar, Amina Bashir Yakasi

The purpose of this study was to evaluate the quality of selected sachet water brands consumed in Kaduna South Local Government Area (LGA). Twenty sachet water samples were collected from the ten most popular brands consumed by residents. The American Public Health Organization (APHA) and the American Society for Testing and Materials (ASTM) standard procedures were used to analyse 18 water quality indicators. The findings were compared to water quality criteria established by the Nigerian Standard for Drinking Water Quality (NSDWQ) and World Health Organisation (WHO). The results of the studies show that, of the eighteen (18) water quality parameters tested, only pH exceeded the allowable limit in portable water as recommended by NSDWQ and WHO. Since pH has no substantial detrimental influence on human health, the water brands are safe to drink. However, the recent epidemic of waterborne infections in area is not linked to the use of sachet water from brands that have NAFDAC, manufacturing, and expiration dates. It is thus advised that further research be conducted in the study area to analyse the quality of sachet water brands that are not NAFDAC-approved, as well as manufacturing and expiration dates.

*Discovery*, 2022, 58(317), 441-452

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### **SOCIAL SCIENCE**

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#### **Information and Communication Technology and Quality of Products of Food Manufacturing Firms: Case of South-South Nigeria**

ANOWOR Oluchukwu F, ANIGBO Godwin C, CHIBUZO Anthony Chinedu, OGWURU Hycenth OR

There is a growing appreciation of the consequence of Information and Communication Technology (ICT) in the day-to-day activities of man. Theoretical and empirical postulations view ICT as both a means and an end for development. This paper therefore sets out in investigating the effects of Information and Communication Technology on the quality of products of food manufacturing firms with South-South region of Nigeria as case study. Questionnaire was designed using Likert's scale of five-point to elicit information from 3750 respondents. The dependent variable is the quality of product of the food manufacturing firms which were measured by perception of respondents. The independent variables are tools of ICT (Computers, Internet, Television and Radio, Video and Audio devices, Social-media). The result with  $R^2$  of 0.823 revealed a significant coefficient of determination as such the independent variables explained about 82 percent of the variation in the dependent variable. F-calculated (100.175) is greater than the F-tabulated (2.8786) which means that the overall estimate has a good fit and also implies that the independent

variables are simultaneously significant. The study concludes that there exists significant-positive relationship between ICT and quality of product of the food manufacturing firms. Hence, maintenance of quality also means setting standards via ICT which will serve as guideline in the assurance of protection and safety of consumers in addition to improving future processing.

*Discovery, 2022, 58(317), 453-459*

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**A case study on a Canadian automobile company (Linamar Corporation) expansion to European market specially in Poland by joint venturing to international strategies**

Gazi Farok

Linamar Corporation is Canada's second-largest manufacturing company that operates globally. It is a publicly traded automobile parts manufacturer. It dominates manufactures and supplies products to automotive and industrial markets. Linamar has two divisions, Powertrain or Driveline and Industrial. Through partnering via joint venture with ArcelorMittal, Linamar can enter a new emerging European market like Poland. The opportunity, market entry strategy, international strategy, FDI and financing are important in these perspectives.

*Discovery, 2022, 58(317), 460-470*

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**Identifying visual representation for National brand identity in packaging design**

Khatijah Md Saad, Muhammad Zaffwan Idris

This paper aims to determine the affective use of visual representation of Malaysia national identity through visual perception. Researchers use the visual identity of the country as a medium of communication. A total of 160 respondents participated in the study. Participants were tertiary students from Malaysia Public Higher Institutions. This paper administrated a through survey questionnaire which based on 12. Visual stimuli categories. The findings of this study will be used to develop visual styles based on the top three visual representation from each categories and to applied in packaging design.

*Discovery, 2022, 58(317), 471-478*

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**The nexus of Psychological Contract, Job Involvement and Organizational Citizenship Behavior among bank employees in Nigerian**

Shodeinde Adekunle Daniel, Oluleye Sunday King, Arandong Idi Jamok, Gonji Bulus Ponjul

This research investigates the relationship existing among the variables of Psychological Contract, Job Involvement and Organizational Citizenship Behavior among bank employees adopting the descriptive and explanatory research design. Further work on this study used a cross sectional survey method. A questionnaire was developed based on past literature containing 34 items with a 5-point Likert Scale. Numerous tests were also done to test the normality, reliability and validity of the data. The independent variable for this paper is Psychological Contract (which has Relational Contract, Employer/Employee Relationship, Internal Advancement, Emotional Affinity and Transactional Relationship as its dimensions), Job Involvement (mediating variable), while Organizational Citizenship Behavior is the dependent variable. 512 management employees (comprising of low-level, middle-level and top-level management employees) working in the sixteen (16) money deposit banks operating and spread within Plateau State, Nigeria. The collected data was analyzed using the multiple regression with the aid of statistical package for social sciences (SPSS version 23.0). Though this research is limited to employees in Nigerian banks, future studies may include other industries such as telecoms, construction, oil and gas, educational institutions, civil service etc.

*Discovery, 2022, 58(317), 479-488*