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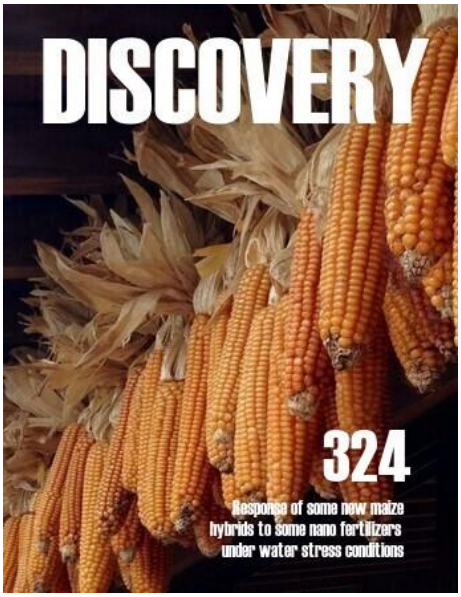
DISCOVERY

About the Cover



Two field trials were conducted during the two successive summer growing seasons of 2019 and 2020, at the Experimental Farm, Faculty of Agriculture, Fayoum University Fayoum Governorate, Egypt. A split- split design with three replicates was used. The main plots were assigned three water stress treatments (skipping of some irrigations) as follows: normal irrigation (7 irrigations), i.e., control treatment, missing the 4^{th} irrigation (64 days after planting; DAP), and missing the 6^{th} irrigation (78 DAP). The sub-plots were restricted to three yellow single cross hybrids of maize, i.e., single cross hybrid 2055, single cross hybrid 2066 and single cross hybrid 2088, and the sub-sub plots received three concentrations Calcium carbonate nanoparticles i.e., 500, 750 and 100 g feddan^{-1} (fed^{-1}; feddan= 4200 m^2). The results showed that irrigation treatment reflected positive significant influences on growth parameters, normal irrigation resulted in the best mean values of plant height in both seasons at 65 and 80 DAP. Also, yellow single cross hybrids of maize were significantly differed in almost mean values of maize growth, under study in both seasons. Maize hybrid of S.C. 2088 was significantly surpassed S.C. 2055 and S.C. 2066 in mean values of all growth characters. Calcium carbonate nanoparticles concentrations had a significant effect on growth parameters, i.e., plant height in both seasons at 65 and 80 DAS. Data revealed that ear characters, i.e., ear height, ear length, ear diameter, ear weight, no. of row/ear, no. of grain/row significantly affected by different irrigation treatments. Normal irrigation produced the highest ear characters, i.e., ear height, ear length, ear diameter, ear weight, no. of row/ears, number of grain/row) between different yellow single cross hybrids of maize. S.C. 2088 was significantly surpassed S.C. 2055 and S.C. 2066 in mean values of all ear characters. Application of calcium carbonate nanoparticles as nano-fertilizers was pioneer and significantly resulted in characters, i.e., ear height, ear length, ear diameter, ear weight, number of row/ear, number of grain/row, high rate of calcium carbonate nanoparticles produced the highest values. (Ref: Fawzy S Abd El-Samie, Ekram A Megawer, Hossam HM Hussein, Sara M Mohamed. Response of some new maize hybrids to some nano fertilizers under water stress conditions. DISCOVERY 2022; 58(324):1297-1302).

Synthesis and characterization of monoazo disperse dyes from salycyclic acid and phenol as coupling components

Juliana Chineze Obi, Ikechi Ikeagwuchi Dandy

Synthesis of four varieties of monoazo disperse dyes derived from arylamine was studied. The dyes were synthesized by diazotization of aryl amines and then coupled to salicylic acid and phenol as coupling components. The impure dyes obtained were purified using Thin Layer Chromatography (TLC) to give dyes (Figure 1) with good colouristic properties. The purity and identities of all the dyes were confirmed by melting point, IR and UV spectroscopy. The UV spectra of all the dyes were carried out in solvents of different dielectric constants (methanol, ethanol and ethyl acetate). The results showed solvatochromic effect. Dyeing and fastness properties of all the dyes synthesized were carried out on nylon, cotton and polyester fabrics. Deep dyeing was observed on nylon fabric because of the amorphous structure of the fabric as compared with cotton and polyester fabrics which have crystalline structures.

Discovery, 2022, 58(324), 1266-1273

Rain and flood characteristics, agricultural damages and coping strategies in North-eastern *Haor* region of Bangladesh

Awal MA

Heavy rain often causes flash flood in the *haor* areas at northeastern region of Bangladesh that brings people's livelihood vulnerable due to destroying the staple food i.e. *Boro* paddy. Although the matter is highly important but it didn't receive proper attention at all. Therefore, the study was conducted to investigate the rainfall characteristics in the riparian and upstream zone and associated disaster due to flood shock in *haor* areas. Both secondary and primary sources of data were collected. Secondary information were collected from published and unpublished literatures, books, newspapers, various offices and webs. Primary data were collcted through consulting stakeholders in the various line ministries, and focus group discussion meeting and questionnaire survey with *haor* farmers. Run-off water fom the rains occurred in the elevated upstream zone like Meghalya, Aasam and Tripura of India, and rains in the *haor* areas are combinely responsible to create flood in *haor* basin at northeastern Bangaldesh. The earthen dams and embankments for protecting flood in the rice growing *haors* are not strong or high enough against the water pressure that eventually collapses and causes flash flood. The soil mass is also hardly available in the *haor* areas to build the embankments boldly or repair them quickly in time. Neverthless, these structural measures for protecting flood and crop loss are not sufficient until the draining capacity of the river networks is fully resumed through proper river administration. Although the *haor* areas experience two major types of flood like early flash flood and monsoon flood. However, the flash flood if occurs early from middle of March to middle of April when the main crop of *haor* areas i.e. *Boro* crop remains at premature stage creates havoc or disaster with food insecurity because it losses paddy grain, fodder, fish, cattle, ducks, poutry, and so on and thus labour hours of the areas. The adaptation and coping strategies against flood shocks to support people's livelihood are also limited in the *haor* areas. Suitable nonstructural measures like rain and flood warning systems can be devised for early forecasting of flooding to ensure save harvest of standing paddy in the areas. Cultivation of *Boro* paddy can also be advanced in innovative way to esacpe the early flash flood effectively. Loan or credit distribution to the affected farmers with zero interest system and agricultural input and extension supports from government might be helpful to shortly start the farm activities soon after flood hit in the *haor* areas.

Discovery, 2022, 58(324), 1274-1296

Response of some new maize hybrids to some nano fertilizers under water stress conditions

Fawzy S Abd El-Samie, Ekram A Megawer, Hossam HM Hussein, Sara M Mohamed

Two field trials were conducted during the two successive summer growing seasons of 2019 and 2020, at the Experimental Farm, Faculty of Agriculture, Fayoum University Fayoum Governorate, Egypt. A split- split design with three replicates was used. The main plots were assigned three water stress treatments (skipping of some irrigations) as follows: normal irrigation (7 irrigations), i.e., control treatment, missing the 4^{th} irrigation (64 days after planting; DAP), and missing the 6^{th} irrigation (78 DAP). The sub-plots were restricted to three yellow single cross hybrids of maize, i.e., single cross hybrid 2055, single cross hybrid 2066 and single cross hybrid 2088, and the sub-sub plots received three concentrations Calcium carbonate nanoparticles i.e., 500, 750 and 100 g feddan^{-1} (fed^{-1}; feddan= 4200 m^2). The results showed that irrigation treatment reflected positive significant influences on growth parameters, normal irrigation resulted in the best mean values of plant height in both seasons at 65 and 80 DAP. Also, yellow single cross hybrids of maize were significantly differed in almost mean values of maize growth, under study in both seasons. Maize hybrid of S.C. 2088 was significantly surpassed S.C. 2055 and S.C. 2066 in mean values of all growth characters. Calcium carbonate nanoparticles concentrations had a significant effect on growth parameters, i.e., plant height in both seasons at 65 and 80 DAS. Data revealed that ear characters, i.e., ear height, ear length, ear diameter, ear weight, no. of row/ear, no. of grain/row significantly affected by different irrigation treatments. Normal irrigation produced the highest ear characters, i.e., ear height, ear length, ear diameter, ear weight, no. of row/ears, number of grain/row) between different yellow single cross hybrids of maize. S.C. 2088 was significantly surpassed S.C. 2055 and S.C. 2066 in mean values of all ear characters. Application of calcium carbonate nanoparticles as nano-fertilizers was pioneer and significantly resulted in characters, i.e., ear height, ear length, ear diameter, ear weight, number of row/ear, number of grain/row, high rate of calcium carbonate nanoparticles produced the highest values.

Discovery, 2022, 58(324), 1297-1302

Understanding and practicing research ethics: A survey of academics

Ayesha Bashir, Tayyba Rashad, Zar Shah, Sana Nazir, Khalid Zaman

In today's world, it is not enough to perform research; it must adhere to all the ethical standards set forth by various authorities. This research aims to assess how well informed the public is about research ethics and to identify the specific codes of behaviour held in the highest regard by the research community. The study's results back up the assumption that academics are ethically conscious and that each discipline has its preferred code of conduct.

Discovery, 2022, 58(324), 1303-1308

Synthesis, spectroscopic studies and fastness evaluation of disperse dyes derived from aniline derivatives on polyester fabric

Emeka Onuh Friday, Emmmanuel Ifeanyi Victor, Nwuruku Olisa Alfred, Linus N Okoro, Bolade O Agboola, Yahaya Muhammadu, Okolo Azubuike Jeremiah, Ugariogu Nnaemeka Silvester, Okoro Edith Omozefe, Mordi Joseph Chukwufumnaya, Ndulaka JC, Chukwu Henry Chima, Ogonna Chinyere Roseline

Monoazo disperse dyes were synthesized via the diazo-coupling method by using 4-sulfanilic acid and 4-chloroaniline as diazonium components and were individually coupled with 1-napthol, 2-naphthol, phenol and salicyclic acid. The absorption wavelengths of these dyes were measured in solvents of different polarities (methanol, ethanol and ethyl acetate). The maximum wavelength (λ_{max}) in methanol and ethyl acetate were found to be the highest and lowest respectively. This showed that solvatochromic effect occurred. Dyes with 2-naphthol ring exhibited a higher wavelength than the rest of the dyes. More so, the various auxochromes in the dye structures displayed remarkable effects on the λ_{max} of the synthesized dyes. All the dyes were applied on polyester fabric via the High Temperature High Pressure (HTHP) dyeing method and their fastness evaluation revealed that they all had outstanding fastness ratings.

Discovery, 2022, 58(324), 1309-1316

Absorption of some macro-element and heavy metals by leaves of spinach *Amarantus hybridus* L

Aminu Sule, Dharmendra Singh, Jibrin Naka Keta

Vegetables are the fresh and edible portions of herbaceous plants. They are important food and highly beneficial for the maintenance of health and prevention of diseases. These vegetables however contain heavy metals that can affect the availability of the nutrients and results to toxicity. This research is aimed to determine the rate of absorption of some heavy metals by spinach (*Amaranthus hybridus* L) irrigated with different water sources. Thermometer, Secchi disc and pH meter immersing methods were adopted for estimating temperature, transparency and pH respectively. After nursery proper, a total of 150 seedlings were randomly selected and divided into 3 groups of ten polypots each, each group 1, 2 and three are treated with different water source (distilled, tap and sewage water respectively) Standard chemistry protocol AAS (atomic absorption spectroscopy) were used to determine heavy metals concentration. The results for the determination of water quality indicators revealed sewage water had higher values of Temperature than distilled and tap water respectively. The results showed that sewage water was highly acidic while distilled and tap water was slightly alkaline. The results further showed that distilled and tap water had higher values of Transparency than sewage water. The analysis of accumulation of chemical elements in leaf showed that *Amaranthus hybridus* L revealed significant ($P<0.05$) increase in concentration of zinc and lead in groups irrigated with sewage water compared to distilled and tap water irrigated groups. Also, concentration of Sodium significantly ($P<0.05$) increase in groups irrigated with sewage water compared to distilled and tap water irrigated groups While, concentration of potassium and magnesium significantly ($P<0.05$) increase in groups irrigated with sewage compared to distilled water irrigated groups. In conclusion, the present study entailed that all sample water has richer plant chemical nutrient contents, hence favours better growth and development of plants. However, following the high concentration of some toxic heavy metals in the leaves of *Amaranthus hybridus* L irrigated with sewage, it is not advisable to consume such leafy vegetable, due to the possibility of chronic health hazards to the consumers.

Discovery, 2022, 58(324), 1317-1323

A qualitative review of effectiveness of Covid-19 protocol on construction sites: A case study of Lagos State

Okorie VN, Olatunde NA

Nigerian's construction sector is a key to the development of national economy. The sector is also known for employment creation and value addition to her national domestic product. None the less, the industry is notorious for its poor site worker's health, safety and well-being (HSW). Thus, the case of construction site workers' HSW became worse during the global COVID-19 pandemic that disrupted global economies and claimed millions of lives. The unique nature of construction sites operations could pave way for the spread of COVID-19. Therefore, this study which follows phenomenological approach obtained information that highlights the various measures taken to reduce the spread of COVID-19 among small, medium and large construction enterprises in Nigeria. The findings suggest that COVID-19 transmission and infection control measures among the small and medium construction enterprises in Lagos Metropolis are completely absent; while among the large firms there are measures such as mandatory face masks and medical teams for emergencies.

Discovery, 2022, 58(324), 1324-1332

Review of drug prescription using world health organization standard prescribing indicators among pediatrics outpatient in Ilorin: A pilot study

Olalekan Ayodele Agede, Louis Okeibunor Odeigah, Joseph Oladele Ole

Background: The use of drug is the most commonly used option in treatment of disease conditions in clinical practice. Irrational prescription and use of medicine has become a major problem in Africa. The patterns of medication prescription in this environment have been under-studied. The need to evaluate these patterns is important in order to improve prescription standards and mitigate the problems associated with irrational prescription and use of medicine. *Objective:* The aim of the study was to assess drug prescription pattern among pediatrics outpatients accessing medical care in our healthcare facility using the WHO prescribing indicators. *Methods:* A total of 157 prescriptions were collected retrospectively from prescriptions written over a period of one month from pediatrics pharmacy section of the pharmacy department of the hospital. The WHO prescribing indicator manual was used to produce a data record form (DRF) for the study. These indicators were assessed in the prescriptions, analyzed and compared to the standard recommended by WHO. Data were analyzed using SPSS version 20 (Chicago, IL, USA). *Results:* This study showed that most drug prescriptions (99.4%) bore the patient's name. All other prescribing indicators reviewed were below the recommendation by World Health Organization (WHO). The average number of drugs per prescription was 0.8. The encounter rates with generic names, antibiotics, and injections were 62.4%, 6.4%, and 28.0%, respectively. The percentage of drugs prescribed from an essential drug list was 52.2%. *Conclusion:* This study deduced that most outpatient drug prescriptions for pediatrics patient were incomplete. Indicators of drug use were below the WHO recommendation. Therefore, efficient intervention programs such as training of prescribing doctors and promotion of rational use of drugs have been proposed.

Discovery, 2022, 58(324), 1333-1338

Assessment of the impact and control of aquatic leech using *endod* in selected areas of central and north Gondar zones, Northwest Ethiopia

Bantie Bewket, Araya Mengistu, Moges Maru

A Cross-sectional and follow-up study designs were done from February 2022 to July 2022 in selected districts. The aim was to assess the role of *Endod* in the control of leech and the farmer's knowledge about leech. Estimation of leech prevalence prior and post *Endod* applications were conducted. Counting was performed by five people within five minutes, a 50-meter distance apart. The knowledge was assessed using a questionnaire. The current finding revealed that 98% of the respondents were aware of the leech as the major animal health problem. The mean leech count per person per 5 minutes before the application of it ranged from 12–21.5 in different streams. A stock solution of *Endod* berries suspended in water for 16 hours was continuously applied to various streams so as to maintain a concentration of 20 g/m3 of water for 6 hours. Application of *Endod* caused mortality of most of the leech populations, with a mean reduction rate of 94.4–100% that persisted for a minimum of 30 days post application. Most of the local communities stated that *Endod* made the treated water bodies free of leech for the first 30 days. No visible livestock toxicity was noticed due to its application. In conclusion, *Endod* could be used to control leech in the study area with continuous application for 6hrs at a concentration of 20g/m3. However, care should be taken in using the appropriate concentration and it should not be used in water bodies that contain fish because it is toxic to fish at the dose required to control leeches.

Discovery, 2022, 58(324), 1339-1407

Synthesis and fastness properties of disperse dyes gotten from some aniline derivatives

Emmmanuel Ifeanyi Victor, Emeka Friday Onuh, Nwuruku Olisa Alfred, Okoro Edith Omozefe, Okolo Azubuike Jeremiah, Mordi Joseph Chukwufumnanya

Selected monoazo disperse dyes were synthesized via the diazotization and coupling method and were characterized by their melting point, Infra- red (IR) and Ultra- violet (UV) spectroscopy. The dyes exhibited solvatochromic effects in solvents of different dielectric constants (methanol, ethanol and ethyl acetate). Results showed that dyes with more electron withdrawing groups had lower wavelengths when compared with their counterparts. The dyes were applied on nylon, cotton and polyester fabrics and tested for light, wash and heat fastness properties. All the synthesized dyes had a deep dyeing on nylon fabric than the other fabrics. However, the fastness properties on nylon were found to be the least and polyester fabric had the best.

Discovery, 2022, 58(324), 1408-1414

Zinc biofortification of wheat grain through agronomic approaches in Bangladesh

Awal MA, Islam T, Rahman MH

Zinc (Zn) scarcity in human wellness affects about two billion people worldwide, is a ubiquitous all-embracing health headache especially in emergent nations like Bangladesh. Geographic regions with dearth of Zn in human wellbeing are mostly where zinc shortfall occurs in soil, *bespeaking* their built-in linkage. Unfortunately, the capability of agricultural set-up to come up with nutritive foods to conquer micronutrient malnourishment (i.e. hidden hunger) for human well-being has gained limited consideration than the usual malnutrition and related issues such as food demand, calorie intake, crop yield and environmental sustainability. Various breaking-in could be used to overcome malnutrition, but biofortification is most impressive, favourable, viable and justifiable. Wheat is one of the major crops grown and consumed worldwide and Bangladesh as well which could prevalent Zn malnutrition; therefore, this is the ultimate sitting duck for Zn biofortification. Zn biofortification of wheat grain could be achieved through agronomic approaches like fertilizer application as soils in Bangladesh are deficit to Zn. The wheat varieties BINA Gom-1 and BARI Gom-30 were grown during 2020-2021 and BARI Gom-32 and BARI Gom-33 wheat varieties during 2021-2022 winter seasons

extended from mid November to mid March. The Zn treatments in each year's of experiment were nil Zn (control), root Zn application, foliar Zn application and root Zn + foliar Zn application and laid-out following a Randomized Complete Block Design (RCBD) with three replications. The root Zn application treatment consisted of 50 kg $ZnSO4{\cdot}7H2O$ ha^{-1}, incorporated into soil before seed sowing. The foliar Zn application treatment consisted of two times of Zn spray on leaves at the heading and milk stages. At each time of foliar Zn application, 0.5 % (w/v) of aqueous solution of $ZnSO4{\cdot}7H2O$ with 800 liter per hectare was sprayed at the very late afternoon until most of the leaves were wet. The root Zn + foliar Zn application is the combination of root Zn application together with foliar Zn spray. Zn application in root (i.e. in soil) or in foliage or apply in root plus foliar had no significant effect on the plant growth and yield of wheat crops. But Zn treatments increased zinc concentration in wheat grain as compared to nil Zn application in the order of: Root Zn + foliar Zn>foliar Zn>root Zn>nil Zn. Thus people's malnutrition can be reduced with providing wheat grain biofortified through foliar Zn apply in alone or combine with Zn apply in root.

Discovery, 2022, 58(324), 1415-1428

SOCIAL SCIENCE

Foreign Direct Investment, corruption, rule of law and economic growth in Zimbabwe

Josiah Chukwuma Ngonad, Takuriramunashe Famba, Joy Chinwe Ngonadi

This study focuses on the impact of corruption, legal enforcement (rule of law and political stability) and economic growth on foreign direct investment in Zimbabwe. This study used the data for the period 1996 to 2019. The finding of this study revealed that there is strong evidence of weak legal institutions for the period 1996-2008 characterized by macro instability such as hyperinflation. Therefore, the country's Foreign Direct Investment decreased significantly during that particular period and this is in contrast with the results obtained between 2009 and 2019 where there was an improvement in the control of corruption though not enough to attract meaningful investment. It is worthwhile for the government of Zimbabwe to respect the rule of law and control corruption to attract meaningful Foreign Direct Investment which is crucial for the country to improve its capital allocation to various sectors of the economy such as infrastructure. Additionally, the government of Zimbabwe should adopt strong regulatory and monitoring instruments which attract meaningful foreign direct investment to promote economic growth.

Discovery, 2022, 58(324), 1429-1438

Profit efficiency assessment of goat marketers in Lagos state, Nigeria

Folasade Aminu, Hassan Mohammed, Stanley Onwughara

The study assessed profit efficiency of goat marketers in Lagos State, Nigeria. Data were collected from 120 goat marketers, selected through purposive and random sampling techniques with the aid of questionnaire and analysed using gross margin analysis and stochastic profit frontier technique. The results showed that 79.2% of the goat marketers were male, 51.7% had secondary education with a mean age of about 57 years and herd size of 24 goats. The gross margin analysis results indicated that goat marketing was lucrative with net profit of ₦22,066.17 in the study area. Costs of veterinary services, housing and transportation were the factors influencing gross margin of the goat marketers while profit inefficiency in goat marketing decreased with the sex of the marketers, education, herd size, primary occupation and membership of cooperative association in the study area. Therefore, the marketers should be sensitized to take advantage of the adult education program of the state government among other things, to improve their educational level, as this will help them to take wise economic decisions that will boost their efficiency levels in the study area.

Discovery, 2022, 58(324), 1439-1446