

Report of the online Webinar and Panel Discussion on “Mental Health: Depression and Young Age Problems”

In connection with the celebration of World Health Day 2021, Prof. J. J. Ghosh Foundation and Indian Science News Association jointly organised the online Webinar and Panel Discussion on ‘*Mental Health: Depression and Young age Problems*’ on 20.04.2021 at 5 pm. The target audience were students and teachers from different colleges and Universities. The Panellists were Dr. Amarnath Mallik, Consultant Psychiatrist, Kothari Medical Centre, Kolkata and Dr. Tilottama Mukherjee, Associate Professor and Head, Department of Psychology, Calcutta University.

Dr. Amit Krishna De, Honorary Secretary of Indian Science News Association and member of Prof. J. J. Ghosh Foundation initiated the program by welcoming the participants and the distinguished speakers. Dr. Aditi Nag Chaudhuri, Secretary, Prof. J. J. Ghosh Foundation on behalf of Foundation welcomed the participants and eminent speakers. She explained the significance of organising this type of webinar and panel discussion in this present situation. Prof. Mrinal K. Poddar, President of Prof. J. J. Ghosh Foundation could not join the webinar for demise of his nearest relative. Dr. Swapna Mukherjee, Head and Associate Professor, Department of Microbiology, Dinabandhu Andrews College, Kolkata mentioned about the aims and objectives of this Foundation before the young generation.

Prof. Manas Chakraborty, Honorary Secretary of Indian Science News Association introduced Indian Science News Association and its importance to the audience. He told about Acharya Prafulla Chandra Ray, Prof. Meghnad Saha and involvement of many other famous personalities associated with ISNA. He also explained the theme of the World Health Day, 2021 with reference to Mental Health: Depression and Young age problems.

Dr. Amarnath Mallik, Consultant Psychiatrist, Kothari Medical Centre, Kolkata highlighted on the topic

Depression in the first 15 minutes of his lecture. He said that Depression is a syndrome and is accumulation of a number of illness. He classified the types of Depression as primary depression and secondary depression and also the subtypes. He was fortunate to come in contact with Prof. J. J. Ghosh. He read an article of Prof. J. J. Ghosh in a popular Bengali journal on Neurohormones. Dr. Mallick also mentioned about the role of different portions of the brain like frontal lobe, Hippocampus and Amygdala in controlling emotions and being affected due to depression. He emphasized on the Psychopharmacology as treatment to depression.

Dr. Tilottama Mukherjee, Associate Professor and Head, Department of Psychology, Calcutta University as the second speaker in her lecture focussed on the term’s depression, anxiety, trauma, helplessness, frustration, anger, stress and irritability and the way out of from them. She gave emphasis on self-compassion and resilience to overcome the mental stress. She spoke about mindfulness training as the means to relieve stress. She informed about the Counseling Cell which has been operating from the lockdown period last year in Calcutta University to deal with the mental health related problems of the students.

The panel discussion was conducted by Dr. Amit Krishna De by asking the questions raised by two members of Prof. J. J. Ghosh Foundation, Dr. Aditi Nag Chaudhuri and Dr. Rini Roy to the distinguished speakers and was attempted to answer by them. Participants from different academic institutions have opened their mind in the chat box and those were answered. Dr. Souvik Roy, Assistant Professor, Post Graduate Department of Biotechnology, St. Xavier’s College, Kolkata sorted the questions to be asked to the invited speakers. In total there were 63 participants in this webinar.

Dr. Madhulika Gupta, Assistant Professor, Department of Microbiology, Lady Brabourne College expressed vote of thanks. □

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A Nano-Chameleon from Madagascar: World's Smallest Reptile

Human beings are always curious about the biggest, tallest and smallest of almost everything. There is, therefore, no wonder that the smallest creatures inhabiting mother earth also trigger our curiosity. This time the creatures are none other than 'earth lions' or chameleons, a class of Old World lizards that made us curious. The name chameleon comes from the Greek words 'chamai' (meaning on the ground, or on the earth) and 'leon' (meaning lion). Chameleons ('Girgitis' in Bengali language) are well known for their colour-changing properties.

Nearly two-thirds of all chameleon species known till date have been found in Madagascar, a mega-diverse island country in the Indian Ocean. Scientists have recently reported (F. Glaw, J. Köhler, O. Hawlitschek, F.M. Ratsoavina, A. Rakotoarison, M.D. Scherz and M. Vences, 'Extreme miniaturization of a new amniote vertebrate and insights into the evolution of genital size in chameleons', *Scientific Reports*, Vol. 11, No. 2522 (2021); doi: 10.1038/s41598-020-80955-10) the discovery of a new, extremely miniature chameleon species, viz. *Brookesia nana* from the montane rainforest in northern Madagascar. The new species is thought to survive on a diet of mites and springtails, which it hunts down in leaf litter.



Male *Brookesia nana*.
Image credit: Glaw *et al.*

In the case of chameleons, their snout-to-vent length (SVL) measures their size. According to Dr. Glaw, the Curator of Herpetology at the Bavarian State Collection of Zoology, the *Brookesia* chameleons diverged into two lineages some 40-50 million years ago. One of these lineages includes larger species having 3.4-6.6 cm SVL, while the other comprises highly miniaturized species, 12 of which are known till date and none exceeding 3 cm SVL. In fact, the smallest *Brookesia* species so far known was an adult female of *B. micra* with 1.99 cm SVL. In

contrast, the newly discovered *Brookesia nana* species, two in number, include one adult male (adulthood determined by length of genital) and one adult female (sexual maturity proven by micro-CT scan which showed developing eggs inside the ovaries). The female species measures 1.92 cm SVL with a body length (tail included) of 2.89 cm, while the male species measures 1.35 cm SVL with a body length of 2.16 cm, tail included. The so called 'nano-chameleon' *B. nana* male species thus appears to be the smallest reptile on mother earth and also the smallest known male species of all higher vertebrates.

Curiously, Malagasy chameleons show reverse sexual dimorphism – males are of considerably smaller sizes than the females. Perhaps as a consequence, male Malagasy chameleons have large hemipenes (chameleon genitals; all reptiles have a pair) to enable them to mate successfully with female chameleons. The newfound male *B. nana* chameleon has unusually large hemipenes, which make it the smallest male amniote (a clade of four-footed vertebrates comprising the reptiles, birds and mammals).

Unfortunately, the future of these itty-bitsy chameleons is at stake because their habitat, a mountain forest, is already facing severe deforestation to make room for agriculture and livestock for the growing population. There is, however, a glimmer of hope – the area where these tiny reptiles have been found have recently been declared as a protected area.

The unusually small size of these *B. nana* chameleons, of the size of a sunflower seed, remains a mystery. □

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Functional Feed Additives for Aquafeeds

The Online Training Programme on 'Functional Fish Feeds' was organized by Kolkata Centre of ICAR-Central Institute of Fisheries Education on 12/3/2021 where, Dr A. K. Pal, Former Jt. Director, ICAR-CIFE Mumbai spoke on 'Functional feed additives (FFA) for aquafeeds'. Newer research is in progress on FFA to be mixed with fish feed in little amounts to increase disease resistance, improve physiological function; big companies working on it. Use of commercial products as FFA (that came out of research) help fish farmers to achieve good growth and immunity of fishes/shrimps under culture with lowered feed and

production costs. Besides selective breeding and genetic modifications, good growth achieved with complete nutrition and rearing in proper environment. As plant protein digestibility is less in fish, nutraceuticals as FFA bridge the essential feed ingredients' gap; deficiencies in feed studied, those mixed with plant feed ingredients to increase its digestibility and nutrient utilization. FFA facilitate in growth, immunity, stress mitigation, protection from diseases, Dr Pal explained.

FFA include immune-stimulants/immuneboosters, organic acids (increases nutrient absorption), nucleotides, prebiotics and probiotics, bioactive peptides (amino acids), exogenous enzymes (total feed requirement is less when added), binders, phytogenics derived from herbs, spices and plant extracts, medicated feed additives. Immunocuticals as FFA used for prevention/treatment of fish disease, some immune-nutrients increases immunity. He discussed about fucoidan extract and propolis extract enhancing fish immune system, causing improvement in enzyme SOD, lysozyme and explained expression level of INF-gamma gene in response to dietary extracts and their usefulness. Mixture of nucleotide RNA, β -carotene and omega-3 fatty acids increase fish lysozomal activity, level of immunologically active proteins and phagocytosis leading to increased immunity and lysis of bacterial cell wall. Exogenous supply of RNA promotes growth in farmed fish/shrimp in early stages of development to meet their high rate of cell replication. New-generation hydrolyzed yeast (with mannoprotein, β -glucans, nucleotides) improves their innate & adaptive immunity during pH and salinity fluctuations; growth, survival and FCR; contributes to reduced risk of disease outbreak during stress. Commercially-available yeast used by farmers should be hydrolyzed to set free the compounds, which are absorbed in fish body. It must have very small particle size with good water solubility.

According to Dr Pal, organic acids in fish feeds are 'Modern molecules to support no antibiotics ever'. It benefits gut health, has good application in shrimp farming. Dietary citric acid and/or microbial phytase improve nutrient utilization and growth in Rohu, both act synergistically to enhance nutrient digestibility and growth at suboptimum protein level in its diet. Mixture of propionic acid, formic acid, acetic acid and cinnamaldehyde found to inhibit *Aeromonas hydrophila* and *Yersinia ruckeri* infections, improved FCR and growth in Tilapia. Sodium diformate and potassiumdiformate also used @ 0.3-0.5% in fish feed. Exogenous enzyme phytase increase growth, improve FCR when used @ 500U/kg in diet in Pangas catfish fingerlings. Phytase breaks down phytic acid (containing proteins,

minerals and phosphorus) and all three (also inositol helping in digestibility) are freed facilitating increased nutrient availability. Pepsin, papain, amylase also used beneficially. Gut probiotics prevent multiplication of pathogenic bacteria, increase nutrient absorption, provide essential nutrients and digestive enzymes to fish/shrimp. Dr Pal explained mechanism of their action (competitive exclusion of pathogenic bacteria in intestinal mucosa, production of antibacterial substances, organic acids). *Bacillus subtilis* colonies established in GI tract improve fish growth when supplemented @ 0.5gm/kg in feed. Prebiotics (cereal fibre, β -glucans, isomalto-oligosaccharides commonly used) supply beneficial compounds to probiotic bacteria in GI tract, selectively stimulate their growth, resistant to digestion in upper GI tract.

Dietary additives Levan, protein, tryptophan, tyrosine, glycine, L-theanine, fish oil, Vitamin C, B6, B5 and B12 are useful for stress mitigation in high stocking major carp culture against endosulfan, conditions of high temperature (T), physical stress, salinity, cold, hypoxia, anoxia and disease. Tryptophan mitigates stress in cultured shrimps during T fluctuation, dietary microbial Levan (1-1.25% supplementation) enhances tolerance of Rohu juveniles to thermal stress significantly and confer protection. Vitamin E combat nitrite stress, arginine prevents fish mortality in low dissolved O₂ level, exogenous supplementation of Gamma amino butyric acid increase hypoxia tolerance in fishes and used in high density aquaculture. Cholesterol in fish feed improves utilization of plant ingredients after binding with ANFs tannin and saponin.

As phytogenics, Aswagandha root extract increased phagocytic cell and lysozyme activities in Rohu; *Moringa oleifera* functions against *A. hydrophila* infection and transportation-induced stress and *Psidium guajava* leaf powder and ethanolic extract controls the infection in Tilapia; *Astragalus radix* root extract increased lysozyme activity and sweet potato peel-offs improved growth in Nile Tilapia. Seaweed blends (brown, red, green) may be used as energy source in fish feed; stimulate growth of beneficial bacteria and digestive function, used as natural prebiotic solution for antibiotic-free poultry production. Discussing on 'Protein alternatives - insects as mini livestock', Dr Pal stated insect meal (IM) in shrimp *Litopenaeus vannamei* lowers FCR, increases weight gain by over 33% and defense mechanism against Early Mortality Syndrome. In challenge test with *V. parahaemolyticus* responsible for EMS, after ten days, survival rate found to reach 90% in diet with 50% fish meal replacement by IM compared to 56% in control. Most of 1500 proteins with antimicrobial activity identified in

different organisms found in insects; insect proteins are promising source of antimicrobial peptides. Finally Dr Pal highlighted on medicated/therapeutic feed 'CIFE-ARGUNIL' that ICAR-CIFE developed; gives good result in treatment of crustacean ecto-parasite *Argulus* sp infection and infestation in major carps in ponds, thus, fishes without parasitic lesions on body are harvested. □

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Brief Report on International Conference on Agriculture, Climate change & Life Sciences 2021

The "International Conference on Agriculture, Climate change & Life Sciences 2021" was organized by IMRF (International Multidisciplinary Research Foundation) Institute of Higher Education, Vijayawada, Andhra Pradesh during March 05-06, 2021. The conference was successfully held online through Zoom platform. In this event, formal inaugural & opening remarks were delivered by Conference chairman Prof. Dr. Ratnakar, Director (Academic) IMRF Institute of Higher Education & Research. His warm and informative address included the importance of academic conference for the exchange of information among earnest researchers. In this regard, IMRF Institute for Education & Research has successfully organized conferences in academic and research disciplines comprising different streams such as Social Sciences, Human Rights, Arts and Education, English Studies, Engineering Sciences, Business Sciences, Life Sciences, Mathematical Sciences. Intellectual academicians, promising researchers, potential leaders, faculty members, investigating pioneers, eminent scientists, advanced educationists, bonafide students from various parts of the world have actively participated in these conferences. In his address he delightedly mentioned his sincere appreciation, due recognition and heart-felt thanks to all the article contributors, intellectual paper presenters, members of the editorial board, foreign-national delegates, eminent speakers, research scholars, people associated with IMRF conferences for their support and cooperation. His inaugural speech was followed by the invited talks delivered by Dr. Reddy P.B, Principal, Department of Zoology, Government PG College, Ratlam, Madhya Pradesh, India and Dr. S.Yamini Sudha Lakshmi, Assistant Professor,

Medical Biochemistry, University of Madras, Taramani Campus, Chennai, Tamilnadu.

Dr. Reddy P.B outlined the investigations on climate change based on IPCC reports. IPCC (Intergovernmental Panel on Climate Change) is the United Nations body for the assessment of the science related to climate change. Although climate change is a part of natural cycle, but in recent scenario, global warming and climate change has become a global controversy. It is assumed that current global warming effects are due to the emission of large quantities of green house gases which in turn is originating from the burning of fossil fuels and from the industry, agriculture and forestry. Surface temperature on the planet increases due to higher concentration of green house gases. To measure the climate change IPCC models are used, but these models are found defective. He concluded that IPCC violated standard rules of procedure in finalizing their assessment reports on global climate change.

The next invited speaker of the day was Dr. S. Yamini Sudha Lakshmi. The topic of her presentation was "Environment – Past, Present and Future." Her talk included how air, land, water, natural resources, flora, fauna, humans and their interactions regulate the environment. Environmental pollution has been identified as world's greatest problem. Urbanization, industrialization, mining, and exploration are the key factors leading to global environmental pollution. The main concern of human population should be to save the environment by minimizing the pollution. In this regard, green buildings preserve precious natural resources thus improve the quality of life. Apart from this, generation of E-waste products should be minimized.

The second day of the conference started with the introductory speech by Dr. Ratnakar. Dr. Zaira Zaman Chowdhury, Assistant Professor, Nanotechnology & Catalysis Research Center, University of Malaya, Kuala Lumpur, Malaysia and Dr. Akhilesh Mishra, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India were the invited speakers of the day.

The first invited speaker of the day focused on the topic "Surface Engineered Carbon: Nano versus amorphous phase carbon, synthesis and environmental application". The elaborative presentation included the present scenario and the future prospects of nanostructured carbon nanotubes (CNT) and graphene. In the last decade the use of nanostructured carbon nanotubes and graphene has increased immensely and in future it may continue to

increase. Although several health and safety concerns are related to it. Structures, methods and products related to carbon nanotubes and graphene were addressed. A constructive strategy is also proposed, with certain guidance on installation, repair, assessment, personal protective equipment (PPE) and staff training related to working with these carbon-based nanomaterials (CNMs) for future applications.

Dr. Akhilesh Mishra, the next speaker of the session delivered talk on the topic “Impact of climate change on agriculture production”. He went on to elucidate the importance of climate variability in relation to crop productivity. Climate change is associated with increase in temperature, increase in CO₂ level and change in rainfall pattern which leads to the declined crop production. Thus it has been a challenge to produce crops in order to meet the need of increasing population. Climate change has become major constraint for crop production. Thus incorporating simple adaptation practices such as using climate-ready crops or thermal stress-tolerant varieties, regulating planting dates, improving water conservation and management practices, using effective irrigation and fertilizer management practices, diversifying crops and improving pest management could help in reducing the impacts of climate change. Other than these, reduction of the risk of climate threats can be a great option to combat this problem. This can be done by collecting reliable local weather information and early warning systems.

Apart from the invited talks, there were total 39 participants, amongst them 36 participants were from different locations of India (West Bengal, Shilong, Karnataka, Kerala, Delhi, Rajasthan, Nagaland, Haryana, Andhra Pradesh, Maharashtra, Madhya Pradesh) and rest of them presented papers from Malaysia. Participants were coming from different fields such as Agriculture, Biotechnology, Nanotechnology, Life Sciences, Veterinary and Animal Sciences, Environmental Sciences. Dr. S. Yamini Sudha Lakshmi and Dr. Pavithra B. H., Head Veterinary Pharmacology & Toxicology, Veterinary College, Bengaluru, Karnataka were the chairpersons of the first and second sessions of day one respectively. The chairpersons of the second day were Dr. Akhilesh Mishra and Dr. K. Syamala, Assistant Professor, Department of Veterinary Parasitology, College of Veterinary and Animal Sciences, Mannuthy, Kerala for the first and second sessions respectively.

I presented my paper entitled “Depth-wise Distribution of Nutrient status of rice growing Lateritic soil of West Bengal, India” in the first session of day one. In West Bengal, 28,000 sq km area is occupied by

red and lateritic soils. These include Birbhum, Bankura, Burdwan, Midnapore and Purulia districts. Light texture, low soil organic carbon content, acidic pH, low phosphorus content and zinc deficiency are the characteristics of these soils. Rice being the majorly cultivated crop in the state, it is essential to know the status of the macro (nitrogen, phosphorus, potassium, sulphur) as well as micro (DTPA-extractable micronutrient zinc, iron, manganese, copper) nutrients for better crop production. Knowledge of the vertical distribution of nutrient status will be helpful for both deep and shallow rooted crops. Five soil profiles one each from Sainthia, Suri II, Rampurhat II, Md Bazar and Nalhati I block of Birbhum district of West Bengal, India were collected and analyzed for pH, electrical conductivity (EC), organic carbon (OC), textural class (% sand, silt, clay) and soil nutrient status following standard analytical methods. Soil samples were found strongly acidic to neutral in soil reaction. No salinity hazards were recorded. OC content was found in low to medium range. pH and EC followed increasing trend with depth whereas opposite distribution pattern was followed by OC. Soil texture varied from silt loam to silt. Available N and P were low to medium and S was low in status. High to medium K content was found at surface layer in all five soil profiles whereas at lower depth its value was found to be low to medium. Fe, Mn and Cu were estimated to occur above critical level, whereas soils were found deficient to marginal in available Zn. Macro as well as micronutrients showed decreasing trend with increase in depth down the profiles. Informations obtained from the profile distribution study will be helpful for fertilizer application which in turn will lead to better crop growth.

The second day closes with the formal vote of thanks proposed by conference chairman Prof. Dr. Ratnakar. He heartily thanked the chairpersons, invited speakers, distinguished participants for their active participation throughout the conference. The conference came to an end with his valedictory address.

I find the conference to be very much enlightening for researchers, faculty members, eminent speakers to gain, collect and exchange knowledges amongst different field of researches. □

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Demise of Professor Biswapati Mukherjee

With a heavy heart this is to inform you that Professor Biswapati Mukherjee, Vice-President of Indian Science News Association, has left us for heavenly abode on Friday, May 7, 2021. It is even more saddening that his wife also breathed her last a few hours later on the same day, reflecting a lifetime bonding of love, affection and true understanding of relationship.



Professor Biswapati Mukherjee

He did his M.Sc. in Chemistry from Kalyani University and Ph.D. in 1968 from the University of Calcutta under the supervision of Late Professor (Mrs.) Asima Chatterjee. He then joined the Department of Pharmacology in Dr. B.C. Roy Postgraduate Institute of Basic Medical Sciences, University of Calcutta as a member of the Faculty. Later on he became a Professor of Neuroscience at the S.N. Pradhan Centre for Neurosciences, University of Calcutta and retired as its Executive Director.

Through funded projects, including one from IFS, Sweden, Professor Mukherjee supervised many Doctoral students in mainly two fields - plant alkaloids and marine neurotoxins - which led to around 140 publications, three Indian patents and a few book chapters. He was a Member of Asian Network for Research on Antidiabetic Plants, Dhaka, Bangladesh and of the Task Group for International Centre for Natural Product Research. He organized two international seminars, whose proceedings were later published as books by Oxford, IBH and Tata McGraw Hill, New Delhi. He also used to teach at M.Sc. (Pharmacy) classes at NIPER Kolkata.

A Chairman of the Organising Committee of the 'Training Programme on Science Communication and Media Practice' of ISNA for the last decade and a half, Professor Mukherjee has been actively engaged in the popularization of science. He played a crucial role in preparing a documentary and co-authoring a book on Acharya Prafulla Chandra Ray and co-authoring and co-editing three books on science communication.

Professor Mukherjee has received many awards and honours, including Dr. B.N. Ghosh Memorial Oration Award (Gold Medal) of Calcutta University and Acharya P.C. Ray Memorial Lecture of ISNA. He is a Fellow of the West Bengal Academy of Science and Technology, and the Phytochemical Society of Asia.

In his passing away, we have lost a valued colleague, great gentleman, sophisticated, friend and mentor. Professor Mukherjee continued to work until just a few days before his death. He will be alive within us forever through his love, admiration and affectionate nature.

May his departed soul rest in peace. □

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