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934th Conference

6th International Conference on

Biodiversity and Conservation

April 27-28, 2017 Dubai, UAE

Scientific Tracks & Abstracts (Day 1)



Biodiversity | Sustainable Development | Climate Change and Global Warming | Ecology and Biodiversity Conservation | Plant and Animal Biodiversity

Session Chair

Vassiliki Vassilopoulou

Hellenic Centre for Marine Research, Greece

Session Co-Chair

Charles A Wade

Mott Community College, USA

Session Introduction

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Title: Amphibian decimation, reduce biodiversity in Panama

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Title: Floristic composition analysis in the natural Wax Palm reserve, La Vega (Cundinamarca, Colombia)

Díaz-Puerto Zarick Juliana, Universidad Distrital Francisco José De Caldas, Colombia

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Private sector participation on forest conservation in Malaysia - Pulau Banding Foundation story

Abdul Rashid Ab Malik
Pulau Banding Foundation, Malaysia

Pulau Banding Foundation (PBF) was set up in 2007 as a non-profit, science-based and non-political Malaysian-based organization, with a vision to promote sustainable development of the 130 million-year old fragile ecosystems of the Belum-Temengor Rainforest Complex (BTRC) and to meet the challenges of balancing forest conservation and development. PBF undertakes research or raises funds to finance research programmes for studies on various aspects of the tropical rainforest ecosystems with special emphasis to BTRC. It also conducts manpower trainings and disseminates knowledge and information to public on the conservation of biological diversity and sustainable management of the natural tropical rainforests. PBF has organized two scientific expeditions in 2012 and 2015 in BTRC involving altogether 350 scientists and assistant scientists. A lot of new species on flora and fauna were recorded during the 10-day expedition. PBF has provided small research grants to few post-graduate students from both local and international universities. Their researches are mainly on biodiversity conservation of flora and fauna of BTRC. In October 2016, PBF in collaboration with public and private sector organisations has organized an International Conference on Conservation and Sustainable Use of Tropical Rainforests or better known as the Belum Rainforest Summit 2016. Five main themes were discussed during the Summit namely Biodiversity conservation and restoration, Tackling climate change issues, Global funding opportunities, Payment of ecosystem services and Green and sustainable investment. Five keynote speakers, 13 invited speakers and 42 oral presentations were deliberated within the five-day Summit covering the 5 main themes. PBF is also involved in conducting environmental educational programme for the school children under Green Ranger Malaysia and Kids for Temengor Expedition (KITE) programmes in collaboration with its NGO partner, Yayasan EMKAY.

Biography

Abdul Rashid Ab Malik spent his entire career with a premier R&D institution, the Forest Research Institute Malaysia (FRIM), Kepong for 32 years until he retired in September 2011. He started his career as a Research Officer in 1979 and held various positions at FRIM. His last post was the Deputy Director General (Research and Development) before he retired. After he retired in 2011, he joined Technology Park Malaysia Corporation Sdn. Bhd., Bukit Jalil as a Project Consultant for one year. In July 2014, he joined Pulau Banding Foundation, Malaysia, a science-based NGO as a CEO until today. He graduated with BS (Forestry) from UPM in 1979; MSc from Imperial College of Science, Technology and Medicine, London in 1986 and PhD from University of London, London in 2003. He authored and co-authored more than 90 publications. He attended various international meetings and conferences on behalf of FRIM and Malaysian Government during his career with FRIM including the International Tropical Timber Organization Council Meeting in Yokohama, Japan; FAO Forestry Minister Meeting in Rome; and ASEAN Forestry Minister Meeting in Beijing.

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Wildlife management practices in Central India: An overview

Anjana Rajput and Dharmendra Verma
State Forest Research Institute, India

Presence or absence of an animal or plant in a region is determined by ecological and historical factors. Animals and plants are living indications of the characteristics of their environment; their ranges mark the places where environmental conditions are the same or similar. Wildlife habitat and species around the world are facing a crisis. It is estimated that global warming may cause the extinction of 15-37% of species by 2050, unlike other environmental losses this one cannot be reversed because nature does not give second chance to biodiversity. In India, the state Madhya Pradesh, the land of pristine biodiversity is very rich in natural resources. There are various mountain ranges i.e. Vindhya, Satpura, Maikal and Aravali. The terrain is blessed with a fine network of many rivers and, unique watershed offers homes for wild animals and plants. There are 64 forest divisions, 9 national parks, 25 sanctuaries and 6 Tiger reserves in the state. Wildlife conservation has become an increasingly important practice due to the negative effects of human actively on wildlife. Habitat loss-due to destruction fragmentation and degradation of habitat is the primary threat to the survival of wildlife. Humans are continually expanding and developing, leading to an invasion of wildlife habitats. As humans continue to grow, they clear forested land to create more space. This stresses wildlife populations as there are fewer homes and food sources to survive. Their conservation in wild habitat through management practices can provide protection to wild plant and animal species. Present paper deals with an overview to the prevailing wildlife conservation practices in Madhya Pradesh. It includes protection, habitat improvement, water development, wildlife health management, monitoring and evaluation of wildlife. Protection is the major component that ensures the security of wildlife and its habitat through; tiger cell, law enforcement, monsoon strategy, elephant patrols, surveillance of footpaths and sensitive areas. These practices are being managed successfully by Indian Forest Service Officers, State Forest Service Officers, in support with Foresters, Forest guards and ministerial staff of the state.

Biography

Anjana Rajput is presently engaged as Head of Wildlife Branch in State Forest Research Institute, Jabalpur, Madhya Pradesh, India. She has done her MSc, and PhD from Sagar University, India, with specialization in Forest Ecology, having more than 20 years research experience in habitat ecology, wildlife conservation and environmental impact assessment. She is recognized as Functional Area Expert for Ecology & Biodiversity from NABET Quality Council of India, New Delhi. She has published various research papers, technical reports and technical bulletin in national and international peer reviewed journals.

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Plant diversity and ecosystem services in Amazonian homegardens of Ecuador

Juan Carlos Carrasco¹ and Verónica Caballero-Serrano²

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²Universidad de Santiago de Compostela, Spain

Homegardens (HG) play a key role in the conservation of plant diversity and at the same time provide ecosystem services that have a direct and positive impact on human welfare. The relationships among plant diversity, ecosystem services and the factors that influence them formed the subject of study in tropical HG in Sangay, Ecuador. We compiled information from 138 HG in 11 localities and found 484 plant species associated with 20 ecosystem services; the most important of which, according to interviews with the gardeners, is that they provide food, medicine and ornamentation. Influential physical factors on plant diversity in the HG were altitude, precipitation and temperature, while socioeconomic factors, including ethnicity, gender, income and education, were perhaps more important determinants of HG diversity. Three groups of HG were identified by Hierarchical Ascendant Correspondence Analysis: “small HG of recent origin,” - having the fewest species and ecosystem services, “large, transitional HG,” - having a wide range of services, and “medium, established HG,” - mainly supplying food, medicine, ornamentation, shade and fencing. Ethnicity may be a stronger determinant of differences in HG composition: For Shuar people, HG were a main source of food, critical to their subsistence in rural areas; in total, Shuar gardeners cultivated on the whole more plant species. On the other hand, HG belonging to mestizos were more diverse, have more exotic plant species and provide mainly cultural and regulatory services. HG in more urban settings mainly provided ornamentation, fencing and shade. This information can be applied by policy makers to the design of strategies for biodiversity conservation and food security.

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Seed size, storage and germination requirements can shape plant community structure in arid Arabian deserts

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Background & Aim: Seed size (mass) and growth forms can affect dispersal distance, position of diaspora storage and consequently affect seedling establishment, growth, and survival and can shape community structure. Fewer studies assessed the relationship between seed size and germination level among different growth forms. Here, we assessed the impact of plant growth form, seed storage, and seed size and masses on seed dormancy, and light and temperature requirements during germination of 23 desert plants with aerial seed bank.

Location: Northern Emirates of the United Arab Emirates (UAE) was the setting taken for this study.

Methods: Seeds of 23 species with aerial seed bank, representing different growth forms (6 herbaceous, 11 small shrubs and 6 trees) were collected from natural habitats of the arid deserts of the UAE. Average seed mass and size were determined for each species. Fresh seeds, and those stored both in room temperatures for 9 months were germinated at daily night/day temperature regimes of 15/25°C, 20/30°C and 25/35°C in both continuous darkness and alternating light/darkness. Pearson correlation coefficients were used to assess the significance of the relationship between seed mass and seed size with final germination, relative light germination (RLG) and germination rate index (GRI) for each growth form at each temperature and light condition.

Results: Trees and shrubs have significantly larger, heavier seeds that are characterized with higher dormancy, compared to herbaceous plants. Germination at all storage conditions was positively photoblastic in herbaceous plant, but was neutrally photoblastic in both shrubs and trees. Field storage enhanced light germination in trees, but not in shrubs and herbs. The relationships between both seed size and mass and final germination at all light and temperature conditions was positive in herbaceous, but negative in shrubby species. The relationship between seed size and LGI was significantly positive in shrubs; but was significantly negative in herbs and trees. GRI was greater for bigger seeds of herbs, but the reverse was true for seeds of trees.

Conclusion: Seed size and storage, and light requirement during germination of species belonging to different growth forms could explain their distribution in the community and consequently could help explain community structure and composition.

Biography

Hatem Ahmed Shabana is a PhD student at Malaga University, currently working as a botanist and ecologist researcher in seed bank and herbarium in Sharjah Research academy, UAE and worked in Egypt at Egyptian environmental ministry. His current and previous work gave him experience in many environmental fields and programs like seed collection and germination, preparing herbarium specimens, plant species surveys, endemic species monitoring and conserving, restoration, public awareness and conservation biology and sustainable use of natural resources.

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Status, distribution and conservation of large carnivores in Nepal

Tej Bahadur Thapa
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Mammalian large carnivores (LC) are wide ranging and play a crucial role in ecosystem structure and function. Most LCs have experienced decline in population and shrinkage of range throughout the globe and Nepal is not exception to such trend. Nepal is inhabited by eleven species of LCs, of which five are felid (tiger, leopard, snow leopard, clouded leopard and lynx), three each canid (gray wolf, dhole and striped hyaena) and ursid (brown bear, Himalayan black bear and sloth bear). I review the status of these carnivores, map their distribution, documents current threats to these taxa, and make recommendation for their conservation. These taxa have localized distribution mainly in the protected areas (PA) and the majority PA is unable to sustain viable populations of LCs under current conditions. Population size is yet to be estimated except tiger and snow leopard. Large carnivores are highly threatened and the primary threats to the persistence of these taxa include habitat loss and degradation, small population effects, lack of connectivity between populations, prey depletion, poaching/persecution, intra-guild predation/completion/displacement, conflict with humans, and climate change. Red list of Nepal's Mammal categorized two of these taxa as critically endangered, seven endangered and remaining two in the vulnerable list. Current conservation actions are extremely limited focusing on tiger and snow leopard. It is often necessary to develop national strategic plan for large carnivore conservation incorporating elements like habitat connectivity, explicit public policies on conflict resolution, land-use and sustainable development, public awareness campaigns, transboundary cooperation among the nation in managing shared population and continuous scientific research and monitoring.

Biography

Thapa Tej Bahadur has been involved in research, teaching and management planning of biodiversity. Broadly his research area aims to understand how human activities influence ecological systems and the services they provide and then to apply that knowledge to conservation and management. His research touches conservation biology, landscape ecology, community ecology, population demography, behavioural ecology, and ecological restoration.

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Methodology for the behavioral study of fish post-larvae of the Corsican coastline (east coast: Bastia)

Amélie Rossi, Marc Levaray, Vanina Pasqualini and Sylvia Agostini
University of Corsica Pasquale Paoli, France

The pelagic larval phase is a decisive step in the life history of coastal fish. This phase is considered as a milestone for the larval dispersal. Indeed, it is usually the only recruitment possibility for coastal species, because adult individuals are sedentary. This stage of fish life is not only crucial for the recruitment of individuals but also for structure and population dynamics. Therefore, it represents a real interest for marine biology and ecology research in a perspective of fundamental knowledge but especially for the management of fish resources. The work presented here is subject to a behavioral study on post-larvae of species found on the Corsican coast. The study site is located on the north east Corsican coast (Mediterranean Sea, France), near the urban area of Bastia. This site is considered because it is close to a natural reserve (Biguglia lagoon) and a Natura 2000 area, the "large Posidonia meadow". Samples are caught with non-destructive light traps and this study aims to obtain both, orientation data in the natural environment (*in situ*) with a tracking device, the DISC (Drifting *in situ* Chamber), developed by the University of Miami (Rosentiel School of Marine & Atmospheric Science) and swimming ability and endurance data in laboratory, with a swimming chamber, developed by Loligo Systems®. The collected data assess post-larval dispersal abilities fished on the Corsican eastern coast. This study comes in support of the work already underway on the subject, including the oceanographic observatory of villefranche-sur-Mer (France).

Biography

Amélie Rossi is a PhD Scholar in Marine Biology at the University of Corsica in the laboratory Stella Mare since October 2014. Her research focuses on the study of physical and behavioral capacities of young stages of Mediterranean coastal fishes (post-arval stage), along the Corsican east coast. Her area of expertise includes the study and analysis of the physical and behavioral capacities of Mediterranean coastal fish post-larvae along the north-eastern Corsican coast. Her work consists of fishing, following in the natural environment, and by experiments directed both in the laboratory and in the field. The purpose of these works is to improve the knowledge of the young stages of Mediterranean coastal fishes in order to better understand this stage of life, during which they migrate from the open sea where they hatched, to the coast where they will.

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Population size and habitat association of Indian gazelle (*Gazella bennettii*) in Nizampur area, district Nowshera, Pakistan**Saif Ullah, Maqsood Anwar, Tariq Mehmood, Muhammad Rais, Safdar Ali Shah, Muhammad Ali, Zaigham Hasan and Muhammad Awais**
PMAS-Arid Agriculture University Rawalpindi, Pakistan

The Indian gazelle (*Gazella bennettii*) also known as Chinkara, is a very adaptable wild animal. Present study determined the population size and habitat association of Indian gazelle in Manglot near Nizampur area of District Nowshera from September 2015 to July 2016. The data on population density was collected by direct counting using vantage point method and scanning from these vantage points. A total of 19 Indian gazelles were observed at four different study sites located between 328 m and 504 m elevation in the study area. Of the total individuals observed, 21% were males, 37% were females, 32% were yearlings and 10% were young. Habitat analysis was done through vegetation survey using quadrature method in its habitat. Relative density, relative frequency, relative cover and importance value index were calculated for all plant species recorded in Indian gazelle habitat at four study sites. A total of 22 quadrates were taken between the elevation of 328 m and 504 m near selected vantage points. As many as 33 plant species belonging to 16 families were recorded in Indian gazelle habitat among which trees were 24.2%, shrubs 30.3%, herbs 18.2% and grasses 27.3%. Indian gazelle in the study area is facing problems due to increasing human population and also extension of agricultural practices in its potential habitat.

Biography

Saif Ullah has completed his MPhil from PMAS-Arid Agriculture University Rawalpindi, Punjab, Pakistan and BS (Hons) from University of Peshawar. He is currently working as visiting Lecturer at Department of Zoology, University of Peshawar. He has worked on the population and habitat of an ungulate species, Indian gazelle during his MPhil degree. Earlier in BS (Hons) degree, he had conducted research on the avian fauna of Khyber Pakhtunkhwa, Pakistan. Being a young Wildlife Biologist, his four papers are in publishing press. He has presented his MPhil and BS (Hons) research work in many international and national scientific conferences and congresses. He has worked as Internee for ungulate survey conducted in the Province of Khyber Pakhtunkhwa, Pakistan. He has more than 5 years' experience in the field of wildlife and its conservation. He is currently member of many international and national organizations and societies.

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Isolation, identification, and characterization of rubber degradation by a mixed microbial culture**Munzer Ullah and Zhu Hu**
China University of Petroleum China

The present research was directed to exploit the potential bacterial and fungi strains for the biodegradation of Polyisoprene (Natural Rubber). In current study, twelve different bacterial strains were isolated from the sewage sludge sample through enrichment and soil burial techniques. The microbes isolated from the samples showed good growth and biodegradation activities on culture medium. Later on these strains were identified and characterized on the basis of morphological and biochemical test. Among these, seven were *Bacillus*, three *Aerococcus* and two were *Staphylococcus* sp. Consequently, two fungal strains were also identified and named as *Aspergillus sydowii* and *Aspergillus candidus*. Biodegradation activities of the mixed culture of microorganism were monitored through UV spectrophotometer and functional groups changes were analyzed through FTIR spectroscopy. Fourier Transform Infrared Spectroscopy (FTIR) (Bio-Rad Merlin) analysis displayed the changes in the region 1200-1400 cm⁻¹ representing the degradation of Polyisoprene rubber after culturing in liquid media. CO₂ evolution in Sturm test was gravimetrically calculated as 42.88 g/l in case of test. However 20.58 g/l in case of control was noted. The difference in amount of CO₂ produced both in test and control indicated the degradation of rubber. This study determined that a mixed microbial culture had a potential tendency toward the degradation of rubber.

Biography

Munzer Ullah did Master and MPhil. from Quaid –e-Azam university Islamabad Pakistan and currently enrolled in prestigious Center of Bioengineering and Biotechnology Chinas University of Petroleum. East China. Zhu hu is currently working as a prof in the said center.

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Amphibian decimation, reduce biodiversity in Panama

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Statement of the Problem: Panama, a small country between the major continents of North and South America, is recognized for its mega-biodiversity. In particular, Eastern Panama (EP) is an important biodiversity hot-spot that is little studied. The isolation and speciation of several species is reflected in the endemism of some species. The restricted distribution for those endemic species has contributed to increase the numbers of endangered species in the region. Nowadays several endangered and undescribed species have been affected by Chytridiomycosis, some of them have disappeared even before they can be described. We have experienced a declination event in EP, with dramatic diminution of several species.

Methodology & Theoretical Orientation: From 2011 to present, we have repeatedly visited the main mountain ranges in EP, collecting ecological information to assess the status of the herpetofauna in the area. We have fixed eight transects that have been visited two to three times per year.

Findings: Based on our results, in EP there are 29 endemic species; some of them are exclusive of EP. Currently there are 14 amphibians, in the endangered categories of the IUCN, although there are several species that have not been evaluated by the IUCN specialists. According to the Environmental Vulnerability Score (EVS), another way to evaluate the conservation status of the species used specifically for amphibian and reptiles, in EP there are 50 species with a high vulnerability, 35 with medium and 12 with low EVS. We found fluctuation in several species; some fluctuations are seasonal, related to the climatic conditions. But also we found death animals Bd positive and low densities for some species in highlands (Fig. 1).

Conclusion & Significance: We identified the main threats affecting the status of conservation of the herpetofauna in EP, among them: Chytridiomycosis, habitat fragmentation and contamination. Direct impacts on the herpetofauna and that recently have affected the populations is chytridiomycosis. Now there is evidence for amphibian decline in EP. The deforestation is an alarming issue in the region, and can affect amphibians, every dry season for example protected areas are deforested by loggers and, in the buffer areas people make fires to open areas for cultivation. Therefore, urgent monitoring projects are needed to determine the status and to suggest feasible conservation strategies that can guarantee the long term survival of species.

Biography

Batista Abel is a Biologist by profession and nature lover. With 15 years of field experience in Panama, Costa Rica and Colombia, he has conducted several studies of wildlife rescue, monitoring and research. He completed his Undergraduate studies at the Universidad Autónoma de Chiriquí, Panama, Graduate studies at the University of Bogota, Colombia Andes and PhD at the Senckenberg Institute (in association with the Goethe University), Frankfurt, Germany, all focused on the study of amphibians and reptiles. His main interest is bioacoustics, interaction between anuran communities, biogeography and taxonomy of amphibians and reptiles of Panama.

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Floristic composition analysis in the natural Wax Palm reserve, La Vega (Cundinamarca, Colombia)**Díaz-Puerto Zarick Juliana**

Universidad Distrital Francisco José De Caldas, Colombia

In Colombia, diversity loss has appeared for different anthropic activities. Due to the actions of different persons and entities, a restoration process has been conducted in the natural Wax Palm reserve located in the town of San Antonio, La Vega, Cundinamarca. In this way, the present study defines the conservation state of the reserve, identifying the existing vegetation units from estimations of the basal area, coverage and dominance, to subsequently perform a taxonomic identification, analyzing ecological alpha diversity indexes (species richness) and establishing the relations between the environmental conditions and the characteristics of floristic vegetation composition. 4 plots of 10x10 m were established, where they were registered and gathered botanical samples of all the individuals with a circumference at breast height (CBH) > 10 cm; for a later taxonomic identification in the forest herbarium of the District University Francisco José de Caldas of the vegetable material gathered in the field. Also, a floristic and structural analysis of the vegetation was performed, by means of the calculation of alpha diversity indexes: Importance Value Index (IVI), Margalef's Index (Dmg), Simpson's index, Menhinick's (Dmn), Shannon-weaver's Index and Brillouin's Index. In the sampling of 400 m² (0, 04 hectares) were found 8 families of vascular plants, where 9 species were identified. The family with the most species was *Vismia* (5), the species with the most individuals was *Guarea glabra* (4). It is estimated that 8 out of 9 species are endemic, being the majority of them deciduous, which is concordant with the moist forest ecosystem; where the reservation is located. Overall, as shown in Figure 1 and 2, big diversity and little dominance are present in the field of study, which is related to a restoration process in the natural reserve.

Biography

Díaz-Puerto Zarick Juliana is currently pursuing the last semester of Environmental Engineering at the District University Francisco José de Caldas (UDFJC) in Bogotá, Colombia. Through different researches, she found her passion in the conservation of the nonrenewable natural resources, and with the application of appropriate technologies identified a sustainable approach in electrical energy generation by means of offshore wind farms. She has carried out research on Electrical Transmission Lines at the Engineering Institute of the National Autonomous University of Mexico (UNAM) and published her research results at the 28th International Power Summer Meeting, also participated as a Speaker at the 2nd Inter-American Conference Climate Change in 2016 with the theme "Current panorama of Mexico's participation in the carbon market".

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Session

Day 2 April 28, 2017

Marine Biodiversity | Forestry | Vulnerable Species | Biodiversity and Food Security | Environmental Pollution & Management

Session Chair
Jim Kielbaso
USA

Session Co-Chair
Abdul Rashid Ab Malik
Pulau Banding Foundation, Malaysia

Session Introduction

Title: Conservation of superior phenotypes of teak (*Tectona grandis*) in central India

Anjana Rajput, State Forest Research Institute, India

Title: Herpetofauna diversity evaluated through an integrative approach

Batista Abel, Senckenberg Research Institute and Natural History Museum Frankfurt, Germany

Title: Biomonitoring of selected freshwater bodies using diatoms as ecological indicators

R U Sawaiker, Goa University, India

Title: People's dependence on forest resources: A case study from Dachigam National Park, Jammu & Kashmir, India

Khursid A Khan, Aligarh Muslim University, India

Title: The wonder of indri song as a driver of forest conservation

Caterina Spiezio, Parco Natura Viva, Italy

Title: Diversity of herbaceous flora of intensively cultivated practical year training program farm of the Faculty of Agriculture & Forestry, University of Ibadan

Eromosele J Gold, Federal University, Nigeria

Title: Breeding of two species of giant African snails, *Achatina achatina* Linnaeus 1758 and *Archachatina ventricosa* Gould 1850: Temperature, rainfall and relative humidity required for each stage of growth and development

Jean-Didié Memel, Université d'Abobo-Adjamé, Ivory Coast

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Conservation of superior phenotypes of teak (*Tectona grandis*) in central India

Anjana Rajput

State Forest Research Institute, India

Statement of the Problem: Among Indian tree species, teak is the most valuable timber tree species with lots of variations existing in nature and there is lot of scope for improvement in this species. Individual tree variation is an important source for practical breeding program and to determine breeding objectives of any species information about inheritance patterns need to be combined with the economic values of each trait. Traits selection is the first and the most important step, while starting any improvement programme.

Methodology & Theoretical Orientation: During present study, existing candidate plus teak trees of Madhya Pradesh, India were evaluated for traits i.e. height, diameter, self- pruning ability, apical dominance, crown diameter, branch thickness, fruit bearing capacity, wood specific gravity of standing tree, heart wood percentage, growth rate and volume. A comparative analysis for different characteristics was done amongst the selected plus tree candidate and trait wise grading was done on the basis observation recorded. Cumulative scoring of candidate plus tree was done based on superior phenotypic characteristics.

Findings: Specific trait-wise trees were identified during present study. Trees of excellent height, girth, clear bole height, ideal circular bole with less tapering, self-pruning ability exist in natural population of Madhya Pradesh, which may be used as reproductive source material for plantation purposes. Wood characteristic like higher specific gravity, higher heartwood percentage which show high inheritance pattern, should be strongly considered along with all the phenotypic characteristics i.e. height, girth, bole form, crown habit, branching pattern etc. They may be used in future tree breeding programmes. A special protection should be provided to conserve those superior genetic resources. It is also requisite to multiply them through original seeds or through micro-propagation technique to sustain the unique creations of the nature.

Biography

Anjana Rajput is presently engaged as Head of Wildlife Branch in State Forest Research Institute, Jabalpur, Madhya Pradesh, India. She has done her MSc and PhD from Sagar University, India, with specialization in Forest Ecology, having more than 20 years research experience in habitat ecology, wildlife conservation and environmental impact assessment. She is recognized as Functional Area Expert for Ecology & Biodiversity from NABET Quality Council of India, New Delhi. She has published various research papers, technical reports and technical bulletin in national and international peer reviewed journals.

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Herpetofauna diversity evaluated through an integrative approach

Batista Abel

Senckenberg Research Institute and Natural History Museum Frankfurt, Germany

Eastern Panama (EP) is an important biodiversity hot-spot due to its great variety of habitats, high endemism and fast habitat loss. Recently, Panamanian scientists and national authorities have emphasized the urgency of surveys to determine conservation strategies for the herpetofauna in this region. From 2011 to the present, I have repeatedly visited the main mountain ranges in EP, collecting geographical data, specimens and tissue samples for mtDNA barcoding, recording frog calls, and ecological information to assess the status of the herpetofauna in the area. Additionally, we have monitored the population of the critically endangered species *Atelopus glyphus* in the Pirre area of the Darién National Park. Through an integrative analysis, I could identify 118 amphibians and 156 reptile species present in EP. Additionally, 29 species were not possible to assign to any described species, thus they were catalogued as candidate species, unconfirmed, or cryptic lineages. After this analysis, I have described nine species new to science, revised the taxonomic status of several genera of amphibians (*Diasporus*, *Ecnomiohyla*, and *Bolitoglossa*) and reptiles (*Lepidoblapharis* and *Dactyloa*), and synonymized one species in the *Pristimantis caryophyllaceus* complex. At one locality within the Serranía de Pirre, a population of *A. glyphus* has decreased dramatically since 2013. An analysis in 2015 confirmed the infection with the *Batrachochytrium dendrobatidis* (Bd) fungus in dead specimens. Not all populations in the region are affected at the same level, with those at lower elevation apparently less susceptible to changes in their population structure than those from higher elevations. Unfortunately, *A. glyphus* and many other species in EP are threatened and disappearing, and for most of them, we have little to no knowledge about their ecology, distribution, and/or habits. As EP is an important area for species diversification and diversity, conservational efforts are required urgently.

Biography

Batista Abel is a Biologist by profession and nature lover. With 15 years of field experience in Panama, Costa Rica and Colombia, he has conducted several studies of wildlife rescue, monitoring and research. He completed his Undergraduate studies at the Universidad Autónoma de Chiriquí, Panama, Graduate studies at the University of Bogota, Colombia Andes and PhD at the Senckenberg Institute (in association with the Goethe University), Frankfurt, Germany, all focused on the study of amphibians and reptiles. His main interest is bioacoustics, interaction between anuran communities, biogeography and taxonomy of amphibians and reptiles of Panama.

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Biomonitoring of selected freshwater bodies using diatoms as ecological indicatorsR U Sawaiker and B F Rodrigues
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Lakes supply water for irrigation, drinking, fisheries, etc., and thus have significant economic and recreational value. In limnetic ecosystem, water quality is influenced by physical, chemical and biological factors. Freshwater communities are very much sensitive to environmental variables. The algal flora constitutes a vital link in the food chain and its productivity depends on water quality at a given time. Diatoms, in particular are of utmost importance, as they are the potential indicators of water quality due to their sensitivity and strong response to many physical, chemical and biological changes. Occurrence of diatom communities in selected fresh water bodies of Goa along with physico-chemical parameters have been studied for a period of two consecutive years and the data has been used in bio-monitoring. Using OMNIDIA GB 5.3 software, Louis Leclercq IDSE/5 index is derived and the level of degradation due to organic and antropogenic pollution has been found out. Findings showed seasonal variations in physico chemical parameters and diatom population. The diversity of diatoms was considerably high in Syngenta, Lotus and Curtorim lakes as compared to Khandola pond. *Gomphonema parabolum*, *Navicula halophila*, *Navicula microcephala*, *Navicula mutica* were indicating organic pollution in all water bodies. *Amphora ovalis*, *Stauroneis phoenicenteron*, *Synedra ulna* were indicating antropogenic pollution at Syngenta, Lotus and Curtorim lakes while *Navicula rhynococephala* was indicating antropogenic pollution at Khandola pond. Biomonitoring has been proven to be necessary and hence the importance of diatoms as ecological indicators of water quality has been stressed.

Biography

R U Sawaiker is a Research Scholar in the Department of Botany, Goa University, India on Limnological studies of fresh water bodies in Goa. During her research, she has analyzed water samples for physico-chemical and biological parameters from four selected fresh water bodies for a period of two years following standard protocols. It was observed that physical and chemical variables tested during study, were possible drivers of diatom communities. This particular paper deals with use of modern software like OMNIDA GB 5.3 to derive Louis Leclercq IDSE/5 index. Diatoms encountered during study were found to be most powerful ecological indicators of degradation levels of selected water bodies. They are right tools for biomonitoring, as indicator value of diatoms is well accepted and highly used across the continents. It is an ideal means by which progress towards integrated water resources management can be monitored.

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