



7th International Conference on

Biodiversity Conservation and Ecosystem Management

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e-Posters

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Population studies of *Herpestes edwardsii* in Ajmer, Rajasthan

Rashmi Sharma

Samrat Prithviraj Chauhan Government College, India

Indian Mongoose *Herpestes edwardsii* (Herpestidae: Carnivora; Mammalia) are the best known inhabitants of urban and rural ecosystem and considered as keystone species in the parts of the world. The number is decreasing at very fast rate. The species in urban areas is of particular concern as urban areas are developing at very fast rate. Human population is also increasing at a very fast rate and conservation of mammals is ignored. Indian mongoose belongs to class Mammalia, order Carnivora and family Herpestidae. Acquainted species are ubiquitously living in and around human habitation. They feed on invertebrates and also check the population of invertebrates. Indian mongoose is native to Bhutan, Bahrain, Afghanistan, India and Iran. Indian mongoose was abundant in Ajmer in earlier decades but now there population is declining alarmingly. Scientists need to understand threats for mammalian population. The present paper deals with number of species present in Ajmer.

Biography

Rashmi Sharma is an Assistant Professor at Samrat Prithviraj Chauhan Government College Ajmer, India. She has presented her paper at various national, international conferences and workshops.

sharmarashmigca@gmail.com

Notes:

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Diversity and distribution of Diptera in Bohol and Mindanao, Philippines using DNA barcodes

Reizl Jose, Kay Ramos, Olga Nuneza and Rudolf Meier
Bohol Island State University, Philippines

This study was conducted to determine diversity and distribution of true flies in Bohol and Mindanao, Philippines. Malaise traps were used to collect samples in different habitats. A total of 104 presumptive species of dipterans were identified based on the number of Molecular Operational Taxonomic Units (MOTUs) clustering at 3% threshold. The results showed that diversity of presumptive species of dipteral is higher in Bohol compared to Mindanao with species diversity indices, $H' = 3.70$ and $H' = 3.26$, respectively. The observed difference may be influenced by the heterogeneous habitat between sampling sites and the longer periods of sampling. Further, DNA barcodes were then mapped using QGIS. The result showed that 87.5% of the presumptive species belonging to eight families of Diptera were found only in Magsaysay Park, Bohol. These include: Culicidae, Dolichopodidae, Empididae, Mycetophilidae, Sepsidae, Stratiomyidae, Tabanidae and Tephritidae. This is possibly due to the unique characteristic of habitat in Magsaysay Park, Bohol, hence, a key site for conservation.

Biography

Reizl Jose has been conducting researches for over a decade. She has done a lot of education campaign and biodiversity conservation in several public schools and universities in Bohol. She has joined several wildlife conservation trainings and workshops. She is one of the leading Research Biologists in Bohol Island State University (BISU), Philippines.

gzlbreyen@gmail.com

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Accepted Abstracts

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Identifying, developing and moving sustainable communities through application of bioenergy for energy or materials: Future perspective through energy efficiency

Abdeen Mustafa Omer
Energy Research Institute, UK

The demand for energy continued to outstrip supply and necessitated the development of biomass option. Residues were the most popular forms of renewable energy and currently biofuel production became much promising. Agricultural wastes contained high moisture content and could be decomposed easily by microbes. Agricultural wastes were abundantly available globally and could be converted to energy and useful chemicals by a number of microorganisms. Compost or bio-fertilizer could be produced with the inoculation of appropriated thermophilic microbes which increased the decomposition rate, shortened the maturity period and improved the compost (or bio-fertilizer) quality. The objective of the present research was to promote the biomass technology and involved adaptive research, demonstration and dissemination of results. With a view to fulfill the objective, a massive field survey was conducted to assess the availability of raw materials as well as the present situation of biomass technologies. In the present communication, an attempt had also been made to present an overview of present and future use of biomass as an industrial feedstock for production of fuels, chemicals and other materials. We may conclude from the review paper that biomass technology must be encouraged, promoted, invested, implemented and demonstrated, not only in urban areas but also in remote rural areas.

abdeenomer2@yahoo.co.uk

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Freshwater fish diversity of north flowing rivers Son and Tons of Uttar Pradesh: Habitat, threats and conservation prospectsAjey Kumar Pathak¹ and Uttam Kumar Sarkar²¹ICAR-National Bureau of Fish Genetic Resources, India²ICAR-Central Inland Fisheries Research Institute, India

Fish diversity, distribution and abundance with environmental parameters from the upstream and downstream parts of two major north flowing major rivers Son and Tons of Uttar Pradesh were investigated. Overall 61 fish species representing 17 families were collected and Cyprinidae was recorded as the most dominated family represented by 23 species. The threatened status category of 61 fish species according to the IUCN Red List Criteria 2012 revealed seven species under near threatened, three species under not evaluated, one under vulnerable (VU) and one under data deficient category. The remaining species were categorized under least concern. The considerable difference between the relative abundance of fishes of both the rivers were observed ($p < 0.05$). The abundance and distribution of *Mastacembelus* was recorded highest in the river Tons followed by *Labeo rohita*, *Rasbora daniconius* and *Labeo bata*. These species were noticed comparatively lower in the river Son and abundance of species like *Rita rita*, *Sperata seenghala*, *Rasbora daniconius* and *Puntius sophore* were found higher. Further, the considerable variations between the fish diversity of these rivers were also noticed ($p < 0.05$). Both fish diversity and species richness showed inverse relationship with respect to altitude. The present study shows that these rivers support considerable fish diversity with 3.8% vulnerability, which is important for the conservation besides supporting considerable carnivorous (50-62.5%), omnivores (16.6-29.2%) and herbivores (8.1-16.6%, 3.8-8.3%) species.

pathakajey@rediffmail.com

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Utilizing ecological fire management to enhance purple copper butterfly habitat**Colleen Farrow**

Central Tablelands Local Land Services, Australia

The purple copper butterfly (*Paralucia spinifera*) is a threatened species that is only found in the Central Tablelands of New South Wales. All known populations reside above 900 meters, predominantly on north facing slopes that receive occasional snowfalls. The butterfly is believed to utilize only one species of native shrub, the native blackthorn (*Bursaria spinosa ssp. lasiophylla*) and relies on a mutualistic relationship with a native ant (*Anonychomyrma itinerans*). Habitat clearing, competition from weeds and a lack of native blackthorn regeneration continue to threaten purple copper butterfly populations. Over the past three years, ecological fire trials have been implemented as a tool to regenerate native blackthorn shrubs. Fire is emerging as an important tool for threatened species across Australia and implementing carefully managed trials on purple copper butterfly habitat is providing a new approach to managing the complex issues surrounding this species. This project has yielded promising results, with significant basal shoot growth and lichen reduction recorded across trial sites. Such outcomes result in an increase of additional food sources for larvae and potential enhancement of habitat areas. While this is a positive outcome and provides management options, additional investigations are required. Studies on the relationship between the butterfly and the native ant will enhance knowledge of their relationship and its role in population dynamics, as will further ecological fire trials and ongoing larvae monitoring counts.

colleen.farrow@lls.nsw.gov.au

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Direct growth of two-dimensional crystals on dielectrics for nanodevices

Daniel de la Torre Llorente

Technical University of Madrid, Spain

This work reviews the European national and regional catalogues of protected species, focusing specifically on the Orchidaceae family to determine which species seem to be well-protected and where they are protected. Moreover, this examination highlights which species appear to be under-protected and therefore need to be included in some catalogues of protection or be catalogued under some category of protection. The national and regional catalogues that should be implemented are shown, as well as what species should be included within them. This report should be a helpful guideline for environmental policies about orchid's conservation in Spain, at least at the regional and national level. Around 76% of the Spanish orchid flora is listed with any figure of protection or included in any red list, either nationally (about 12-17%) or regionally (72%).

iel.delatorre@upm.es

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Breeding biology of red vented bulbul (*Pycnonotus cafer*) in district Okara, PakistanBushra Allah Rakha¹, M Z Waseer² and M S Ansari¹¹Pir Mehr Ali Shah Arid Agriculture University, Pakistan²University of Sargodha, Pakistan

The breeding biology of red vented bulbul (*Pycnonotus cafer*) was studied in district Okara, Pakistan. A total of 69 nests were located in the study area and breeding activity was recorded from 51 active nests. The parks were the preferred sites for successful nests construction (46%) followed by orchids (28%) and agricultural fields (27%). The data on position of the nests on plant showed that highest numbers of successful nests were found on forks (48%) while nests on middle, terminal and other positions were recorded as 17%, 10% and 25%, respectively. The preferred height for nest construction on plant was recorded 1-2m (58%) followed by 2-3 m (17%), 0-1 m (16%), 3-4 m (7%) and 4-5 m (1%). Red vented bulbul prefer to make nests on Northern white cedar (*Thuja occidentalis*; 32%) followed by Guava (*Psidium guajava*; 19%), Mango (*Mangifera indica*; 9%), White mulberry (*Morus alba*; 9%), Sweet orange (*Citrus x sinensis*; 9%), Bubul (*Vachellia nilotica*; 7%), Banyan (*Ficus benghalensis*; 4%), Weeping fig (*Ficus benjamina*; 3%) and Date palm (*Phoenix dactylifera*; 3%) in the study area. The highest number of nests were recorded with clutch size 3 (87%) followed by 2 (11%) and 4 (2%). A total of 154 eggs were recorded from 51 nests, from which 10% eggs were infertile, 19% were predated and other losses counted 4%. A total of 104 eggs under observation were hatched, from which 28% were predated and 6% were fallen out from the nest. The fledgling success was highest in parks and orchids (39%) compared to agricultural fields (22%). It is concluded that breeding biology of red vented bulbul in Okara have unique features with preferred plant for nest construction as northern white cedar and highest breeding success in parks and orchids.

arbushra@uuar.edu.pk

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Environmental services generated by the Brazilian Army tutored areas located in Atlantic forest

Helder de Barros Guimarães
Brazilian Army, Brazil

In this work, we are dedicated to investigating the environmental services generated by the Brazilian Army tutored areas located in Brazil. The five study areas were the field instruction and others 4 Battalion. Before coming under the responsibility of the Army, these areas were used in the cultivation of sugar cane and grass for livestock. Today, the whole represents the largest proportion of the remnants of Atlantic forest biome north of the Rio São Francisco. These findings lead to the following hypotheses: the Brazilian Army develops various activities of instruction and training in areas with forest cover which, combined with restrictions imposed by the military administration, contributed to the regeneration of local ecosystems, forest areas under the tutelage of the Army Brazilian generate various environmental services of interest of the state and metropolitan society and broader ecological importance and the lack of environmental regulations that categorize the specific areas of the military can induce directions of uses incompatible with military activities. To test them were identified and discussed climatic environmental services, the maintenance of inventories and carbon absorption, maintenance and regeneration of biodiversity and watershed recharge. We identified the evolution of the environmental condition of forests subordinate to the Army based on comparison of photographs and leaf area index. In the quest to observe the existence of incompatibility of some provisions of law with military training activities were identified environmental legal aspects that govern these areas. Finally, we identified the current uses, intended uses and scenarios envisioned up to induced inertial and objects of study. The results show the important environmental role played by forests studied and important contribution made in terms of environmental services for the military areas for RMR, softening the local climate by acting as smoothing the flow of some springs and providing conditions for the conservation of fauna and flora the Atlantic forest biome.

helder.prof@gmail.com

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Understanding the value of natural resources for human well-being

Kamaljit K Sangha

Charles Darwin University, Australia

This paper focuses on the key benefits of managing nature's systems for people's well-being and, more broadly, for the modern economy and overall development. Firstly, it explores a historical perspective of human connections with nature and how nature has played a key role in shaping our ancient and modern civilizations. Secondly, it elaborates how natural resources are important for people's well-being and outlines the consequences of mismanaging them in terms of social-economic repercussions in the present times. To understand and evaluate the role of natural resources towards human well-being for policy decision-making, this chapter outlines three main approaches: Realizing our connections with nature, applying an integrated and inclusive approach to development and an ethical approach to live in harmony with nature. It explains the need for and how to, realizes our connections with nature and proposes an integrated development model that is focused on people's well-being, not the standard input and output measures and accounts for the role nature's services. Applying an ethical approach to lead a meaningful life that is in harmony with nature and embedding ethical principles in development, this paper underscores the importance of natural systems in modern economy.

kamaljit.sangha@cdu.edu.au

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Observations and distribution patterns of blue shark, *Prionace glauca* (Chondrychthyes: Carcharhinidae), along the Algerian Basin (southern Mediterranean)Mendil Hamza¹, F Sarano² and et F Hemida¹¹University of Algiers 3, Algeria²Longitude 181 NATURE, France

The blue shark, *Prionace glauca* is the sole representative of the genus *Prionace*. A highly migratory species, this pelagic shark is cosmopolitan and occupies tropical and temperate waters. In the Mediterranean and mainly in the Algerian Basin, studies on *Prionace glauca* are rare or discontinuous. As a part of an ongoing research project for the collection of data on the biology and eco-ethology of certain species of shark on Algeria's coast, the information collected by the project observers along the Algerian coast (East Region, Central Region and West Region) were analyzed. The dataset includes geographic location information of some catches, gear, size and sex. A total of 268 blue shark record ranging from 59 to 312 cm TL (122 were observed between 2007 and 2008, 146 individuals observed between 2014 and 2017), were considered for the sex ratio study by size, season and region. Catches are higher in the Western and Central region; the eastern region is less represented. The sex ratio varies by region and size classes. The spatial distribution of females according to size classes suggests that the center region is probably a mating area. The projection data and results on a GIS (Geographical Information System) has allowed better understand the various aspects of the distribution of this species and the potential for the presence of distribution models in the Algerian Basin.

mendilhamza@gmail.com

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Alternatives to the cross river superhighway balances sustainable infrastructure development with biodiversity conservation

Mahmoud Ibrahim Mahmoud
James Cook University, Australia

Statement of the Problem: Roads infrastructure development is necessary but can be problematic when poorly planned. Spatial scientists can provide evidenced-based reasoning in realizing viable and smart road infrastructure provisioning to optimize nature conservation, minimize environmental damages and maximize socioeconomic benefits.

Methodology & Theoretical Orientation: Based on integrated spatially explicit impacts assessment and cost-benefit analysis, the African case study presented in this study show how re-routing poorly planned highways can reduce negative environmental impacts, conserve biodiversity provide innovative and flexible ecosystem management solutions. Examining the proposed 260 km superhighway in Cross River State, south-eastern Nigeria illustrates how human actions threaten frontiers of biodiversity and wildlife conservation in equatorial Africa.

Findings: The examined proposed highway by the Cross River State Government in Nigeria would have intersected ~115 km of intact tropical rainforest or protected areas and would cost ~US\$2.5 billion to construct. The two alternative routes 1 and 2 we offered and evaluated would be less damaging to the Cross River National Park, unprotected forests and biodiversity habitats. Although, the alternative routes are slightly longer (~290 and ~353 km), yet costing less (~ US\$0.9 billion) to construct, compared to the state government proposed superhighway. The first alternative suggested, entirely avoids intact forest while aiming to provide maximum benefits to farmers and settlers.

Conclusion & Significance: In the context of achieving target #9 of the global sustainable development goals, smart infrastructure provisioning and sustainable land-use management suggestions from research outcomes should be incorporated as strategic tools for developing an informed conservation economy policy and decision-making in Africa. If biodiversity conservation and ecosystem management are to be achieved Africa wide, road infrastructure developments must be optimized to reduce environmental impacts and maximize socioeconomic benefits which can be realized by promoting lessons, trade-offs and synergies learnt from the cross river superhighway case study.

mahmoud.mahmoud@jcu.edu.au

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Examining vegetation structure, species diversity, richness and vegetation-environmental relationships in the subtropical forests of Kotli District (AJK), Pakistan, using a multivariate approachMuhammad Shoaib Amjad¹, Arshad M², Page S³ and Berrio J C⁴¹Women University of Azad Jammu and Kashmir Bagh, Pakistan²Pir Mehr Ali Shah Arid Agriculture University, Pakistan³University of Leicester UK⁴University of Leicester, UK

A phyto-sociological survey was carried out during 2014-2016 using a stratified random sampling design at 15 different localities in Kotli District, AJK Pakistan. Quantitative data on species composition and environmental variables were collected from 450 quadrats. Based on cluster analysis, three different plant associations were recognized viz. subtropical scrub forest association, subtropical pine forest association and subtropical broad leaf humid association which are clearly separated on a two dimensional Detrended Correspondence Analysis (DCA) diagram. The number of plant species per site varied from 17 to 47; Shannon and Simpson diversity indices were 1.83-3.19 and 0.75-0.95, respectively; Menhinick and Margalef species richness values were between 0.68-1.35 and 2.48-5.95, respectively, Equitability values between 0.65-0.90 and Evenness values between 0.37-0.71. DCA and Canonical Correspondence Analysis (CCA) indicated altitude and aspect to be the main determinants of the plant species distribution patterns and classification and grouping of vegetation into different associations. CCA indicated that both species diversity and richness showed strong correlations with altitude as well as aspect and grazing intensity. All the forest stands were immature (33.8-54.7%) with average tree density varying between 280 to 2060 ha⁻¹, and basal area between 1.99-19.18 m²/ha⁻¹. The results clearly reflect the deteriorating forest structure in this region, demanding urgent conservation measures involving effective participation by local communities.

malikshoaib1165@yahoo.com

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Sustainable solutions to biodiversity conservation, local livelihoods and climate change: Our Korup rainforest story, southwest region, Cameroon**Orume Robinson and ESemé Neville Ebune**

Korup Rainforest Conservation Society, Cameroon

Poor communities are often critically dependent on ecosystem services to sustain their livelihoods sometimes posing threats to biodiversity. Though the Convention on Biological Diversity (CBD) and other international agreements explicitly connect biodiversity conservation, poverty alleviation and human well-being, there are substantial debates regarding their relationships. There is therefore growing literature at the interface of rural livelihood improvement and biodiversity especially when compounded by impending impacts of climate change. Considering the pitfalls of ICDPs, present-day conservation policies generally aim at a win-win solution that can address all these concerns. Korup is Cameroon's first rainforest national park with rich biodiversity and endemism. Despite previous conservation efforts, recent research reveals annual wildlife off takes of over 37000 animals, far above sustainable limits for tropical rainforest. This amongst other human threats from local communities is driving vulnerable species to local extinction. As law enforcement increasingly becomes less effective as a sole biodiversity protection measure, we have rolled out an innovative co-management approach; sharing responsibilities and benefits between stakeholders. Our special features are Conservation-Development Agreements (CDAs), Education for Sustainable Development (ESD), Climate Smart Livelihood Measures (CLISLIM) and a performance based incentive system (Conservation bonuses and credits) aimed at relieving pressure on biodiversity, improving livelihoods and increasing resilience. Our approach is consistent with IUCN and internationally agreed principles of respect for traditional owners' rights and institutions, resolving long standing exclusion, restored rights and cultural identity as well as empowered communities to support and participate in conservation efforts. Nevertheless, there is still need to identify peculiarities in approaches, environmental characteristics, models and the communities in which success is most likely. This workshop is intended to use our Korup example to draw weaknesses, strength, opportunities and potential threats from our model that can guide our team and the conservation community.

r.orume@korup-conservation.org

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Human-wildlife conflicts in selected areas of Azad Jammu and Kashmir, Pakistan**Nausheen Irshad and Sajjad Hameed Mughal**
University of Poonch Rawalakot, Pakistan

Human-Wildlife Conflict (HWC) exists in both developed and developing countries; it is more serious in developing nations. Knowledge of species ecology and of species sensitivity to anthropogenic disturbance is an important prerequisite for conservation/ management. Therefore, Azad Jammu and Kashmir the part of great Himalayas has been selected to highlight the wildlife hunting practices during January 2015 to February 2018. During current studies it was found that the problem mainly arises due to feeding habits of wild animals as some are frugivorous (Small Indian civet, Himalayan palm civet, Small Kashmir flying squirrel and Indian flying fox) who damaged human cultivated fruit trees. Besides Indian crested porcupine and Wild boar acts as a serious crop pest and therefore eradicated whenever encountered. The feeding upon domestic animals (common leopard) and poultry (Asiatic jackal, red fox and small wild cats) was also reported as a factor of predation. We also recovered numerous wild animals (N=50) killed by local community. Despite protected status, the killed mammals belonged to categories of Critically Endangered (*Panthera pardus*), near threatened (*Viverricula indica*) and vulnerable (*Hylopetes fimbriatus*) species. The important birds include critically endangered (*Falco peregrines*), endangered (*Lophura leucomelanos*), vulnerable (*Catreus wallichii*) and near threatened species (*Lophophorus impejanus*). It was found that mammals were primarily killed due to human wildlife conflict (HWC) (60%) followed by recreation (20%), trade (15%) and accidental killing (5%). Whereas, the foremost hunting reasons for birds are recreation (50%) and food (25%). Birds are also being used as an important trade commodity (25%). The drastic hunting/killing of the species needs our immediate attention. This unwarranted killing must be stopped forthwith, otherwise these animals will become extinct.

nausheen_irshad@yahoo.com

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Assessment of damage inflicted by the small Kashmir flying squirrel (*Hylopetes fimbriatus*) (Gray, 1837) in district Bagh, Azad Jammu and Kashmir**Nausheen Irshad and Siyab Maroof Khan**
University of Poonch Rawalakot, Pakistan

In world, nearly every country is going through the vertebrate pest destruction specifically from rodents. It became sometime so drastic that results in scarcity of food. The small Kashmir flying squirrel (*Hylopetes fimbriatus*) is a frugivore rodent, hence causes substantial economic loss. The current study highlights the harmful effects of flying squirrel on fruit trees in district Bagh, Azad Kashmir during a period stretching from November 2016 to November 2017. The damage was assessed by counting of affected trees (wild and planted) in an area of 40000 meter square. The stomach content (n=16 dead individuals) and fecal pellets (n=100) were also analyzed to find the food habits of the species. The results revealed that the squirrel species feed upon 14 (N=14) plants. Among planted fruit trees the highest damage percentage was recorded for *Juglans regia* (walnut) 60.6%, followed by *Prunus armeniaca* (apricot) 59%, *Prunus persica* (peach) 46%, *Malus pumila* (apple) 32%, *Diospyros kaki* (Japanese fruit) 32%, *Punica granatum* (pomegranate) 31% and *Pyrus communis* (Pear) 27%. The *Pinus wallichiana* (88.79%), *Pinus roxburghii* (82.70%) and *Quercus incana* (74.60%) were wild tree species feed by squirrel species. There was a significant difference (p=0.000) found among the occurrence of different fruits components in the feces in different seasons. The small Kashmir flying squirrel has been designated "Vulnerable" in Pakistan. Despite of having protected status it is being killed by humans whenever encountered. During current studies a total of 45 individuals were found killed by orchard owners due to its feeding habits. Although squirrels not only use the forest to live and eat, but also play a vital role in sustaining and expanding plant communities and ecosystems. Therefore it is requisite to check the efficacy of different strategies (netting, fencing and use of repellents) to save both humans' assets and squirrel populations in the study area.

nausheen_irshad@yahoo.com

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Modeling the oasis of the future: Intercropping of cam metabolism agricultural varieties for food security in poor soils and semi-arid climates**Pedro Nahoum**

Botanica Pop Ltd., Brazil

With the world climate change, the increase of semi-arid areas and desertification, the degradation of arable land, the instability of rainfall regimes and the reduction of available water for agriculture, new models of sustainable agricultural production are needed. The innovation of the present proposal consists in the use of CAM metabolism; the most efficient pathway to convert water in biomass in poly-culture of plant species and cultivars to: (1) Generate biomass to: (1) Increase soil organic matter, (2) produce sustainable energy and (3) be used as forage for domestic animals feeding; (2) the production of higher added value vegetable products than agricultural commodities, which can also be processed on farm, such as fruits, medicinal plants, ornamental plants and natural fibers. Recent technologies such as automation, big data, Artificial Intelligence (AI), nanotechnology and applied genomics are generating a future picture of increasing unemployment and distances between social classes inserted and not inserted in the digital world. Monoculture and synthetic agricultural cultivars will tend to decrease the use of labor in the countryside, while diversified systems of poly-culture, integrating cultivars obtained through classical improvement, traditional cultivars and wild species, under incipient domestication or not, with low-impact intensive livestock (such as bees, chickens and sheep) can serve as a model for the generation of employment and income in public or private rural properties of all size scales. The objective is to create intercropping models of CAM metabolism cultivars of *Bromeliaceae* (*Ananas comosus* (L.) Merrill) and *Cactaceae* (*Cereus jamacaru* De Candolle), suitable for semi-arid climates, with low availability of water and oligotrophic soils, with the use of organic fertilizers through the technology of drip irrigation and biodegradable mulching, with the biomass productivity analysis of the arboreal forage cultivar (*C. jamacaru*) and the herbaceous fruit and forage cultivar (*A. comosus*). It is emphasized that precision agriculture and the use of flying robots (still called drones), as well as the input of data and images through smart phones, were desirable as they can be an accessible, low cost and practical way of inserting rural workers in the field of current technologies.

botanicapop@gmail.com

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Impacts on biosphere of plant cultivation by the genus *Homo*: From before the fire domestication to the genomics applied to industrial agriculture**Pedro Nahoum**

Botanica Pop Ltd, Brazil

Horticulture>Agriculture is a historic direction in plant production by the *Homo sapiens*. Many terrestrial mammals and bird species are seed and pollen dispersers and *H. sapiens* has been doing it too since the first fruit eaten. Organic deposits are found in places where human groups stay for even a short period, so there were always seed germination processes next to the human dwellings. Our species probably had a slow and gradual transition between natural seeds dispersed from feeding to the plant germination learning. Plant production is much older than agriculture - on June 8th, 2017 an article was published featuring fossil records of *H. sapiens* presence with fire around 315,000 years B.P. in Morocco, while agriculture, as an incipient monoculture practice, has around 23,000 years B.P. There are over 200,000 years of sustainable plant cultivation of our species before agriculture started. The original plant production system was not the monoculture of wheat and grains in the crescent fertile of Mesopotamia 9,000 years BC, as many think - the original cultivation comes from the forest gardening, much older and more related with permaculture, with a horticultural approach and much higher biodiversity indexes. Biodiversity and agrobiodiversity losses, the genetic erosion process, impede adaptive responses to stressful environments, like deforested and semi-arid areas and the whole planet earth is affected by the climatic changes. Very low biodiversity indexes in monocultures with synthetic inputs use is an important argument against GMOs, genetic engineered cultivars and synthetic growing for extensive areas, as have been occurring in South America and is starting in Africa now. Each area unity converted in monocultures is related to genetic erosion of natural biodiversity, with losses in the intraspecific genetic diversity of well-spread species, the extinction of endemic species and the reduction of humanly created agrobiodiversity.

botanicapop@gmail.com

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Habitat suitability and distribution models of brown bear (*Ursus arctos*) in two protected areas (Sefid kouh and Oshtran kooh, Lorestan, Iran)**Sahar Roshanara, Sohrab Ashrafi and Roghayeh Garmaeepour**
University of Tehran, Iran

Brown bear is the largest carnivore in Iran, has a very large variety and several subspecies in the world. The brown bear as an umbrella and flagship species has a great importance in mountainous ecosystems. Brown bears in Iran have three diverging populations: (1) Hyrcanian forests on the northern slopes of the Alborz Mountains and the southern shores of the Caspian Sea, (2) mountains of the Caucasus in the northwest of the country and (3) Central Zagros mountains in the west. Human activities such as agriculture, forestry, highways and human settlements that result in the degradation or fragmentation of habitats are major threats to Brown bear populations. Part of the brown bear distribution areas in Iran is the Zagros Mountains, which Sefid kouh and Oshtran kooh protected areas are considered as important brown bear habitats in there. In this study, we used the GPS to record presence species points, as well as maximum entropy method (MAXENT) and ArcGIS 10.3 software to evaluate the habitat suitability and distribution of brown bear in two mentioned hotspots of brown bear. Results showed that roads, seasonal temperature, topography and cities are the most important drivers affected distribution of brown bears in the study area. These factors, by interacting with each other, ultimately reduce the habitat suitability and isolate the brown bear population of the protected area of Sefidi kouh and Oshtran kooh in Lorestan province.

roshanara@ut.ac.ir

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Season affects the water quality index of Ganga River in Kanpur, UP

Sunita Verma, Divya Tiwari and Ajay Verma
Christ Church College Kanpur, India

Ten important physicochemical parameters were estimated to ascertain the seasonal effects on water quality of Ganga River for public consumption. Parameters were estimated over two years to quantify the changes over the years in weighted water quality index. Water quality index calculated based on pH, conductance, TDS, chlorides, nitrate, sulfate, phosphate, alkalinity, hardness, BOD and DO. Maximum phosphate value was seen in rainy season i.e. 0.54 mg/L while maximum in rainy season i.e. 0.72 mg/l. Value of sulfate concentration ranged within 32.9-45.5 mg/l. Dissolved oxygen varied from 5.6-4.9 mg/l. BOD values are 20-23 mg/l above the prescribed limits.

sunitaverma2k11@gmail.com

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Trans-boundary conservation of Tibetan antelope by identifying its potential movement corridors in the alpine desert of Qinghai-Tibetan Plateau**Xiaowen Li, Jianbin Shi, Haijing Zhuge and Jiaxun Li**
Beijing Normal University, China

The alpine desert of Qinghai-Tibet Plateau (QTP) provides the world's largest habitats for the endangered Tibetan antelope (*Pantholops hodgsonii*, also known as chiru). Most female Tibetan antelope populations are seasonal long-distance migrants, but their migration routes (corridors) remain mysterious in the alpine desert of QTP. Three contiguous nature reserves (i.e. Altun, Kekexili, Qiangtang nature reserves) have been established to protect the endangered ungulate species and their habitats in QTP, but they are delineated and managed according to administrative boundaries. In this study, we employed a GIS-based model (i.e., Linkage Mapper) to identify potential movement corridors of chiru according to principle of the least-cost path. We also examined the impacts of human disturbance on the spatial patterns and conservation status of the identified corridors of chiru. Our results indicated that only 66% of the movement corridors for chiru were covered by the existing reserves, whilst 76% of the corridors were disturbed by human activities with a high overall disturbance index. The human disturbance index within the existing reserves was much lower than that outside the reserves, indicating the conservation efficacy of the reserves. More efforts and priority should be given to protect those corridors connecting the existing reserves for better movement and gene flow of chiru populations in different reserves. Our research developed the conservation strategy for different categories of the corridors (inside, outside, inter-reserve, opening) for chiru considering their spatial relationship with the existing nature reserves and highlighted urgent needs to implement trans-boundary conservation strategy between the three nature reserves across the alpine desert of QTP.

lixw@bnu.edu.cn

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Effectiveness of conservation education workshops on Azerbaijani students' knowledge about rare vegetation degradation within the buffer zones in Gobustan National Park, Azerbaijan

Yelena M Gambarova and Adil Y Gambarov
R.I.S.K. Company, Iran

This article presents the effectiveness of conservation education workshops on Azerbaijani students' knowledge about rare vegetation distribution and skills on monitoring of threats to rare vegetation within the "buffer zones" (areas between industry zone and non-industrial protected area in Gobustan National Park), environmental affect and responsible environmental behavior. The evaluation process consists of the following steps: Identify purpose of evaluation, select evaluation method, design evaluation tools, collect data, analyze and report results. Donald Kirkpatrick's evaluation model has been applied for the training evaluation. Students' knowledge about and attitudes towards rare vegetation have been assessed through making use of rare vegetation knowledge test consisting of 12-15 multiple-choice items with three-four options (multiple-choice questions ask respondents to select among several possible answers). These tests assessed biodiversity conservation knowledge and will asked respondents to identify rare plant species. This part elicited students' opinions about the park and biodiversity conservation by presenting 2-3 statements (e.g. people should be allowed to let their goats graze freely in Gobustan park) and asking students how much they agreed or disagreed with each statement. In order to examine how the students demonstrate their knowledge about application of GIS and remote sensing technologies in environment protection special topic questionnaire and remote sensing exercises have been developed. Performing these exercises, students demonstrated their knowledge in the identification of the buffer zones.

Elenag@risk.az