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Cultural Entomology- An Approach towards Entomo-Fauna Conservation

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Abstract

Biodiversity loss is the major havoc for humanity today and entomo-fauna being the most diverse vulnerable group. Every year some percentage of insect species is introduced in the IUCN Red List featuring endangered and extinct species. Conservation of this diverse group is possible with the approach of Cultural Entomology involving the Human-insect interactions and utilization of insects by human, which has created a special link between insects and humans. Human utilizes insects as nutritious food, raw materials for medicine, portrayal in literature for entertainment and amusement. The tradition of deploying insects for human purposes is perpetuating, and the wild species are protected so far by local or regional tribes of countries. Tribal customs and traditions should be more emphasized and advertised through protecting them with Intellectual Property Rights. Creating awareness about these beneficial natures of insects can perform a significant role in the endangered and rare listed Entomo-fauna conservation.

Introduction

Insects have been a matter of interest for people, whether as a helping friend or as a cause of nuisance. Since ancient times insects occupy an essential part in human life, such as being a part of poems, movies, painting, sculpture, cuisines, medicine, and impacting social, cultural, and aesthetic values. With beauty and morphological diversity, insects have drawn human attention and established a special relationship with humanity. Although some insects proved as a pest in the agricultural ecosystem, the majority of insects with its functional diversity and species richness play a crucial role in maintaining biodiversity.

With the changing climate, biological factors, and human interference in biological stability (anthropogenic factors), several insect species are on the verge of extinction. Insects have been listed as rarely found and endangered species in the Red List of IUCN (International Union for Conservation of Nature). Sánchez-Bayo and Wyckhuys (2019) reported the decline in insect species might lead to the extinction of 40% of world's entomo-fauna in next few decades, and the most vulnerable taxa are Lepidoptera, Hymenoptera, Coleopteran (terrestrial ecosystem) and Odonata, Ephemeroptera, Plecoptera and Trichoptera (aquatic ecosystem). This decline in biodiversity, especially insect diversity in the world, has now become a global issue for biological conservation.

Cultural entomology can be an approach to maintain this global biodiversity through the creation of awareness among people towards insects. This cultural entomology implies human's attitude towards insects and the impact of insects on their soul, art, mind, and perspective towards nature. To

create a social change for reducing insect diversity loss and successful conservation, studying people's attitudes towards insects and the environment is necessary, which leads to the implementation of this branch, cultural entomology. Rendering the beneficial aspects of insects to the public and showing the positive side of insect-human interaction will encourage and boost them to conserve the entomo-fauna.

As a Food Source

In the Asian subcontinent predominantly in India, over many years, entomophagy is being practiced. The tribes of North-eastern India use insects as a source of nutrients - proteins, lipids, vitamins, and minerals. Insects are more abundant in protein than maize, soya bean, lentil, meat, and fish. Some caterpillars act as a source of protein, calcium, and iron. There have been reports on a variety of eatable insects in various continents like Africa, America, and Asia. In the Indian subcontinent, different regional tribes and their traditions are the sole reason for maintaining the biodiversity of insects. They consume larva, ants, bugs, termites, and locusts as food in Madhya Pradesh, Andaman & Nicobar Island, and North-east India. Moreover, insects proved as an excellent food source in South India also. (Meyer-Rochow and Chakrovarty, 2013).

As a Medicine

Colonial social arthropods living in close proximity such as bees, wasps, ants, termites, crickets, scarabaeid grubs, cicada nymphs, centipedes, etc. are susceptible to be attacked by microbes. Thus they protect their colony by producing some antimicrobial compounds. These compounds can treat asthma, viral infection, and bacterial infections. These properties of insects are exploited by human beings to prepare medicines. Some tribes of India use these insects as raw material for the preparation of their folk medicines. Some other records of the insect as medicine have been found in Nyishi and Galo tribes (Arunachal Pradesh), who use 12 species of insects to treat different disorders. There are examples beyond the sea in Thailand, Laos, Myanmar, Japan, and Korea. One of the promising examples is the use of coleopteran insects in treating cancer in Korea. This Cancer Coleotherapy is done using a Meloid beetle, *Mylabris phalerata*, as a medicinal source (Meyer-Rochow and Chakrovarty, 2013).

As a Part of the Literature

Since time immemorial, insects are found as a part of stories, poems, songs, movies, and other works of literature. The wordsmiths describe insects in their writings mesmerized by their beauty, glittering colors, and melodious sounds. Poetic entomology is the branch that deals with this cultural aspect of insects. The striking

illustration of insects in literature is the Japanese Haiku poems. They have described the culturally relevant singing insects such as cicadas, crickets, grasshoppers, illuminating insects like fireflies, flamboyant insects with alluring beauty like dragonflies, butterflies, and noxious insects like flies and mosquitoes, etc. (Dunn, 2000). The alliance of insects with the environment is beautifully penned down in several pieces of literature. In India also, ancient scripts like Atharvaveda, Mahabharata, Ramayan have mentioned insects as Madhumamakshika (Honey bee), Pipilika (Ants), Pathanga (Grasshopper), Umbakapalika (Termite queen).

As an Aesthetic Paradigm

To change the public's perspective towards insects and nature, the aesthetic values of insects can play a major role. Some insect species, with their species richness and functional diversity, become the point of attraction for human beings. These characteristics like surviving in extreme environmental conditions (High and low temperature), adopting to adverse climate (by undergoing diapauses), the adjustment in physiology (filter chamber and cryptonephric excretion), modified diverse morphological structures (modified legs, prothorax, presence of spine, poisonous setae, etc.) are the reasons for diverse nature of insects and beautiful colouration of wings in butterfly, beetle and bugs, appealing modifications in beetles like rhinoceros beetle, bioluminescence in lampyrids, camouflaging nature in phasmids, grasshoppers and moths, mimicking characters of butterflies, beetles, etc. are a prodigious boon for insects to become popular among the public. Bringing these charismatic traits of insects to the public spotlight can contribute significantly to conservation biology.

Other than the above mentioned entomo-human interactions, there are some other fields where insects play a vital role, whether being a part of ancient sculpture, paintings, ornaments, or contributing to today's research and pest control. These interactions have made insects an indispensable part of human life and nature from distant times.

Conclusion

Being the most diverse living group and having the capacity to earn people's attention, insects always have the lion's share in maintaining biological diversity. Thus declining insect species diversity is now a key challenge for human beings. Creating awareness among people about the inevitable danger, if biological diversity is not maintained, is necessary. Encouraging long followed tribal traditions will surely have a major impact. Conserving these traditions through IPRs (Intellectual Property Rights) and creating interest among the public for protecting these traditions will ensure the objective of entomo-fauna conservation.

Changing people's attitudes towards insects through cultural entomology is imperative. Human dependence on insects and their functional diversity can trigger awareness among people towards threatened and endangered species, thus creating interest among the public for entomo-fauna conservation.

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