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Diversity of apis Dorsata f. and honey production and management in Similipal biosphere reserve

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Abstract
The present study attempted to gauge the impending threats that the wild honey populations of Similipal are facing in the wake of anthropogenic manipulation and natural disasters. The extensive loss of forest habitat is a major threat to the wild honeybees population. In-discriminated deforestation, changes in 200 agricultural patterns, encroachment of forest by tribal and local population, soil erosion, landslide caused by road and tourist track construction etc. are emerging threat to the wild habitat of bees for their nesting and foraging. Rampant destruction of premature hives for collection of honev. '? Destruction of wild honeybee colonies by improper methods of honey collection. Gradual reduction of experienced honey collectors due to their ageing and new generations are least interested to adopt this profession for reasons. Hard work involved in collection of honey. Traditional practices are unhygienic method and risk involved. Limited income generation from such honey collection. Therefore, they are changing their mindset for seeking job opportunities, more income to substantiate their family due to hard cost of living, and seeking better communication and infrastructure facilities for their good living. Traditional practice of collecting honey leads not only to poor quality, but also endangers the species and potential growth of the forest. No proper grading and standardization units. Lack of proper and effective technology. Exploitation by intermediaries and the local traders by cheating the tribals in weight and low price while collecting honey in comparison to government support price. Lack of awareness amongst honey collectors about its market value.

Keywords: honey production, management and similipal biosphere reserve…. etc

Introduction
Honeybees probably originated in Tropical Africa and spread to South Africa, Northern Europe, India and China. The first bee appears in the fossil record in deposits about 40 million years ago during the Eocene period. At about 30 million years before present, they appear to have developed social behaviour and structurally identical with modem bees. The fossil records indicate that bees evolved from wasp like ancestors, during middle cretaceous period, co-incidental with the appearance of angiosperms as the dominant vegetation (Zeuner et ai, 1976). The evolution and divergence of bees has been closely linked to that of angiosperm plant, with the plants evolving flowers with odour, shape, colour and excess nectar and pollen food rewards to attract the bee.

Objectives
Therefore, the present study has been taken up keeping in mind the following objectives

- To study on h abitat of nature grown Apis dorsata F. in Similipal Biosphere Reserve.
- To study the bee flora for nesting and foraging in and around the Similipal forest.
- To study the morphometric and life cycle of Apis dorsata F
- To study the foraging behavior of Apis dorsata F. on different wild flowers.

Material and Method
The present research work “Impacts of wild honeybee (Apis dorsata F.) on Biodiversity and Tribal Economy of Similipal Biosphere Reserve was carried out during the period from 2005-2007. Keeping the objectives in mind, following materials and methods have been adopted to carry out the research on the above project.

Identification of study area
Exploratory survey was taken up in various parts of Similipal Biosphere Reserve which is limited to eight forest regions such as Kundabai, Podadhia, Uppertaldhia, Banibasa, Chandri, Kochilaghati, Gobindpur, Lulung and nine rock cliffs having large number of wild honeybee hives such as Puthini, Ramajadi, Peli, Shamibrukha, Chandri, Ledam, Lampti, Rimiligadi & Kali to know about the habitat of wild honey bee, morphemetry, their foraging behaviour, their relation with plants and animals, methodology of honey collection by Hill Kharia and how honey & honey bee hive products influence the livelihood of Hill Kharia. Assistance was taken from the official of Forest Department, Nongovernment organizations, officials of District Supply & Marketing Society (DSMS) working in and around the Similipal Biosphere Reserve and Tribals of Similipal forest for survey work.

- **habitat of apis dorsata f. of similipal biosphere reserve**

Apis dorsata F. has strong relation with the environment of Similipal forest, which is considered as its natural abode. The habitat, the natural environment of Apis dorsata F. was studied for edaphology, topography, meteorology and floral, faunal & human population.

- **Edaphology**

In ecological studies, edaphology embodies the study of soil characteristics, which affect plant growth (Mishra, 1968). Physical properties (texture, structure & colour) and chemical properties (Soil, water & Chemical composition) determine both productivity & fertility of the soil. For this study, the working plan of Forest Department was consulted. The Director of the Similipal Biosphere Reserve also provided required information in this aspect.

- **Topography**

The topography is a detailed description ofthe physical features of an area. The Similipal Biosphere Reserve represents a compact block of mountains varying from small hillocks to high mountain peaks. Information on this aspect was collected from available literature.

- **Meteorology**

The science dealing with atmosphere and weather is called meteorology. Climatological data pertaining to atmospheric temperature of each study area was recorded during the study period. This was done with standard equipment like thermometer.

- **Floral Environment**

Forest is a integral part of the natural ecosystem and maintain a balance between various components within the ecosystem, viz. climatic, abiotic and biotic factors. It constitutes a community of living trees, which maintain environmental quality and make important natural habitat for wild life. Information relating to the forest of Similipal Biosphere Reserve was studied on the spot and also gathered from available literature.

- **Faunal Environment**

The topography, soil type coupled with climatic variation and rich vegetation support a variety offaunal composition of Similipal Biosphere Reserve. Information in this regard was gathered from Director, Similipal Biosphere Reserve, Baripada.

- **Human Population**

The information on human resources was gathered by interacting with the tribal people, from the office of Director, Similipal Biosphere Reserve and also from Tribal Development Corporation, Baripada.

- **Bee Flora and Rock Cliff for Nesting**

For study ofbee flora and rock clifffor nesting eight forest regions i.e. Kundabai, Podadhia, Uppertaldhia, Banibasa, Chandri, Kochilaghati, Gobindpur, Lulung and nine rock cliffs i.e. Puthini, Shamibrukha, Peli, Ramjadi, Kali, Chandri, Ledam, Lompti, Rimiligardi of Similipal Biosphere Reserve were selected. The bee flora for nesting were visualised through direct observation.

- **Bee Flora For Foraging**

For study of bee flora for foraging the above eight forest region of Similipal forest were selected. The different wild flowers from where Apis dorsata F. collected the nectar and pollen were visualised through direct observation, data about the local name, scientific name, and family of the plant was collected during the course of discussion with research personnel, staff of Similipal Forest Development Corporation (SFDC) and Tribals.

- **Architecture of Hive of Apis Dorsata F.**

In nature different kinds of organism grow in association with each other. Wild honeybees have mutual relationship with plants and its environment & accordingly construct their hives on the rock cliffs and branches of the trees. Architectural structure of hive of Apis dorsata F. was studied by collecting their hive with the help of Hill Kharia. The measurement of different types of chamber of the hive were taken by millimetre scales.

- **Morphometry**

The morphometry is numerical expression of the shape of an animal. The nature grown Apis dorsata F. were collected from the hive by the help of Hill Kharia people and preserved in 70% ethanol in a glassjar. The biometry of the bees was taken as per standard procedure (Rohlf, 1990). Twenty bees were picked up randomly from the glass jar and linear measurement such as length of body, width of body, length of 35 head, forewing, hind wing, foreleg, hind leg &proboscis were taken with slide calliper. The data recorded were statistically analysed for mean & standard deviation. Body length: The body length was measured from the anterior end ofthe head to the posterior tip of abdomen. Body width; The body width was measured at the thickest part of the thorax. Wing length: Wings were detached from the thorax and measurement taken from the point of articulation to the distal extremity ofthe wing. Leg length: Legswere detached from the thorax and measurement taken from the point of articulation to the claws ofthe leg. Proboscis length: For proboscis length, the head was stretched with a needle and labrum grasped with fine forceps and the proboscis was pulled to its fullest limit. The length was recorded as the distance from the point of attachment of fronto-clypeal plate with clypeus to the tip of fully extended glossa. Using slide calliper and millimetre scale did measurement

- **Apis Dorsata F. as Pollinator**

To know the efficiency ofApis dorsata F. as pollinator on different wild flowers, fifty different types of pollinators were observed, the percentage of Apis dorsata F. as pollinator was calculated by using the formula. Number ofApis dorsata F. in total number of pollinator

- **4.8 Foraging Behaviour**

For study of foraging behaviour of Apis dorsata F. in its natural habitat three study areas were selected i.e. Podadhia, Devkund and Lulung. Accommodation of Forest Department was utilized at Lulung for the said studies. The foraging behaviour of bee was visualised through direct observation from 0500h to 1800h ofthe day

- **Methodology of Honey and Wax Collection**

Collection of honey from hive of Apis dorsata F. is a traditional occupation of Hill Kharia of Similipal Biosphere Reserve. Information about the technology of honey collection from the hive ofApis dorsata F. from the branches of tall trees and from rock cliffs was collected by the following local tribal technology as well as by direct visual observation.

- **Analysis of Similipal Forest Honey**

The sample of Similipal forest honey was collected from the hive of Apis dorsata F. and the physiochemical analysis of honey was conducted by the research scholar at “Central Bee Research Training Institute (CBRTI), Pune and the comparative study was made with other apiary honey.

- **Impact of Apis Dorsata F. on Tribal Economy**

The different tribes of Similipal forest earn their livelihood by collecting different Non-Timber Forest Products (NTFP). So the socioeconomic condition of the tribals is associated with economy of Similipal. The Hill Kharia (Honey collector) depends upon honey and honeybee hive products

for their livelihood. To know the role of honey and honeybee hive products on the economy of Hill Kharia, four study areas was selected i.e. Gobindpur, 37 Uppertaldhia, Balabhadrapur and Banibasa. Interviewed all the Hill Kharias by these villages through a prepared questionnaire about their economy in their own language. The economic institution of "Dhangar" (Person who is employed by a land owner) - among the Oram, Munda and Ho of Bihar.

Conclusion

The vast splendor of biological diversity has come about with grandeur and precession since ages, each species being unique in its own way. Species of plants and animals in a given ecosystem co-exist and interact with one another and with abiotic components to maintain equilibrium. The single most important factor in maintaining this is the optimal level of population of each species. In fact, each species has a definite role and importance of its own in the ecosystem. Human beings, at the apex of ecological pyramid are no way different from or more important than other species. What is paradoxical is, Man is the only species who can create microenvironment with in macro environment and at the same time exploit natural resources living and nonliving for meeting his needs, much faster than these can regenerate and replenish themselves. The present research investigation is a move in that direction. It embodies both perspectives of conservation and propagation of a species- the Wild Honey Bee and sustenance of livelihood system of tribal groups especially the Hill Kharia, the hunter-gatherers. The ecosystem that has been harbouring vast repertoire varieties of animal, plant and human species including the studies species is no other than the famous Similipal -the pride ofOrissa. The present research was carried out on the ecology, morphology, ethology of one of the species of wild honey bee i.e. Apis dorsata F. of Similipal Forest, the role of the species in fostering bio-diversity and collection of honey in sustaining the tribal economy by adopting appropriate methodology. The study brings out the following inferences, which could be considered as inferred- hypotheses for researchers to test and validate in future.

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