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Studies on Diversity of Beetles in Girgaon Region, District Chandrapur, Maharashtra, India

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Abstract: ***Beetles refer to as modified front wings which serves protective covers for a membranous hind wings belong to superorder Endopterygota order coleoptera in class insecta represent 40% of known insect. The diversity of beetles is very vast. They found in everywhere all habitats, except the polar and marine region i. e., leaves, vegetative foliage, from trees and their bark to flowers, underground near roots, including dead or decaying ones, tissue, even inside plants like galls. There are particular species that are adapted to practically every kind of diet. Girgaon village is covered 568.6 Hectares total forest area and out of 68% used for agriculture. Though a serious attempt has not been made in the past to record diversity of beetles in Girgaon region, Tehsil Nagbhir in District Chandrapur. In the present study, the total numbers of beetles collected from three locations of Girgaon region were 27 species under 11 families and 23 genera are recorded.***

Keywords: Diversity, Beetle, Farm, Foerst, Lake, Girgaon region

1. Introduction

Beetles make up the biggest order of insect coleoptera not only the Arthropoda but also in entire Animal Kingdom about 360, 000 species worldwide where as 17, 431 species have been reported from India (Trigunayat Kritika and Sharma Jaimala 2017)). The beetle is one - fourth of all known animal species in the world. The recorded beetle's species of Maharashtra state are 51. Family Scarabaeidae is the largest family of beetles which contains more than 30000 species in world (Banerjee M 2014).

They are adapted to various modes of life, viz. - terrestrial, aquatic, areal, fossorial, subterranean and cavernicolous are mostly concealed in habit. They are highly sclerotized endopterygota with biting - chewing type of mouthparts and compodiform or eruciform larvae. Beetle's are different in colour, the order represents a heterogeneous assemblance of very minute in size i. e., 0.5 mm long and large size about 155 - 160 mm long. The few characteristics of beetles more successful such as presence of horny or leathery elytra which protects the folded hindwings. In some beetles species wings are reduced, compound eyes are three types - acone, eucone and pseudocone.

Three pairs of legs are modified widely, only hind legs are modified for swimming, eleven segmented antennae are present and head is strongly sclerotized, mobile head with reduced or obsolete epicranial suture. They play most important role in ecosystems. About 3 - 4 species are phytophagous in whole life living on plants, fungi, wood, variety of stored products which include tobacco, dried fruits and cereals. Beetles are prominent in human culture, from the sacred scarabs of ancient Egypt to beetle wing art and use as pets or fighting insects for entertainment and gambling. Many beetle groups are brightly and attractively coloured making them objects of collection and decorative displays.

The many plants are important for agriculture, household and forestry. They attack in all parts of living plants, grains, wood products and processed fibers. The wood and scavengers boring beetles are useful recyclers of organic nutrients and decomposers, *Colorado potato beetle (*Chrysomelidae) are sirious agricultural pest. The beetles can be considered as a pest. Beetles are not only pest can also be beneficial, by controlling the population of pests. The *ladybird* or *ladybug (*Cocciilinidae) is one of the best and widely known examples. Both the larvae and adults also feed on aphid colonies that damages crops, other ladybug feeding on mealybugs and scale insect. If the common food sources are rare, they can eat young plants, bugs, small cattepillars, thrips, nectar and honey dew.

A gap in the knowledge exists for the beetle diversity of Girgaon region as this study is the first ever survey of Coleoptera. As there is no information available on beetle in this region therefore this work undertaken on diversity of beetles in Girgaon region, Tehsil Nagbhir, District Chandrapur.

2. Material and Method

1) Site Selection

The site selection was done on the basis of (Site A farm - Longitude - 20.378657 and Lattitude - 79.589409., Site B forest - Longitude - 20.383341 and Lattitude - 79.611279. and Site C lake - Longitude is 20.391606 and Lattitude is 79.590293. region). These three sites were selected on collection in beetle's species.

2) Collection / Sampling

In the present study majority of the insects were collected from all variety of plants: grass, flowers, weeds, shrubs, herbs, trees and some from cow dung surface of soil and under the stones. Some were found on and around building walls and nearby water sources. By Hand picking, beating and trapping method were used for collection.

3. Observation

Though a serious attempt has not been made in the past to

record diversity of beetles in Girgaon region, Tehsil Nagbhir, in District Chandrapur. In the present study, the total numbers of beetles collected from three locations of Girgaon region were 27 beetle's species under 11 families and 23 genera are recorded. The identified species and their average abundance of three sites.

In site a found 9 species of 6 families, site B found in 8 species of 6 families and site C found in 6 species of 2 family. The site A and C are found four similar species of beetles in three families – Altica oleracea, Dacladispa armigera, Cocciinela transversalis and Hydrophilus acuminatus. Carabidae is the most dominant family in Girgaon region it represented in 6 families, Cocciilinidae and Chrysomelidae family was represented in 4 species, Hydrophillidae and Tenebrionidae represented in 3 species. Curculionidae family was represented in 2 species. Anthicidae, Cidae, Dytiscidae, Scarabaeidae and Staphylinidae were having 1 representative each. (Table 1)

Table: List of beetles collected from three locations in Girgaon region

Sr No	Family	Scientific Name	Common Name	Sampli ng site	Abundance
1	Anthicidae	*Anthicus cervinus*	Antlike flower Beetles	A	+++
2	Chrysomelidae	*Altica oleracea*	Leaf beetle	A C	++++
		Lilioceris lilii	Scarlet lily beetle	A	++
		Dacladispa armigera	Rice hispa	A C	++++
		Chrysolina hypericin	Saint John's wort Beetle	B	++
3	Cocciilinidae	*Cocciinela Transversalis*	Transverse Ladybird	A C	++++
		Cycloneda sanguine	Blood red ladybird Beetle	A	++++
		Cheilomenes Sexmaculata	Six - spotted zigzag Ladybird	A	+++
		Exochomus aethiops	Coccinelle foncee	A	+
4	Carabidae	*Chlaenius sericeus*	Harpale vert Soyeux	C	++
		Platynus ovipennis	Harpale aelytres Ovales	C	++
		Cymindis humeralis	Rotschulteriger	C	++++
		Pheropsophus Verticalis	Bombardier beetle	C	++
		Styphlomerus Placidus	Asturianu	B	++++
		Chlaenius Impunctifrons	Lionepha erasa	C	++
5	Ciidae	*Cis boleti*	Minute tree - fungus beetle	B	++
6	Curculionidae	*Sitophilus oryzae*	Rice weevil	B	++++
		Sitophilus granaries	Wheat weevil	B	++++
7	Dytiscidae	*Cybister lateralimarginalis*	Aquatic diving beetle	A	++++
8	Hydrophilidae	*Hydrophilus piceus*	Great silver water beetle	A	++++
		Hydrophilus Caschmirensis	Large scavenging water beetle	A	++++
		Hydrophilus Acuminatus	Dark diving beetle	A C	+++
9	Scarabaeidae	*Heteronychus arator*	African black beetle	B	++++
10	Staphylinidae	*Paederus riparius*	Rove beetle	A	+++
11	Tenebrionidae	*Tribolium destructor*	Destructive flour beetle	B	++
		Tenebrio obscurus	Dark mealworm	B	++++
		Tribolium confusum	Confused flour beetle	B	+++

4. Result and Discussion

Total 27 species, 11 distinct families and 23 genera were recorded during the present study at Girgaon region. This area rich in most represented families Carabidae (*Ground beetle*), Cocciilinidae (*Lady bird beetle*), Chrysomelidae (*Potato beetle*), Tenebrionidae (*Flour beetles*) and other family of beetles such as, Curculionidae (*Weevils, snout beetles*), Scarabaeidae (*Dung beetles*), Staphylinidae (*Rovebeetles*), Dytiscidae (*Aquatic diving beetles*), Hydrophilidae (*Water scavenger beetles*), Ciidae (*Tree fungus beetles*) and Anthicidae (*Antlike flower beetles*).

Carabidae was the most dominant family (22%) was represented by 6 species of Coleoptera. Cocciilinidae and Chrysomelidae family was represented by 4 species (15%). Hydrophillidae and Tenebrionidae family was represented by 3 species (11%). Curculionidae family was represented by 2 species (7%). Anthicidae (3%), Cidae, Dytiscidae, Scarabaeidae and Staphylinidae (4%) were having 1 representative each. The similar families were earlier made by Shashikant Trimbak Hon (2018) A total of 29 species of 23 genera and 8 families are recorded.

The nine beetle species collected from Farm (site A) and Forest (site B) in February month and ten beetle species collected from Ambeghata lake (site C) in March. Site A beetles species found in *Anthicus cervinus, Lilioceris lilii, Cycloneda sanguinea, Cheilomenes sexmaculata* and *Cocciinela transversalis* these two same species found in agricultural fields of Sivakasi in relation to weather factors C. Sundareswari (2019). *Exochomus aethiops, Cybister lateralimarginali* similar findings were also reported by Wenfei Liao *et al.,* (2020) In this study wetlands 39 out of 96 dytiscid species (40.63%) that are known from the Urban landscape. *Hydrophilus piceus, H. caschmirensis* and *Paederus riparius*. The Site B beetles species found in *Chrysolina hyperici, Styphlomerus placidus, Cis boleti, Sitophilus oryzae, S. granarius, Heteronychus arator, Tribolium destructor, T. confusum* and *Tenebrio obscurus*. The site C beetles species found in *Chlaenius sericeus, Chlaenius Platynus ovipennis, Chlaenius impunctifrons, Cymindis humeralis* and *Pheropsophus verticalis.*

Scarabaeidae, Dytiscidae and Hydrophillidae is the most dominant of all the families, *Heteronychus arator, Cybister lateralimarginalis* and *Hydrophilus caschmirensis* the adults of these beetles are more noticeable and sighted due to their relatively large size, bright colors, often with elaborate ornamentation. Curculionidae family is a very small size species are obtained *Sitophilus granarius* and *Sitophilus oryzae*. This study indicated that the diversity of beetles species richness and evenness of Coleoptera in Girgaon region.

Similarly Bhumi Thakkar *et al., (*2016) had recorded the families of Coccinellidae, Cerambycidae, Chrysomelidae and Curculionidae families were represented by 6.8% in Gujarat. A total of 5195 individuals and 32 families belonging to Coleoptera were recorded. The similar observations were earlier made by Kakkar N and Gupta S. K. (2009) in Haryana, Thakare V G *et al (*2011), Wankhede V *et al (*2014) and Shashikant Trimbak Hon (2018) in Maharashtra

5. Conclusion

Girgaon region Tahsil Nagbhir, Dist Chandrapur, Maharashtra, India is reach in beetle diversity with 27 species belonging to 11 families and 23 genera. The Carabidae family is the most represents family in Girgaon region. On the basis of field observations, it is concluded that beetles are most populous during the winter. Their population declines noticeably in summer. Perhaps, many a species hibernate or aestivate to overcome the unfavorable climatic condition. The diversity has great value to human welfare and it is a need to examine the present status i. e. how many species of plants, animals and microbes occur on the planet Earth, Therefore, the major concern today is to make the inventory of diversity of a given ecosystem which will help to make the review of loss of diversity of an area and it will also help to make the solid step to conserve and to prevent the diversity loss.

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