

INSECT DIVERSITY FROM RAJUR COLLEGE CAMPUS: AKOLE, MAHARASHTRA



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CERTIFICATE

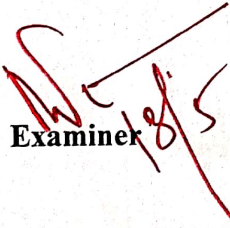
This is to certify that the project entitled "Insect Diversity from Rajur College Campus: Akole, Maharashtra" submitted by Miss. Dnyaneshwari Sudhir Godase was carried out satisfactory under the guidance of Mr. R.N. Kasar, Assistant Professor, Department of Zoology, Adv. M. N. Deshmukh Art's, Science and Commerce College Rajur, Akole during the academic year 2022-2023.

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Godase

Miss. Dnyaneshwari Sudhir Godase

DECLARATION

I hereby declare that the data presented in the dissertation entitled **Insect Diversity from Rajur College Campus: Akole, Maharashtra** is submitted to the U. G. Department of Zoology, Adv. M. N. Deshmukh Art's, Science and Commerce College Rajur, Akole, in fulfillment of the requirement for the award of the Degree of Bachelor in Science in Zoology. It was the result of my research work carried under the guidance of **Mr. R. N. Kasar**, Assistant Professor, Department of Zoology, Adv. M. N. Deshmukh Art's, Science and Commerce College Rajur, Akole during academic year 2022- 2023.

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Chapter 1: Introduction

INSECTS are among the crucial components of several ecosystems, where they perform many important ecological services. They aerate the soil, pollinate flowering plants, act as predators, parasites and parasitoids to manage the insect pests, and act as plant pests. Except for most saline and coldest locations on the earth, insects dominate compositional diversity in all other ecosystems.

Biodiversity, one of the most fascinating aspects of biology encompasses functioning, intact plant and animal communities and the processes that affects them [9]. Insects are extremely diverse and important to ecosystems [20], [5] and they are what make the ecosystems tick, remarked [18]. Understanding the extent of insect diversity is one of the major challenges in modern ecology. They have permeated the diverse and essential natural processes that sustain biological systems, making up over 75% of known species of animals [3]. Thus, the diversity and ecological importance of insects makes them very valuable for studies of biodiversity. Similarly, Insects have great potential for understanding ecosystems and as measures of ecosystem health, but the incompleteness of knowledge and the limitation of resources increase the difficulty of work on insect biodiversity [3]. Now a days India is occupying a significant space, documenting nearly 7 percent of global faunal diversity [6]. There are about 7, 51,000 known species of insects, which is about three-fourth known species of plants and animals on the planet [2]. The structure of insects has allowed them to exploit niches in almost all the habitats of the world. There are 1.4 million species of insects described in the scientific literature which is 80% of life currently recorded on earth [20], [4]. The insects are responsible for many processes in the ecosystem and its loss can have negative effects on entire communities [18]. It is suggested that conservation of natural resources and biodiversity has become urgent issues in recent years for attaining an environmentally sustainable future [2]. While a lack of data has historically excluded the use of many taxa as possible indicators [18]. Therefore, careful targeting of any study is essential. Keeping in view the diverse and characteristic feature of insects, the present survey was aimed to describe some aspects of insect diversity found in and around our college campus since there was no known published checklist of insect in Rajur college campus till date.

Chapter 2. Materials and Methods

2.1 Study Area

The present study was conducted in the Rajur College campus, Akole which is located at 19.520627°N and 73.880995°E respectively. The college is located in a sprawling area of rustic land, 0.5 km east of Rajur village and core of Kalsubai-Harishchandragadh Wildlife Sanctuary is only 20 km away from it. Rajur is the entry point to the mountain ranges (Western Ghats) and the nerve center of the eastern parts of the district. The entire campus covering an area of more than 9s acres blessed with green vegetation having garden lands, botanical garden, large trees, shrubs, herbs and grasses of different types.

2.2 Methodology

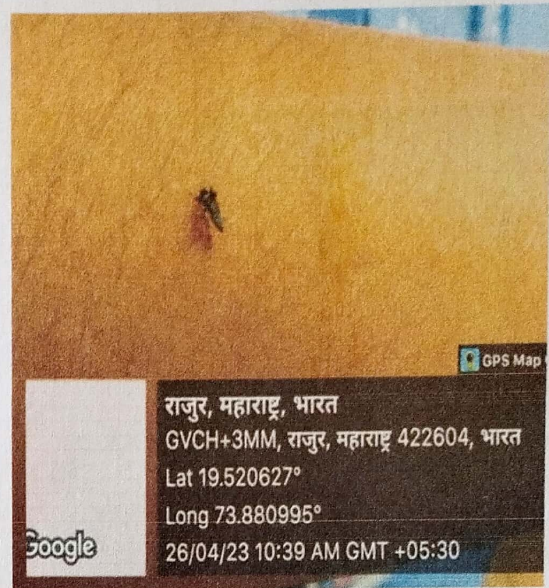
The study involved field visits to the entire campus from February 2023 to April 2023. The findings presented here are based on random survey and observations were made from morning, evening and night. The insect's photographs were collected by netting, hand picking and trapping. The insect preservation was avoided.

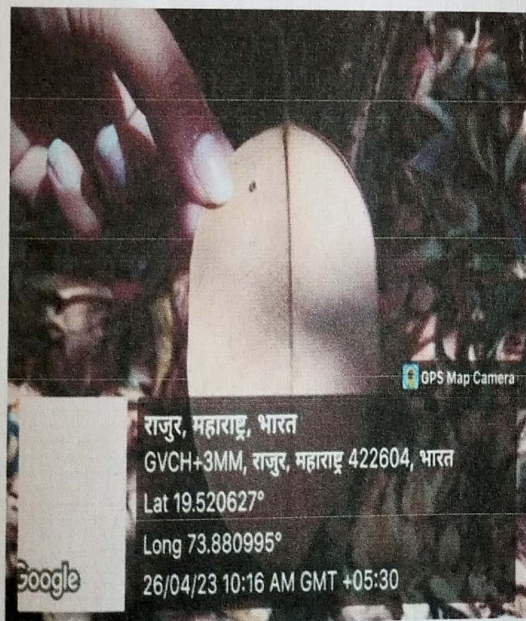
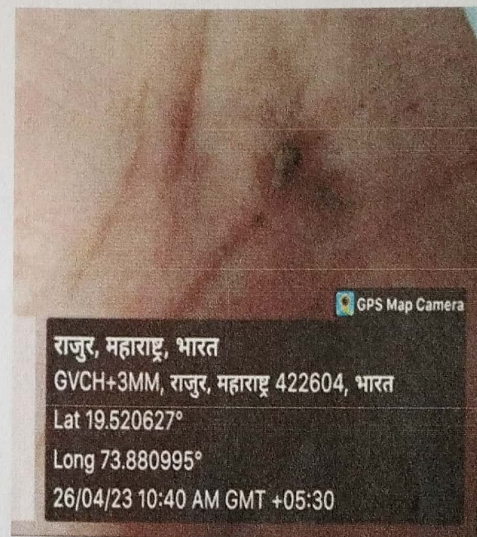
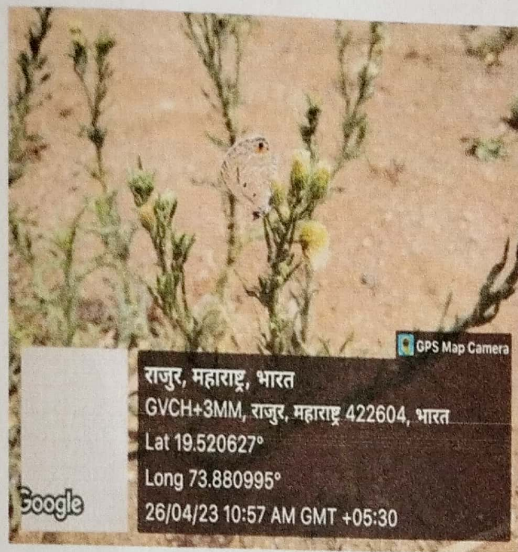
Chapter 3. Result

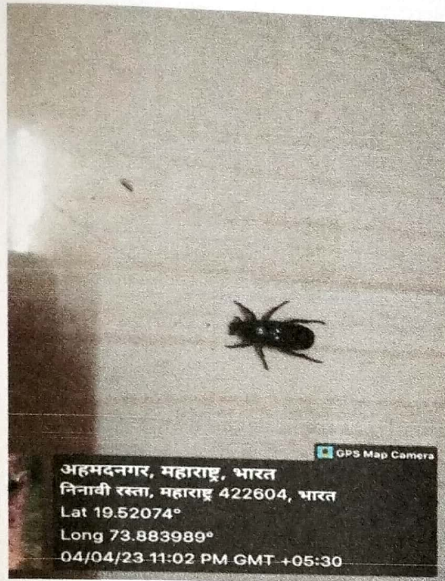
This is the first study which reports the distribution of insects in the Rajur College campus, Akole, Ahmednagar. Diversity study of the insect in the present campus can be utilized as an indicator of changing environmental conditions in the campus. In this study, a total of 25 individual of insects from **11 Orders** were collected. They are from the order of Blattodea (roaches and cockroaches), Coleoptera (beetles), Diptera (flies), Hemiptera (plant-bug), Hymenoptera (wasps, bees and ants) Lepidoptera (moth and butterfly), Mantodea (mantis), Mecoptera (scorpionflies), Odonata (dragonfly and damselfly), Orthoptera (grasshoppers and crickets), Thysanura (lepidisma) and Trichoptera (caddisfly). The total number of insects recorded and the insect's orders and name were presented in Table 1 below.

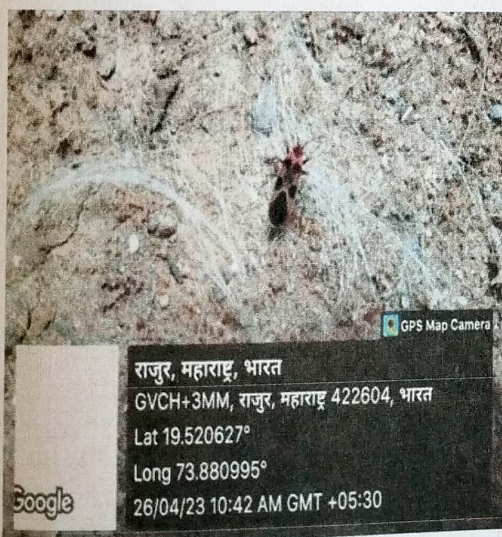
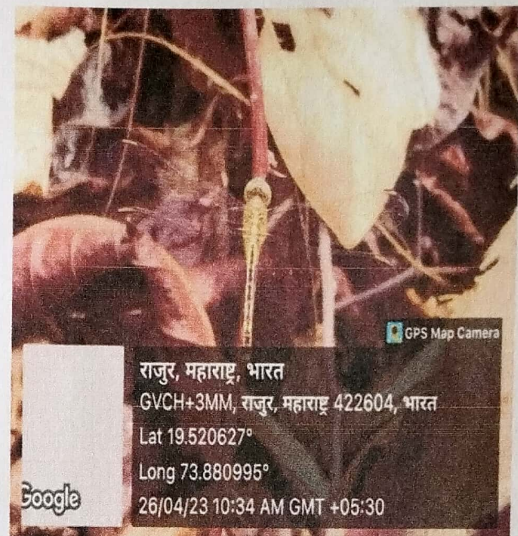
Sr. No.	Order	Genus	Common Name
1.	Diptera	<i>Musca</i>	House Fly
		<i>Aedes</i>	Mosquito
2.	Lepidoptera	<i>Luthrodes pandava</i>	
		<i>Daphnis nerii</i>	Oleander hawk-moth
		<i>Lymantria dispar</i>	Gypsy Moth
3.	Neuroptera	<i>Myrmeleontidae</i>	Antlion
4.	Hymenoptera	<i>Crematogaster</i>	Ant
		<i>Xylocopa violacea</i>	Violet carpenter bee
5.	Coleoptera	<i>Pseudotorynorrhina japonica</i>	Dung Beetle
6.	Phasmida	<i>Phasmatoptera</i>	Stick Insect
7.	Dictyoptera	<i>Periplaneta americana</i>	Cockroach
		<i>Blattella germanica</i>	Cockroach
8.	Odonata	<i>Diplacodes</i>	Dragon Fly
		<i>Boyyeria</i>	
9.	Hemiptera	<i>Pyrrhocoris apterus</i>	Firebug
10.	Orthoptera	<i>Teleogryllus emma</i>	Cricket
		<i>Oedipoda</i>	Locusts
11.	Mantodea	<i>Amantis</i>	Amantis
		<i>Statilia</i>	Mantis

Table 1: List of Insect found in College Campus











Chapter 4. Discussion

However, the insect fauna of India is vast [9]. Lepidoptera are commonly known as 'butterflies' and 'moths'. The various publications on Butterflies and Moths of India have been published by Wynter-Blyth (1957) [26], Marshall and De Niceville (1882) [10]. The Coleoptera (beetles) are the largest single order of insects, they total a staggering 360 000 named species with 125 different families. Many beetles are regarded as major pests of agricultural plants and stored products. They attack all parts of living plants as well as processed fibers, grains, and wood products. Scavengers and wood boring beetles are useful as decomposers and recyclers of organic nutrients. Predatory species, such as lady beetles, are important biological control agents of aphids and scale insects. The Hemiptera is the largest and by far the most successful of the hemimetabolic insects (where the young look like wingless adults). There are at least 80,000 named species globally. Hemipterans are important as they are Dipterans are one of the major successes of the insect world, and the 145,000 species (about 160 families) are reported. Dipterans (flies) have been of incredible importance to mankind all over the world, this is because many of the primary diseases of humanity are transmitted by flies. Odonates are primarily aquatic insects and their life history is closely linked to specific aquatic habitats. This habitat specificity makes them a good indicator of wetland health. India with its unique geography and diverse bioclimatic regions, support a rich Odonate fauna. Adult Odonates feed on mosquitoes, blackflies and other blood-sucking flies and act as an important biocontrol agent of these harmful insects. In addition to the direct role of predators in ecosystem, their value as indicators of quality of the biotope is now being increasingly recognized [12], [17]. The other orders that were sighted in the campus included the Neuroptera, Orthoptera, Mecoptera, Thysanura, Trichoptera, Mantodea, Blattodea, and Dermaptera are also ecologically important as indicator species. Several groups of insects are known to exhibit and live in social groups. This arrangement is beneficial to the faunal forms as they can create a better impact on the environment. The most well-known social insect is the Honey bee that has a high economic importance. The honey bee can also indicate the productivity of the ecosystem. During the study, insects living in colonies representing three orders including Hymenoptera, dipteran and Hemiptera were observed [15]. Biodiversity study of insects is focused directly on the variations

at the species of insects. Employing different methods of sampling is crucial to provide a comprehensive data on insect diversity. Shannon-Weiner index of species diversity is commonly used to ascertain the species diversity [8]. Similarly, assessment of species diversity should focus on species richness, species abundance and species evenness [9]. The survival of a large number of endemic species in a community or habitat warrants frequent monitoring of the ecological processes besides adoption of appropriate conservation strategies in order to safeguard its rich genetic diversity [20]. Compared to vertebrates and many plants, insects usually have relatively short life spans, rapid generation times and often high reproductive output, meaning that populations can fluctuate greatly, both temporally and spatially. Knowledge of how to conserve insects often suffers from a dearth of information. This applies to understanding both the status of species or populations and, to a somewhat lesser extent, how to mitigate threats to them [13]. Generally, species tend to have high extinction rates in fragmented habitats [7], [19], [16]. Therefore, it is suggested that as with many other organisms, the best strategy is to protect large tracts of land, rather than many small, widely spaced patches of high-value habitat [19]. That said, minimum habitat sizes for insects are often smaller than for vertebrates, so efforts to protect even small areas may have a significant payoff in terms of insect conservation. The biodiversity (diversity index, species abundance) of insect fauna in the present campus is mainly due to the rich vegetation in this area as vegetation plays an important role for the existence of insect fauna in a community as it provides the main source of food etc. for insects. This diversity has been modified at times and has tried to sustain itself in changing circumstances. The outcome of the study can be used constructively in planning sustainability of both man and natural environment. The various insect orders that were identified during the brief study have only highlighted the potential magnitude of biodiversity on the campus. The estimated numbers insects on the Campus are the products of the mosaics of critical habitats and the corridors that link them. Thus it is important to maintain this connectivity in order to sustain the rich insect biodiversity on the campus, a system of monitoring the critical habitats and indicator species has to be evolved [25]. Overall, our results highlighted that a small compact area like a segregated college campus supports a diverse insect species.

Chapter 5. Conclusion

This study was an attempt to analyses some aspects of biodiversity of insects from Rajur College campus. Since it is a preliminary study, a lot of research is necessary in this regard and further collections are essential for getting a detailed record of the faunal diversity of insects and development of standard monitoring procedures for assessing the environmental stability in this area.

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