

**DIVERSITY OF BEETLES (INSECTA: COLEOPTERA) IN AND
AROUND SANGAMNER TEHSIL TAL. SANGAMNER DIST AHMADNAGAR.**

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Abstract

On the earth insects are the largest group of animals which present over worldwide. There are about 1.5 million species of insects are known to science up to now. Amongst them it is estimated that there are 200 million insects for every human alive. Insects are useful for human being and some are harmful to humans cause great loss. Beetles are the insects which belong from family Coleoptera. Coleoptera is the largest family of insects having largest number of insects with about 400,000 described species. All type of beetles are belong from Coleoptera family. The superorder of beetle is Endopterygota having complete Metamorphosis. Beetles are feed on plants and animal debris also on fungi, and help in decomposition of plant and animal matter which effective for the environment. Complete the life cycle's stages on animal body and hence helps in investigations of crime scene to understand the time of death of person. This is the most important social impact of beetle for society. The present study give the different presence of beetles in Sangamner region and near some places of sangamner taluka. Also their habit and habitat and their social use. Sangamner region is rich in environment and having favorable environment for insect. In present study the collection of beetle photographs from different location were collected and their identification.

Keywords : Beetles, Sangamner, Coleoptera, Endopterygota, Metamorphosis.

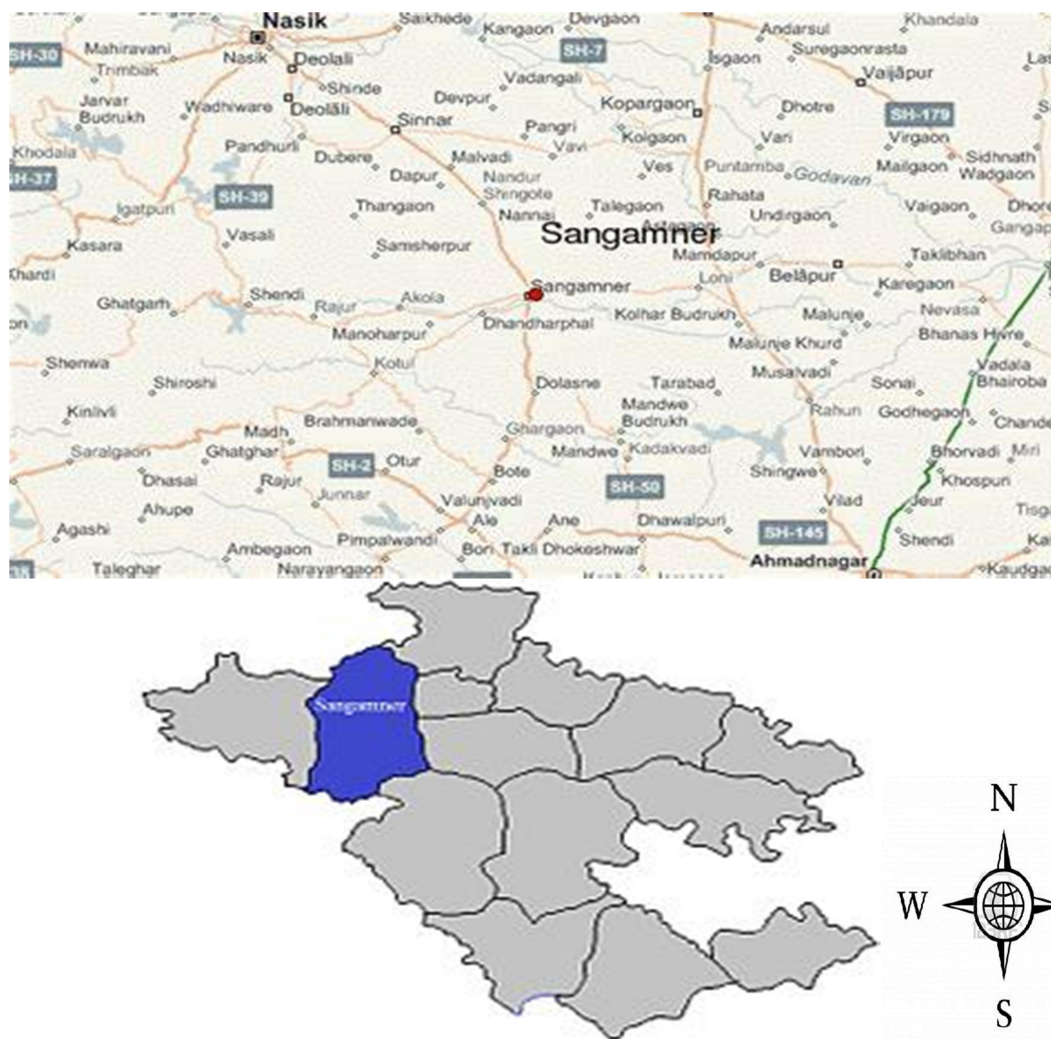
INTRODUCTION

Beetles are useful as well as harmful insects to human beings. Insects are 'the little things that run the world' [1] insect herbivores have been identified as important mediators in forest processes [2]. Most of the beetles are act as a pest and damage the crop which reduces the crop yield. Amongst them some beetles are useful and eat the pest beetle which damage the crop for example Lady bird beetle, which eats the aphids, thrips, scale insects and other plant sucking insects. Beetles are dominate every major terrestrial biome and are responsible for many essential ecosystem processes[3]. The order of Coleoptera of insects commonly called as beetles. The Coleoptera word history is a from the Greek keleos, meaning sheath, and pteron, meaning wing, thus sheathed wing. The reason for the name is that most beetles have two pairs of wings, the front pair, the elytra, being hardened and thickened into the sheath-like or shell-like protection for the rear pair and for the rear part of the beetle body [4]. There are the order Coleoptera is enormously rich in species and wide spread in many the terrestrial and freshwater environments throughout the world. Almost all biologists are well familiar

that beetles are the most diverse in all animal groups, with 3,50,000 described species [5] and approximately 15,088 species were recorded from India [6]. The survey of Sangamner region gives tremendous varieties of beetles which present in hot as well as freshwater region. Some are present at the forest and on crop plants at farm. Some found in cow dung which named as dung beetle (Rhinoceros). Predatory species, such as lady beetles, are important biological control agents of aphids and scale insects [7]. It is a necessary activity to conserve the biodiversity of coleopteran species because it has become an important concern due to rapid species loss and increasing habitat degradation around the world [8]. Most of the beetles are pests. Some are agricultural crop pests, while others are stem borer pests. Some are biological pest controllers, while others are scavengers [9]. Some species of beetles that are adaptation to practically every kinds of diet. Furthermore, beetle is indicator of soil properties [10] temperature and humidity variation of the environments [11], forest disruptions [12] and environmental disturbances in the landscape structure [13]. The order Coleoptera includes 3,50,000 species, amongst which about 1, 5088 species of coleopteran insects are known from Indian region [14]. The insects alone make up around 55% of all the species known till date [15][16]. The beetles are exceedingly variable ecologically and biologically[17] [18]. Useful model organisms is the ladybug or ladybird is the one the best example (family Coccinellidae). Both the larvae and adults are found feeding on aphid colonies [4]. If normal food sources are scarce, they may feed on other things, such as small caterpillars, young plant bugs, honeydew, and nectar [19]. The diversity of beetles is very wide. They are found in all major habitats, except marine and the Polar regions. The family Scarabaeidae is the largest family of insects which contains more than 30000 species in the world [20] Coleoptera are found in nearly all natural habitats, that is the vegetative foliage, from trees and their bark to flowers, leaves, and underground near roots, even inside plants like galls, tissue, including dead or decaying ones [21]. Ground beetles (family Carabidae) are common predators of many different insects and other arthropods, including fly eggs, caterpillars, wireworms, and others [22]. Dung beetles (Coleoptera, Scarabaeidae) have been successfully used to reduce the populations of pestilent flies and parasitic worms that breed in cattle dung [19]. Dung beetles are taxonomically as well as functionally very important component of terrestrial ecosystem [23]. About 3/4 of beetle species are phytophagous in both the larval and adult stages, living in or on plants, wood, fungi, and a variety of stored products, including cereals, tobacco, and dried fruits. Because many of these plants are important for agriculture, forestry, and the household, the beetle can be considered a pest [24] The diversity of beetles is very wide. They are found in all major habitats, except marine and the Polar Regions. Furthermore, beetle is indicator of soil properties [10], temperature and humidity variation of the environments [11], forest disruptions [17] and environmental disturbances in the landscape structure[13]. The present study gives the information about the beetles which are observed in Sangamner region their habit and habitat and their use. For beetle diversity the different locations were get observed and find out the amazing results.

Study Area :

Sangamner thashil is an important agricultural zone with a variety of crops as well as non-agricultural land, forests, mountain areas, etc. It includes the Coleoptera& various habitats. because of the shift in cropping patterns. Chemical pesticides and fertilizers are harming the diversity of coleopteran beetles. Sangamner tehsil is located in Ahmednagar district of Maharashtra. Lat. & Long -19.5761°N, 74.2070°, Height -549 m, Agriculture-1202.9 Sq. Km, Forest-194.89 Sq. Km, No. of Villages 170, Temperature (Maximum)-30.5°C Avg, Temperature (Minimum)-13.7°C Avg. Climate ,Generally hot, dry, and moderate. Rainfall-396.06mm To 495.05mm.



Sangamner location in Maharashtra State

MATERIALS AND METHODS

The different types of material and methods are get followed to control the insect pest. In the present study the two types of methods are get followed, the active and passive.

The active method is hard and times consuming method requires human strength and energy for capturing the insects, for example Hand Picking method and there are different types of nets and beating sheets are available for catching the insects. And in the passive method the trap methods are used to catch the insects.

The insect is get collected during the time of June to March . Mostly during the period of rainy season. With the help of following method :

1.1 Hand Picking method : This is the most common method of catching of insects. Insects are get caught with the help of forceps and hands. This method is suitable for catching the large insects like beetles and grasshoppers. It is very tedious (hard working) method and not suitable for catching the biting and stinging natured insects [25].

1.2 Insect Net : This is the another method of catching of insects. Insect nets are easy to made at home having a handle either made from iron rod, wooden stick or steel, the hoop or ring and a cloth or net is get attached to the ring. The ring is made up of steel wire, which if bent by rough usage springs back to its round shape and will stand a great deal of wear and tear [26].

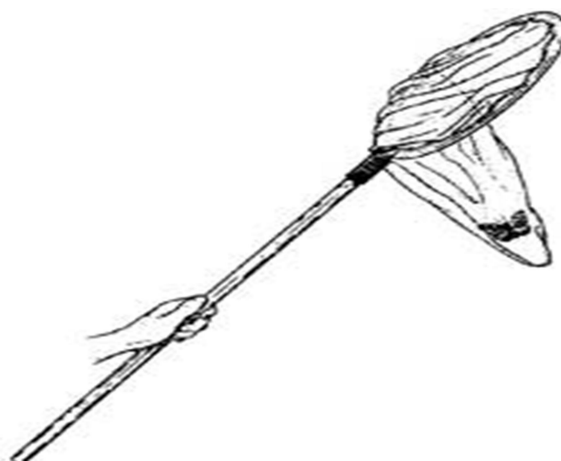


Fig 1 :Insect Collecting Net

1.3 Pitfall Traps : The pitfall trap is the passive method of collecting the insects. In this the different types of attractants are used like fruity smell, flower smell or fleshy smell attractants are used to attract insects. Plastic container mostly used. One of the most basic is the pit fall trap, which consists of a jar with an attractant that is put below the soil surface to collect crawling insects [26].

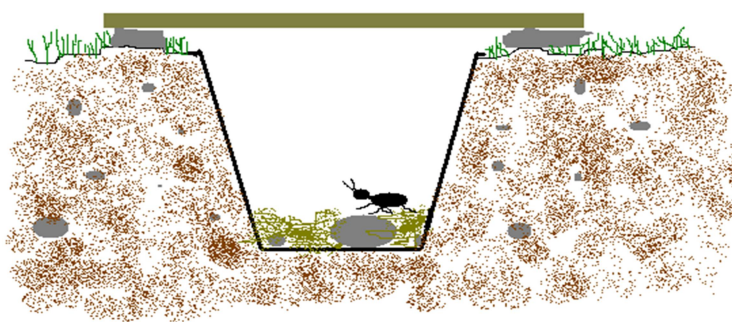






Fig : Pitfall Trap





1.4 Light Traps : Light traps are the lamps like kerosene, gas light, led lamp etc. Get placed under the white muslin cloth to attract the insects. Light traps can be constructed easily from materials generally available at home [27][28].





RESULT


During the survey the different types of beetles are get collected with the help of the methods which are given above mostly by hand picking method. The beetles were get collected from different locations of study area. Some are found under the soil, some at cow dung, and some are stem borer leaves under the bark and stem of plants. Some found on the grass and some are stored grain. Mostly they are pest but some are useful to control the pest and use in different economic level. The beetles are as follow found in study area :

Sr. No.	Scientific name	Common name	Family	Species No	Photograph

1	Asiatic Rhinoceros Beetle	Coconut Beetle	Scarabaeidae	12	
2	Cymindis Beetle	Ground Beetle	Carabidae	08	
3	Protaetia Cuprea	Rose Chafer	Scarabaeidae	17	
4	Dung Beetle	Dung Beetle	Scarabaeidae	21	

5	Mycetophagidae beetle	Hairy Fungus Beetle	Mycetophagidae	05	
6	True Weevils	Snout Beetle	Curculionidae	09	
7	Rhomborhina beetle	Scarab Beetle	Scarabaeidae	04	
8	Lycidae	Net winged beetle	Lycidae	08	

9	<i>Coccinella septempunctata</i>	Seven spot ladybird beetle	<i>Batocera rufomaculata</i>	11	
10	<i>Callosobruchus chinensis</i>	Bean weevil	Chrysomelidae	09	
11	<i>Batocera rubus</i>	Fig borer, Mango stem borer	Cerambycidae	02	
12	<i>Tribolium castaneum</i>	Red flour beetle	Tenebrionidae	08	

13	Batocera rufomaculata	Mango stem borer	Cerambycidae	11	
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DISCUSSION

The present study shows that the beetle diversity in Sangamner region is rich and having different varieties of beetles. The beetles belonging from families like Scarabaeidae, Cerambycidae, Tenebrionidae, Chrysomelidae, Coccinellidae, Lycidae, Curculionidae, Mycetophagidae, Carabidae are observed in the study area. Study area is rich in flora and having diversity of insects due to its forest area and water rich zones. Mostly the large quantity of beetles are get observed in rainy season as compared to winter and summer. The given research gives the information of beetles which get observed in study area.

CONCLUSION

The given study gives information about beetles belonging from order Coleoptera, is the largest order of insects and having big group of insects. The large quantity of beetles are get observed and collected during the rainy season as compared to the winter and summer. This indicated that the rainy season gives the harbour environment for the growth and development of beetles, and also provide good habit and habitat and also enough food for their growth. As we know that beetles are mostly pest and damaged the crop and vegetation and feeds on debris. Rainy season gives plenty of food options and also some debris as a food. During the month of July to September frequency of beetle in environment is large like the beetles from family Scarabaeidae (Rhomborhina beetle, Dung Beetle, Protactia Cuprea, Asiatic Rhinoceros Beetle) are get observed in wide range. Similarly the family Cerambycidae (Batocera rubus ,Batocera rufomaculata) also get noticed. The lady bird beetle is get noticed from family Batocera rufomaculata. The lady bird beetle is act as a enemy of many pest like aphids and other small insects pest which damaged the crop. It's a soldier beetle eats the pest and hence not harmful to the crop. The other families of beetles also get noticed. Hence the given study gives the different diversity of beetles from different location of study area according to their habit and habitat some are stem borer, some stored grain pest, some are dung beetle leaves in cow dung and in other debris matter. The beautiful diversity is get observed in study area.

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