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Diversity and checklist of Beetles (Arthropoda: Coleoptera) from Forest areas and Agricultural areas of District Akola, (Maharashtra), India

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Abstract

A survey was organised from August 2016 to February 2020 in the forest areas and agricultural areas of Akola district to know the diversity of Beetles for further research. A total of 68 genera and 90 species belonging to 13 different families of beetles viz. Buprestidae (Metallic Wood-boring Beetle), Carabidae (Ground Beetles), Cerambycidae, Chrysomelidae (Leaf beetles), Coccinellidae, Dytiscidae, Geotrupidae, Gyrinidae, Hydrophilidae, Hybosoridae, Meloidae (Blister Beetles), Scarabaeidae, Tenebrionidae (Darkling Beetles) were collected and identified from various habitats along with their valid scientific names, systematic position, and distribution within agricultural fields and forest areas of Akola district.

Keywords: ***Arthropoda , Beetles, Coleoptera, Diversity, Insecta.***

Introduction

Beetles occur in almost all habitats of the world Ground-beetles and tiger beetles belong to family Carabidae, which is one of the most species-rich family, comprising more than 40,000 species, as per the studies conducted by Slipinski *et al.,* 2011. Beetles are a group of mostly predatory insects, abundant in the field; their coloration, shape, and activity attract human beings. They are nocturnal hunters and prey on a wide range of small animals such as other insects and spiders; some species are diurnal and feed on plant tissues. Several workers have reported beetle species in different areas (Choate, 2001). Each species rarely occurs in more than one or a very few habitat types and habitat associations tend to be highly specific (Morgan *et al.*, 2000; Rafi *et al.*, 2010; Borges *et al.* 2007; Scudder *et al.* 2005). (Wiesner, 1975; Satoh *et al.*, 2003; Knisley and Fenster, 2005; Knisley, 2011; Arnett, 1973; Chandra 2007; Chandra and Ahirwar, 2005) stated various habitat types of tiger beetles. Thakare and Zade (2012a) reported beetles from the vicinity of Melghat Tiger Reserve, India.Yusuf et data available on coleopteran beetles of Akola district was noticed, so this will be

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al. , 1994 worked on medivcinal planys of Bangladesh, Zhu *et al.* 2011 studied on Antioxidant activities of wheat germs,Yadav *et al.* 2009observed flavone glycoside of *Uraria picta,*Yves , 1990 studied on the beetles associated with stored products. As there is no any scientific the first record for the upcoming researcher in the field of further reference.

Material and Methods

Study Area- Akola is a city in Vidarbha region in the state of Maharashtra in central India. The city of Akola is located in the north-central part of Maharashtra state, western India, on the banks of Morna River. It is an important district in the Vidarbha region of Maharashtra State, India. Akola district includes seven tehsils which are Akola, Akot, Telhara, Balapur, Barshitakali, Murtijapur and Patur. Akola is located at latitude 20.7° North and longitude 77.07° East. It is at an altitude of 925 ft (287m) to 1036.745 ft (316m) above sea level. Annual temperatures range from a high of 47.6 °C (117.68 °F) to a low of 2.2 °C (35.96 °F) The main crop of Akola district is Cotton, Soyabean, Kharif Jowar , Green Gram, Black Gram, Pigeon Pea, Gram, Wheat, Safflower including horticultural crops such as mango, sapota, orange, sweet orange, banana and vegetables etc. The total reserve forest area in Akola district is 468 sq. km. which includes

reserve forest and protected areas under territorial, social forestry and wildlife division akola. The seven surveys were undertaken in different regions of forest land and agricultural fields in akola district showing in the Fig. 1. Total 15 sampling spots were selected from the Akola district. The visits were planned in August to December. Help from local farmers was also obtained during the study. The specimens were collected either by hand or by sweeping net in daytime. In the night time, the collection was made using light of 100 watts lamp in front of a white cloth. The specimens were studied with the help of Stereo Zoom Binocular Microscopes (ZEISS and Magnus make) with photographic attachment. After identification the specimens were photographed by Raynox RADCR-0250 macro snap -On lens with Canon 60D cameras. Identified specimens were not collected; they were left in the field after identification as per Wildlife Protection Act 1972. Identification was made with the help of keys provided by Zoological Survey of India, Kolkata (Jonathan *et al.* 1986), bugguide net open-source platform on web.

Fig 1: Showing Sampling Sites of Coleopterans (Beetles) (Courtesy- Google Maps)

Results and Discussion

In the present investigation and survey a total of 68 genera and 90 species belonging to 13 different families of beetles (Coleoptera) viz. Buprestidae (Metallic Wood-boring Beetle), Carabidae (Ground Beetles), Cerambycidae, Chrysomelidae (Leaf beetles), Coccinellidae, Dytiscidae, Geotrupidae, Gyrinidae, Hydrophilidae, Hybosoridae, Meloidae (Blister Beetles), Scarabaeidae**,** Tenebrionidae (Darkling Beetles) were identified. This is the first record of coleopteran beetles along with their scientific names, systematic position, and distribution within agricultural fields and forest areas of Akola district (Table 1 & Fig 2). Kazmi,, and Ramamurthy, 2004 reported Coleoptera from Indian thar Desert, Moitreyee, 2014 studied diversity and composition of Beetles of Durgapur,

Fig 2: Families of Beetles showing no of genus and species in Akola district.

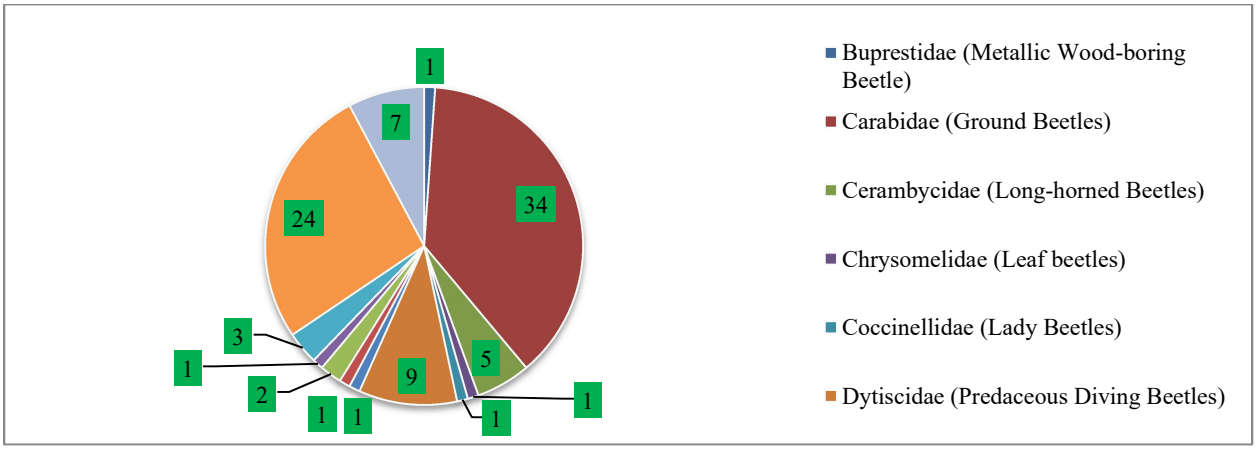

Table-1: Showing List of Families of Beetles (Coleoptera) from study area

Classification: **Phylum- Arthropoda, Subphylum- Hexapoda, Class- Insecta, Order – Coleoptera (Beetles)**			
Family	**Subfamily**	**Genus & Species**	**Chief habitats**
Buprestidae (Metallic Wood-boring Beetle)		*Psiloptera sp*. Dejean, 1833	Wood, decayed vegetation,
Carabidae (Ground Beetles)	Brachininae (Bombardier Beetle)	*Brachinus hirsutus* *Brachinus cyanipennis* *Brachinus fulminates* *Brachinus phaeocerus* *Brachinus* sp. *Pheropsophus* sp.	Under stones, logs, bark, leaf litter.
	Broscinae	*Broscus cephalotes* *Zacotus matthewsii*	Under stones,
	Cicindelinae (Tiger Beetles)	*Cicindelidia punctulata* *Cicindelidia Sp.* *Ellipsoptera Sp.* *Parvindela Sp.*	logs, bark, leaf litter
	Elaphrinae	*Elaphrus californicus* *Diacheila polita*	logs, bark, leaf litter
	Gehringiinae	*Gehringia olympica*	Leaf litter
	Harpalinae	*Agonum sp.* *Melanius* sp. *Calosoma orientale* Hope *Siagona* sp. *Anthia sexgutata* Fabricius, 1896	Under stones, logs, bark, leaf litter.
	Loricerinae	*Loricera pilicornis*	Under stone, in logs and fallen trees
	Nebriinae	*Nebria trifaria*	Understone
	Omophroninae	*Omophron americanum* *Omophron nitidum*	Under stones, logs, bark, leaf litter.
	Patrobinae	*Patrobus longicornis* *Diplous californicus*	
	Paussinae	*Physea hirta*	

		Metrius contractus	
	Psydrinae	*Nomius pygmaeus* *Psydrus piceus*	
	Scaritinae	*Paraclivina postica* Scarites sp.	
	Trechinae	*Bembidion impotens* *Pogonus texanus*	Leaf litter.
Cerambycidae (Long-horned Beetles)		*Acanthaophorus serratocornis* Oliv. *Stromatium barbatum* Fab. *Stromatium* sp. *Celosterna scabrato, Aeolesthes* sp.	under bark
Chrysomelidae (Leaf beetles)	Synetinae	*Thricolema anomala*	Under leaf and bark
Coccinellidae (Lady Beetles)		*Cheilomenes sexmaculata* Fabricius	On leaves
Dytiscidae (Predaceous Diving Beetles)		*Cybister tripunctatus* Sharp, 1882 *Cybister confuses* Sharp, 1882 *Eretes sticticus* Linnaeus *Hydaticus fabricii* MacLeay, 1883 *Hydaticus vittatus* Fabricius *Hydaticus luczonicus* Aube *Rhantaticus congestus* Klug, 1883 *Sandracottus dejeanii* Aube, 1838 *Sandracottus mixtus* Blanchard, 1853	Ponds, Lakes, Streams.
Geotrupidae (Earth-Boring Scarab Beetles)	Bolbocerantinae	*Bolbocerastes* sp.	Under soil
Gyrinidae (Whirligig Beetles)	Gyrininae	*Dineutes* indicus Muller, 1764	Non acidic water
Hydrophilidae (Water Scavenger Beetles)		*Hydrophylus olivaccous* Muller, 1764 *Sternolophus rufipes* Fabricius, 1792	Non acidic water
Hybosoridae (Scavenger Scarab Beetles)	Hybosorinae	*Hybosorus orientalis*	Dung, fungus, carrion, rotten wood, decayed vegetation,
Meloidae (Blister Beetle)		*Mylabris pustulata* Thumberg *Mylabris phalerata* Thumberg *Psalydolytta* sp.	Bushes, trees
Scarabaeidae (Dung Beetles)	Scarabaeinae	*Copris remotus* *Heliocopris bucephalus* *Orphnus impressus* *Onthophagus gazelle* *Onthophagus abreui* *Onthophagus dama* fabricius *Onthophagus quadridentatus* *Onthophagus ramosus* Wiedmann *Onthophagus turbatus* Walker *Onthophagus pactolus* Fabricius *Onitis lama* Lansberge *Onitis philemon* Fabricius *Onitis subopacus* Arrow *Tiniocellus spinipes* Roth *Anatona stillata* Newman, 1938	Dung, fungus, carrion, rotten wood, decayed vegetation, pollen, plant sap, grass, roots, leaves, fruits..

	Cetoniinae (Fruit and Flower Chafers)	*Chiloloba* Burmeister 1842 *Clinteria* Burmeister, 1842 *Oxycetonia versicolor* Fabricius	
	Dynastinae (Rhinoceros Beetles)	*Phyllognathus Dionysius* Fabricius *Eophileurus platypterus* Wiedmann	
	Rutelinae (Shining Leaf Chafers)	*Rhinyptia* Burmeister, 1844	
	Melolonthinae (May Beetles and Junebugs)	*Holotrichia* Hope, 1837 *Apogonia* sp. Blanchard, 1850 *Scizonycha ruficollis* Fabricius	
Tenebrionidae (Darkling Beetles)	Lagriinae (Long-jointed Beetles)	*Cossyphus depressus* Fabricius 1781 *Gonocephalum consobrinum* Blair, 1923 *Gonocephalum helopioide* Fairmaire, 1894	Stored Grain
	Tenebrioninae	*Opatroides vicinus* Fairmaire, 1896 *Scleron irregulata* *Rhytinota subfossulata* Solier, 1835 *Chaenius* Sp.	Wood borers

Conclusion

In this survey, total 68 genus along with number of 90 species belonging to 13 different families of beetles are reported as Carabidae-34, Scarabaeidae-24, Dytiscidae- 9, Tenebrionidae- 7, Cerambycidae - 5, Meloidae -3, Hydrophilidae-2, Buprestidae-1, Chrysomelidae-1, Coccinellidae-1, Geotrupidae-1, Gyrinidae-1, Hybosoridae-1 each. It is observed that family Carabidae and Scarabaeidae show abundance followed by Dytiscidae, Tenebrionidae & Cerambycidae. Beetles play a very important role in natural ecosystems. They must be conserved as they are a major part of the food-chain in lower animals. These records will be the baseline data for the forest department and other researchers which leads to special attention towards beetles for the conservation measures in planning and monitoring practices in Akola district, India.

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