https://doi.org/10.33451/florafauna.v29i2pp366-370
FLORA AND FAUNA ISSN 2456 - 9364 (Online)
2023 Vol. 29 No.2 PP 366-370 ISSN 0971 - 6920 (Print)

A baseline account of scarabaeid beetles of area within and around historic Ahmednagar city (Maharashtra) India

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Received **:** 11.07.2023; ***Accepted*** : 08.08.2023

ABSTRACT

The present study provides a preliminary account of Scarabaeid (Coleoptera: Scarabaeoidea) beetles of some areas in and around Ahmednagar city, Maharashtra, India. A total of 27 scarabaeoid taxa representing 22 genera and 4 families were recorded. Family Scarabaeidae is the most diverse of all 4 families recorded. The Scarabaeidae is represented by 24 taxa under 5 subfamilies (Scarabaeinae, Cetoniinae, Dynastinae, Melolonthinae, and Rutelinae). The important scarabaeoid families such as Geotrupidae, Hybosoridae, Trogidae are also represented from study area. The scarabaeid beetles were recorded for the first time from the study area, including 5 different localities in and around Ahmednagar city. The genus *Onthophagus* was the most dominant comprising 05 species. The result obtained serves as baseline information on the diversity and abundance of Scarab beetles of Ahmednagar. It will be helpful for future research on the beetle fauna of the study area.

Figure : 01 References : 23 Table : 01
KEY WORDS : Ahmednagar, Diversity, Scarabaeidae

Introduction

Coleoptera is the most speciose insect order that includes more than 3,89,487 extant species under 176 families worldwide[22]. About 22,334 species of beetles have been reported from India [8]. The superfamily Scarabaeoidea includes many important families of scarabaeiform beetles such as Belohinidae, Geotropidae, Glaphyridae, Hybosoridae, Passalinae, Pleocomidae, Scarabaeidae, Trogidae, *etc* [4] The family Scarabaeidae is one of the most diverse families within order Coleoptera and the largest family of scarabaeiform beetles. The members of Scarabaeidae are popularly known as "Dung Beetles". They are usually phytophagous (as crop pests) and coprophagous in nature. They are characterized by having lamellate form of antennae. The scarab beetles are heavily built, stout-bodied with size diminutive to truly massive. Scarabaeid beetles include about 30,000 species throughout the world. Dung beetles of India include about 420 species under 38 genera [19]. This Family contains both beneficial and harmful beetles. Among which Coprophagous ones are known as 'Scavenger or Dung beetles' that feed on animal excreta, carrion, and dead vegetable matter. These beetles are significantly important in nutrient recycling, parasite suppression, soil aeration, fly control, and as bioindicators[11, 20].

Ahmednagar city is a historically and geographically important area in the state of Maharashtra. It is the capital city of Ahmednagar district-the largest district in Maharashtra as well as in India. There are a number of taxonomic studies on scarabaeid beetles in Maharashtra[13-18]. In addition, numerous

ACKNOWLEDGEMENTS : Authors are thankful to Zoological Survey of India (ZSI), WRC, Pune for assistance in identification of beetle specimens. Thanks are also due to Dr. Dhriti Banerjee (Director, ZSI, Kolkata, India) for co-operation and support. Thanks are duly extended to Dr. RJ Barnabas (Principal, Ahmednagar College, Ahmednagar) for providing laboratory facilities and encouragement.

TABLE-1: The list of scarabaeid taxa reported from the present study

Family Scarabaeidae		
Subfamily Scarabaeinae	*1.*	*Copris* sp.
	2.	*Digitonthophagus gazella*
	3.	*Gymnopleurus cyaneus*
	4.	*Helicopris gigas*
	5.	*Oniticellus cinctus*
	6.	*Onitis brahma.*
	7.	*Onitis philemon*
	8.	*Onthophagus madoqua*
	9.	*Onthophagus cervus*
	10.	*Onthophagus dama*
	11.	*Onthophagus hindu*
	12.	Onthophagus ramosus
	13.	*Tibiodrepanus* sp.
Subfamily Cetoniinae	*14.*	*Clinteria klugi*
	15.	*Chiloloba acuta*
	16.	*Gametis versicolor*
	17.	*Heterorrhina elegans*
	18.	*Protaetia aurichalcea*
Subfamily Dynastinae	*19.*	*Oryctes rhinoceros*
Subfamily Melolonthinae	*20.*	*Holotrichia akolana*
	21.	*Holotrichia reynaudi*
	22.	*Maladera* sp.
	23.	*Apogonia* sp
Subfamily Rutelinae	*24.*	*Rhinyptia* sp.
Family Geotrupidae	*25.*	*Bolboceras nigricans*
Family Hybosoridae	*26.*	*Hybosorus orientalis*
Family Trogidae	*27.*	*Omorgus* sp.

published records dealing with scarabaeid beetle fauna of different states of India are also available [3,5-7,9,13,21]. However, perusal of literature shows that there is no published record on the scarabaeid beetle fauna of Ahmednagar city and adjoining areas except for one[12]. Keeping in view, the scarcity of available taxonomic records of dung beetle diversity of Ahmednagar, the present research work was undertaken to prepare a taxonomic inventory of scarabaeid beetles of Ahmednagar city and nearby areas. This research work is an effort towards creating a piece of baseline information on the diversity of scarabaeid beetles of Ahmednagar.

Materials and Method

1. Study area: Includes sites within and around historic Ahmednagar city. A faunistic survey was conducted between August 2019 and January 2020, and the beetle specimens were collected following localities: (1) Chand Bibi Mahal [19.093172N, 74.839901E], (2) Area around Kapurwadi lake [19.112022N, 74.781918E], (3) Dongargan village [19.24790N, 74.76125E], (4) Pimpalgaon-Malvi village[19.208100N, 74.759042E], and, (5) Ahmednagar College Campus [19.09073N, 74.74974E].

2. Collection and preservation: Beetle specimens were collected by Handpicking mostly during early morning hrs. Forceps and camel brush were used wherever necessary for the handling of the specimens. Beetles were collected from dung pats of cows and buffaloes during the day. Scientific procedures were followed to prevent any damage to specimens which helped to keep the collection morphologically intact for taxonomic study. The specimens were killed using ethyl acetate vapors. Collected specimens were relaxed, pinned, dried and preserved in the laboratory for further studies. Entomological pins of suitable size were used for all the specimens which were labeled with respect to the locality, name of the collector, date of collection. The specimens were stored in wooden boxes with glass lids.

3. Photography: The specimens were photographed with a Nikon D5100 DSLR Camera using 18-55mm kit lens.

4. Identification: The beetle specimens were identified using taxonomic literature on dung beetles[1,2,6,23.] and were sent to ZSI (Zoological Survey of India), Pune for ultimate identification. The identified specimens were deposited at the National Zoological Collection, Zoological Survey of India, Western Regional Centre, Pune, Maharashtra, India. The classification of Scarabaeoidea was followed from recent taxonomic publication[4].

Results and Discussion

A total of 27 scarabaeid taxa representing 22 genera and 4 families were recorded. Family scarabaeidae is the most diverse of all 4 families recorded. The scarabaeidae is represented by 24 taxa under 5 subfamilies (Scarabaeinae, Cetoniinae, Dynastinae, Melolonthinae, and Rutelinae) (Table-1; Fig. 1).

A similar study[18] on scarab beetles of the Vidarbha region (Maharashtra, India) recorded a total of 97 species under 39 genera and 7 subfamilies with Scarabaeinae being the dominant subfamily having 57 species. Most of the taxa reported from this study have also been reported from studies on beetles of different regions of Maharashtra by other researchers[15-17]. In the present study, the subfamily Scarabaeinae is represented by 13 taxa and was found to be the most diverse and commonly distributed of all other subfamilies within Family Scarabaeidae. Globally, the subfamily Scarabaeinae includes about 5700 species in 227 genera and 12 tribes[19]. The genus *Onthophagus* was the most common of all genera within the study area with 5 species. The other common genera recorded from the study area include *Onitis, Holotrichia, Gymnopleurus, Digitonthophagus, Helicopris, Chiloloba, Gametis*, *etc.* The important scarabaeoid families such as Geotrupidae, Hybosoridae, Trogidae are also represented from study area. The classification of the taxa was followed[4].

The result obtained would serve as baseline information on the diversity and abundance of Scarab beetles of Ahmednagar. However, future studies are required to carry out intensive surveys to gauge the actual diversity of beetles from the study area. The results obtained indicate the faunal richness of the Ahmednagar area. The output of this research work will help agricultural biologists to formulate effective strategies for the control and management of beetles which are serious crop pests in the Ahmednagar area. It will also be helpful to future research on the beetle fauna of the study area.

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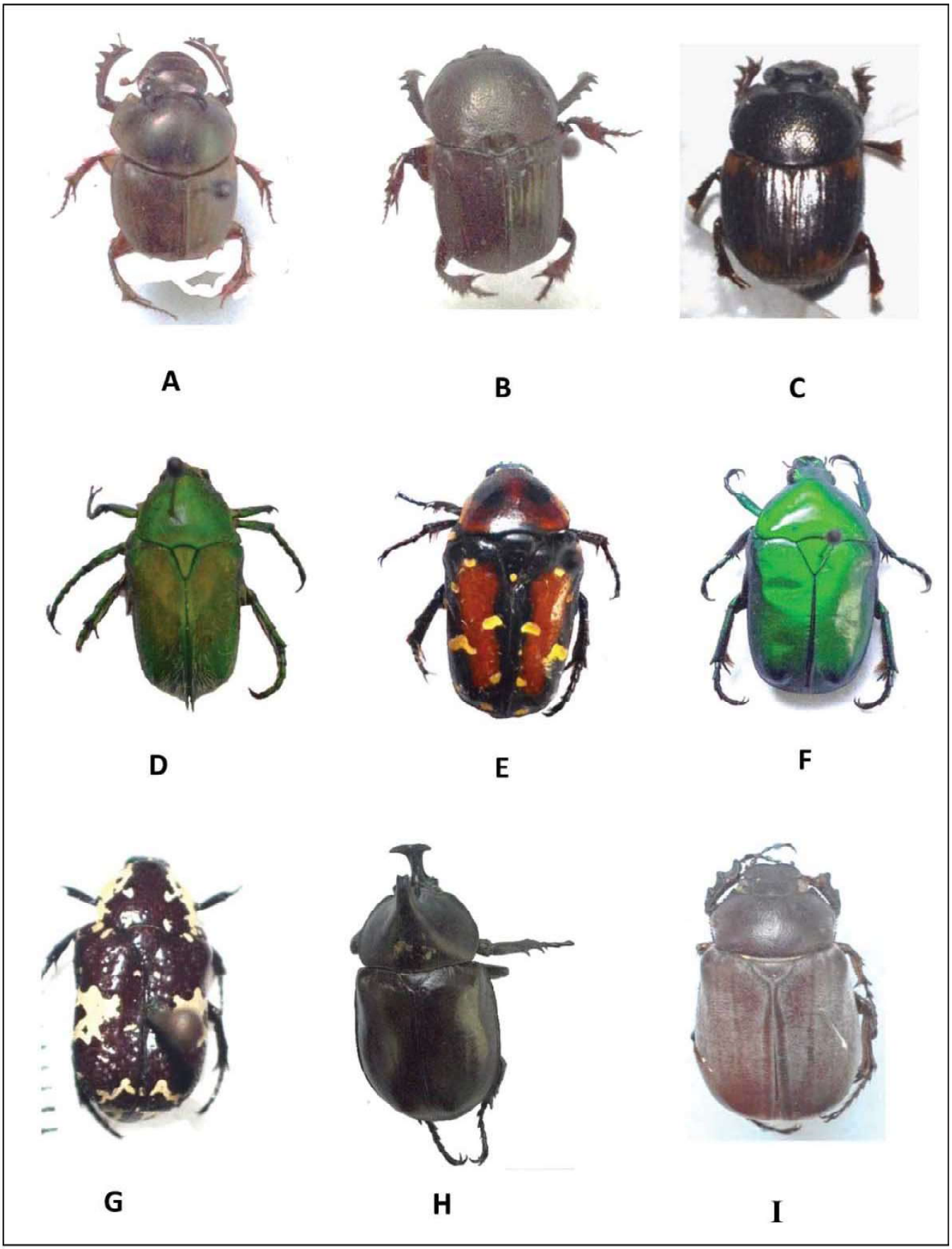

Fig. 1 : ***A: Diginthophagus gazella, B: Onitis philemon; C: Onthophagus cervus, D: Chiloloba acuta, E: Gametis versicolor, F: Heterorrhina elegans, G: Protaetia aurichalcea, H: Oryctes rhinoceros & I: Holotrichia akolana.***

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