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Scarab beetles (Coleoptera: Scarabaeidae) from Salt Lake City, Kolkata, West Bengal

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Abstract

Salt lake, being a part of East Kolkata Wetland, is a township adjacent to Kolkata. Present communication reports 14 species of scarab beetles belonging to 3 subfamilies, Scarabaeinae, Rutelinae, Dynastinae of family Scarabaeidae from Salt Lake City, Kolkata, West Bengal.

Keywords: Scarab Beetles, Salt Lake, Phytophagous, and Coprophagous Beetles.

1. Introduction

Scarab beetles belonging to superfamily Scarabaeoidea under Order Coleoptera includes 12 families, 43 subfamilies, 118 tribes and 94 subtribes throughout the world ^[1]. The family Scarabaeidae comprises 91% of the total 27,800 species of Scarabaeoidea fauna known worldwide ^[2]. The family includes subfamilies Scarabaeinae and Aphodiinae which are Laparosticti or dung beetles for housing in the dung, while Rutelinae, Melolonthinae, Dynastinae, Cetoninae, Sericinae, Euchirinae, Hoplinae, Valginae and Trichinae are Pleurosticti or phytophagous which feed on plants and are pests of crops ^[3].

The pleurostict scarabs play an important role as indicator to subtle changes in vegetation of a particular region. The adult of these beetles generally feed on flowers, leaves, fruits, tree sap, while the larvae feed on plant roots, rotten wood ^[4]. On the basis of their nesting pattern, Laprosticki are classified into three functional groups viz. rollers (telocoprid), tunnelers (paracoprid) and dwellers (endocoprid). Rollers form balls from a dung pat which they roll and bury the balls in the ground for feeding and breeding, while tunnelers make vertical chambers underground near the dung pat and make their nests with the help of dung pat whereas dwellers breed in dung pats itself ^[5].

Salt Lake City, a planned satellite township falling in the North 24 Parganas district of West Bengal, India. In the Salt Lake area of West Bengal, ^[6] had done a work on faunal diversity. But entomofauna of the area is poorly documented. Few works on the fauna of salt lake were done by ^[7] and ^[8]. With respect to the scarab beetles, ^[9] reported 4 species viz. *Oryctes rhinoceros* (Linnaeus, 1758), *Heteronychus lioderes* Redtenbacher, 1867, *Anomala bengalensis* (Blanchard, 1851) and *Onthophagus dama* (Fabricius, 1798) and ^[10] reported *Adoretus lacustris* Arrow, 1917 and *Adoretus flavus* Arrow, 1917 from the area. Because of its vulnerability to rapid urbanization, thorough inventory of the existing fauna of Salt Lake area is crucial. Arrow ^[11-13] in his faunal work on Indian Scarabaeidae recorded 142 species from areas now under West Bengal. Twenty five species have been added to the list of fauna of West Bengal and 4 species have been added to Indian fauna ^[10].

The present communication with the aim of developing an inventorying the Scarabaeidae fauna of the Salt Lake area reports 14 species belonging to 8 genera under 3 subfamilies i.e. Rutelinae, Dynastinae and Scarabaeinae with additional records to the existing coleopteran fauna of the area.

Materials and Methods

The specimens for the present study were collected during day time using forceps and vials from dung, plants decayed matter and ground. They were killed in benzene vapours, preserved dry pinned. Later, the specimens were brought to the laboratory at the Zoological Survey of India, Kolkata and identified using Leica, M205A stereo zoom microscope with the help of available literatures ^[11, 12, 13] and matched with the reference collections present in the laboratory. The illustrations of those beetles were given which were studied by authors.

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Salt Lake city extends between 22.58°N and 88.42°E. The city is adjacent to the state capital Kolkata. In 1960, the new town Salt Lake was formed from the East Kolkata Wetland to minimize the pressure on housing and infrastructure and the master plan was approved on 9th April, 1964. Since then for

the last 38 to 40 years the city has been urbanised into a continuous urban area adjacent to Kolkata [14]. With the changing time and modernization, the old plant hedges were being replaced by walls or wire fences, thus reducing vegetation of the area.

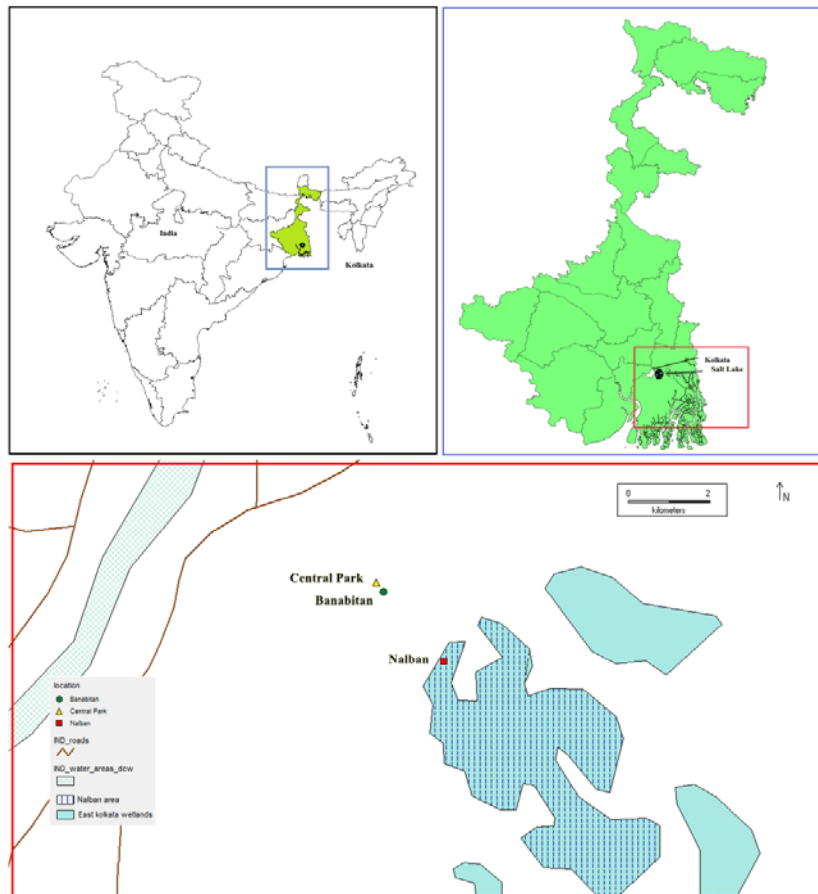


Fig 1: Map of Sites in Salt Lake city.

Results

The study identified 10 species of Scarabaeidae belonging to 8 genera under 3 subfamilies from the Salt Lake area. Out of these, 8 species are new to the area, thus accounting to a total of 14 species from the area.

Systematic Account

Family Scarabaeidae
Subfamily Rutelinae
Tribe Anomalini

1. *Anomala bengalensis* Blanchard, 1851

Distribution: India: West Bengal, Bihar, Karnataka, and Tamil Nadu. Elsewhere: Myanmar.

Feeding habit: Phytophagous.

Remarks : Recorded by Roy *et al.* (2014).

2. *Anomala biharensis* Arrow, 1917 (Fig: A)

Material examined: 01 ex. Nalban, Salt Lake city, 07.x.2014. coll. J. Ghosh. Distribution: India: West Bengal, Bihar, Chhattisgarh, Haryana, Madhya Pradesh, Uttar Pradesh and Uttarakhand. Feeding habit: Phytophagous.

3. *Anomala bilobata* Arrow, 1912 (Fig: B)

Material examined: 03 exs. Central Park, Salt Lake city, 09.x.2014.coll.D.Bhunia

Distribution: India: West Bengal. Elsewhere: Burma.

Feeding habit: Phytophagous.

4. *Anomala polita* (Blanchard, 1851) (Fig: C)

Material examined: 01 ex. Nalban, Salt Lake city, 09.x.2014.coll.J.Ghosh

Distribution: India: Assam, Bihar, West Bengal, Chhattisgarh, Karnataka, Maharashtra, Madhya Pradesh, Meghalaya, Uttar Pradesh and Uttaranchal. Elsewhere: Nepal and Pakistan.

Feeding habit: Phytophagous.

Tribe Adoretini

5. *Adoretus flavus* Arrow 1917

Distribution: India: West Bengal and Punjab.

Feeding habit: Phytophagous.

Remarks: Recorded by Chatterjee and Biswas (1995).

6. *Adoretus lacustris* Arrow, 1917

Distribution: India: West Bengal.

Feeding habit: Phytophagous.

Remarks: Recorded by Chatterjee and Biswas (1995).

7. *Adoretus lasiopygus* Burmeister, 1855(Fig: D)

Material examined: 01 ex. Banabitan, Salt Lake city, 12.x.2014.coll. D.Bhunia Distribution: India: Assam, Bihar,

Chhattisgarh, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere: Sri Lanka, Bangladesh. Feeding habit: Phytophagous.

8. *Adoretus versutus* Harold, 1869(Fig: E)

Material examined: 01 ex. Central Park, Salt Lake city, 12.x.2014.coll.D.Bhunia Distribution: India: Uttarakhand, West Bengal, Madhya Pradesh, Tamil Nadu and Chhattisgarh. Elsewhere: Sri Lanka, Malay Peninsula, Fiji Island, Samoa, Tongatabu, Mauritius, Seychelles. Feeding habit: Phytophagous.

Subfamily Dynastinae
Tribe Dynastini

9. *Xylotrupes gideon* (Linnaeus, 1767) (Fig: F)

Material examined: 02 exs. Central Park, Salt Lake city, 10.x.2014.coll.D.Bhunia Distribution: India: West Bengal, Sikkim, Assam, Maharashtra. Elsewhere: Sri Lanka. Feeding habit: Phytophagous.

Tribe Pentodontini

10. *Heteronychus lioderes* Redtenbacher, 1867(Fig: G)

Material examined: 02 exs. Nalban, Salt Lake city, 10.x.2014.coll.J.Ghosh. Distribution: India: Bihar, Chhattisgarh, Himachal Pradesh, Madhya Pradesh, Odisha, Uttarakhand and West Bengal. Elsewhere: Nepal, Burma, Thailand, Malay Peninsula. Borneo, Celebes, Java. Feeding habit: Phytophagous.

Tribe Oryctini

11. *Oryctes rhinoceros* (Linnaeus, 1785) (Fig: H)

Material examined: 01 exs. Central Park, Salt Lake city, 10.x.2014.coll.D.Bhunia Distribution: India: Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, West Bengal. Elsewhere: Pakistan, Bangladesh, Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia (Java, Sumatra), Cambodia, Korea, Laos, Philippines, Taiwan, Vietnam, American Samoa, Fiji, Palau, Papua New Guinea, Samoa, Tokelau, Tonga, Wallis, Futuna. Feeding habit: Phytophagous

Subfamily Scarabaeinae
Tribe Onthophagini

12. *Onthophagus (Colobonthophagus) dama* (Fabricius, 1798)

Distribution: India: Arunachal Pradesh, Assam, Bihar, Karnataka, Madhya Pradesh, Maharashtra, Sikkim, Tamilnadu and West Bengal. Elsewhere: Bhutan and Nepal. Feeding habit: Coprophagous. Remarks: Recorded by Roy *et.al* (2014).

Tribe Coprini

13. *Catharsius molossus* (Linnaeus, 1758) (Fig: I)

Material examined: 02 exs. Central Park, Salt Lake city, 12.x.2014.coll. J.Ghosh. Distribution: India: Andaman Island, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Odisha, Sikkim, Uttar Pradesh, Uttaranchal, West Bengal. Elsewhere: Afghanistan, Cambodia, China, Nepal, Pakistan, Laos, Sri Lanka, Thailand, Malaysia, Vietnam. Feeding habit: Coprophagous.

Tribe Onitini

14. *Onitis philemon* Fabricius, 1801 (Fig: J)

Material examined: 02 exs. Nalban, Salt Lake city, 10.x.2014.coll. J.Ghosh Distribution: India: Arunachal Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal. Feeding habit: Coprophagous.

Discussion

Salt Lake once being a part of the East Kolkata Wetlands, a Ramsar site, may yield interesting faunal documentation, if thorough surveys are undertaken. But, due to rapid urbanization the area faced devastating effects both on its flora and fauna. Though in few patches, some greeneries exist, like Central Park, Nalban and Banabitan which harbour few phytophagous subfamilies of scarabs like Rutelinae and Dynastinae. Coprophagous scarabs viz. *Catharsius molossus* and *Onitis philemon* were collected few in number, probably due to gradual decline in the number of cattle stable which used to be the residing place of these beetles in the dungs of the cattle. The dung beetles feed on animal excreta as both adults and larvae and thus helping in secondary seed dispersal, nutrient cycling and parasite suppression. They also help in ecosystem functions such as biological pest control and soil fertilization [15]. The gradual cause in local species decrease is seemingly associated with the loss of habitat and rapid loss of survival conditions for these beetles. Earlier there were uncultivated or wasteland around villages, which was used for cattle roaming, foraging and human feces [16]. But now due to population explosion, there is a strong pressure for urbanization, industrialization. The anthropogenic disturbances to natural system, more around human inhabitations, have affected them and are the main causes for their decline [17]. The formation to natural habitat around human inhabitations to provide space for cattle to graze, promoting natural cattle herding, and minimal intensive and mono culturing avoiding input of veterinary antibiotics might help in conservation of these beetles [16]. Salt Lake area is considered to be one of the green breathing space in a highly concretized city of Kolkata. Therefore, extensive inventories on the insect fauna of such vulnerable area are crucial before substantial portion of the insect fauna gets depleted.

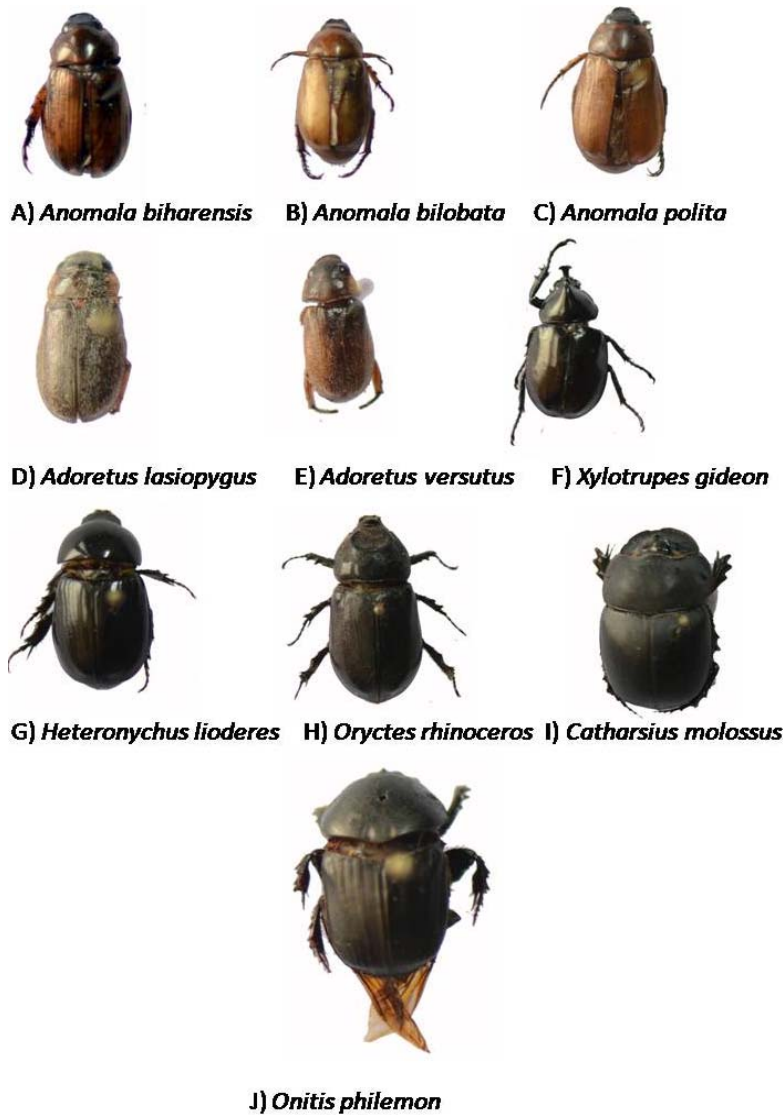


Fig 2: Images of the Scarab beetles.

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