

An environment cleaner: the secret earth boring beetles (Coleoptera: Bolboceratidae) of India

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Introduction:

- Earth borer beetles are members of the scarab group.
- "geos" from Greek meaning earth and "trypetes" from Greek meaning borer (geotrupidae).
- Scarab are present on all continents except Antarctica.
- Generally, dung beetles are an incredibly diverse and are categorised into four ecologically distinct groups: dwellers (Endocoprids), tunnellers (Paracoprids), stealers (Kleptocoprids) and rollers (Telecoprids).
- The Earth-boring Scarabs are Paracoprids and tunnels and dig the soil.
- Reported more than 600 species.
- The taxonomic treatment remains controversial and hence proper studies are needed on this group especially from India.

How to recognize earthborers?

- short, domed body, spiny legs and short antennae with terminal clubs
- antennae 11 segmented terminating in relatively large, subspherical clubs formed of three segments.
- Pronotum strongly developed and, viewed from the side, extending lower than lateral margin of wing case or 'elytron'.
- The adult emerges only after dusk and only after heavy rain when the soil is damp.
- As they produce sound during flight they termed as "musician beetles," (by Howden) and attracted to lights.
- Most of the time, they remain hidden in burrows in the ground.

Life history:

Few details are available on this group.

- They are tiny to large round and bulbous earth-boring scarabs, tank-like beetles with bulbous orange extensions on their antennae.
- As their name suggests, they dig into the ground, and sometimes upto 2-3 meters deep.
- The burrows are always circular in cross section leaving pile of soil at the entrance. if the beetle burrow is open, it indicates that the beetle has left, The depth of the burrow depends both on the soil type and the size of the beetle.
- Female lay a single egg at the end of each long tunnel and food is left there for the growing grub.
- Larval feeds on fungi, dung, compost and decaying plant material.
- Grub eats its food, come out of the tunnel to the surface, and pupate.
- Recently Bolboceratinae has been raised to Bolboceratidae. Further the Bolboceratinae divides into two tribes: Athyreini and Bolboceratini. The Athyreini occur in South America, Africa, and in a narrow band to northern India. The Bolboceratini are essentially worldwide and are found mostly in areas with sandy or light clay soils.

Taxonomic studies:

The studies on this particular group is lacking in India. Recently after the studies carried out by Krikken (2013a, 2013b), the studies gained some momentum in India resulted in the description of more than 25 new species from this region (Kalawate and Hillert, 2021). The three species discovered by me are depicted in Plate 1:

Importance of these beetles:

1. Due to their soil tunneling habit they are termed as environment cleaners
2. Pay important role in providing the nutrients in the soil and cleaning the soil.
3. General people of public does not know their importance and role.
4. Hence, they are secret agent which cleans our planet and keep the soil healthy



Bolboceras sahydreinse Kalawate and Hillert, 2018

Bolboceras trimbak Kalawate and Hillert, 2021

Bolboceras bopdevense Kalawate and Hillert, 2021

Plate 1. Some new species described in recent years

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