



E-ISSN: 2320-7078

P-ISSN: 2349-6800

www.entomoljournal.com

JEZS 2020; 8(4): 78-81

© 2020 JEZS

Received: 22-05-2020

Accepted: 24-06-2020

Dr. Ramesh D

Assistant Professor, Department of Veterinary Physiology and Biochemistry Veterinary College, Hassan, Karnataka, India

Dr. Vinuthan MK

Assistant Professor, Department of Veterinary Physiology and Biochemistry Veterinary College, Hassan, Karnataka, India

Dr. Chandrashekara N

Assistant Professor, Department of Veterinary Microbiology Veterinary College Hassan Karnataka, India

Dr. Chandramohan S

Senior Scientist, Division of Animal Biochemistry, Center for Wildlife, IVRI, Izatnagar, Bareilly, Uttar Pradesh, India

Morphometric analysis of *Oryctes rhinoceros* and *Onthophagus bonasus* Fabricius in Hassan district of Karnataka

Dr. Ramesh D, Dr. Vinuthan MK, Dr. Chandrashekara N and Dr. Chandramohan S

Abstract

Dung Beetles are known to be the natural scavengers, they like dung – they are Coprophagous (dung eating) insects. These Beetles fed on the dung of Mega variety of Fauna (huge variety of mammals) in the present study Morphometric analysis of *Oryctes rhinoceros*, *Onthophagus bonasus* Fabricius dung beetles were carried out. Though both the beetles were found to belong to the same family called Scarabaeinae. The outcome of the study revealed that the Morphometric values of the *Oryctes rhinoceros* were larger value due to its larger size. However the present study paves the way for the further study of the dung beetle species existing in the geographical locations of India. Further this would be the basal data in identification of the species of the dung beetles prevalent in the Karnataka.

Keywords: Dung beetle, morphometric, *Oryctes rhinoceros*, *Onthophagus bonasus* Fabricius

Introduction

Dung beetles play a small but remarkable role in the pasture ecosystem. They feed on manure, use it to provide housing and food for their young, and improve nutrient cycling, soil structure, and forage growth in the meantime. Dung beetles are important enough in manure and nutrient recycling that they well deserve the pasture managers attention.

Dung Beetles are known to be the natural scavengers, they like dung – they are Coprophagous (dung eating) insects. These Beetles fed on the dung of Mega variety of Fauna (huge variety of mammals). Dung Beetles formally fall within the class Insecta, Order Coleoptera (Beetles), family Scarabaeidae. About 7000 species of Scarabaeinae family has been reported worldwide [2]. They live on every continent except Antarctica. Some of them have a brightly coloured, metallic appearance and are attractive insects. Dung beetles are classified as rollers, tunnellers, or dwellers. Rollers take a small piece of dung from a cow pat and shape it into a ball. They roll the ball away and bury it in the ground. The beetles use the ball as food or as a place to lay eggs.

Tunnellers dig a tunnel through the cow pat and into the soil underneath it, where they lay eggs. The dung that enters the tunnel is their food source. Dwellers live inside the cow pat in a shallow pit. Here they feed and lay eggs.

The beetles often play an important role in their environment. They aerate and fertilize the soil and remove cow pats from its surface. This clears the land and prevents dung from being washed away by rain to contaminant waterways. The nutrient-rich dung also provides good food for earthworms.

In the current morphometric study the dung beetles in the Hassan district were studied morphometrically in detail of the species like *Onthophagus bonasus* Fabricius and *Oryctes rhinoceros*.

Materials and Methods

The beetles were collected by handpicking in the field and around the college premises which arrives due to the light sources in the night. The specimens were studied under stereozoom microscope. The illustrations were made with the use of digital camera attached to Leica M205A stereomicroscope and Nikon DSLR D-7000. The specimens were identified with the help of available literature from the recent reports from India [1, 4].

Corresponding Author:**Dr. Ramesh D**

Assistant Professor, Department of Veterinary Physiology and Biochemistry Veterinary college, Hassan, Karnataka, India

Results and Discussion

Both the species of beetles belongs to Scarabaeinae: Midcoxae jointed and a single spur on middle tibia^[3].

Oryctes rhinoceros (Linnaeus, 1758)

Scarabaeus rhinoceros Linnaeus, 1758; Syst. Nat.i: 346. *Oryctes rhinoceros*: Burm., 1847; Randh. Ent. v: 202. *Oryctes rhinoceros*: Arrow, 1910; Fauna British India, Coleoptera, I: 278. Distribution: India (Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, West Bengal), Myanmar, Sri Lanka. Tribe Pentodontini Mulsant, 1842. As reported^[4].

Onthophagus (Digitonthophagus) bonasus (Fabricius, 1775)

Scarabaeus bonasus Fabricius, 1775; Syst. Ent. p. 23.

Onthophagus (Digitonthophagus) bonasus Balthasar, 1963; Monogr. Scarab. Aphod. palaearkt. orient., 1 : 296. Distribution: India (Bihar, Karnataka, Maharashtra, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, West Bengal), Pakistan. As reported^[1, 4].

The outcome of the present study like Morphometric analysis of 14 parameters of *Oryctes rhinoceros* and *Onthophagus (Digitonthophagus) bonasus* found in the Hassan district of Karnataka was studied and is presented in the table 1. Listed below.

Further the different body parts of the beetles were marked and are depicted in the Figure1 & 2 for *Oryctes rhinoceros* (Adult Beetle) Figure 3, 4 and 5 for *Onthophagus bonasus* Fabricius (Adult Beetle).

Table 1: Values depicting the morphological identification of *Oryctes rhinoceros* (Adult Beetle) *Onthophagus bonasus* Fabricius beetles found in the Hassan district of Karnataka.

Serial No.	Morphological Parameters	<i>Oryctes rhinoceros</i> (Adult Beetle)	<i>Onthophagus bonasus</i> Fabricius (Adult Beetle)
1	Head :LENGTH	1.0cm	0.25cm
2	Wings:	4.2cm	1.65cm
3	Pronotum :	1.7cm	0.45cm
4	Legs:	2.0 cm	0.52cm
5	Tibial spine:	Prominent	PROMINENT
6	Elytral Striae:	Elytral striae VERY wide, as wide as intervals	Elytral striae wide, as wide as intervals
7	Elytra:length	2.8cm	0.65cm
8	Horn on forehead:	0.8cm	0.23cm
9	Tibial tooth:	Prominent	Prominent
10	Elytral suture:	Prominent	Grayish prominent
11	Complete length of the beetle	4.8cm	1.62cm
12	WIDTH of the beetle	1.8cm	0.7cm
13	Complete Length of Both Wings upon extended	8.5cm	3.52cm
14	Scutellum	triangular, regularly narrowed from base to apex	triangular,

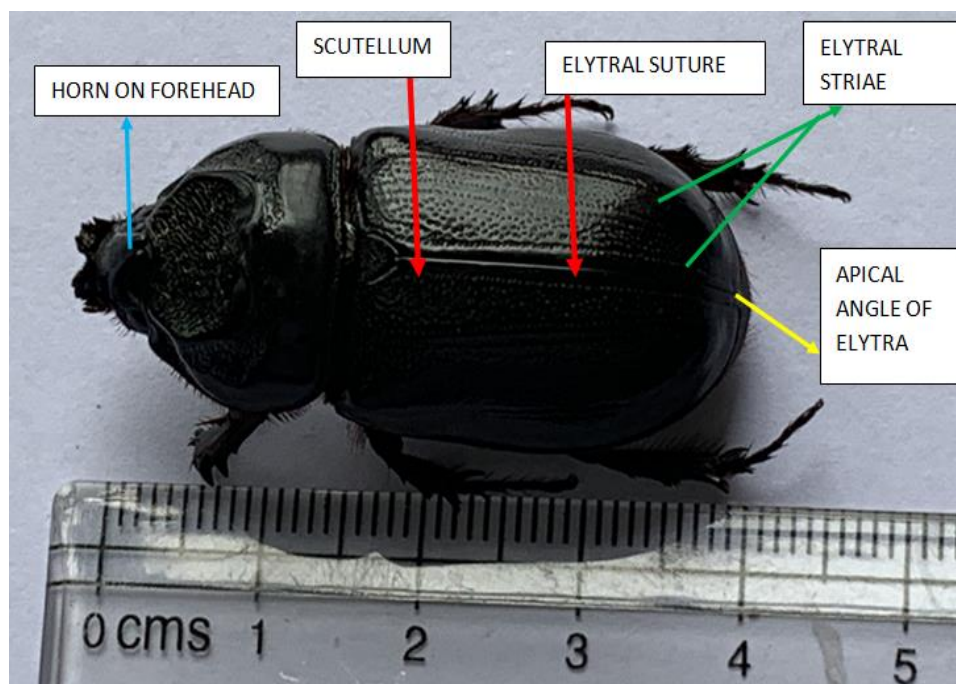


Fig 1: Depicting different parts of the beetle *Oryctes rhinoceros*

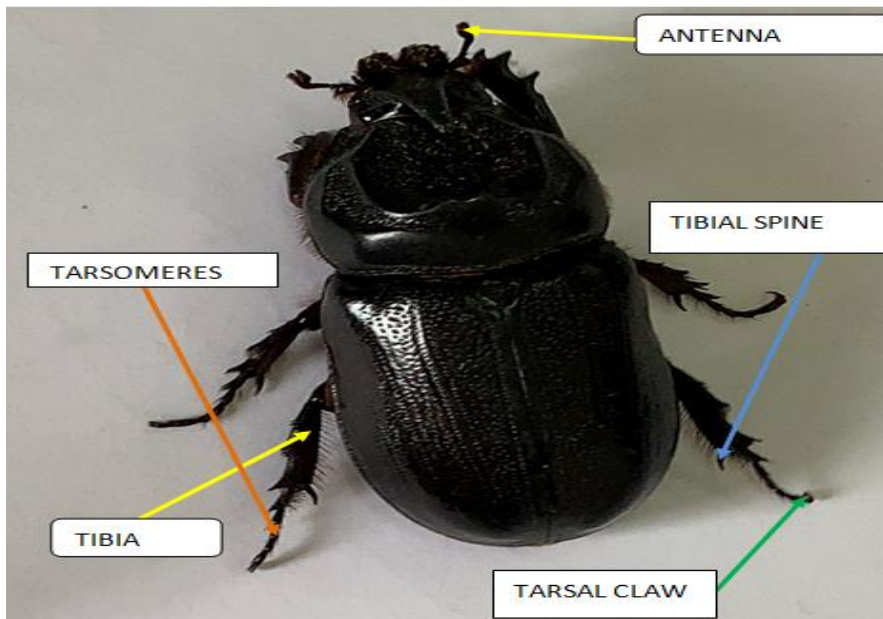


Fig 2: Depicting different parts of the beetle *Oryctes rhinoceros*

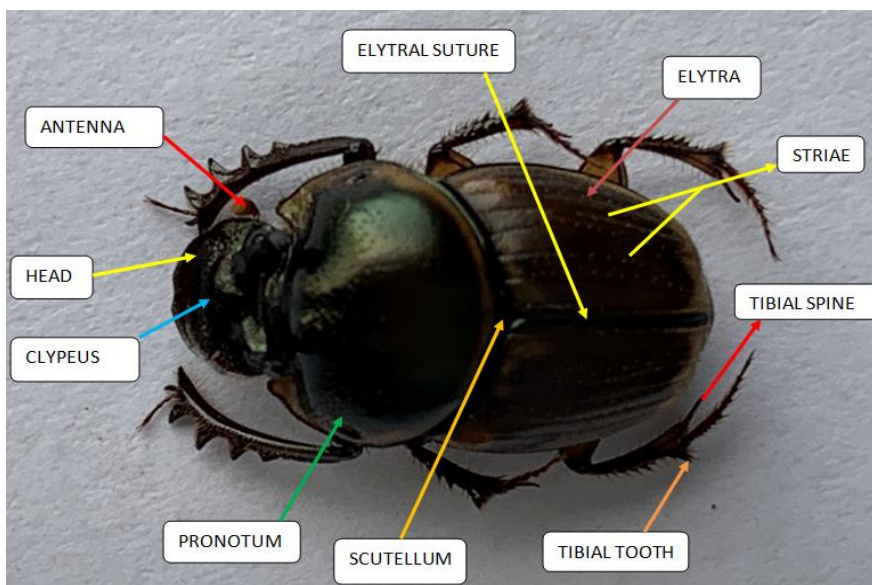


Fig 3: Depicting different parts of the beetle *Onthophagus bonasus* Fabricius (Dorsal view)

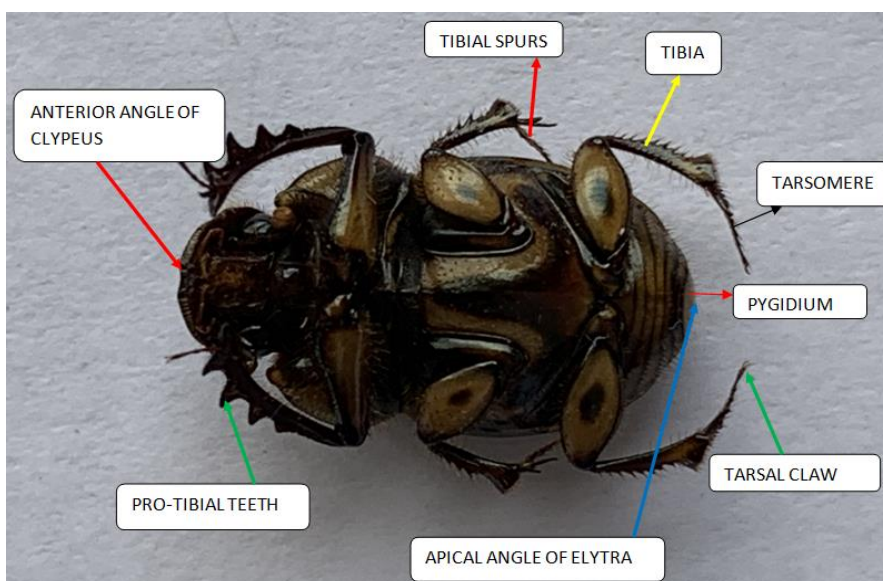


Fig 4: Depicting different parts of the beetle *Onthophagus bonasus* Fabricius (Ventral view)



Fig 5: Depicting different parts of the beetle *Onthophagus bonasus* Fabricius

The two species which are morphometrically studied are of two distinct species of dung beetles which was also reported in India [1, 4]. However the parameters studied in the current study are naïve report on these dung beetles. Though the dung beetles are much essential for the current day farming community by helping the proper aeration and increasing the fertility of the soil, current days there was very limited data are available on the study of these beetles. In the present study the values reported for *Oryctes rhinoceros* is larger value in all the parameters like : Head length, Wings, Pronotum , Legs, Tibial spine, Elytral Striae, Elytra: length, Horn on forehead: Tibial tooth, Elytral suture: Complete length of the beetle, width of the beetle, Complete Length of Both Wings upon extended and Scutellum. However with respect to the beetles of Scarabaeidae cytological data of dung beetle species from the genus *Onthophagus latreille* (Coleoptera: Scarabaeidae, Scarabaeinae) was studied from Haryana [6]. In addition studies on the beetles of Scarabaeidae reported different dung beetle species in the Pakistan [5]. However recently two new species of dung beetles for the genus *Copris* (Coleoptera: Scarabaeidae: Scarabaeinae) from Vietnam was identified [7]. The outcome of the current study would definitely pave the way for the further study of the dung beetle species existing in the geographical locations of India. Further this would be the basal data in identification of the species of the dung beetles prevalent in the Karnataka

Conclusion

Though the different parameters were studied on these beetles provide the baseline data about the dung beetle further studies are needed to be carried out at molecular level by using vast number of species and identifying variety of specimens citing its importance in the geographical locations and its major function in the ecological balance.

References

1. Devanshu Gupta, Kailash Chandra, Salma Khan. An updated checklist of scarabaeoid beetles (Coleoptera: Scarabaeoidea) of Pench Tiger Reserve, Madhya Pradesh, India Journal of Entomology and Zoology Studies 2014; 2(5):225-240.
https://www.researchgate.net/publication/268776865_An_updated_checklist_of_scarabaeoid_beetles_Coleoptera_Scarabaeoidea_of_Pench_Tiger_Reserve_Madhya_Pradesh_India

2. Fernando Z. Vaz-de-mello, wd Edmonds, federico C. Ocampo, paul schoolmeesters. A multilingual key to the genera and subgenera of the subfamily Scarabaeinae of the New World (Coleoptera: Scarabaeidae), 2000 <http://dx.doi.org/10.11646/zootaxa.2854.1.1>;
<https://www.biotaxa.org/Zootaxa/article/view/zootaxa.2854.1.1/39657> ;
3. Halffter G, Matthews EG. The natural history of dung beetles of the subfamily Scarabaeinae (Coleoptera: Scarabaeidae). Folia Entomologia Mexicana. 1996; 12(14):1-312.
<https://onlinelibrary.wiley.com/doi/abs/10.1002/mmzn.19690450211>
4. Kalawate AS. A preliminary study on the dung beetles of the northern Western Ghats, Maharashtra, India. Journal of Threatened Taxa. 2018; 10(2):11316-11331; <http://doi.org/10.11609/jott.3844.10.2.11316-11331>
5. Nadia Noureen, Mubashar Hussain, Muhammad Faheem Malik, Sumera Afsheen. New records of dung beetle fauna from Pakistan. Journal of Entomology and Zoology Studies 2015; 3(3):428-430.
<http://www.entomoljournal.com/archives/?year=2015&vol=3&issue=3&ArticleId=526>
6. Paramjeet Kaur, Abhay Singh Yadav. New cytological data of dung beetle species from the genus *Onthophagus latreille* (Coleoptera: Scarabaeidae, Scarabaeinae) from Haryana Journal of Entomology and Zoology Studies 2014; 2(3):1-6.
<http://www.entomoljournal.com/vol2Issue3/pdf/17.1.pdf>
7. Van Bac Bui, Kenneth Dumack, Michael Bonkowski. Two new species and one new record for the genus *Copris* (Coleoptera: Scarabaeidae: Scarabaeinae) from Vietnam with a key to Vietnamese species Eur. J Entomol. 2018; 115:167-191 doi: 10.14411/eje.2018.016 <http://www.eje.cz>.