Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

J E Z S Journal of Entomology and Zoology Studies

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2015; 3(3): 428-430

Received: 29-04-2015
Accepted: 30-05-2015

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New records of dung beetle fauna from Pakistan

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Abstract
Dung beetles (Scarabaeidae; Coleoptera) were collected from district Gujrat, Bhimber, Mirpur and Kotli. A total of 548 specimens were recorded and identified into 2 families, 7 genera, 4 tribes and 18 species. *Catharsius (Catharsius) sagax* (Quenstedt, 1806), *Tiniocellus (Tiniocellus) spinipes* (Roth, 1851), *Oniticellus (Oniticellus) cinctus*, (Fabricius, 1775), of family Scarabaeinae and *Aphodius (Paraphodius) crenatus* (Harold, 1862) of family Aphodiinae are new to dung beetle fauna of Pakistan and being reported for the first time.

Keywords: Scarabaeidae, Aphodiinae, Coleoptera, Diversity.

1. Introduction
Dung beetles belong to family Scarabaeidae; Coleoptera. These insects are efficient decomposers and play a vital role in nutrient recycling, soil turnover, seed dispersal and as parasitoids of several flies [1, 2, 3, 4, 5, 6, 7]. These Beetles use dung as their major food source and for nesting [8]. These species are one of the most important components of the ecosystem for its regulation and maintenance and represent a well-established community within an ecosystem [9].

About 7000 species of Scarabaeinae family has been reported worldwide [10]. The perusal of available literature indicates that there is very little work has been carried out on diversity and distribution of Scarabaeidae in Pakistan. Siddique *et al.* [11] reported about 50 species comprising the work of different researchers from various regions of Pakistan. But still there are vast areas yet to be explored. This study incorporates the dung beetle fauna recorded from District Gujrat, Bhimber, Mirpur and Kotli.

2. Material and Methods
Dung beetles were sampled by using pitfall traps and through hand picking during 2014-2015 from croplands of district Gujrat, Bhimber, Mirpur and kotli. Specimens were then identified by using systematic keys up to species level [12, 13]. The data reported 548 specimens of dung beetles from the studied areas.

3. Results and Discussions
The study revealed 548 specimens recorded from all districts. 18 species from 2 families, 7 genera and 4 tribes were identified. Among these species, *Catharsius (Catharsius) sagax* (Quenstedt, 1806), *Tiniocellus (Tiniocellus) spinipes* (Roth, 1851), *Oniticellus (Oniticellus) cinctus*, (Fabricius, 1775), *Aphodius (Paraphodius) crenatus* (Harold, 1862) are new to dung beetle fauna of Pakistan.

4. Taxonomic Account of New Species
4.1. Aphodiinae: Hind tibia bearing two sloping carinae. Hind femor somewhat thick and not so long. Pronotum simple……..…. *Aphodius* Illiger

4.2. *Aphodius crenatus*, Harold
Brown in colour, body very convex and elongate, and scutellum distinguished with median line. A short horn at clypeus and paraocular lobes are angular (Fig. A).
Material Examined; Gujrat, 12.IX.2014
Specimens Recorded; 1♂

4.3. Scarabaeinae: Midcoxae jointed and a single spur on middle tibia……1

1. Antennal club completely hairy, Elytra bearing double carination……. *Catharsius* Hope

- Pronotum not punctuate, elytra finely punctate ……. *Oniticellus* Serville - Pronotum strongly punctured, Elytra granulated at intervals…….*Tiniocellus* Peringuey

4.4. *Catharsius* (*Catharsius*) *sagax* (Quenstedt, 1806)

Black in color, body broad and convex, enlarged head and clypeus bearing granules without smooth shiny area. Pronotum having granules and elytra distinctly striated. Upper margin of declivity at pronotum straight and male bearing more or less erect horn further than head (Fig. D).

Material Examined; Gujrat, 14.VIII.2014

Specimens Recorded; 2♂

4.5. *Tiniocellus (Tiniocellus) spinipes* (Roth, 1851)

Dark brown in colour and pronotum metallic, clypeus slightly excised, head without ridges. Pronotum having incomplete median line and front tibia with four strong teeth (Fig. B).

Material Examined; Gujrat, 18.XI.2014.

Specimens Recorded; 1♂

4.6. *Oniticellus* (*Oniticellus*) *cinctus* (Fabricius, 1775)

Oval and elongate body, colour black and incomplete median line on pronotum. Clypeus slightly bidentate. Elytra well defined, striated and bearing yellow borders at margins externally (Fig.C).

Material Examined; Gujrat, 15.X.2014, 25.X.2014, 10.XI.2014, 22-X.2014, Mirpur, 8.IX.2014, 17.IX.2014, Kotli, 12.XII.2014, 18.XII.2014, 24.XII.2014.

Specimens Recorded; 5♂, 14♀

Fig A: *Aphodius crenatus*

Fig B: *Tiniocellus spinipes*

Fig C: *Oniticellus cinctus*

Fig D: ***Catharsius sagax***

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