TWO NEW RECORDS OF THE GENUS APHODIUS ILLIGE, 1798 (COLEOPTERA, APHODIIDAE) IN IRAQ

Ameer Ibrahim Abdulzahra

Department of Science, Basic Education College, University of Babylon, Babylon, Iraq
Email: ameerIbrahim2751988@gmail.com

Received Date: 28 November 2018, Accepted Date: 24 February 2019, Published Date: 27 June 2019

ABSTRACT
In this study, the dung beetles Aphodius (Bodilus) ictericus (Laicharting, 1781) and Aphodius (Planolinellus) vittatus Say, 1825 which belongs to the family of Aphodiidae (Order: Coleoptera) are redescribed here as to being found for the first time in Iraq.

The specimens were collected from different regions in the middle of Iraq; the main diagnostic characters and some morphological features of males were drawn and pictured.

Keywords: Aphodiidae, Aphodius, Coleoptera, Dung beetles, Iraq, Scarabaeoidea.

INTRODUCTION
Aphodiidae family belongs to superfamily (Scarabaeoidea) and consists of nearly 358 genera and 3395 species distributed randomly in the world (Şenyüz, 2017); there are 1084 species that belong to 155 genera from 6 tribes in the Palaearctic region (Dellacasa et al., 2006). The adults of aphodiid are in most cases coprophagous (dung feeding) and are fed directly on the dung. Besides, most species of Aphodiidae simply release their eggs within or inside the dung of herbivorous mammals where the larvae will develop (Borghesio and Palestrini, 2002).

Aphodius Illige, 1798 is a large genus of scarab beetles with more than 1650 species distributed world-wide (Dellacasa, 1988). In most species, both the adults and larvae are coprophagous (Valiela, 1974); However, some species have herbivorous or saprophagous larvae (Cambefort and Hanski, 1991). Other species have trophic habits that are closer to saprophagy than coprophagy and tend to lay eggs in the interface between the trophic resource (dry dung, accumulations of manure, decomposing leaves) and the soil. In this case, the larvae never enter the dung (Verdú et al., 1997); some members of the genus dominate dung beetles are found in the Palearctic and Nearctic regions (Frolov and Akhmetova, 2005).

The members of genus Aphodius are diagnosed according to the following features: size, length, mostly less than 2-10 mm and body more or less elongated. Head nearly always with clips covering mouthparts, sometimes exposing tips of the mandibles; mandibles usually reduced and membranous, rarely sclerotized as well. Furthermore, antennae with 9 segments, club pubescent and with 3 segments; elytra nearly or entirely covering pygidium; mesocoxae contiguous or nearly so; metatibiae variable, but usually dilated at apices, usually with 2
Two new records of the genus *Aphodius*
apical spurs; tarsi with distinct claws, and rarely reduced. Femora smooth or with grooves onanterior or posterior margin. Abdomen is with 6 visible sternites; pygidium smooth, withouttransverse ridge or longitudinal groove at the base, often exposed (Cambefort and Hanski,1991; Smith and Skelley, 2007).

In Iraq, the following species are recorded for the genus *Aphodius*: *A. suturalis*, *A.elermonti* (Derwesh, 1963), *A. pruinosis* (Derwesh, 1965), *A. erraticus*, *A. lividus*, *A.hydrochoeris*(Kaddou, 1967) and *Aphodius* sp.(Khalaf and Al-Omar, 1974). The aim of thecurrent study to provide additional information to these dung beetles to Iraqi fauna.

**MATERIALS AND METHODS**

Many specimens of genus *Aphodius* species were collected from agricultural regionswhere livestock are represent (Presence of dung) from different regions in the middle of Iraq(Babylon, Najaf and Karbala) by light trap containing ethyl alcohol (concentration of about70%). The specimens were washed with distilled water to remove alcohol from them; then,they were saved by freezing. After that, they were examined with a binocular dissectingmicroscope; the Dino-lite digital microscope was used to film the species being studied.

Finally, several references have been used that contain a description of the *Aphodius*species as well as references that contain taxonomic keys to identify and diagnose species,such as: Jessop (1986); Cooper and Gordon (1987); Frolov (2001); Almquist (2001);Dellacasa and Dellacasa (2005); Carlsson and Jansson (2014); Akhmetova and Frolov (2014)were used.

**RESULTS AND DISCUSSION**

In this study the survey showed two new record species of the genus *Aphodius* as follows:

**Male of *Aphodius (Bodilus) ictericus*** (Laicharting, 1781) (Pl. 1A).

**Diagnosis:** Small, body length 4.0-5.5 mm, head is tubercular; antennae and maxillary palpsare light brown; pronotum contains pits of highly concentration, brown to dark brown withlighter fore angles or sides. Elytra intervals sparsely punctate; elytron disc glabrous, andthere is a distinctive dark central band on elytron, and bristles of low density on the base ofelytra (Pl.1B). Legs are light brown and the hind tarsi are shorter than or as long as hind tibiae. Aedeagus is rounded at the apex, its base is semi-rectangular, clearly curved at thelateral view. Apices of parameres are broadly rounded in a lateral view (Fig.1A, B).

**Material examined:** (2♂♂): Babylon, 5. III.2018; Najaf 1♂♂, 6.V. 2018.

**Distribution:** This species is widely distributed in the western Palaearctic region, and itsnatural habitat includes entire Europe, and South Siberia. (Frolov, 2001). North Africa, theTranscaucasia, Asia Minor, Iran and North Kazakhstan (Akhmetova and Frolov, 2014).
Plate (1): *Aphodius*(Bodilus)*ictericus*; (A) Male, (B) Elytron

Figure (1): Male of *Aphodius (Bodilus) ictericus*; (A) Aedeagus (lateral view), (B) Parameres (dorsal view).

**The male of Aphodius (Planolinellus) vittatus** Say, 1825 (Pl.2)

**Diagnosis:** Body length is about 3.2-4.4 mm, elongate, parallel-sided, somewhat robust, and black with reddish maculations on each elytron. Head with frontal suture pronounced bearing median tubercle; clypeus alutaceous, anterior margin is narrowly semicircular; metatibial apical spinules are short, and equal in length; pronotum contains pits of highly concentration. The base of elytron contains a few bristles; fore tibiae are distally tridentate and proximally serrulate at the outer margin with upper smooth side; middle and hind tibiae with distinct transverse carinae on the outer side. Aedeagus is with parameres moderately membranous apically; in lateral view, distinctly curved apically (Fig.2 A, B).
Two new records of the genus *Aphodius*

**Material examined:** (3♂♂): Karbala, 2.IV.2018; Najaf 2♂, 13.V. 2018).

**Distribution:** The species occurs in South and Eastern Europe, the transcaucasus, Turkey, Syria, Kazakhstan, Middle Asia, Mongolia, and China (Dellacasa et al., 2006), Northern Africa (Frolov, 2001), Russia (Almquist, 2001), North America into Mexico and Canada (Gordon and Skelley, 2007).

**Plate (2):** Male of *Aphodius (Planolinellus)vittatus*

**Figure (2):** Male of *Aphodius (Planolinellus) vittatus*; (A) Aedeagus (lateral view), (B) Parameres (dorsal view).
LITERATURE CITED

Akhmetova, L. A. and Frolov, A. V. 2014. A review of the scarab beetle tribe Aphodiini (Coleoptera, Scarabaeidae) of the fauna of Russia. *Entomological Review*, 94: 846-879.

Almquist, D. 2001. New dung beetle (Coleoptera: Scarabaeidae) records for Florida. *Insecta Mundi*, 15(3): 149-150.

Borghesio, L. and Palestini, C. 2002. Reproductive behaviour and larval development in *Aphodius* (*Agrilinus*) *rufus* Moll, 1792 and *Aphodius* (*Oromus*) *alpinus* Scopoli, 1763 (Coleoptera: Scarabaeoidea: Aphodiidae). *Elytron*, 16: 75-81.

Cambefort, Y. and Hanski, I. 1991. Dung beetle population biology. *Dung Beetle Ecology*, 1: 36-50.

Carlsson, S. and Jansson, N. 2014. *Dyngbaggar i Östergötlands län*. Länsstyrelsen Östergötland, 50pp.

Cooper, J. and Gordon, R. D. 1987. Studies on the genus *Aphodius* of the United States and Canada (Coleoptera: Scarabaeidae). VIII. A new species from Northeastern North America. *Journal of the New York Entomological Society*, 95(4): 531-533.

Dellacasa, M. 1988. Contribution to a world-wide catalogue of Aegialitidae, Aphodiidae, Aulonocnemididae, Termitotrogidae (Coleoptera Scarabaeoidea). *Memoires della Societa Entomologica Italiana*, 66[1987]: 455.

Dellacasa, M. and Dellacasa, G. 2005. Comments on some systematic and nomenclatural questions in Aphodiinae with descriptions of two new genera and on Italian taxa (Coleoptera: Aphodiidae). *Memorie della Società Entomologica Italiana*, 84(1): 45-101.

Dellacasa, M. Dellacasa, G., Král, D. and Bezděk, A. 2006. Tribe Aphodini Leach, 1815. *Catalogue of Palaeartic Coleoptera*, 3: 105-143.

Derwesh, A. I. 1963. A preliminary list of Coleoptera from Iraq. *Directorate General of Agricultural Research and Projects, Technical Bulletin*, 13: 1-38.

Derwesh, A. I. 1965. A preliminary list of identified insect and some arachnids of Iraq. *Directorate General of Agricultural Research and Projects, Bulletin*, 112: 1-123.

Frolov, A. V. 2001. Species of the subgenus *Bodilus* (genus *Aphodius*) from Russia and adjacent countries (Coleoptera: Scarabaeidae). *Zoosystematica Rossica*, 10(1): 89-95.

Frolov, A. and Akhmetova, L. 2005. Size correlation between larvae and adults in *Aphodius* (Coleoptera, Scarabaeidae). *Bulletin De l'istitut Royal Des Sciences Naturelles De Belgique, Entomologie*, 75: 321-324.
Two new records of the genus *Aphodius*

Gordon, R. D. and Skelley, P. E. 2007. A monograph of the Aphodiini inhabiting the United States and Canada (Coleoptera: Scarabaeidae: Aphodiinae). *Memoirs of the American Entomological Institute*, 79: 580.

Jessop, L. 1986. Dung beetles and chafer: Coleoptera: Scarabaeoidea. *Handbook for the Identification of British Insects, Royal Entomological Society*, UK, 5(11): 1-53.

Kaddou, I. K. 1967. Check-List of some insect fauna of Iraq. *Biological Research Centre, Publication*, 1: 1-53.

Khalaf, A. N. and Al-Omar, M. A. 1974. A second list of insect from Iraq. *Biological Research Centre, Publication*, 2: 1-38.

Şenyüz, Y. 2017. A new genus and species of Aphodiini (Coleoptera: Aphodiidae) from Istanbul Turkey. *Journal of the Entomological Research Society*, 19(2): 113-119.

Smith, A. B. T. and Skelley, P. E. 2007. A review of the Aphodiinae (Coleoptera: Scarabaeidae) of southern South America. *Zootaxa*, 1458: 1-80.

Valiela, I. 1974. Composition, food webs and population limitation in dung arthropod communities during invasion and succession. *American midland naturalist*, 92(2): 370-385.

Verdu, J. R., Lumaret, J. P. and Galante, E. 1997. Biology of *Aphodius hyxos* Petrovitz (Coleoptera: Scarabaeoidea: Aphodiidae) and description of the third larval stage. *The Canadian Entomologist*, 129(4): 657-665.
تسجيلان جديدين للتنسيق Aphodius Illige, 1798 في العراق (COLEOPTERA, APHODIIDAE)

امير ابراهيم عبد الزهرة
قسم العلوم، كلية التربية الاساسية، جامعة بابل، بابل، العراق

تاريخ الاستلام: 24/11/20112، تاريخ القبول: 24/2/2012، تاريخ النشر: 24/10/2012

الخلاصة
في هذا البحث، تم وصف خنافس الروث Aphodius (Bodilus) ictericus (Laicharting, 1781) و Aphodius (Planolinellus) vittatus Say, 1825 (Coleoptera, Aphodiidae) التي تعود لعائلة Aphodiidae، كما تم وصف خنافس الروث Aphodius ictericus Laicharting, 1781 لساحة العراق لأول مرة.

جُمعت العينات من مناطق مختلفة من وسط العراق: صورت و سُمِّيت الصفات التشخيصية و بعض الصفات المظهرية الأساسية لذكور النوعين أعلاه.