

First records of *Phradonoma cercyonoides* and *Reesa vespulae* (Coleoptera: Dermestidae: Megatominae: Megatomini) in Greece

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ABSTRACT

Phradonoma cercyonoides Reitter, 1887 and *Reesa vespulae* (Milliron, 1939) (Megatominae: Megatomini) are reported for the first time from Greece. Distribution, invasiveness and status of both species are discussed. *Phradonoma cercyonoides* is tentatively suggested as alien to the country. An updated list of the non-native Dermestidae of Greece is provided, supplementing our knowledge on the alien Dermestidae of Europe.

KEYWORDS: Coleoptera, Dermestidae, carpet beetles, non-native species, alien species.

ΠΕΡΙΛΗΨΗ

Τα κολεόπτερα *Phradonoma cercyonoides* Reitter, 1887 και *Reesa vespulae* (Milliron, 1939) (Megatominae: Megatomini) καταγράφονται για πρώτη φορά στην Ελλάδα. Η εξάπλωσή, εισβλητικότητα και η κατάσταση και των δύο ειδών συζητούνται. Παρατίθεται μια ενημερωμένη λίστα των μη-ιθαγενών Dermestidae της Ελλάδας, συμπληρώνοντας τις γνώσεις μας για τα ξενικά Dermestidae της Ευρώπης.

ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ: Κολεόπτερα, Dermestidae, ξενικά είδη, μη-ιθαγενή είδη.

INTRODUCTION

Since the beginning of the 20th century, globalization and the development of international trade around the world has led to an immense rise of introduced organisms far beyond their natural distribution (Hulme 2009). In Europe, insects represent one of the largest taxa of non-native organisms numbering more than 1500 species (Roques *et al.* 2009; Roques 2010). In the last decades, various alien beetles such as *Phenolia (Lasiodites) picta* (Macleay, 1825) (Kalaentzis *et al.* 2019) and *Xylotrechus chinensis* (Chevrolat, 1852) (Leivadara *et al.* 2018) have been detected in Greece.

Alien to Europe Dermestidae were summarized by Denux and Zagatti (2010), who listed 39 species. These have been associated with the destruction of cultural heritage (e.g. preserved museum specimens) (Manachini 2015) and infestation of

material goods, such as stored products, plant material, clothing as well as leather, wool and silk goods (Orlova-Bienkowskaja 2019). Thus, non-native carpet beetles pose a significant threat towards various industry products and household materials, affecting both human well-being and economy.

Regarding Greece, 12 non-native Dermestidae species were reported (Kraatz 1858; Mroczkowski 1965; Legakis 1988; Buchelos & Athanassiou 1999; Kavalieratos *et al.* 2017; Masó Ros & Agulló Villaronga 2019; Langeveld *et al.* 2020). In the present publication, two new alien carpet beetles are recorded for the country—*Phradonoma cercyonoides* Reitter, 1887 and *Reesa vespulae* (Milliron, 1939) (Megatominae: Megatomini)—thus raising the number of alien species to 14. In addition, a checklist of all non-native carpet beetles of Greece is provided.

MATERIALS AND METHODS

Material examined

The examined specimens will be deposited at the Museum of Zoology of the University of Athens, Greece (ZMUA) and J. Háva's personal collection (JH).

Two individuals identified as *Phradonoma cercyonoides* (Fig. 1) were collected near urban areas in Attica Province and a single *Reesa vespulae* (Fig. 2) specimen was collected from Pieria Province.

Phradonoma cercyonoides Reitter, 1887

1 ex., Attica (Attiki), Athens, Zografou, Panepistimioupolis (37.9719°N 23.7584°E), iv.2018, V. Koutsoukos, semi-urban habitat (JH).

1 ex., Attica (Attiki), Salamina, Paloukia, Agios Lavrendios (37.9629°N 23.5146°E), iv.2020, V. Koutsoukos, urban habitat (ZMUA COL 00002370).

Reesa vespulae (Milliron, 1939)

1 ex., Pieria, Leptokarya (on window), 30.vii–15.viii.1993, J. Háva, urban habitat (JH).

Checklist

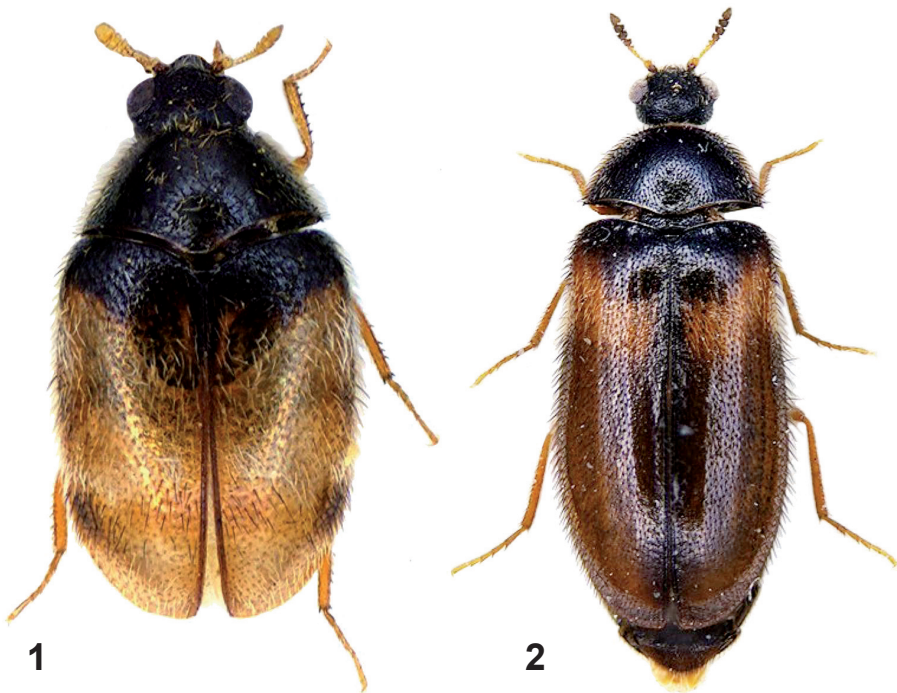
The checklist of the non-native Dermestidae of Greece has been based on literature review and composed in compliance with the list of the Dermestidae alien to Europe (Denux & Zagatti 2010).

DISCUSSION

The collection of two adults of *Ph. cercyonoides* from the same province within two years suggests that the species has formed an established population at least in the Attica province. The species is known from Africa (Egypt, Libya, Morocco, Nigeria, Senegal, Sudan, Western Sahara), as well as from counties of the Levantine Coast (Israel, Syria) (Háva & Herrmann 2019). *Phradonoma cercyonoides* has been also introduced in two European countries, the United Kingdom (Aitken 1975) and Germany (Háva & Herrmann 2019). It is currently unknown whether Greece falls within the natural distribution range of the species. Therefore, two hypothetical scenarios are offered. First, the species may have always existed in Greece, and possibly in the neighbouring countries, but remained up to now undiscovered. The

second hypothesis favours an accidental introduction event, possibly leading to the establishment of the species, due to the similarity of environmental conditions in Greece with the species' known distribution. Although the species inhabits most of the eastern and southern Mediterranean Basin, its presence in the continental Europe is associated with unintentional introduction events. Given the fact that *Ph. cercyonoides* has not been yet reported from the neighbouring countries such as Turkey, Italy or bordering Balkan nations, a natural range expansion is for the moment excluded. The presence of a great geographical barrier (the Mediterranean Sea), could further support the claim that *Ph. cercyonoides* is indeed non-native to Greece. A molecular analysis could potentially shed a light to the status of the species in question. The authors tentatively suggest that *Ph. cercyonoides* should be treated as alien to Greece.

Reesa vespulae is a species of the Nearctic origin, currently widespread throughout Europe, Afghanistan, Japan, Russia, South Korea, China, North Africa, New Zealand, Australia, Canada, USA, Mexico, Argentina and Chile (Denux & Zagatti 2010; Háva 2020; Tsvetanov & Háva 2020). The collection of a single specimen does not warrant validation of an established population in Greece; however, the extended distribution of the species in Europe is taken into consideration. In areas



Figs 1, 2: (1) *Phradonoma cercyonoides* Reitter, 1887, dorsal view; (2) *Reesa vespulae* (Milliron, 1939), dorsal view. (Photographs kind courtesy of Andreas Herrmann)

of its native distribution, *R. vespulae* is associated with nests of bees and aculeate wasps (Aldini 1998). In Europe, it is mainly found in human habitats feeding on stored products, plant material, museum specimens and fungi (Mäkisalo 1970; Stejskal & Kučerová 1996; Kadej *et al.* 2017; Tsvetanov & Háva 2020).

CHECKLIST

Attageninae

Attagenus unicolor Brahm, 1791 (Buchelos & Athanassiou 1999)

Dermestinae

Dermestes ater De Geer, 1774 (Legakis 1988)

Dermestes bicolor bicolor Fabricius, 1781 (Mroczkowski 1965)

Dermestes frischii (Kugelann, 1792) (Masó Ros & Agulló Villaronga 2019)

Dermestes lardarius (Linnaeus, 1758) (Legakis 1988)

Dermestes maculatus (De Geer, 1774) (Mroczkowski 1965)

Dermestes peruvianus Laporte de Castelnau, 1840 (Langeveld *et al.* 2020)

Megatominae

Anthrenus flavipes LeConte, 1854 (Mroczkowski 1965)

Phradonoma cercyonoides Reitter, 1887 Present publication

Reesa vespulae (Milliron, 1939) Present publication

Trogoderma glabrum (Herbst, 1783) (Mroczkowski 1965)

Trogoderma granarium Everst, 1898 (Kavallieratos *et al.* 2017)

Trogoderma inclusum LeConte, 1854 (Kraatz 1858)

Trogoderma versicolor (Creutzer, 1799) (Legakis 1988)

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