

Staphylinid forensic communities from Lisbon with new records for Portugal (Coleoptera: Staphylinidae)

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ABSTRACT

From experiments conducted to study insect species composition and seasonal succession in piglet carcasses, 35 Staphylinidae species were collected, of which 5 are reported for the first time in Portugal: *Anotylus pumilus*, *Stenus (Metastenus) bifoveolatus*, *Bryophacis maklini*, *Mycetoporus mulsanti* and *Mycetoporus piceolus*. Results of this study improve the knowledge of entomosarcosaprophagous fauna in Portugal, especially relevant to forensic science.

Key words: Coleoptera, Staphylinidae, faunistic, new records, forensic entomology, Portugal

RESUMEN

Los Staphylinidae de la comunidad sarcosaprófaga de Lisboa, con nuevas citas para Portugal (Coleoptera)

A partir de experiencias desarrolladas para conocer la composición específica y la sucesión estacional de la fauna asociada con cadáveres de cerdos, se han recogido 35 especies de Staphylinidae, de las cuales 5 son nuevas para la fauna portuguesa: *Anotylus pumilus*, *Stenus (Metastenus) bifoveolatus*, *Bryophacis maklini*, *Mycetoporus mulsanti* and *Mycetoporus piceolus*. Los resultados obtenidos incrementan el conocimiento en relación con la fauna entomosarcosaprófaga en Portugal, de especial relevancia en la práctica forense.

Palabras clave: Coleoptera, Staphylinidae, faunística, nuevas citas, entomología forense, Portugal

INTRODUCTION

Staphylinidae is one of the most diverse Coleoptera families, with 45724 species described worldwide (HERMAN, 2001) and 1547 in the Iberian Peninsula (GAMARRA & OUTERELO, 2005, 2007, 2008a, b, c, 2009a, b, c, d, e, f, g). This group comprises species with a variety of feeding habits, but most of them are predators (KOCH, 1989). Particularly, staphylinid species have been considered the commonest predators found on cadavers (SMITH, 1986). This finding was also corroborated by PRADO E CASTRO *et al.* (2009b).

Despite the forensic importance of rove beetles, their faunistic knowledge in Portugal remains incipient, regardless all contributions already made to study this Coleoptera family in Portugal (e.g., OLIVEIRA, 1894; SEABRA, 1943; FERREIRA, 1962; COIFFAIT, 1963; SERRANO, 1981; AGUIAR & SERRANO, 1995; BOIEIRO *et al.*, 1999; MARTINS DA SILVA *et al.*, 2006).

The occurrence and distribution of species from 16 Staphylinidae subfamilies (Aleocharinae, Paederinae, Staphylininae, Omaliinae, Oxytelinae, Leptotyphlinae, Osoriinae, Tachyporinae, Steninae, Habrocerinae, Phloeocharinae, Trichophyinae, Euaesthetinae, Pseudopsinae, Micropeplinae and Proteininae) in the Iberobaleares Region has been recently compiled in catalogues (GAMARRA & OUTERELO, 2005, 2007, 2008a, b, c, 2009a, b, c, d, e, f, g) that also include lists of all the bibliographic references available for the Iberian Peninsula, in each of the subfamilies.

The aim of this paper is to provide information about 35 Staphylinidae species collected in cadavers in Lisbon and thus contribute to a better knowledge of this Coleoptera family in Portugal. New records are provided as well as some data about species distribution.

MATERIAL AND METHODS

From October 2006 to August 2007, in Lisbon (Portugal), Staphylinidae specimens were collected using a modified Schoenly trap (PRADO E CASTRO *et al.*, 2009a) in order to sample the fauna associated with pig carrion. Four piglets were used in four different experiments of 10 weeks each, in order to cover all seasons of the year. The experiments consisted

on leaving a dead animal as bait inside the trap and during periodical visits collecting the insects that colonized the carcass and bred on it. This was made daily in the first three weeks and afterwards in alternate days. A 40% ethylene glycol solution with formalin and detergent was used in the trap as killing and temporary preservative agent for the arthropods, after which they were removed to 80% ethanol. The experiments were performed in Instituto Superior de Agronomia, Tapada da Ajuda, Lisbon (UTM coordinate 29SMC8384). The location is a forested “island” inside the urban perimeter, mainly composed of *Ailanthus altissima* (Mill.) Swingle, *Fraxinus angustifolia* Vahl and *Ulmus minor* Mill., in an altitude of 80 m a.s.l..

The specimens, collected by C. Prado e Castro, are deposited in the collection of the Department of Animal Biology of the University of Lisbon.

RESULTS AND DISCUSSION

This study has allowed the collection of specimens from 35 species belonging to 8 different Staphylinidae subfamilies. Some of them represent the first record of unknown *taxa* for Portugal, thus enlarging the faunistic knowledge of this group. In the following list, the new records are signalized with an asterisk. For each species the biogeographical distribution, as well as date of collection and number of specimens collected are presented below. Geographic distribution of species is based on GAMARRA & OUTERELO (2005, 2007, 2008a, c, 2009c, d, g) catalogues.

Subfamily ALEOCHARINAE

Acrotona fungi (Gravenhorst, 1806)

Species with a broad distribution, present in the Palaearctic, Oriental and Ethiopic regions.

Material examined: from 19.10.2006 to 19.3.2007, 41 specimens.

Aleochara (Aleochara) curtula (Goeze, 1777)

A holarctic and neotropical species that, in the Iberian Peninsula, has been referred from the northern half.

Material examined: 29.10.2006, 1 specimen; 6.7.2007, 1 specimen.

***Aleochara (Baryodma) intricata* Mannerheim, 1831**

Species distributed throughout the Palaearctic region.

Material examined: 24.11.2006, 2 specimens; 25.04.2007, 1 specimen; 20.07.2007, 1 specimen.

***Aleochara (Xenochara) tristis* Gravenhorst, 1806**

Palaearctic species.

Material examined: 9.11.2006, 1 specimen; 2.1.2007, 1 specimen.

***Aleochara (Coprochara) verna* Say, 1836**

A euronearctic species, spread throughout the Iberian Peninsula.

Material examined: 1.11.2006, 1 specimen.

***Atheta (Mycetota) laticollis* (Stephens, 1832)**

Eurosibiric species, spread throughout the Iberian Peninsula.

Material examined: from 27.10.2006 to 15.12.2006, 6 specimens; 13.3.2007, 1 specimen; 3.4.2007, 1 specimen; from 19.4.2007 to 30.4.2007, 3 specimens; from 30.6.2007 to 28.7.2007, 7 specimens.

***Atheta (Microdota) parvicornis* (Rey, 1873)**

Westerneuropean species, in the Iberian Peninsula is present about the northern half.

Material examined: 5.5.2007, 1 specimen; 8.5.2007, 1 specimen; 4.6.2007, 1 specimen.

***Atheta (Atheta) pertyi* (Heer, 1839)**

This is a euromediterranean and macaronesic species, spread throughout the Iberian Peninsula.

Material examined: from 22.10.2006 to 23.2.2007, 199 specimens; from 18.4.2007 to 29.5.2007, 66 specimens.

***Atheta (Tetropla) sodalis* (Erichson, 1837)**

Species of euroturanic and nearctic distribution, in the Iberian Peninsula is only known from Portugal.

Material examined: from 22.10.2006 to 28.12.2006, 29 specimens; 5.2.2007, 1 specimen.

***Cordalia obscura* (Gravenhorst, 1802)**

A westpalaeartic and nearctic species, spread throughout the Iberian Peninsula.

Material examined: 6.11.2006, 1 specimen; 30.11.2006, 1 specimen; 17.4.2007, 1 specimen; 19.5.2007, 1 specimen; 6.7.2007, 1 specimen.

***Dimetrota cadaverina* (Brisout, 1860)**

European species.

Material examined: from 21.10.2006 to 16.11.2006, 5 specimens; 28.12.2006, 2 specimens; 15.2.2007, 1 specimen.

***Liogluta nitidula* (Kraatz, 1856)**

Species of euroturanic distribution.

Material examined: 7.6.2007, 1 specimen; 8.7.2007, 1 specimen; 11.7.2007, 1 specimen.

***Oligota (Oligota) pusillima* (Gravenhorst, 1806)**

Species widely distributed in Euroasiatic, Nearctic and Neotropical regions.

Material examined: from 3.12.2006 to 21.1.2007, 29 specimens; 16.3.2007, 1 specimen; from 1.5.2007 to 27.8.2007, 65 specimens.

Subfamily MICROPEPLINAE***Micropeplus staphylinoides* (Marsham, 1802)**

Holomediterranean species, spread throughout the Iberian Peninsula.

Material examined: 27.11.2006, 1 specimen.

Subfamily OXYTELINAE***Anotylus complanatus* (Erichson, 1839)**

Widespread species, referred from Palaearctic, Australian and Neotropical regions.

Material examined: from 19.10.2006 to 3.4.2007, 187 specimens; from 17.4.2007 to 30.7.2007, 180 specimens.

***Anotylus inustus* (Gravenhorst, 1806)**

Westpalaeartic species.

Material examined: 27.10.2006, 1 specimen.

****Anotylus pumilus* (Erichson, 1839)**

New species record for Portugal. Species was known from the western Palaeartic region. In the Iberian Peninsula up to now it had been referred from the center area, Cádiz and Mallorca (Balearic Islands).

Material examined: from 4.11.2006 to 3.4.2007, 38 specimens.

Subfamily PAEDERINAE

***Nazeris ibericus* Kock, 1940**

This species has an iberic distribution, being present in the western third of the Iberian Peninsula.

Material examined: from 19.5.2007 to 7.6.2007, 4 specimens.

Subfamily PROTEININAE

***Proteinus atomarius* Erichson, 1840**

Although it is a holarctic species, in the Iberian Peninsula is only known from Portugal, Cádiz province and Balearic Islands.

Material examined: from 24.10.2006 to 28.12.2006, 25 specimens; from 19.04.2007 to 3.5.2007, 3 specimens.

Subfamily STAPHYLININAE

***Creophilus maxillosus* (Linné, 1758)**

A well known species, present in Palaeartic, Nearctic and Oriental regions.

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Material examined: from 27.10.2006 to 30.10.2006, 8 specimens; from 13.02.2007 to 29.03.2007, 30 specimens; from 23.04.2007 to 06.07.2007, 19 specimens.

Ocypus (Pseudocybus) aethiops (Waltl, 1835)

This species has a holotirrenic distribution, being spread throughout the Iberian Peninsula

Material examined: from 15.12.2006 to 07.02.2007, 7 specimens; 04.07.2007, 1 specimen.

Philonthus (Philonthus) discoideus (Graavenhorst, 1802)

Cosmopolitan species.

Material examined: 29.10.2006, 1 specimen; 10.03.2007, 1 specimen.

Philonthus (Philonthus) longicornis Stephens, 1832

Cosmopolitan species.

Material examined: 30.4.2007, 1 specimen.

Philonthus (Philonthus) varians (Paykull, 1789)

Cosmopolitan species.

Material examined: from 26.10.2006 to 23.2.2007, 18 specimens; from 23.4.2007 to 17.5.2007, 41 specimens; from 2.7.2007 to 27.8.2007, 6 specimens.

Quedius (Raphirus) fumatus (Stephens, 1832)

A westmediterranean species, in the Iberian Peninsula is known from the northern half.

Material examined: 29.4.2007, 1 specimen; 19.5.2007, 1 specimen.

Quedius (Raphirus) latinus Gridelli, 1938

Species of tirrenic distribution.

Material examined: 28.10.2006, 1 specimen; 23.12.2006, 1 specimen.

Xantholinus (Idiolinus) translucidus Scriba, 1870

This is a holotirrenic species.

Material examined: 12.12.2006, 1 specimen.

Subfamily STENINAE

**Stenus (Metastenus) bifoveolatus* Gyllenhal, 1827

New species record for Portugal. This species, with euroturanic distribution, was only known, in the Iberian Peninsula, from Sierra de Guadarrama, thus much enlarging the distribution of the species.

Material examined: 01.3.2007, 1 specimen.

Subfamily TACHYPORINAE

**Bryophacis maklini* (Shalberg, 1871)

New species record for Portugal. This species, with euroturanic distribution, is considered by some authors as a synonymy of *B. rugipennis* (Pandellé, 1869); species neither referred from Portugal. In the Iberian Peninsula it was known from southeastern area.

Material examined: 12.12.2006, 1 specimen; 15.12.2006, 1 specimen; 19.2.2007, 1 specimen.

Mycetoporus longulus Mannerheim, 1830

It is a species with euroturanic distribution. In the Iberian Peninsula it was known from the northwest and central areas of Spain and from central Portugal.

Material examined: 9.7.2007, 1 specimen.

**Mycetoporus mulsanti* Ganglbauer, 1895

New species record for Portugal. Although this species is broadly distributed by the Mediterranean basin, as well as in the Iberian Peninsula, up to now was unrecorded from Portugal. So, this is the first reference for this country.

Material examined: 3.11.2006, 1 specimen; 23.12.2006, 1 specimen; 28.12.2006, 1 specimen; 2.1.2007, 2 specimens.

Mycetoporus nigricollis Stephens, 1835

Holomediterranean species.

Material examined: 18.11.2006, 1 specimen; 15.12.2006, 1 specimen; 1.1.2007, 2 specimens.

****Mycetoporus piceolus* Rey, 1883**

New species record for Portugal. This species has a European distribution. In the Iberian Peninsula it has been referred from the north to the center.

Material examined: 01.2.2007, 2 specimens.

***Mycetoporus solidicornis* Wollaston, 1864**

This species, tirrenic in distribution, in the Iberian Peninsula is found in the northern half, as well as in Balearic Islands.

Material examined: 3.12.2006, 1 specimen; 28.12.2006, 1 specimen; 3.4.2007, 1 specimen.

***Tachyporus (Palporus) nitidulus* (Fabricius, 1781)**

Cosmopolitan species.

Material examined: 29.5.2007, 1 specimen; 4.6.2007, 1 specimen.

From a faunistic point of view, our data contribute to broaden the knowledge concerning the presence and distribution of the Staphylinidae family in Portugal. As regards the sarcosaprophagous community, most staphylinid species belong to its necrophilic component (e.g. ARNALDOS *et al.*, 2005) because they are predators of other elements of the community, being attracted to carrion to feed on maggots and the larvae of other insects (BYRD & CASTNER, 2010). Since many staphylinid species feed on fungi (BOHAC, 1999), a usual resource in a decomposing cadaver, they also belong to the opportunistic component. Among the predacious species, some are specialists, while others have generalist diets (BYRD & CASTNER, 2010). Although these categories of sarcosaprophagous arthropods do not allow an accurate direct estimation of the postmortem interval, its study and evaluation provides some valuable environmental data that may contribute to the estimation of time since death and other interesting factors for forensic purposes. Regarding the knowledge of Staphylinidae related to corpses in Portugal, it is only known the recent contribution of GROSSO-SILVA & SOARES-VIEIRA (2009), who only refer the species *Creophilus maxillosus* (Linnaeus, 1758) as belonging to this community, being present soon after dead. Thus, the data provided here are interesting not only from the faunistic but also from the forensic science' point of view.

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