

## NEW RECORDS OF SAPROXYLIC BEETLES (COLEOPTERA: ELATERIDAE, MYCETOPHAGIDAE, MELANDRYIDAE AND COLYDIIDAE) FROM PORTUGAL

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**Abstract:** Considering its ecological role and biodiversity, saproxylic beetles have great importance in forest ecosystems. However, in Portugal there is still a lack of studies concerning this ecological group, particularly on faunistics. Here we present five new records of species from this country: *Drapetes biguttatus* (Piller & Mitterpacher), *Mycetophagus quadriguttatus* Müller, *Orchesia micans* (Panzer), *Abdera bifasciata* Marsham and *Cicones pictus* Erichson. All the species were collected in cork oak woodlands through two different techniques: baited pitfall traps in felled trunks and flight-interception traps in the canopies. On account of their saproxylic life-cycle these species represent important records for the Portuguese woodlands. More studies are needed to broaden the knowledge of this ecological group in Portugal, since they can be a valuable tool for forest biodiversity assessment and management programmes in the future.

**Key words:** Coleoptera, saproxylic beetles, Elateridae, Mycetophagidae, Melandryidae, Colydiidae, faunistics, Portugal.

### Registros novos de coleópteros saproxílicos (Coleoptera: Elateridae, Mycetophagidae, Melandryidae e Colydiidae) de Portugal

**Resumo:** Os são muito importantes nos ecossistemas florestais, tendo em conta a sua função ecológica e biodiversidade. Contudo, Portugal carece ainda de estudos que englobem este grupo ecológico, particularmente estudos de faunística. No presente trabalho damos a conhecer cinco novidades faunísticas para este país: *Drapetes biguttatus* (Piller & Mitterpacher), *Mycetophagus quadriguttatus* Müller, *Orchesia micans* (Panzer), *Abdera bifasciata* Marsham e *Cicones pictus* Erichson. Todas as espécies foram amostradas em montados de sobre através de duas técnicas distintas: armadilhas de queda ("pitfall") com isco em troncos caídos e armadilhas de intercepção aérea nas copas. Devido aos seus ciclos de vida saproxílicos, estas espécies constituem registos importantes para as florestas portuguesas. Mais estudos são necessários para alargar o conhecimento deste grupo ecológico em Portugal, dado que poderão constituir uma importante ferramenta em programas de avaliação da biodiversidade florestal, bem como da sua gestão futura.

**Palavras chave:** Coleoptera, coleópteros saproxílicos, Elateridae, Mycetophagidae, Melandryidae, Colydiidae, faunística, Portugal.

### Nuevas citas de escarabajos saproxílicos (Coleoptera: Elateridae, Mycetophagidae, Melandryidae y Colydiidae) de Portugal

**Resumen:** Los coleópteros saproxílicos son muy importantes en los ecosistemas forestales, teniendo en cuenta su función ecológica y biodiversidad. Aun con todo, Portugal sigue careciendo de estudios que se ocupen de este grupo ecológico, en particular estudios de faunística. En el presente trabajo damos a conocer cinco novedades faunísticas para el país: *Drapetes biguttatus* (Piller & Mitterpacher), *Mycetophagus quadriguttatus* Müller, *Orchesia micans* (Panzer), *Abdera bifasciata* Marsham y *Cicones pictus* Erichson. Todas estas especies se colectaron en alcornocales mediante dos técnicas distintas, trampas de caída ("pitfall") con cebo en troncos caídos y trampas de intercepción aérea en las copas. Debido a sus ciclos de vida saproxílicos, las citas de estas especies son importantes para los bosques portugueses. Son necesarios más estudios para ampliar el conocimiento de este grupo ecológico en Portugal, puesto que podrían constituir una herramienta importante en programas de evaluación de la biodiversidad forestal, así como de su gestión en el futuro.

**Palabras clave:** Coleoptera, coleópteros saproxílicos, Elateridae, Mycetophagidae, Melandryidae, Colydiidae, faunística, Portugal.

## Introduction

Saproxylic beetles are "during some part of their life cycle, dependent upon the dead or dying wood of moribund or dead trees (standing or fallen), or upon wood-inhabiting fungi or upon the presence of other saproxylics" (Speight, 1989). They play essential roles in forest ecosystems, such as nutrient recycling, contributing also to its high biodiversity (Alexander, 2002; Méndez Iglesias, 2005; Lachat *et al.*, 2006). For instance, in European forests, about 20-56% of all estimated Coleoptera species are saproxylics (Grove, 2002a). On the other hand, some forest management practices, like clear cutting, is thought to produce a negative impact on saproxylic species, some of them rare and/or endemic (*e.g.*, Siitonen & Martikainen, 1994; Kaila *et al.*,

1997; Martikainen *et al.*, 2000; Similä *et al.*, 2003; Lachat *et al.*, 2006). Consequently, this ecological group became an important target in conservation programmes in Northern Europe, regarding forest systems sustainability (*e.g.*, Martikainen *et al.*, 1998; Fowles *et al.*, 1999; Sverdrup-Thygeson, 2001; Grove, 2002b; Jonsel & Weslien, 2003; Martikainen & Kaila, 2004; Gibb *et al.*, 2006). However, in the Mediterranean region, particularly in Portugal, minor attention has been given to saproxylic beetles conservation, their determinant ecological role and high specific richness (Méndez Iglesias, 2005). Considering this, the present work intends to contribute to a better knowledge on the Portuguese saproxylic beetles.

## Material and methods

The sampling work was performed in “Herdade da Ribeira-Abaixo” (HRA), located in “Serra de Grândola” (Grândola, Baixo Alentejo). HRA constitutes an agro-ecosystem dominated by cork oak woodlands (*Quercus suber*) and with the undercover mainly constituted by crimson spot rockroses (*Cistus ladanifer*) and sageleaf rockrose (*Cistus salvifolius*).

Three sites were chosen according to a cork oak density gradient (high, medium and low density), where saproxylic Coleoptera were collected by two combined methods: flight-interception traps, which usually collect a higher number of species, and baited pitfall traps in felled trunks, which usually collect beetles associated with tree hollows and are rarely captured by the first method (Antonsson & Jansson, 2001; Ranius & Jansson, 2002). The bait used in pitfall traps was a modified version of Turquin’s solution (Turquin, 1973). The list of species follows the classification system proposed by Lawrence & Newton (1995) to the sub-family level. For each species we present the collecting method(s) in which the specimen(s) were trapped and the cork oak density level where they occurred, as well as some aspects of their ecology and distribution.

## Results

Family ELATERIDAE Leach, 1815  
Subfamily Lissominae Laporte, 1835

### *Drapetes biguttatus* (Piller & Mitterpacher, 1783)

EXAMINED MATERIAL: “Serra de Grândola” - HRA (29SNC31), 19-10-1999, 1♂, 1♀, collected with baited pitfall traps. The specimens occurred in sampling points with medium cork oak density.

Lissominae click-beetles, considered before as a separate family (Burakowski, 1973; Costa *et al.*, 1988) or as a subfamily of Throscidae (Cobos, 1959; Muona, 1996), is now recognized to be a subfamily of Elateridae (*e.g.*, Calder, 1998). In overall, Lissominae species’ larvae occur underneath bark, in decaying stumps and fallen rotten logs of old deciduous trees such as *Quercus*. The larvae usually feed in the sapwood, preferring moist, decaying or rotten wood formed by the activities of parasitic fungi (Burakowski, 1973). Adults of *D. biguttatus* are usually seen in old growth *Quercus* woodlands and are often found on foliage or bark surfaces, where they may feed on plant shoots or tips, nectar or possibly epiphytic microflora (Burakowski, 1975).

Lissominae elaterids occur mainly in tropical and subtropical regions, having few Palearctic species (Cobos, 1967). *Drapetes biguttatus* was recorded in some Central and Southern European countries (*e.g.*, Portevin, 1931; Cobos, 1959; Burakowski *et al.*, 1985; Gobbi & Platia, 1995), but its distribution remains poorly known.

Family MYCETOPHAGIDAE Leach, 1815  
Subfamily Mycetophaginae Leach, 1815

### *Mycetophagus (Parilendus) quadriguttatus* Müller, 1821

EXAMINED MATERIAL: “Serra de Grândola” - HRA (29SNC31), 11-03-2000, 1♂, collected with a flight-interception trap. The specimen occurred in a sampling point with high cork oak density.

Despite some beetles of this species have been occasionally reported in stored products with fungal decay (*e.g.*, granary refuse, haystacks, warehouses, *etc.*), they are

mainly associated to old decaying broad-leaved timber with mildewed cavities. Both adults and larvae live under bark of dead trees and feed upon soft rotting tissue of polypore fruiting bodies within rotten trunks (Lawrence, 1991; Alexander, 2002). Although locally rare, this species is widely distributed in Europe (Nikitsky, 2005a).

Family MELANDRYIDAE Leach, 1815  
Subfamily Melandryinae Leach, 1815

### *Orchesia (Orchesia) micans* (Panzer, 1794)

EXAMINED MATERIAL: “Serra de Grândola” - HRA (29SNC31), 24-09-1999, 1♂, 1♀, collected with baited pitfall traps. The specimens occurred in both medium and high cork oak density sampling points.

Generally, larvae of false darkling beetles, and particularly of *O. micans*, live under bark in dead-rotten fallen trunks. For instance, *O. micans* larvae have been found in *Polyporus* on dead *Fraxinus* and on dead *Quercus suber* (García de Viedma, 1965). Adults live also under bark, associated with polypore fungi, especially in damp woodland (Hoebeke & McCabe, 1977; Angelini *et al.*, 1995; Alexander, 2002). *O. micans* is most often found in ancient woodland (Alexander, 2002) and this Palearctic species is widely distributed in Europe (including Spain) and in the Near East (Nikitsky, 2005b).

Subfamily Melandryinae Leach, 1815

### *Abdera (Abdera) bifasciata* (Marsham, 1802)

EXAMINED MATERIAL: “Serra de Grândola” - HRA (29SNC31), 19-07-1999, 1♂, collected with a flight-interception trap. The specimen occurred in a sampling point with high cork oak density.

False darkling beetles of genus *Abdera* develop mainly in small bracket fungi. Most records are from ancient woodland, usually associated with *Quercus* species (Alexander, 2002). The distribution of *A. bifasciata* extends to Corsica, Danish mainland, French mainland, Great Britain, Italian mainland, Poland, Sardinia and Spanish mainland (Nikitsky, 2005b).

Family COLYDIIDAE Erichson, 1842  
Subfamily Colydiinae Erichson, 1842

### *Cicones pictus* Erichson, 1845

EXAMINED MATERIAL: “Serra de Grândola” - HRA (29SNC31), 19-10-1999, 1♂, 1♀, collected with baited pitfall traps. The specimens occurred in sampling points with low cork oak density.

Colydid beetles are generally predators (and some ectoparasitic on larvae or pupae of other beetles), but species of genus *Cicones* are usually mycetophagous; feeding upon fungal fruiting bodies, spores and hyphae in decaying plant material and rotting wood (Alexander, 2002). *C. pictus* occurs in Southern and Central Europe (Schuh, 1998), but the knowledge on its distribution is yet poorly known.

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