

**Original araştırma (Original article)**

**Research on three click beetles species from Turkey  
(Coleoptera: Elateridae)**

Türkiye'den üç Elateridae (Coleoptera) türü üzerinde araştırmalar

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**Summary**

In this study, specimens of three species of the family Elateridae (Coleoptera) were collected from Antalya, Çanakkale, Denizli, Hatay, Kütahya and Rize provinces in 1988, 1991, 1992, 1993, 2008, 2010 and 2011. New records for Turkey and detailed redrawing, description of the male genitalia and its comparison with literature of *Ampedus rubellus* Gurjeva 1977, detailed locality records for Turkey and a photograph and description of the bursa copulatrix of *Melanotus (Spheniscosomus) cuneiformis* (Baudi di Selve, 1871), and description, detailed drawing of the male genital morphology and its comparison with closely related species of *Agriotes subsulcatus* Pic, 1913, are provided.

**Key words:** New record, detailed locality records, male genitalia, bursa copulatrix, Turkey

**Özet**

Bu çalışmada, Antalya, Çanakkale, Denizli, Hatay, Kütahya ve Rize illerinden 1988, 1991, 1992, 1993, 2008, 2010 ve 2011 yıllarında Elateridae (Coleoptera) familyasından üç türe ait örnekler toplanmıştır. *Ampedus rubellus* Gurjeva 1977 Türkiye için yeni kayıt olup bu türün erkek üreme organı betimlemesi ve yeniden çizimi verilmiş ve literatür ile karşılaştırılmış, *Melanotus (Spheniscosomus) cuneiformis* (Baudi di Selve, 1871)'in Türkiye için ayrıntılı bölge kayıtları ve çiftleşme kesesi fotoğrafı ve betimlemesi, *Agriotes subsulcatus* Pic 1913'un erkek üreme organının betimlemesi, ayrıntılı çizimi ilk defa verilmiş ve en yakın türün erkek genital organı ile karşılaştırılması verilmiştir.

**Anahtar sözcükler:** Yeni kayıt, ayrıntılı bölge kayıtları, erkek üreme organı, çiftleşme kesesi, Türkiye

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Alınış (Received): 17.02.2012

Kabul ediliş (Accepted): 28.04.2012

## Introduction

According to the literature, the Elateridae fauna of Turkey is very rich. There are more than 450 reported species and the genera *Agriotes* (82 species), *Ampedus* (38 species) and *Melanotus* (21 species) are of outstanding importance (Mertlik & Platia 2008; Platia 2008; Kabalak & Sert 2009; Platia & Gudenzi 2009; Platia et al. 2009; Schimmel et al. 2009; Gülperçin & Tezcan 2010; Kabalak & Sert 2010a, 2010b; Platia 2010; Kabalak & Sert 2011; Platia 2011a, 2011b; Platia et al. 2011; Platia & Nemeth 2011; Sert & Kabalak 2011, Kabalak & Sert 2012). These studies showed that, in the future, many new species and new records may be discovered through comprehensive research. As well as describing new species and giving new records, the description of male and female genital organs of known species could contribute to other studies on the family Elateridae, such as systematic and faunistic studies.

## Materials and Methods

Photographs of *Agriotes subsulcatus*, *Ampedus rubellus*, *Melanotus (Spheniscosomus) cuneiformis*, which were taken with a Leica MZ-16A stereoscopic microscope, are given. The body lengths of the specimens were measured along the midline from the anterior margin of the frons to the apex of elytra. The widths of the specimens were measured across the broadest part of the elytra. Male genital organs of *A. rubellus* and *A. subsulcatus* were drawn in detail, described and discussed in the context of the literature. A photograph and description of the bursa copulatrix of *M. (S.) cuneiformis*, was removed by using standard methods and put in 10-15% KOH solution for clearing, are given. Specimens are deposited in the Zoological Museum of Hacettepe University (Ankara, Turkey) and collection of Dr. Giuseppe PLATIA (Forli, Italy).

## Results and Discussion

Subfamily: Elaterinae Leach, 1815

*Ampedus rubellus* Gurjeva, 1977 (Fig. 1).

Examined specimen: 1 male, Length 8.95 mm, width 2.73 mm.

Male genital organ description (Fig. 4): Basal piece almost 'V' shapely notched, outer lateral margins slightly arcuate, posterior margin roof likely concave; outer lateral margins of parameres arcuate, with distinct and clearly pointed distal teeth and apex of parameres pointed; median lobe clearly longer than parameres, arms of median lobe short and horn shaped, gradually narrowing from arms to medial, almost parallel sided from distal to medial, gradually narrowing from distal to apical, its apex finger shapely rounded, median lobe with thin sclerotized longitudinal line.

Locality Record: Rize Çamlıhemşin 700m 40°57'33"N 40°57'46"E 02.VI.2011 1 male leg. Ç. Karacaoğlu and A. C. Kuyucu (in Hacettepe University Zoology Museum).

This species is a new record for Turkey.

World Distribution: Azerbaijan, Georgia, Russia (South European territory) (Cate 2007); Armenia (Platia 2011b)

*Agriotes subsulcatus* Pic, 1913 (Fig. 2).

Examined specimen: 1 male, Length 8.53 mm, width 2.35 mm.

Male genital organ description (Fig. 6) : Basal piece 'U' shapely notched, outer lateral margins slightly arcuate from posterior to medial and almost parallel sided from medial to apical, posterior margin concave; outer lateral margins of parameres straight with small and clearly pointed distal teeth and apex of parameres pointed; median lobe clearly longer than parameres, arms of median lobe short and parallelly extending, median lobe gradually narrowing from arms to proximal, slightly enlarging from proximal to apical, its apex swollen and rounded, median lobe with thin sclerotized longitudinal line.

Locality Record: Hatay Hassa 952 m 36°29'42"N 36°14'25"E 09.IV.2008 1 male leg. E. Yağmur (in Hacettepe University Zoology Museum).

World Distribution: Turkey (Cate 2007; Mertlik and Platia 2008).

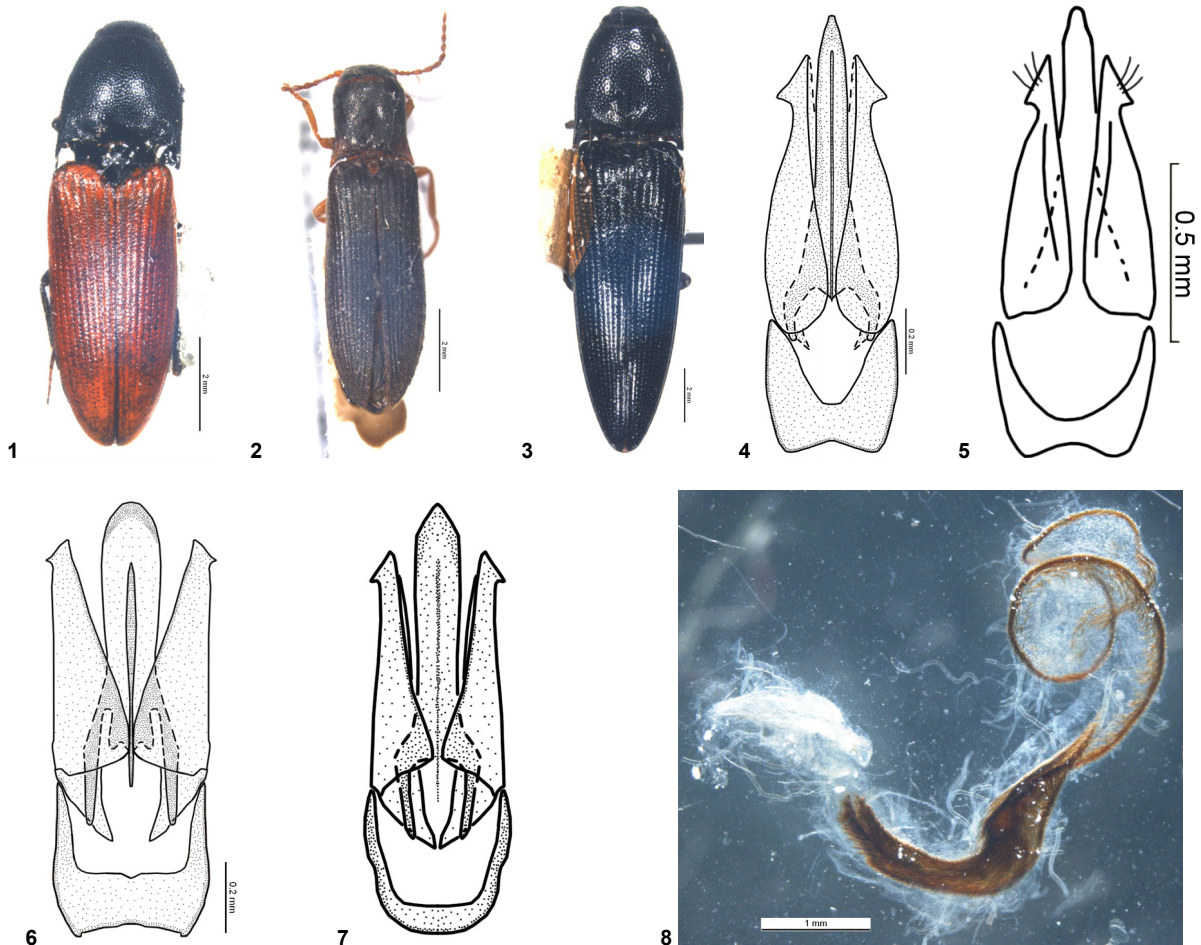
Subfamily: Melanotinae Candèze, 1859

*Melanotus (Sphenicosomus) cuneiformis* (Baudi di Selve, 1871) (Fig. 3).

Examined Specimen: 1 female, Length 16.52 mm, width 4.29 mm.

Bursa Copulatrix Description (Fig. 8): Bursa copulatrix with dense nail-like spines in large crescent-like part and thin flagellum-like part.

Locality Record: Denizli: Honaz 1 female August – September 2010 leg. M. Avcı (in Hacettepe University Zoology Museum); Antalya: Gündoğmuş 19.V.1988 leg. R. Widenfalk. Antalya: North of Kumluca 26.V.1991 leg. G. Gillerfors. Antalya: Kale 3.VI.1992 leg. V. Hosek. Antalya: Çakıllı pass 1200 m 8.VII.1993 leg. G. Magnani. Çanakkale: 23 km West of Çan 21.V.2008 483 m leg. R. Krolik. Kütahya: 10-15 km S of Domaniç 800 m 17.VII.2010 leg. F. Angelini (in collection of Giuseppe PLATIA).



Figures 1 – 8. Habitus of species (scale = 2 mm): 1. *Ampedus rubellus*, 2. *Agriotes subsulcatus*, 3. *Melanotus (Sphenicosomus) cuneiformis*; Male genital organ drawings (scale = 0.2 mm): 4. *Ampedus rubellus*, 5. *Agriotes rubellus* (redrawn from Gurjeva 1977, scale = 0.5 mm), 6. *Agriotes subsulcatus*, 7. *Agriotes sameki* (redrawn from Platia 2003); 8. Bursa copulatrix of *Melanotus (Sphenicosomus) cuneiformis* (scale = 0.2 mm).

World Distribution: Cyprus, Syria (Schenkling 1925, 1927) and Cyprus, Turkey (Cate 2007; Preiss & Platia 2003).

*Ampedus rubellus* was described by Gurjeva (1977) who stated that it is very similar to *Ampedus praeustus* (Fabricius, 1792) but well distinguished from it by the structure of antennae and male genitalia. According to Cate (2007), *A. rubellus* is distributed in Azerbaijan, Georgia and Southern European territory of Russia. Platia (2011b) also recorded it from Armenia. The distribution area of this species is very close to the collecting province (Rize). Especially, there are floristic and topographic similarities between the collection area and distribution area of the species which could explain the presence of *A. rubellus* in Turkey. Gurjeva (1977) also gave a male genital organ drawing of *A. rubellus*, but not in detail (Fig. 5). There are distinct similarities between our findings and Gurjeva's findings, except for differences on the outer lateral margins and distal teeth of parameres.

*Agriotes subsulcatus*, which was described by Pic (1913), is a member of *nucleus* group of genus *Agriotes* with supra-antennal keels reaching to anterior margin of the frons, briefly etched apex of prosternal sutures and generally longer antennae. According to the literature (Winkler 1924 (as *Ectinus*); Schenkling 1925 (as *Ectinus*); Gurjeva 1972; Lodos 1998; Platia 2003; Cate 2007, Mertlik and Platia 2008), the male genital organ of *A. subsulcatus* is undescribed. In the key for males of the *nucleus* group, this species is described as close to *A. sameki* by Platia (2003). The second antennal segment is as long as wide and pronotal disk is rather depressed in *A. subsulcatus*, while the second antennal segment is longer than wide and pronotal disk is very convex in *A. sameki*. In the comparison of the male genital organ morphologies of *A. subsulcatus* and *A. sameki* (Fig. 7), some differences were detected. In *A. subsulcatus*, the basal piece is angled, parameres are thick, median lobe is thick and its apex is rounded, while in *A. sameki* the basal piece is rounded, parameres are thin and median lobe is thin and its apex is roof like.

According to Cate (2007), there are 32 species in the subgenus *Spheniscosomus* Schwarz, 1892 in the Palearctic region. Only *Melanotus* (*S.*) *cuneiformis* and *M. (S.) sulcicollis* are present in Europe and North Africa (Cate, 2007). *M. (S.) cuneiformis* is known from Cyprus, Syria and Turkey (Schenkling 1925, 1927; Cate 2007; Preiss & Platia 2003). Preiss & Platia (2003), and Cate (2007) also reports this species from Turkey, but they did not give a precise locality records. A description and photograph of the bursa copulatrix of *M. (S.) cuneiformis* is provided for the first time.

## Acknowledgements

We would like to thank Prof. Dr. Mustafa AVCI (Süleyman Demirel Üniversitesi, Orman Fakültesi, Orman Mühendisliği Bölümü, Isparta), Assist. Prof. Sinan ANLAŞ (Celal Bayar Üniversitesi, Alaşehir Meslek Yüksekokulu, Organik Tarım Programı, Manisa), Assist. Prof. Ersen Aydın YAĞMUR (Celal Bayar Üniversitesi, Alaşehir Meslek Yüksekokulu, Organik Tarım Programı, Manisa), and Res. Ass. Çağışan KARACAOĞLU (Hacettepe Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, Ankara) and Res. Ass. Arda Cem KUYUCU (Hacettepe Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, Ankara), Dr. Giuseppe PLATIA (Via Molino Vecchio, Gatteo (FC) Italia) for supplying materials for this study.

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