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Original article (Orijinal araştırma)

A new *Leptusa* Kraatz, 1856 (Coleoptera: Staphylinidae: Aleocharinae) species from Turkey[1]

Türkiye'den yeni bir *Leptusa* Kraatz, 1856 (Coleoptera: Staphylinidae: Aleocharinae) türü

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Abstract

In this study, a new Aleocharinae Fleming, 1821 (Coleoptera: Staphylinidae) species, *Leptusa* (*Roubaliusa*) *giresunensis* sp. n. (Coleoptera: Staphylinidae: Aleocharinae), is described from Giresun Province in Turkey. The study was conducted between March 2013 and March 2016 in the Eastern Black Sea Region and new species was collected in 2014-2015. Photographs of the habitus are given and antenna, aedeagus, spermatheca, and both male and female sternite VII-VIII and tergite VIII are illustrated for the new species. Furthermore, species list of the *Leptusa* for Turkey, identification key and maps of the new species and congeners are given. The habitus, aedeagus and spermatheca are distinguished from similar species *Leptusa trapezuntis* Pace, 1989 and *Leptusa flagrifera* Assing, 2009 (Coleoptera: Staphylinidae: Aleocharinae).

Keywords: Aleocharinae, *Leptusa*, new species, Staphylinidae, Turkey

Öz

Bu çalışmada, yeni bir Aleocharinae Fleming, 1821 (Coleoptera: Staphylinidae) türü, *Leptusa* (*Roubaliusa*) *giresunensis* sp. n. (Coleoptera: Staphylinidae: Aleocharinae) Türkiye (Giresun)'den tanımlanmıştır. Çalışma 2013 Mart ve 2016 Mart tarihleri arasında Doğu Karadeniz Bölgesi'nde yürütülmüş ve yeni tür 2014-2015 yılları arasında toplanmıştır. Yeni türün vücut fotoğrafı verilmiş ve anten, aedeagus, spermateka, erkek ve dişi bireye ait 7. ve 8. sternit ve 8. tergitleri çizilmiştir. Ayıca *Leptusa* türlerinin Türkiye listesi, teşhis anahtarı ve yeni tür ile yakın türlerin haritaları verilmiştir. Benzer olan *Leptusa trapezuntis* Pace, 1989 ve *Leptusa flagrifera* Assing, 2009 (Coleoptera: Staphylinidae: Aleocharinae) türlerinden dış morfolojisi, aedeagus ve spermateka yapıları bakımından farklılıkları verilmiştir.

Anahtar sözcükler: Aleocharinae, *Leptusa*, yeni tür, Staphylinidae, Türkiye

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Introduction

The genus *Leptusa* is represented by numerous species in the Palearctic and other zoogeographic regions (Assing, 2004a). According to Schülke & Smetana (2015) *Leptusa* is represented by 409 species and 74 subspecies belonging to 71 subgenera in the Palearctic region. Besides nine species are given as *incertae sedis*.

One of the most diverse endemic species in Turkish is *Leptusa* Kraatz, 1856 in the Staphylinidae. The vast majority of the *Leptusa* species in Turkey have been recorded in the north and east (Assing, 2007). Studies on *Leptusa* in Turkey have been faunistic, new species/records and zoogeographical, particularly those of Volker Assing (Assing, 2002, 2003a, 2004b, 2007, 2009a, b, 2017). Also, the monograph on *Leptusa* by Pace (1989) is highly relevant.

Leptusa in countries neighboring Turkey include 27 species in five subgenera from the Caucasus region (excluding for Turkey) (Assing, 2017). Fourteen species are known from the Russian areas of Greater Caucasus, 17 species from Georgia, five species from Armenia and two from Azerbaijan (Assing, 2017). In addition, eight species are known from Iran, 11 species from Bulgaria and 24 species from Greece (Schülke & Smetana, 2015).

The genus includes 26 species and two doubtful subspecies in seven subgenera (Anlaş, 2009; Assing, 2009a, b, 2011, 2013; Schülke & Smetana, 2015). With the new species, the number of *Leptusa* species in Turkey has been raised to 27.

In Anatolia, 20 species in this genus are endemic. In *Leptusa,* the phenomenon of endemism is very widespread, as its habitats are mainly linked to mountainous regions and also lots of the *Leptusa* species are micropterous and confined to montane, subalpine and alpine habitats (Pace, 1989; Assing, 2017).

In *Leptusa*, a positive identification of species and subgenera generally relies on the male sexual characters (Assing, 2002). In the more recent taxonomic literature on *Leptusa*, the shape and internal structures of the median lobe of the aedeagus has been given particular emphasis, the male secondary sexual characters have been largely ignored. However, it has been shown that features of the male tergites VII-VIII and sternites VII-VIII may also be of considerable taxonomic significance (Assing, 2007).

The aim of the present study was to contribute to the knowledge of the *Leptusa* fauna of Turkey by describing a new species and explain how it differs from related congeners.

Material and Method

This report is based on material collected during field studies in Giresun Province in the Eastern Black Sea Region of Turkey between March 2013 and March 2016. All samples are collected by sifting leaf debris (*Rhododendron* sp.). Insects were killed with ethyl acetate and preserved in 10% acetic acid and 96% alcohol. The coordinates of the specimens were recorded by GPS. In the laboratory, genitalia were extracted using pins and put into KOH for cleaning the adipose tissue. Photographs of the habitus was taken using a Leica MZ 16A stereoscopic microscope, male and female sternite VII-VIII and tergite VIII, aedeagus, and female spermatheca were drawn. Maps were created using ArcMap 10.2.2 (Figures 1&2). The structure of the habitus, aedeagus and spermatheca of *Leptusa giresunensis* sp. n. was compared with *Leptusa trapezuntis* Pace, 1989 (Ordu-Gürgentepe, Akkuş; Giresun and Gümüşhane) and *Leptusa flagrifera* Assing, 2009 (Fuman County, Gilan Province, Iran) (Coleoptera: Staphylinidae: Aleocharinae). The material was deposited in cSrt (private collection of the senior author) in Hacettepe University. From anterior margin of labrum to posterior margin of tergite VIII represents the whole-body length (Figure 3a). The length of the median lobe of the aedeagus was measured from the apex of the ventral process to the base of the capsule. Also, a species list of the *Leptusa* for Turkey is given in Table 1.

Figure 1. Localities of *Leptusa* species collections.

Figure 2. Distribution of the new species.

Table 1. Species list of the *Leptusa* for Turkey

Subgenus	Species	Distribution in Turkey	References
Dendroleptusa Pace,1983	*samia* Assing, 2004	Manisa	Anlaş, 2009; Assing, 2007
Dysleptusa Pace, 1982	*fuliginosa* Aube, 1850	Artvin, Bolu, Düzce, Kastamonu, Rize, Sinop	Anlaş, 2009; Assing, 2003a, 2007, 2009a, 2011, 2013; Pace, 1989
	improvisa Assing, 2009	Antalya	Assing, 2009a
Leptusa Kraatz, 1856	*pulchella* (Mannerheim, 1830)	Artvin, Rize, Trabzon	Anlaş, 2009; Assing, 2003a, 2007
Neopisalia Scheerpeltz 1966= *Stenoleptusa* Scheerpeltz, 1966	*cimmeria* Pace, 1996	Rize	Anlaş, 2009; Assing, 2002, 2003a, 2007; Pace, 1996
	confinis Pace, 1982= *paphlagonica* Pace, 1982= *othmaniorum* Pace, 1983	Balıkesir, Bartın, Bursa, İstanbul, Kastamonu, Kocaeli, Sakarya, Samsun, Sinop, Zonguldak	Anlaş, 2009; Assing, 2002, 2007, 2009a,b, 2011, 2013; Pace, 1982,1989
	crinita Assing, 2007	Rize	Anlaş, 2009; Assing, 2007, 2009a
	diecki Pace, 1983= gurgentepensis Pace, 1989	Giresun, Gümüşhane, Ordu, Samsun, Trabzon	Anlaş, 2009; Assing, 2002, 2003a, 2007, 2009a,b; Pace, 1983a, 1989
	janczyki Pace, 1983	According to Anlaş, 2009 Rize or/and Artvin	Anlaş, 2009; Assing, 2009b; Pace, 1983a, 1989
	korgei Scheerpeltz, 1970	Rize	Anlaş, 2009; Assing, 2002, 2003b; Scheerpeltz, 1970
	longilobata Assing, 2007	Gümüşhane, Trabzon	Anlaş, 2009; Assing, 2007
	nurdaghensis Assing, 2003	Hatay	Anlaş, 2009; Assing, 2003b, 2004a
	rizensis Pace, 1996	Rize	Anlaş, 2009; Assing, 2007; Pace, 1996
	sica Assing, 2003	Rize	Anlaş, 2009; Assing, 2003a, 2007, 2009a
	soganlica Assing, 2007	Trabzon	Anlaş, 2009; Assing, 2007
	spoliata Assing, 2002	Giresun, Ordu	Anlaş, 2009; Assing, 2002, 2004b, 2007
	venusta (Hochhuth, 1849)	Artvin, Kars, Rize, Trabzon	Anlaş, 2009; Assing, 2002, 2003a, 2007; Pace, 1989
Roubaliusa Scheerpeltz, 1966	*trapezuntis* Pace, 1989	Giresun, Gümüşhane, Ordu	Anlaş, 2009; Assing, 2003a, 2007, 2009a; Pace, 1989
	giresunensis sp. n.	Giresun	Giresun (Present paper)

Table 1 (continued).

Subgenus	Species	Distribution in Turkey	References
Stictopisalia Scheerpeltz, 1966	*amisensis* Pace, 1982	Samsun	Assing, 2009b; Pace, 1982, 1989
	asiatica Bernhauer, 1909= *abantensis* Fagel, 1968 = *flagellulifera* Assing, 2009	Adana-Gaziantep (Eastern Osmaniye), Bitlis (Eastern Van Lake), Bolu, Düzce, Kastamonu, Karabük, Kocaeli, Ordu, Sakarya (Gök Tepe), Zonguldak	Anlaş, 2009; Assing, 2003a, 2007, 2009b, 2013, 2014; Bernhauer, 1909; Fagel, 1968; Pace, 1989
	artviniensis Pace, 1982= batumiensis Pace, 1983	Artvin, Rize, Trabzon	Anlaş, 2009; Assing, 2002, 2003b; Pace, 1982, 1983b, 1989
	fibula Assing, 2003	Ordu, Giresun, Gümüşhane, Trabzon	Anlaş, 2009; Assing, 2003a, 2007, 2009a
	ionopolitana Pace, 1982	Kastamonu	Anlaş, 2009; Assing, 2009b, 2014; Pace, 1982, 1989
	merkli Bernhauer, 1900= anatolica Fauve, 1900	Bolu, Bursa, İstanbul, Kocaeli, Sakarya, Yalova	Anlaş, 2009; Assing, 2002, 2003b, 2009b, 2011, 2013, 2014; Bernhauer, 1900
incertae sedis	*taurica* Assing, 2004	Kahramanmaraş	Anlaş, 2009; Assing, 2004a, 2009a,b
	marasica Assing, 2006	Kahramanmaraş	Anlaş, 2009; Assing, 2006

Results and Discussion

Leptusa (*Roubaliusa*) *giresunensis* sp. n.

Type Locality

Holotype: Giresun: Tirebolu, Tirebolu-Doğankent, 29 m, 40°54'30" N, 38°50'55" E, 16.IV.2014, leg: Y. Turan, M. Kabalak, O. Sert, 2015, det. Y. Turan, 1♂ (cSrt).

Paratypes: same data as holotype 1♂, 1♀; Giresun: Dereli, Yavuzkemal, Konuklu village, 1,178 m, 40°38'29" N, 38°18'10" E, 15.IV.2014 and 28.IV.2015, leg: Y. Turan, M. Kabalak, O. Sert, 2014, 2015, det. Y. Turan, 2♂♂, 5♀♀ (cSrt).

Description (Holotype)

Body length 2.91 mm (for all specimens: 2.89-3.61 mm.), body reddish, head slightly darker at least medially, VI and anterior half of III-V and VII abdominal segments blackish, II-XI antenna segments reddish-brown and I darker. Head feebly transverse; punctation barely visible, dense, shallow microsculpture; in dorsal view eyes shorter than postocular region (Figure 3a). Antennomere IV oblong V weakly oblong, VI quadrate VII-X transverse (Figure 3b). Pronotum roughly 1.35 times as wide as long and 1.3 times as wide as head; maximal width in anterior half; punctation dense and fine, barely recognizable distinct microreticulation; elytra without sexual dimorphism, slightly wider than pronotum, at suture about as long as pronotum; humeral angles moderately marked; punctation rather dense; barely visible in the pronounced microsculpture; hind wings reduced. Abdomen segments V-VI widest, barely wider than elytra; all segments microsculpture distinct. Sternite VII-VIII and tergite VIII with sexual dimorphism.

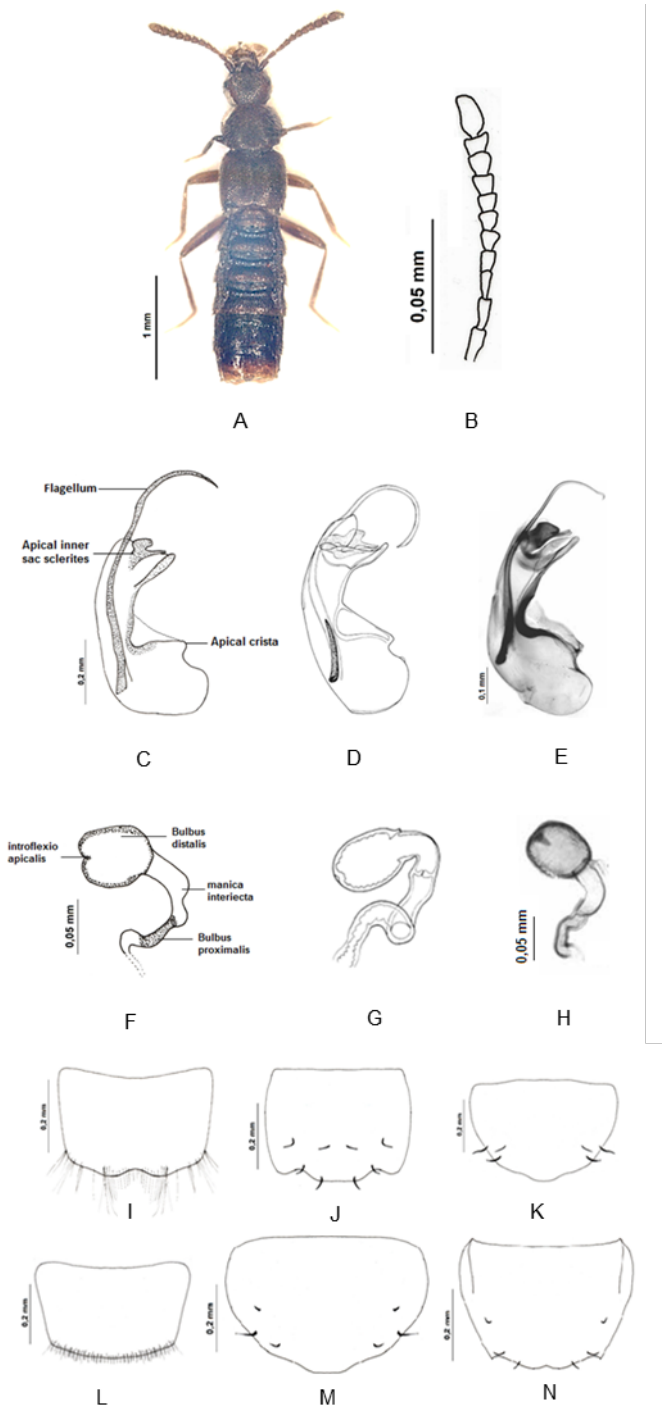

Figure 3. A) Habitus, B) antenna, C) aedeagus (*Leptusa* (*Roubaliusa*) *giresunensis* sp. n.), D) aedeagus (*Leptusa trapezuntis*) (Pace, 1989), E) aedeagus (*Leptusa flagrifera*) (Assing, 2009b), F) spermatheca (*Leptusa* (*Roubaliusa*) *giresunensis* sp. n.), G) spermatheca (*Leptusa trapezuntis*) (Pace, 1989), H) spermatheca (*Leptusa flagrifera*) (Assing, 2009b), I) male sternite VII (*Leptusa* (*Roubaliusa*) *giresunensis* sp. n.), J) male tergite VIII (*Leptusa* (*Roubaliusa*) *giresunensis* sp. n.), K) male sternite VIII (*Leptusa* (*Roubaliusa*) *giresunensis* sp. n.), L) female sternite VII (*Leptusa* (*Roubaliusa*) *giresunensis* sp. n.), M) female sternite VIII (*Leptusa* (*Roubaliusa*) *giresunensis* sp. n.), N) female tergite VIII (*Leptusa* (*Roubaliusa*) *giresunensis* sp. n.).

♂: sternite VII posterior margin in the middle weakly concave, with long setae both side of middle (Figure 3i); posterior margin of tergite VIII straight (Figure 3j); posterior margin of sternite VIII convex (Figure 3k); aedeagus about 0.5 mm long, with apically curved and long flagellum, median lobe with ventral process narrow at base, slightly convex on ventral side and apical crista swollen; apical inner sac sclerites rooster head-shape (Figure 3c).

♀: sternite VII posterior margin nearly straight; sternite VIII posterior margin slightly convex (Figure 3m); tergite VIII posterior margin weakly concave in the middle (Figure 3n); bulbus distalis of spermatheca wide, introflexio apicalis slightly curved; manica interiecta curved proximally, bulbus proximalis slightly curved as in Figure 3f.

Key to species:

1 Eyes shorter than postocular region in dorsal view 2

1' Eyes as long as postocular region in dorsal view; ♂: flagellum of the adeagus slightly curved, apically notched, apical inner sac not curved, ventral process of the median lobe slim; ♀: bulbus distalis of spermatheca narrow, bulbus proximalis of spermatheca slightly curved ..... *Leptusa flagrifera* Assing, 2009

2 ♂: flagellum of the adeagus distinctly curved, apical inner slightly curved, ventral process of the median lobe slim; ♀: bulbus distalis of spermatheca narrow, bulbus proximalis of spermatheca strongly curved ..... *Leptusa trapezuntis* Pace, 1989

2' ♂: flagellum of the adeagus slightly curved, apical inner sac curved in the middle, ventral process of the median lobe thick; ♀: bulbus distalis of spermatheca thick, bulbus proximalis of spermatheca sligthly curved ..... *Leptusa giresunensis* sp. n.

Leptusa is a staphylinid genera with numerous species that are small in size. In the taxonomic literature on *Leptusa*, morphological characters of habitus and reproductive organs are both important for distinguishing the species. Furthermore, variation in the male tergites VII-VIII and the male sternites VII-VIII may also be of taxonomic significance (Assing, 2002, 2007). This is particularly so for subgenera and species groups with rather uniform median lobes and spermatheca (Assing, 2007). Also, an identification key for *Leptusa* species of Turkey or/and Palearctic region is not available. Consequently, it can be difficult to diagnose the species. In this study, when comparing the new species with congeners species, it is difficult to see clear differences for habitus. So, as described above, aedeagus, spermatheca and secondary sexual characters were used to distinguish between the new species and related congeners.

Leptusa giresunensis sp. n. most closely resembles *L. trapezuntis* and *L. flagrifera.* When the habitus is compared with *L. trapezuntis* and *L. flagrifera*, there is no obvious difference. Clear differences are, however, evident in aedeagus and spermatheca. *Leptusa giresunensis* could be differentiated based on the following characteristics: Flagellum of *L. giresunensis* curved slightly, flagellum of *L. trapezuntis* is distinctly curved, apical of flagellum of *L. flagrifera* is notched; apical inner sac (rooster head-shape) curved distinctly in the middle in *L. giresunensis*, in *L. trapezuntis* slightly curved and in *L. flagrifera* not curved; in *L. giresunensis* median lobe ventral process (finger-shape) thicker than *L. trapezuntis* and *L. flagrifera* (Figure 3c,d,e). Bulbus distalis of spermatheca of *L. giresunensis* thicker than *L. trapezuntis* and *L. flagrifera*; in *L. trapezuntis* bulbus proximalis is distinctly curved, but in *L. giresunensis* and *L. flagrifera* slightly curved (Figure 3f,g,h). According to habitus characters: eyes about as long as postocular region in dorsal view in *L. flagrifera*, but eyes shorter than postocular region in dorsal view in *L. giresunensis* and *L. trapezuntis*; punctuations of pronotum barely visible, microreticulation distinct in *L. trapezuntis*, punctation fine and dense, barely noticeable in the pronounced microreticulation in *L. giresunensis* and *L. flagrifera*. In male sternite VII deeply concave in *L. flagrifera*, but in *L. giresunensis* weakly concave in the middle (Table 2).

Table 2. Characteristics of the species

Characters	*Leptusa giresunensis* sp. n.	*Leptusa trapezuntis*	*Leptusa flagrifera*
Aedeagus flagellum	Slightly curved	Distinctly curved	Slightly curved, apically notched
The apical inner sac (cock-shape)	Curved in the middle	Slightly curved	Not curved
Median lobe ventral process (finger-shape)	Thick	Slim	Slim
Bulbus distalis of spermatheca	Thick	Narrow	Narrow
Bulbus proximalis of spermatheca	Slightly curved	Strongly curved	Slightly curved
Eyes	Shorter than postocular region in dorsal view	Shorter than postocular region in dorsal view	As long as postocular region in dorsal view
Male sternite VII	Deeply concave	Not known	Weakly concave
Collection localities in Turkey and Iran	Giresun Province, Turkey	Ordu Province (Pace, 1989; Assing, 2003), Giresun and Gümüşhane Provinces (Assing, 2007), Turkey	Gilan Province, Iran (Assing, 2009b)
Zoogeographical distribution	Turkey	Turkey	Iran

Etymology

The name of the new species is derived from the name of Giresun Province of Turkey in which the type locality is situated (Figures 1&2).

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