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A new species of the genus *Rhinoppia* (Acari, Oribatida, Oppiidae) from Turkey

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ABSTRACT — A new species of oribatid mite of the family Oppiidae, *Rhinoppia (Rhinoppia) alidagiensis* n. sp. is described from soil and litter in Kayseri Province, Turkey. The new species differs from the other species of *Rhinoppia (Rhinoppia)* by the shape of rostrum, sensillus, body dimensions and number of genital setae.

KEYWORDS — Acari; Oribatida; *Rhinoppia*; taxonomy; new species; Turkey

INTRODUCTION

The number of species and subspecies of oribatid mites in the world is 9910 (Subías, 2004, updated 2015). In Turkey, however, the number of the identified species of oribatid mites is 143 (Özkan et al., 1994; Erman et al., 2007). The number of these taxa can be at least 4-5 times through further studies to be undertaken in Turkey, due to habitat heterogeneity, based on comparison with the fauna of the other countries in the Palaeartic region.

The genus *Rhinoppia* was erected by Balogh (1983), with the type species, *Oppia nasuta* Moritz, 1965. So far, 39 species and 4 subspecies of *Rhinoppia* are known (Subías, 2004, updated 2015). Of these, nine species namely: *R. (R.) artvinensis* Toluk and Ayyıldız, 2008, *R. (R.) tasdemiri* Toluk and Ayyıldız, 2008, *R. (R.) elifae* Toluk, Ayyıldız and Subías, 2009, *R. (R.) emarginata* Toluk and Ayyıldız, 2009, *R. (R.) exobothridialis* Toluk and Ayyıldız, 2009, *R. (R.) obsoleta* (Paoli, 1908), *R. (R.) mahunkai* Toluk, Ayyıldız and Subías, 2009, *R. (R.) trilobata* (Khanbekjan and Gordeeva, 1991) and *R. (R.) subjectinata* (Oudemans, 1900) have been found in Turkey prior to this study (Ayyıldız, 1988; Erman et al., 2007; Toluk and Ayyıldız, 2008, 2009; Toluk et al., 2009).

The genus *Rhinoppia* can be characterized by the following features: Rostrum smooth or incised; costulae absent or reduced to the bothridial costulae that exist between the bothridia and the interlamellar setae; interbothridial tubercles present; sensilli fusiform or pectinate; notogastral cristae absent; anterior edge of notogaster without humeral processes; ten pairs of notogastral setae; setae c2 present; genital plates with six pairs of setae, exceptionally with five pairs; lyrifissures iad paraanal in position (Toluk and Ayyıldız, 2009). As a result of the present study, one species, *Rhinoppia (Rhinoppia) alidagiensis* n. sp. proved to be new to science.
MATERIALS AND METHODS

All specimens were collected from soil and litter using a standard Berlese-Tullgren funnel extractor. For microscopic study, mite specimens were cleared in 80% lactic acid and mounted on microscopic slides in modified Hoyer’s medium. Drawings were made with the aid of a camera lucida attached to the compound microscope. Examined materials were transferred into 70% ethanol with glycerol (up to 5%) for the preservation.

The specimens to be studied using the SEM were cleaned by soaking in Terg-a-zyme solution for 6-12 h, followed by brief (1-2 s) submersion in an ultrasonic bath. They were dried using critical point dried using critical point drying and mounted on Al-stubs, and gold-coated in a Poloron sputter coater apparatus.

Measurements and description are based on specimens mounted in temporary cavity slides and on permanent slides. The terminology used in this paper follows Grandjean (see Travê and Vachon, 1975), Balogh (1983), and Subías and Balogh (1989) as well as those by Norton and Behan-Pelletier (2009).

Rhinoppia (Rhinoppia) alidagiensis n. sp. (Figures 1-4)

Diagnosis — Rostrum tridentate. Lamellar and interlamellar setae smooth. Bothridial setae fusiform, distal half being distinctly expanded, with short setae unilaterally. Notogaster elongate oval. Six pairs of genital setae fine and short.

Measurements — Body length: 308 – 336 (holotype: 332) µm, body width: 118 – 140 (holotype: 134) µm (n=13).

Prodorsum (Figures 1A, 2A-D) — Rostrum tridentate; separated by 2 deep incisions; dents rounded. Rostral setae (ro) smooth, 20 µm in length. Lamellar setae (le) thin, smooth, 10 µm in length. Interlamellar setae (in) thick, 12 µm in length. Lamellar setae nearer to interlamellar than to rostral setae. Distance between le-le shorter than that of in-in. Bothridia cup shaped, with laterally-oriented opening. Sensilli fusiform, distal half distinctly expanded, pectinate unilaterally.

Notogaster (Figures 1A, 2A) — Elongate oval, longer than wide, ratio 2:1. Ten pairs of smooth notogastral setae present. Setae c 20 µm long. Setae la, lm, and lp about 20, 12, and 4 µm long, respectively. Setae of p series 12 µm long.

Ventral side (Figure 1B) — Length of subcapitulum 72 µm, width 48 µm. Setae h 2 µm in length. Distance between h-h 16 µm. Prodorsum widest at level of pedotectum I. Epimeral borders easily visible and strongly chitinized. Polygonal network ornamented at epimeres 1, 2 and 3+4. Epimeral setal formula 3-1-3-3. Genital plates 36 µm in length, 40 µm in width, with six pairs of setae. Anal plates 52 µm in length, 48 µm in width, with two pairs of setae. Distance between genital and anal plates 66 µm. One pair of aggenital, three pairs of adanal setae. Lyrifissures iad paraanally, adanal setae ad1 postanally, ad2 paraanally, ad3 preanally situated.

Legs (Figures 3-4) — Formula of leg setation (trochanter to tarsus): I (1-5+1-4+2-20+2); II (1-4+1-4+1-15+2); III (1-3-1+1-3+1-12); IV (1-2-1-3+1-10). Structure and setation of legs as shown in Figs. 3 and 4.

Etymology — The specific name alidagiensis is named after the locality, Ali Mountain (Ali Dağları), Kayseri, Turkey where the new species was found.

Type material — Holotype (female ZMEU: 266) and six paratypes (all females, ZMEU: 267-272), soil, 38°40.1’N, 35°32.46’E, 1450 m. a.s.l., five paratypes (all females, ZMEU: 273-277), 38°40.1’N, 35°32.46’E, 1740 m. a.s.l., two of them were mounted on aluminum stubs and gold-coated for scanning electron microscopy, 5 Apr. 2010, Ali Mountain, Kayseri, Turkey. Holotype and eleven paratypes are deposited in the Acarological Collection of the Zoological Museum, Erciyes University, Kayseri, Turkey (ZMEU); all specimens are preserved in 70% ethanol.

Remarks — Among the known species of the subgenus Rhinoppia (Rhinoppia), the new species with tridentate rostrum resembles R. (R.) vera (Mihelčič, 1956), R. (R.) nasuta (Moritz, 1965), R. (R.) tridentata Subías and Minguez, 1985, R. (R.) ordunensis (Iturrondobeitia and Saloña, 1988), R. (R.) centrodentata Gordeeva and Niemi, 1990, R. (R.) pinsapi (Arillo and Subías, 1996), R. (R.) samaina Mahunka,
FIGURE 1: Rhinoppia (Rhinoppia) alidagiensis n. sp.: A – Dorsal view; B – Ventral view (scale bar for all figures = 100 µm).
FIGURE 2: *Rhinoppia* (*Rhinoppia*) *alidagiensis* n. sp.: A – Dorsal view; B – Prodorsum; C – Rostrum; D – Sensillus.
FIGURE 3: Rhinoppia (Rhinoppia) alidagiensis n. sp.: A – Leg I; B – Leg II (scale bar for all figures = 40 µm).
Figure 4: *Rhinoppia (Rhinoppia) alidagiensis* n. sp.: A – Leg III; B – Leg IV (scale bar for all figures = 40 µm).
Table 1: Diagnostic characters of *Rhinoppia (Rhinoppia) alidagiensis* n. sp. and other closely related species.

| Species                  | Body measurement (μm) | Rostrum                        | Sensillus                  | Ratio of prodorsal setae (ro, le, in) | Location of setae la and lm | Gential setae |
|--------------------------|-----------------------|--------------------------------|----------------------------|---------------------------------------|------------------------------|---------------|
| *R. (R.) cristafrontalis* | 382 x 181             | Dents rounded, median dent longer than lateral ones and prolonged anteriorly | Pectinate, six long cilia unilaterally, cilia proximal setae longer than distal ones | ro>in>le                       | Setae la arise before the lm | Six pairs     |
| *R. (R.) tridentata*     | 240 x 130             | Dents sharpened, median dent longer than lateral ones | Pectinate, seven long cilia unilaterally, cilia proximal setae longer than distal ones | ro>le>in                       | Setae la arise before the lm | Six pairs     |
| *R. (R.) samaini*        | 265-295 x 137-158     | Dents sharpened, median dent longer than lateral ones | Pectinate, eight cilia unilaterally, cilia equal in length | ro>in>le                       | Setae la arise before the lm | Six pairs     |
| *R. (R.) pinsapi*        | 294-338 x 162-175     | Dents sharpened, median dent longer than lateral ones | Pectinate, five cilia unilaterally | ro>in>le                       | Setae la and lm arise approximately at the same transverse level. | Six pairs     |
| *R. (R.) ordanensis*     | 260-280 x 152-168     | Dents sharpened, median dent longer than lateral ones | Pectinate, 3-10 cilia unilaterally | ro>le>no                       | Setae la arise before the lm | Five pairs    |
| *R. (R.) elfae*          | 284-324 x 128-160     | Medium and lateral dents equal in size, tapering | Pectinate, seven long cilia unilaterally, proximal cilia longer than distal ones | ro>le>in                       | Setae la arise before the lm | Five pairs    |
| *R. (R.) epilata*        | 300                   | Dents rounded or median dent sharply ended, median dent longer than lateral ones | Pectinate, five cilia unilaterally, cilia equal in length | ro>le>in                       | Setae la arise before setae lm | Six pairs     |
| *R. (R.) undulata*       | 352-380 x 104-116     | Rostral part wide, without apex, slightly concave or undulate medially | Head wide, bearing unilaterally 7-8 long and thick cilia | ro>le=in                       | Setae la arise before the lm | Six pairs     |
| *R. (R.) nova*           | 360 x 165             | Median dent longer than lateral ones, like nose prolonged anteriorly | Clavate, with six cilia at equal length | ro>le=in                       | Setae la arise before the lm | Six pairs     |
| *R. (R.) navata*         | 291 (277-309) x 173 (163-185) | Median dent longer than lateral ones, like nose prolonged anteriorly | Fusiform, with six cilia | ro>le>in                       | Setae la arise before the lm | Six pairs     |
| *R. (R.) alidagiensis* n. sp. | 332 (308-336) x 134 (118-140) | Dents rounded, length of median dent equal to lateral ones | Fusiform, with eight cilia | ro>in>le                       | Setae la arise before the lm | Six pairs     |

2001, *R. (R.) epilata* (Miko, 2006), *R. (R.) elfae* Toluk, Ayyıldız and Subías, 2009 and *R. (R.) undulata* (Mahunka and Mahunka-Papp, 2010) (Mihelčič, 1956; Moritz, 1965; Subías and Minguez, 1985; Iturrondo-beitia and Saloña, 1988; Gordeeva and Niemi, 1990; Khanbekian and Gordeeva, 1991; Arillo and Subías, 1996; Mahunka, 2001; Miko, 2006; Toluk, Ayyıldız and Subías, 2009; Mahunka and Mahunka-Papp, 2010). The differentiating characters of these species are given in Table 1.

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