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First record of the genus *Lucoppia* (Acari: Oribatida) from Turkey

Tunahan BEZCİ, Şule BARAN*
Department of Biology, Faculty of Arts and Sciences, Sakarya University, Sakarya, Turkey

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Abstract: Redescription and SEM images of *Lucoppia burrowsi* (Michael, 1890) are given. The genus *Lucoppia* is recorded for the first time in Turkey.

Key words: Acari, Oribatida, *Lucoppia*, new record, Turkey

Most oribatid mites are members of soil fauna. They are free-living organisms; none of them are parasites, but some are intermediate hosts of tapeworms (Shimano, 2004). Oribatids have an important role in the soil ecosystem. They affect litter decomposition by a mechanical breaking down of organic materials and fragmentation, by digestive functions that cause physical and chemical changes to organic substances, by dispersing bacterial and fungal spores by carrying them on their body surface and digestive system, and by stimulating microfloral activity through grazing (Norton, 1985; Behan-Pelletier, 1999). Oribatid mites are also effective bioindicators of changes in the soil ecosystem (Behan-Pelletier, 1999; Yang et al., 2015).

Oribatid mites are represented by more than 10,000 species within 164 families, and by 1262 genera and subgenera in the latest version of the world mite catalogue (Subías, 2004, updated 2016).

The fauna of Acari in Turkey and its first and second supplements were given by Özkan et al. (1988), Özkan et al. (1994), and Erman et al. (2007), respectively. In those studies, 144 species included in 75 genera and 43 families of oribatid mites were listed. Prior to this study, no data relating to the oribatid mites of Amasya Province were available.

The genus *Lucoppia* Berlese, 1908 is recorded from Turkey for the first time in this study. The genus *Lucoppia* is included in the family Oribatulidae Thor, 1929 and is characterized by short inclined lamellae, absence of cuspides, presence of translamella, long (longer than lamella) lamellar setae closer to interlamellar setae than to rostral setae, 14 pairs of strong notogastral setae, five pairs of genital setae, two pairs of anal setae, one pair of aggenital setae, three pairs of adanal setae, and tridactyle legs (Balogh and Balogh, 1992; Weigmann, 2006, 2011). The genus is represented by 4 species and has global distribution (except Antarctica) (Subías, 2004, updated 2016). Formerly, none of these species were known in Turkey.

In the present paper, the morphological features of *Lucoppia burrowsi*, which is new for Turkish fauna, are presented. The scanning electron microscopy images of the species are also given. The main goal of our research is to contribute to the knowledge of the Turkish oribatid mite fauna.

Mites were extracted with a Tullgren funnel apparatus from the soil samples collected from Amasya Province. They were fixed and stored in 70% ethanol. Mites were sorted from the samples under a stereomicroscope (Olympus SZX51) and mounted on slides in modified Hoyer's medium or 35% lactic acid.

The terminology used in this paper follows Balogh and Balogh (1992). Examined materials are deposited in the acarological collection of the second author, Sakarya University, Sakarya, Turkey.

Family: Oribatulidae Thor, 1929.

Genus: *Lucoppia* Berlese, 1908.

Type species: *Notaspis burrowsi* Michael, 1890.

***Lucoppia burrowsi* (Michael, 1890)**

Material examined: The examined material was collected from grassy soil, Amasya Province, Turkey, 40°69′N, 35°81′E, 398 m a.s.l., 31.01.2015 (2 ♀♀).

Measurements: Body length 589–648 µm, width 372–406 µm, setae *ro* 55–57 µm, setae *le* 120–124 µm, setae *in* 53–57 µm, setae *ex* 65–67 µm, *ss* 62–63 µm, setae c_2 113–115 µm, and setae c_1 96–101 µm.

* Correspondence: sbaran@sakarya.edu.tr

Prodorsum (Figure 1A–1C): Rostrum conical, without tooth. Lamella and translamella short and narrow; lamellar setae closer to interlamellar setae than to rostral setae. All prodorsal setae setiform, straight, and finely barbed (Figure 1B). Bothridia dorsally opened. Sensillus with moderately long stalk and clavate barbed head (Figure 1C). Ratio of prodorsal setae: *le* > *ex* > ss > *ro* ≥ *in*.

Notogaster (Figure 1A–1C): Ovoid, anterior border of notogaster convex. Fourteen pairs of notogastral setae rather long (from about 88 to 114 µm), setiform, and finely barbed (Figure 1A). Notogastral porose area *Aa* large and oval, about 37 µm in length (Figure 1C).

Venter (Figure 2A–2D): Apodemata sejugalis weakly developed, apodemata IV absent. Anal plate far from genital plate (Figure 2A). Epimeral setation formula: 3:1:3:3. All epimeral setae thin and smooth (Figure 2B). Five pairs of short genital setae: two pairs in posterior, three pairs in anterior part of the genital plate. One pair of thin and smooth aggenital setae, two pairs of anal and three pairs of adanal setae present (Figure 2C–2D). Anal setae and adanal setae ad_3 short (18–22 µm) and smooth. Setae ad_1 and ad_2 distinctly longer (37–48 µm), thicker, and behind anal plates (Figure 2D). Lyrifissures *iad* well-visible, parallel with anterior edge of anal plates (Figure 2D).

Legs: All legs tridactylous.

Lucoppia burrowsi, which is a new record for Turkey, is discussed below in comparison with the other known species of the genus *Lucoppia*.

The newly recorded species differs from *L. feideri* Subías, 2009 in the absence of cuticular reticulation on notogastral surface, thin and short adanal setae ad_3, *ag*, and epimeral setae.

Other species of the genus is *L. ornata* Berlese, 1916, which differs from the newly recorded species *L. burrowsi* by short notogastral setae, position of setae h_1, and short globular sensillus.

L. nicora Djaparidze, 1986 differs from *L. burrowsi* by the shape of the lamellar complex (thicker and longer lamellae), large fusiform sensillus, and long genital setae. According to Weigmann (2011), *L. nicora* might be considered a species of the subgenus *Zygoribatula* due to the different shape of its lamellar complex.

Length of body was given as 620–780 µm by Weigmann (2011) and 620–750 µm by Seniczak and Seniczak (2012). The body length of our samples is between 589 and 648

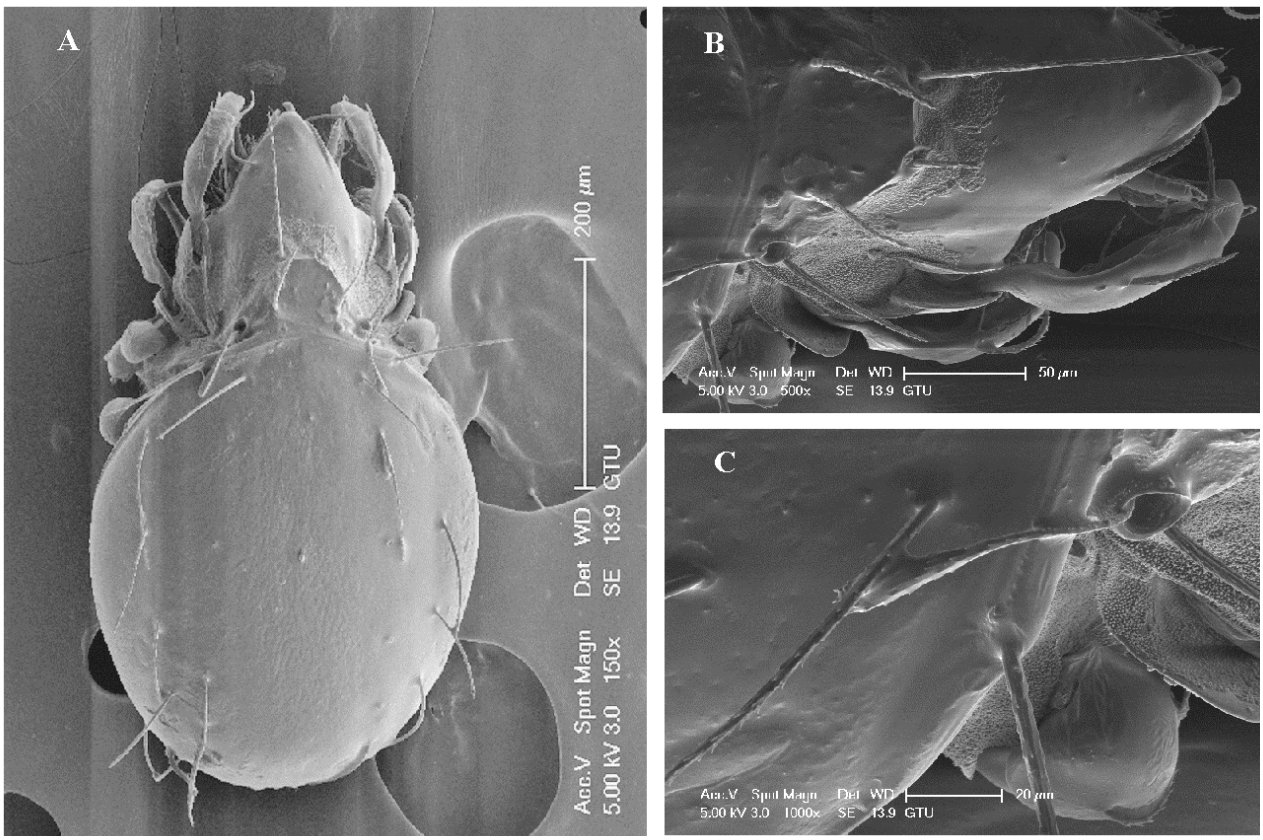

Figure 1. *Lucoppia burrowsi* SEM images. A- Dorsal view of adult, B- prodorsal region, C- sensillus, bothridium, notogastral setae c_1 and c_2 and porose area *Aa*.

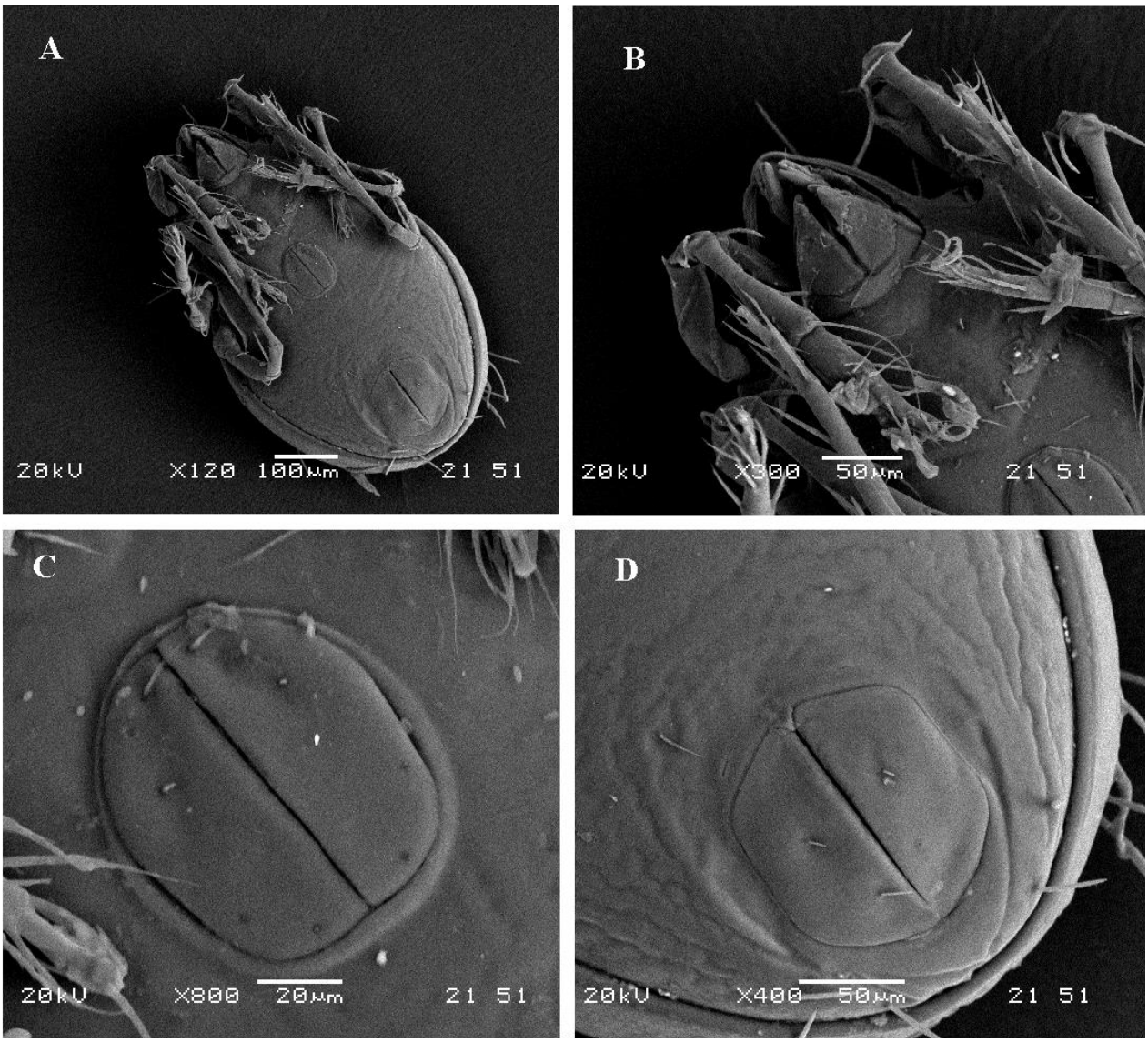

Figure 2. *Lucoppia burrowsi* SEM images. A- Ventral view of adult, B- epimeral region, C- genital plate, D- anal plate.

µm and slightly smaller than that of the previously studied specimens.

It has been stated (Weigmann, 2011) that in this species the shape of the notogaster was quite variable from slender to broad ovoid, and the length of the notogastral setae was also highly variable. Therefore, the shape of the notogaster and the length of the notogastral setae may not be very useful diagnostic characters for this species.

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