Mites of Genus Corynoppia (Acari: Oribatida) with Description of a New Subspecies from Turkey

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ABSTRACT

The known species of genus Corynoppia; C. kosarovi (Jeleva, 1962) is redescribed and a new subspecies Corynoppia andulau sakaryaensis ssp. nov. is described. An identification key for the species of genus Corynoppia Balogh, 1983 is also given.

Key words: Acari, Oribatida, Corynoppia, new subspecies, Turkey

INTRODUCTION

Although all over the world oribatid mites are represented with approximately 10,000 species (Subias, 2014), the number of known oribatid mite species is restricted with about 150 from Turkey (Ozkan et al., 1988; Ozkan et al., 1994; Erman et al., 2007).

Up to date the oribatid mites were mainly collected from Eastern Anatolian (Erzurum and Erzincan), Central Anatolian (Kayseri, Yozgat, Ankara and Konya) and Eastern Blacksea (Artvin) regions of Turkey. In recent years from the Marmara region (Sakarya) a few more studies have been done (Baran, 2010; Baran et al., 2010; Baran, 2012; Baran and Kılıç, 2013; Baran and Sarial, 2013).

Genus Corynoppia comprises eight species and one subspecies that have tropical and subtropical distributions (Subias, 2004; online version 2014) all over the world. Hitherto one species Corynoppia kosarovi (Jeleva, 1962) has been recorded from Turkey (Baran et al., 2011).

The genus was characterized by absence of lamellar costula, presence of thickened notogastral, lamellar and adanal setae ad1 and well developed apodemata IV (Balogh and Balogh, 1992; Subias and Arillo, 2001).

The present paper includes description of the new subspecies of C. andulau sakaryaensis and redescriptions of the previously known species Corynoppia kosarovi from Turkey. An identification key to known species and subspecies of the genus is also given.

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MATERIALS AND METHODS

Mites were extracted by a Tullgren funnel apparatus from the soil and litter samples collected from Sakarya 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. Drawings were made with the aid of a camera lucida attached to a compound microscope. All measurements are given in micrometers (µm).

The terminology used in this paper follows Balogh (1983) and Subías and Balogh (1989). Examined materials are deposited in the Acarological Collection of the first author, Sakarya University, Sakarya, Turkey.

RESULTS

Key to known species of Corynoppia of the world

1. Rostral setae setiform, not similar to notogastral setae .............................................................. 2
   - Rostral setae enlarged, similar to notogastral ones ................................................................. 4
2. Adanal setae ad2 setiform ............................................................................................................ 3
   - Adanal setae ad2 penicillated ................................................. C. hispanica Subías and Shtanchaeva, 2011
3. Setae ad3 delayed relative to the ag ............................................. C. kosarovi kosarovi (Jeleva, 1962)
   - Setae ad3 and ag are almost aligned ....................... C. kosarovi matritensis (Pérez-Iñigo, 1967)
4. Setae ad2 setiform ...................................................................................................................... 5
   - Setae ad2 enlarged .................................................................................................................... 6
5. Setae in ciliated, filiform ...................... C. weigmanni (Murvanidze and Behan-Pelletier, 2011)
   - Setae in not ciliated, setiform ................................................. C. maritima Pérez-Iñigo jr., 1991
6. Setae ad3 setiform ...................................................................................................................... 7
   - Setae ad3 enlarged .................................................................................................................... 8
7. Setae c2 setiform ....................................................................................................................... 9
   - Setae c2 enlarged and ciliated (papillose) ... C. papillisetigera Iturrondobeitia and Saloña, 1998
8. Setae ad2, ad3 and ro racquet shaped, similar to notogastral ones ... C. foliata (Mihelčič, 1957)
   - Setae ad2 and ad3 similar to notogastral ones but smaller, seta ro enlarged and ciliated,
     different from notogastral ones .................................................................................................... 9
9. Anal setae barbed ......................................................... Corynoppia andulau sakaryaensis ssp. nov.
   - Anal setae smooth ................................................................. C. andulau andulau Mahunka, 2001

Corynoppia kosarovi (Jeleva, 1962)  
(Figs. 1-3)

Measurements and colour: 320 (315-338) µm in length, 162 (160-167) µm (n=17) in width. Colour light brown.

Prodorsum (Figs. 1, 2): Lamellar setae foliate and covered with small papillae (Fig. 2). In front of lamellar setae translamellar line well noticeable. Interlamellar and exobothridial setae small and setiform. Sensillus fusiform, curved, unilaterally ciliated and long. Interbothridial
space with a pair of parallel lines with two pairs of light spots in between these lines. Prodorsum laterally granulated.

_Notogaster_ (Fig. 2): Dorsosejugal suture convex and medially pointed. Anterior border with two small humeral spines. Setae $c_2$ very fine, hardly visible. Rest of the notogastral setae foliate, racquet shaped and covered with small papilla like the lamellar setae.

_Ventral region_ (Fig. 3): Epimeral borders easily visible and thick. All ventral setae short fine and smooth except $ad_3$, which is similar to notogastral ones. Epimeral setal formula 3-1-3-3. Five pairs of genital, two pairs of anal, three pairs of adanal and one pair of aggenital setae present. Setae $ad_1$ in preanal, setae $ad_5$ in postanal position, lyrifissures $iad$ in paraanal position. Adanal setae $ad_3$ and $ad_5$ setiform. Setae $ad_1$ originated approximately at the same level with setae $ag$. There are some variations in relative position between $ag$ and $ad_3$ (Fig. 3).

_Studyed Materials_: All materials were collected from moss under pine, from the campus of Middle East Technical University, Ankara, Turkey, 06-May-2006. Geographic co-ordinates of the type locality: 39°00’N, 35°00’E. One specimen mounted on aluminum stubs and gold-coated for scanning electron microscopy. The others (16) stored in 70% ethanol and deposited in the

_Figs. 1-2. Corynoppia kosarovi. Scanning electron microscopy images. 1, prodorsum; 2, dorsal view of adult._

_Fig. 3. Corynoppia kosarovi. Variations in relative position between $ag$ and $ad_3$._
Acarological Collection of the first author, Sakarya University, Sakarya, Turkey.

*Corynoppia andulau sakaryaensis* ssp. nov.  
(Figs. 4-8)

*Measurements and colour:* 207 µm in length, 127 µm (n=2) in width. Colour light brown.

*Prodorsum:* Prodorsum forwardly narrowing and elongated. Rostral and lamellar setae, similar to notogastral setae, foliate and covered with small papillae. Interlamellar and exobothridial setae setiform. Sensillus curved with ciliated head. Interbothridial space with a pair of sharp crests. Between these crests two pairs of light spots present. Surface of prodorsum finely granulated.

*Notogaster:* Dorsosejugal stule convex and medially pointed. Anterior border of notogaster with a pair of weak crista. Setae *c₂* very fine, hardly visible. Rest of nine notogastral setae enlarged, nearly fusiform and covered with small papillae like the lamellar setae.

*Ventral region* (Figs. 4-8): Epimeral surface ornamented by polygonal pattern. Epimeral fissures I easily visible and thick. All epimeral setae and aggenital setae (*ag*) short and fine. Epimeral setae formula 3-1-3-3. Five pairs of genital setae, two pairs of anal setae. One pair of aggenital, three pairs of adanal setae. Adanal setae *ad₁* and *ad₂* setiform. Setae *ad₃* originated posteriorly with respect to setae *ag*. The genital and aggenital setae simple, anal setae barbed, all three pairs of adanal setae enlarged. *ad₁* stronger than the others. Lyrifissures *iad* in paraanal position.

*Studied Materials:* All materials were collected from Prof. Dr. Nedim TUNA commemorative forest, grassy soil from Sakarya University campus, Turkey, 09-November-2010. Geographic coordinates of the locality: 40°74′N, 30°33′E. One specimen (SUAC-5443) mounted on aluminum.

Fig. 4. *Corynoppia andulau sakayaensis* ssp. nov. Scanning electron microscopy image of ventral region.
stubs and gold-coated for scanning electron microscopy. The holotype (SUAC-5441) and one paratype (SUAC-5442) were stored in 70% ethanol, and deposited in the Acarological Collection of the first author, Sakarya University, Sakarya, Turkey.

Remarks. The new subspecies *C. andulau sakayaensis* ssp. nov. differs from *C. andulau* by barbed anal setae (Fig. 6).

**DISCUSSION**

Up to date only one species of the genus, *Corynoppia kosarovi* (Jeleva, 1962), was known from Turkey (Baran et al., 2011). The species *C. kosarovi* is represented by two subspecies (Subias and Arillo, 2001; Subias, 2004). The differences between the subspecies *C. kosarovi kosarovi* (Jeleva, 1962) and *C. kosarovi matritensis* (Pérez-Íñigo, 1967) were given as well marked translamella, loger sensillus and slightly posterior position of setae *ad3* with respect to setae *ag*.

We considered the redescribed species in this study as *C. kosarovi kosarovi* because of the setae *ad*, which is originated approximately at the same level with setae *ag* although there are

**Figs. 5-8. Corynoppia andulau sakayaensis** ssp. nov. Scanning electron microscopy images. 5, genital plate; 6, anal plate; 7, setae *ag* and *ad3*; 8, setae *ad2*. 
some variations in relative position between ag and ad, (Fig. 3).

The mean body size of C. kosarovi kosarovi was given as 325/165 µm (length / width) by Iturrondobeitia and Saloña (1998). Csiszár and Jeveva (1962) gave the body dimensions as 325 µm in length and 166 µm in width. According to our data, the dimensions are as follows: 315-338 µm in length and 160-167 µm in width. In this respect dimensions of the specimens found in Turkey are similar to those of previously known specimens.

The species C. foliata very similar to C. andulau by enlarged setae ad, but differs from it by racquet shaped rostral setae.

The species C. andulau differs from C. foliatooides and C. maritima by enlarged setae ad, C. andulau can easily differentiated from C. kosarovi by the shape of sensillus, setae ad, and ad.

The species C. andulau and C. papillisetigera differ from each other by the shape of setae c (minute and setiform in C. andulau and papillose in C. papillisetigera). C. andulau and C. weigmannii differentiated by shape of setae ad, (enlarged in C. andulau, setiform in C. weigmannii).

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