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First record of the family Cunaxidae (Acari: Trombidiformes) from Syria with description of a new species

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ABSTRACT — This paper presents the first record of cunaxid predatory mites from Syria. Two species were collected on Malva sylvestris L. growing within citrus orchards: Cunaxa capreolus Berlese and a new species named Cunaxa celineae n. sp., herein described.

KEYWORDS — Cunaxa capreolus; Cunaxa celineae; taxonomy; predatory mite; Middle East

INTRODUCTION

Knowledge of mite fauna in Syria is very limited. Recent surveys (2011-2014) on these small arthropods were conducted in more than fifty citrus orchards in Latakia Governorate. The results showed the presence of eighteen predatory mite species of Phytoseiidae Berlese and four species of their common prey of the family Tetranychidae Donnadieu, on citrus trees, soil litter and on wild plants (Barbar, 2013, 2014). In addition to these two families, other mites were also collected and identified at least to the family level, including Cunaxidae mites.

Cunaxidae family includes more than 400 species (Skvarla et al., 2014). Members of this family are fast-running, red, brown or yellow generalist predators and several species have been reported to feed on phytophagous mites, small insects [i.e. Cunaxa capreolus (Berlese)] and rootknot nematodes [i.e. Coleoscirrus simplex (Ewing)] (Zaher et al. 1975; Walter and Kaplan 1991; Castro and Moraes 2010).

The genus Cunaxa Von Heyden includes the highest number of species in the Cunaxidae with a total of fifty species known from all continents, except for Antarctica (Skvarla et al., 2014). Two Cunaxa species were found during surveys on citrus orchards in Syria (see Barbar, 2013, 2014). The first one is the cosmopolitan species C. capreolus, which was originally described by Berlese (1887) and redescribed several times (i.e. den Heyer, 1979, 2009; den Heyer et al., 2011). The second one was identified as new for science.

In this paper, the new species is described and illustrated and C. capreolus is redescribed. Morphological differences with related species or previous descriptions are presented.

MATERIALS AND METHODS

Mites were collected on Malva sylvestris L. (a wild plant species growing within citrus orchards), infested by high densities of Tetranychus urticae Kokh and Bryobia sp., in two sites in Latakia Governorate,
Barbar Z.

Syria: in Al-Bahlouliyah, 38°35’95”N 57°35’07”E on 01 July 2012 and in Al-ya’robiyah, 30°35’50”N 48°35’70”E on 15 February 2014. Mites were removed from leaves using the "dipping-checking-washing-filtering" method (Boller, 1984), mounted on slides in Hoyer’s medium and dried in an oven at 45°C for three days. Mites were identified using keys to world subfamilies, genera, and species proposed by Skvarla et al. (2014) and specimens were compared with original descriptions or re-descriptions of corresponding or related species.

All measurements of specimens are given in micrometers (µm). Body length is measured from the anterior edge of the propodosomal shield to the posterior limit of the idiosoma. Leg length is measured from the proximal edge of the trochanter to the distal end of the claw (Skvarla et al., 2011). The setal notation follows Kethley (1990) as it has been applied to cunaxids by den Heyer and Castro (2008).

The following abbreviations are used for leg chaetotaxy: sts: simple tactile seta; dtsl: dorsoterminal solenidion; tsl: terminal solenidion on tarsi I-III; T: trichobothrium; asl: attenuate solenidion; bsl: blunt rod-like solenidion; bbsl: bulbous solenidion; fam: famulus (= peg organ), (Sergeyenko, 2009; Skvarla et al., 2011, 2014). Setae in brackets indicate duplex or triplex. Specimens were deposited in the Arthropod Collection of the Department of Plant Protection, Faculty of Agriculture, Al-Baath University, Homs, Syria.

_Cunaxa capreolus_ (Berlese)

Female (n=2) Gnathosoma — Surface of basifemur, telofemur, and genu of palps dorsally smooth and covered ventrally by a very few number of dots. Tibiotarsus of palps covered proximodorsally by denticles. Palpal chaetotaxy from trochanter to tibiotarsus: 0-1-1-3-5. Dorsalateral setae on the basi-and telofemora simple. Stout spine-like setae on the genua and tibiotarsi present. Telofemoral apophysis unincuated, with an obtuse angle formed between its proximolateral side and distolateral side of trochanter. Dorsally the coxal region possesses a papillated area anterolaterally. Proximal segment of chelicerae papillate. Chelicera terminating in a claw-like digit and with one dorsolateral simple seta. The ventral surface of the hypognathum bears 4 pairs of simple hypognathal setae (hg1-hg4) and two pairs of adoral setae. Longitudinal lines and papillae extended from the central area of hypognathum to the insertions of setae hg1. Basic area patterned with rough spots.

Idiosomal dorsum — Propodosomal plate with two pairs of sensillae (vi, sce) and two pairs of simple setae (ve, sci). Propodosomal plate smooth except for the presence of papillae in areas laterally to setae sce and striae on anterolateral corners of propodosomal shield. Length of setae sci slightly shorter than half the distance between their bases. Hysterosomal shield smooth, bears four pairs of setae (c1, c2, d1 and e1). Setae fi1 and h1 on integument. A transverse regular dorsal striae pattern runs from the posterior side of hysterosomal shield to the end of dorsum. Longitudinal striae dorsolaterally. Cupule im1 present on integument postero-lateral to e1. Setae h2 occur ventrally.

Idiosomal venter — Idiosomal venter with one pair of propodogastral, four pairs of hysteroastral, four pairs of genital setae (g1-4, subequel in length) and a pair of anal setae. Genital valves with longitudinal striae. A transverse striae anterior to setae g1 and posterior to setae g4.

Legs — Leg chaetotaxy: coxae I-IV, 3-1-3-2 sts; trochanters I-IV, 1-1-2-1 bst; basifemora I-IV, 4-4-3-1 sts; telofemora I-IV, 4 sts-4 sts-1 asl, 3 sts-1 asl , 3 sts; genua I-IV, 2 asl, 1 very short asl, [1 asl, 1 sts], 4 sts-2 asl, 5 sts-1 asl, 5 sts-1 asl, 5 sts; tibiae I-IV, [1 asl, 1 sts], 1 asl, 4 sts-1 asl, 5 sts-1 bsl, 5 sts-1 T, 4 sts; tarsi I-IV, 3 asl, [1 asl, 1 fam, 1 sts], 1 dtsl, 2 tls , 20 sts-1 bsl, 1 dtsl, 1 tls, 20 sts-1 tls, 20 sts-19 sts. Surface of trochanters and basifemora I-IV with transverse broken striae. remaining leg segments with papillae which on dorsal side are larger and fewer than on ventral side.

Measurements — Length of idiosoma 392 – 430; width 305 – 310. Length of hypognathum 150; width 100 – 102. Length of palps 180 – 190. Chelicerae 138 – 140. Legs: I 280 – 305; II 275 – 285; III 304 – 312; IV 320 – 338. Length of setae: hg1 17; hg2 17; hg3 18; hg4 34; vi 140 – 170; ve 12 (15); sce 240 – 250; sci 25; c1 38 (33); c2 15; d1 25 (23); e1 25; fi 1
Cunaxa celineae n. sp.

Female (n=1) (Figures 1-3)

Gnathosoma — (Figure 1). Palps consist of five segments (Figure 1a). Surfaces of trochanter, basifemur, telofemur, and in particular genu covered by denticles. Palpal chaetotaxy from trochanter to tibiotarsi: 0-1-2-3-5. Dorsolateral setae on the basifemor and telofemora simple. Stout spine-like setae on the genua and tibiotarsi present. Apophysis of telofemur cone-like with slightly pointed apex and closer to the central part of the segment (Figure 1a). Proximal segment of chelicerae papillate, second segment has some denticles proximodorsolaterally and followed distally by some "furrow-like" lines in different lengths (Figure 1b). Chelicera terminating in a claw-like digit and with one simple seta (Figure 1b). The ventral surface of the hypognathum bears four pairs of simple hypognathal setae (hg1-4).

Remarks — All morphological characteristics of specimens collected seem to be close to those collected from South Africa and UAE (den Heyer, 1979, 2009). However, specimens of the three localities differ in number of sts on tarsi I-IV. The specimens collected differ from Iranian specimens in number of sts on coxa IV and on tarsi I-IV (den Heyer et al., 2011).

Material studied — Two Females, Syria, Latakia Governorate, Al-ya’robibah on M. sylvestris, 15 February 2014 (Coll. Barbar, Z.)
Figure 2: *Cunaxa celineae* sp. nov., female idiosoma. Dorsum (a); venter (b).
Figure 3: Cunaxa celinae sp. nov., female. Basifemur, telofemur, genu, tibia and tarsus of: leg I (a), leg II (b); leg III (c) and leg IV (d).
and two pairs of dorsal setae. Hypognathum with few random papillae and short transverse lines at its base (Figure 1c).

Idiosomal dorsum — (Figure 2a). Propodosomal plate with two pairs of sensillae (vi, sce) and one pair of simple setae (sci). Setae ve absent. Propodosomal plate generally smooth except for the presence of an oval area of thin broken striae around setae sci. Length of sce about 1.4 times longer than vi. Six pairs of hysterosomal setae (c1, c2, d1,e1, f1, h1) situated on small platelets. Setae f1 and h1 longer than other setae. A transverse regular striae pattern occurs between setae c1 and d1, widely spaced between setae d1-e1, e1-f1 and f1-h1. Thin striae in form of broken lines in the central regions between setae e1-f1 and between setae f1-h1. Cupule im present posteriolateral to e1. Setae h2 occur ventrally.

Idiosomal venter — (Figure 2b). Idiosomal venter with one pair of propodogastral, four pairs of hysterosogastral, four pairs of subequal in length genital setae (g1-4) and a pair of anal setae. Genital valves with longitudinal striae. Cupule ih present.

Legs — (Figure 3). Leg chaetotaxy: coxae I-IV, 3-1-3-2 sts; trochanters I-IV, 1-1-2-1 sts; basifemora I-IV, 4-4-3-0 sts; telofemora I-IV, 4 sts-4 sts-1 asl, 3 sts-1 asl, 3 sts; genua I-IV, [1 asl, 1 asl], [1 asl, 1 asl], 1 asl, 4 sts-2 asl, 5 sts-1 asl, 5 sts-1 asl, 5 sts; tibiae I-IV, [1 asl, 1 asl], 1 asl, 4 sts-1 asl, 5 sts-1 asl, 5 sts-1 bsl, 5 sts-1 T, 1 bbsl, 4 sts; tarsi I-IV, 3 asl,[1 asl, 1 fam, 1 sts], 1 dtsl, 2 tsl, 18 sts-1 bsl, 1 dtsl, 1 tsl, 21 sts-1 tsl, 21 sts-18 sts. Surfaces of trochanter and basifemora I-IV with transverse broken striae. Remaining leg segments with papillae which on dorsal side are larger and fewer than on ventral side.

Measurements — Length of idiosoma 540; width 365. Length of hypognathum 168; width 100. Length of palps 225. Chelicerae 153. Legs: I 342; II 330; III 370; IV 380. Length of setae: hg1 15; hg2 20; hg3 20; hg4 30; vi 195; sce 265; sci 22; c1 20; c2 17; d1 20; e1 16; f1 38; h1 38; h2 12; g1-4 12. Distance between setae sci-sci 46.

Male and immature — unknown.

Differential diagnosis — This new species closely resembles C. anomala Khaustov and Kuznetzov (1998) by the absence of setae ve, but differs from the latter species by possessing the following combination of characters: (1) the presence of a very short bulbous solenidion bbsl anterior to the trichobothrium on tibiae IV (absence of this seta in C. anomala); (2) proximal segment of chelicerae papillate, second segment has some denticles proximally and dorso-laterally and followed distally by some “furrow-like” lines in different lengths (only the proximal segment is papillate in C. anomala) (3) hypognathum with short transverse lines at its base (smooth in C. anomala) (4) the presence of an oval area of thin broken striae around setae sci (absence of this area on dorsal propodosomal in C. anomala) and (5) idiosomal length of C. celineae is 540 µm and about 1.5 times longer than that in C. anomala (363 µm).

Etymology — The name of the species refers to the first name of author’s daughter, Celine Barbar, to whom this species is dedicated.

Type material — Female holotype, Syria, Latakia Governorate, Al-Bahlouliyiah, on M. sylvestris, 01 July 2012. (Coll. Barbar, Z.).

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