



## *Caligonella quinqueocellata* Khaustov (Caligonellidae): a new addition to Turkey's acarofauna\*

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### Abstract

This study presents the first record of *Caligonella quinqueocellata* Khaustov for the mite fauna of Turkey. The single female specimen was collected from grassy and mossy soil in the Karasu Valley. This species was previously recorded from the Crimea and Iran. As of right now, this is the third report on this species.

**Keywords:** Acari, Karasu Valley, mite, new record, Raphignathoidea

### Introduction

Members of the family Caligonellidae Grandjean are relatively small, reddish in colour and considered free-living predators (Fan 2000; Fan & Zhang 2005; Pishehvar & Khanjani 2020). The chelicerae are basally fused in midline and form a conical stylophore that bears on its dorsal surface a pair of looped peritremes (Summers & Schlinger 1955; Fan 2000). In the genus *Caligonella* Berlese, a pair of peritremes originate on anterior tip of stylophore, loop mediolaterally and terminate on posterior area of the dorsal surface (Doğan *et al.* 2021).

There are currently 12 identified species of *Caligonella* in the world (Beron 2020; Khaustov 2021; Mohammad-Doustaresharaf & Kazemi 2022); three of them, *Caligonella humilis* (Koch), *C. haddadi* Bagheri & Maleki and *C. urhani* Akyol, are described or recorded from Turkey (Koç & Ayyıldız 1996; Akyol 2018; Yamaç *et al.* 2019; Doğan 2019). With the present work, an additional member, *Caligonella quinqueocellata* Khaustov, is added to the mite fauna of Turkey.

### Materials and methods

The mite specimen was extracted by using Berlese-Tullgren funnels during a study on the raphignathoid mites (Raphignathoidea) of Karasu Valley (Turkey), cleared in 60% lactic acid and mounted in Hoyer's medium on microscope slides (Fan & Zhang 2005; Walter & Krantz 2009). With the use of an Olympus BX63 differential interference contrast (DIC) microscope, the morphology of the species was investigated and its images were captured with the aid of an integrated digital camera (Olympus DP73). Terminology follows those of Grandjean (1944, 1946) and Kethley (1990). Measurements are given in micrometers (µm). Material examined is deposited in EBYU (Acarology Laboratory of Erzincan Binali Yıldırım University, Erzincan, Turkey).

## Results

### Family Caligonellidae Grandjean, 1944

### Genus *Caligonella* Berlese, 1910

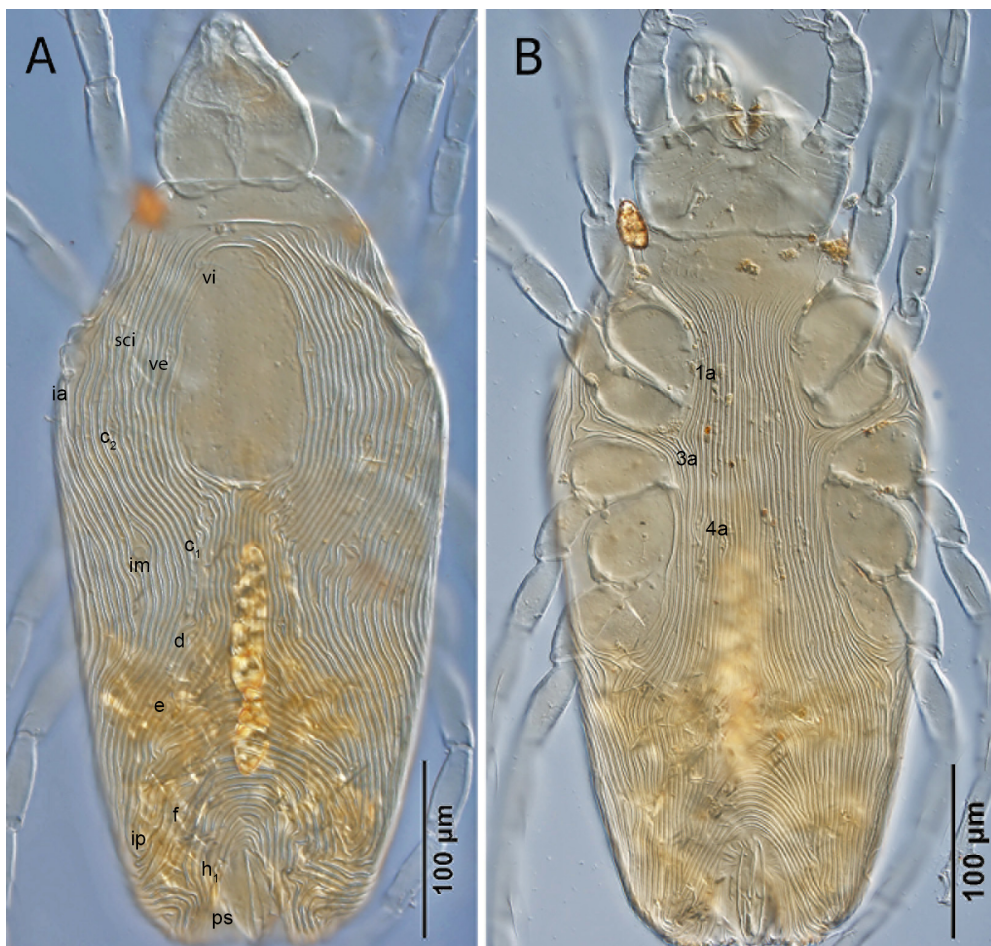
### *Caligonella quinqueocellata* Khaustov

*Caligonella quinqueocellata* Khaustov, 2021: 911; Mohammad-Doustaresharaf & Kazemi, 2022: 769.

#### Description

*Female* (Figures 1–3). Body ovoid, length of idiosoma (excluding gnathosoma) 418, width 229.

*Dorsum*. Dorsal idiosomal striae thick and dual (Fig. 1A). Dorsal body setae 11 pairs, smooth, 15–20 long. Distances of between dorsal setae as follows: *vi*–*vi* 40, *ve*–*ve* 80, *vi*–*sci* 56, *ve*–*sci* 29, *sci*–*sci* 136, *sci*–*sce* 63, *sce*–*sce* 216, *c*<sub>1</sub>–*c*<sub>1</sub> 34, *c*<sub>2</sub>–*c*<sub>2</sub> 146, *c*<sub>1</sub>–*d* 59, *d*–*d* 39, *d*–*e* 50, *e*–*e* 89, *e*–*f* 37, *f*–*f* 71, *h*<sub>1</sub>–*h*<sub>1</sub> 24, *h*<sub>1</sub>–*h*<sub>2</sub> 39, *h*<sub>2</sub>–*h*<sub>2</sub> 85. Dorsal shield present, ovate, 131 long, 72 wide, with a few sparsely distributed punctation and fine striae (Fig. 2A). Five pairs of ocelli located posterolateral to *sci*, anterior one much bigger than others (Fig. 2B). Three pairs of dorsal cupuli present, almost round; *ia* located immediately posterior to ocelli, *im* posterolaterad of *c*<sub>1</sub> and *ip* laterad of *f*. Anal covers posterodorsal, with one pair of pseudanal setae (*ps*<sub>1</sub>) (Fig. 3A).



**FIGURE 1.** DIC micrographs of *Caligonella quinqueocellata* Khaustov (female)—A) Dorsal view, B) Ventral view.

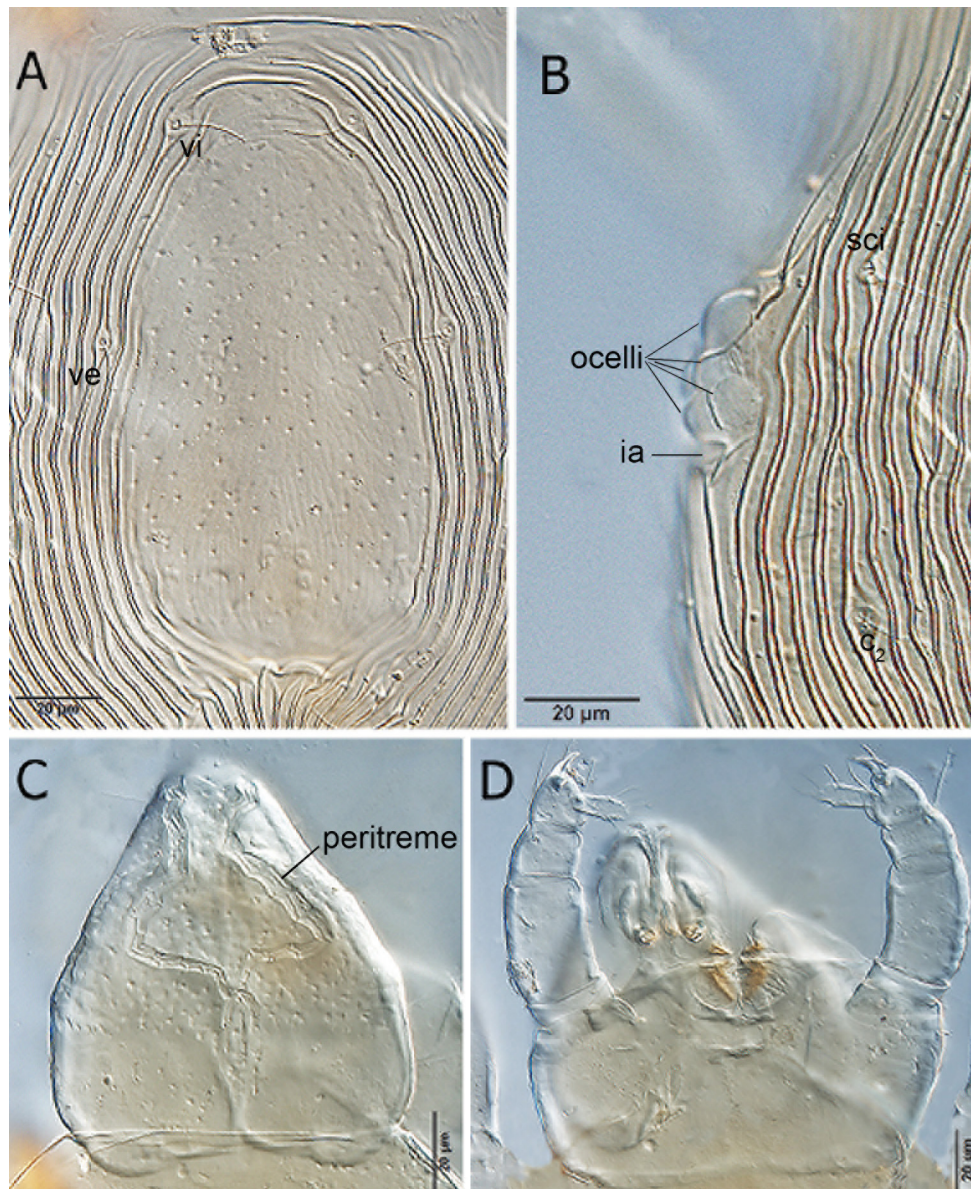


## Venter

Ventral idiosomal striae dual, without shield between the coxae (Figs 1B, 3D). Coxal fields I–II and III–IV with sparsely distributed punctation; coxal field IV with posterior shield-like projection and sparsely distributed punctation. Intercoxal setae  $1a$  located on coxa I,  $3a$  located just at the edge of coxa III,  $4a$  set on striated integument (Fig. 3D). Three pairs of aggenital ( $ag_{1-3}$ ) and one pair of genital setae ( $g_1$ ) present (Fig. 3B). All ventral setae smooth and pointed. Cupuli  $ih$  located laterad of  $g_1$ .

## Gnathosoma

Stylophore almost oval, distinctly punctated in anterior 2/3 and posterior part smooth. Peritremes distinctly curved in central part of stylophore (Fig. 2C). Subcapitulum (Fig. 2D) with a few sparsely distributed punctation, one pair of subcapitular setae ( $m$ ) and two pairs of adoral setae ( $or_{1-2}$ ). Cheliceral base large. Palpal chaetotaxy: Tr 0, Fe 1, Ge 1, Ti 3, Ta 7(+1 $\omega$ ). Tibial claw well developed (Fig. 2D).



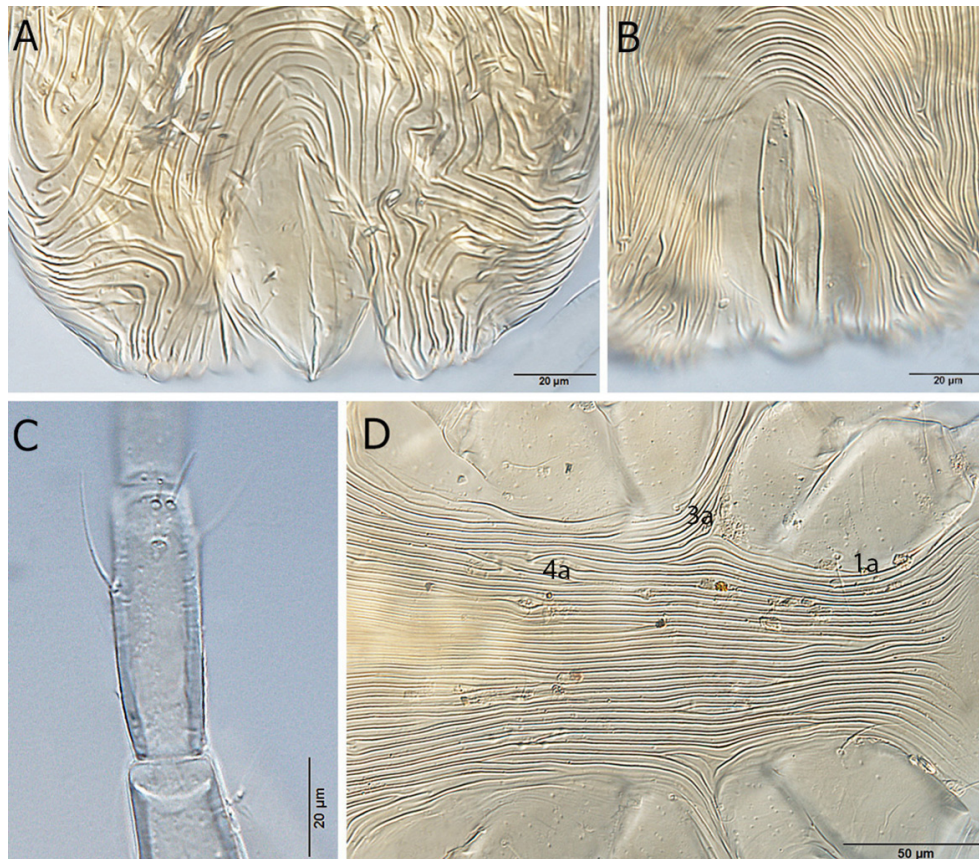
**FIGURE 2.** DIC micrographs of *Caligonella quinqueocellata* Khaustov (female)—A) Dorsal shield, B) Ocelli, C) Stylophore, D) Ventral view of gnathosoma.



## Legs

Legs measurements from base of trochanter to tip of tarsal claw: leg I 312, leg II 231, leg III 256 and leg IV 300. Segments of legs punctuate. Counts of setae on legs (solenidia and intercoxal setae in parentheses) as follows: coxae 2(+1 $\alpha$ )-1-1-1, trochanters 1-1-1-1, femora 2-2-2-2, genua 5(+1 $\kappa$ )-5-2-2, tibiae 5(+1 $\varphi$ +1 $\varphi\varphi$ )-5-4-4, tarsi 16(+1 $\omega$ )-11(+1 $\omega$ )-9-9. Outer solenidion ( $\varphi\varphi$ ) on tibia I about 3 times longer than inner solenidion ( $\varphi$ ) (Fig. 3C), solenidia I $\omega$  and II $\omega$  about equal in length. The shapes of the leg setae match those of the type specimens given by Khaustov (2021).

*Specimen examined.* One female from grassy and mossy soil, the Karasu Valley, TURKEY, 39°36'00.5"N 39°09'44.0"E, 1502 m a.s.l., 26 April 2022, leg. S. Doğan.



**FIGURE 3.** DIC micrographs of *Caligonella quinqueocellata* Khaustov (female)—A) Anal shields, B) Genital shields, C) Right tibia I, D) Coxal region.

## Remarks

*Caligonella quinqueocellata* was originally described from Crimea (Khaustov 2021) and later recorded from Iran (Mohammad-Doustaresharaf & Kazemi 2022). This is a new record for the Turkish mite fauna. This species is recognized by having a dorsal shield, five pairs of ocelli, one pair of pseudanal setae and the absence of the ventral shield.

*Caligonella quinqueocellata* can be easily distinguished from all congeners in having five pairs of ocelli on prodorsum vs. only two pairs in the others. Apart from *C. quinqueocellata*, in the genus there are two species having a dorsal shield: *C. claviparma* Smith Meyer & Ueckermann and *C. scutovata* Smith Meyer & Ueckermann. *Caligonella quinqueocellata* differs from *C. claviparma* in having one pair of pseudanal setae vs. two pairs in *C. claviparma*, differs from *C. scutovata* by the absence of ventral shield and location of setae *ve* on striated integument whereas ventral shield is present and *ve* are located on the dorsal shield in *C. scutovata*.

The morphological features of the Turkish specimen are completely similar to those of the types of *Caligonella quinqueocellata* described by Khaustov (2021) except the posterior part of stylophore which appears smooth instead of striated.

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