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A new species of *Proctolaelaps* Berlese from Iran (Acari: Ameroseiidae)

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Abstract

Proctolaelaps cossoides n. sp. collected from soil and debris in northern Iran is described. Keys are provided to determine the position of this mite among closely related species as well as for known species of *Proctolaelaps* in Iran.

Zusammenfassung

Eine neue Art der Gattung *Proctolaelaps* Berlese aus dem Iran (Acari: Ameroseiidae) – *Proctolaelaps cossoides* n. sp., eine neue Milbenart aus Boden und Detritus im nördlichen Iran, wird beschrieben. Schlüssel zur Bestimmung der Stellung der neuen Art innerhalb engverwandter Arten sowie der bisher bekannten *Proctolaelaps*-Arten Irans sind gegeben.

Keywords: Acari, taxonomy, soil and debris, *Proctolaelaps cossoides*

1. Introduction

Proctolaelaps Berlese, 1923 has association with some insects and can be found in the nests of birds and mammals, in flowers and in debris. About 90 species of *Proctolaelaps* have been described (HALLIDAY et al. 1998). In the catalogue of Acari of Iran, KAMALI et al. (2001) listed 6 species of *Proctolaelaps*: *P. bickleyi* (Bram, 1956), *P. hystricoides* Lindquist & Hunter, 1965, *P. longipilis* (Chant, 1958), *P. pygmaeus* (Müller, 1859), *P. regalis* De Leon, 1963 and *P. scolyti* Evans, 1958. In this paper, we describe and illustrate a new species of *Proctolaelaps* collected by the second author of this paper in northern Iran, Mazandaran province, Amol County. We also provide keys to the species closely related to *P. cossoides* n. sp. and *Proctolaelaps* species found in Iran.

2. Materials and methods

Soil and debris were placed in a modified Berlese/Tullgren set-up. The extracted mites were cleared in Nesbitt's solution and mounted in Hoyer's medium on a microscope slide. The mite was examined under a phase contrast microscope. Legs measured from the base of coxae to

the tip of pretarsus and setae from the base of insertion to tip. Measurements are in micrometres (μm) and are for the holotype. Notations for dorsal idiosoma and ventral setae follow LINDQUIST & EVANS (1965) and LINDQUIST (1994) respectively with a revised dorsal chaetotaxy as given by CHRISTIAN & KARG (2006).

3. Description of female

Dorsal idiosoma (Fig. 1) – Dorsal shield entire 368 long, 200 wide at I_1; reticulate over entire surface; with 44 pairs of dorsal setae; all dorsal setae simple; marginal setae of r_{3-6} and R_{1-6} located on the dorsal shield but on a strip. Length of dorsal setae: i_1 18, i_2 20, i_3 19, i_4 18, i_5 20, I_1 19, I_2 & I_3 20, I_4 21, I_5 13, z_1 21, z_2 22, z_3 21, z_4 20, z_5, Z_1, Z_2, Z_3, Z_4 22, Z_5 42, s_1 20, s_2 22, s_3 23, s_4 25, s_5 24, S_1 23, S_2 & S_3 24, S_4 24, S_5 20, r_1 12, r_2 18, rx_1 20, rx_2 19, r_3 27, r_4 21, r_5 21, r_6 & R_1 20, R_2 & R_3 19, R_4 18, R_5 19, R_6 17; with 3 sub-marginal setae 13 – 14, UR_1 positioned ventrolaterally at the level of $R_1 - R_2$, other two (UR_2 & UR_3) more posterior; dorsal shield also with 17 pairs of pores.

Ventral idiosoma (Fig. 2) – All ventral setae simple; tritosternum 70 with paired laciniae, free for two-thirds of total length and pilose; a pair of lineate, sclerotised presternal plates; sternal shield smooth but slightly reticulate laterally, 80 long along midline, 127 and 85 wide at anterior margin and ST_2 level respectively, with 3 pairs of sternal setae, ST_1 24, ST_2 25 and ST_3 29, and two pairs of lyrifissures, one pair posterior to ST_1 and another pair located between ST_2 to ST_3; metasternal platelets smooth, each with a seta ST_4 20, without any visible pore; epigynial shield slightly convex posteriorly and reticulate, with a pair of simple setae ST_5 18; anal shield 70 long and 55 wide, anterior margin rounded and posterior truncated, slightly reticulated in anterior half, with para-anal setae 15 and post-anal seta 38; twelve pairs of setae JV_1, JV_2, JV_3, JV_4, ZV_1, ZV_2, ZV_3, ZV_5, SV_2, SV_3 13-16, ZV_4 22, and JV_5 32 on soft cuticle surrounding anal shield; two pairs of metapodal plates, secondary platelet small, primary platelet 22 long; peritreme extending to seta r_1, peritremal shield free posteriorly.

Gnathosoma-Tectum (Fig. 3) – With three prongs, middle prong simple and longer than the lateral prongs, lateral prongs with three denticles each; hypostome with 8 rows, 7 rows with hypognathal denticles most bearing 3 large teeth (Fig. 5); capitular setae 20, internal posterior rostral setae 36, external 15, and rostral setae 23, all simple; corniculi horn-like and not divided; chelicera (Fig. 4) with fixed digit 26 long and a row of 7 teeth and 2 distal teeth, movable digit 28 long and with 3 teeth; palp apotele two-tined.

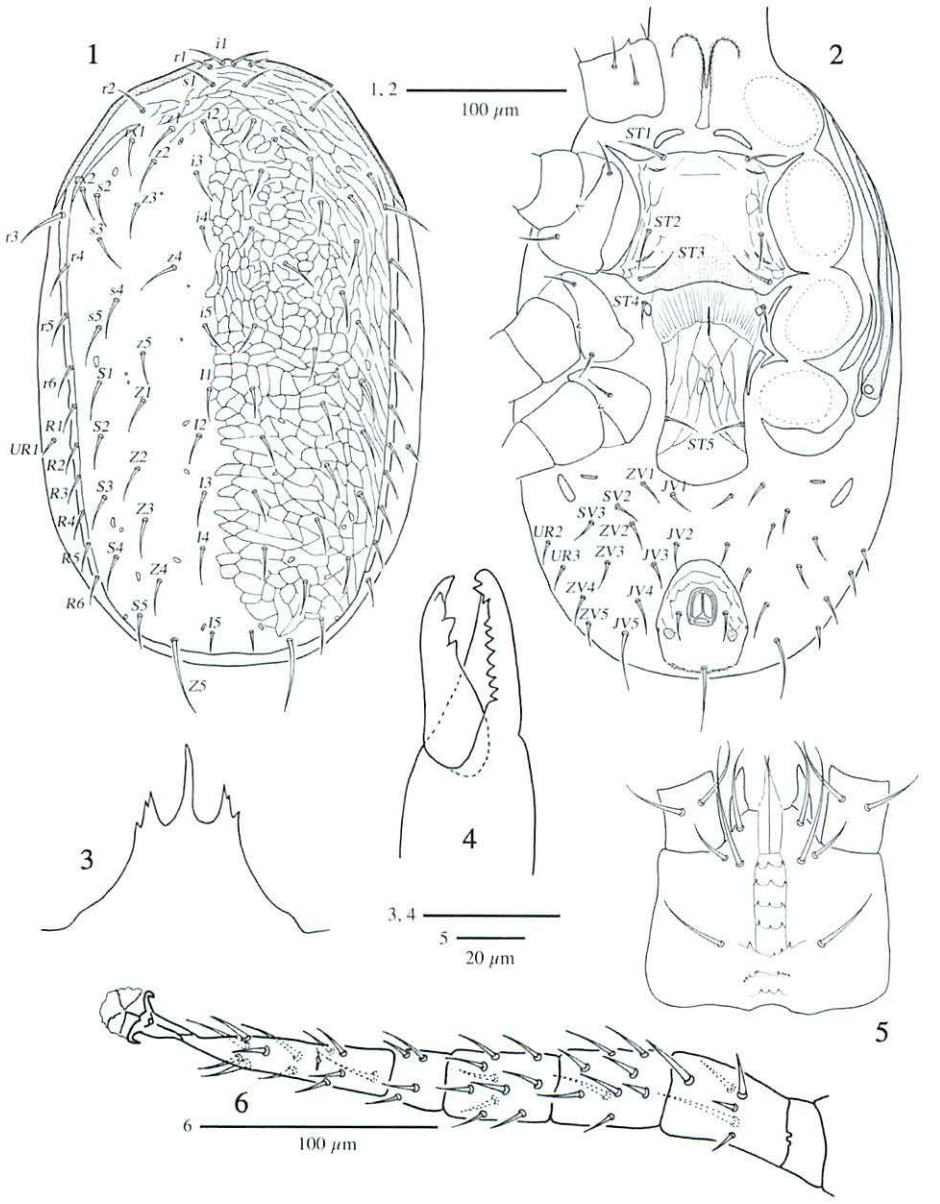
Legs – Leg I 310, leg II 268, leg III 260, leg IV 337 (Fig. 6); setation of legs I-II-III-IV: coxae 2-2-2-1, trochanters 6-5-5-5, femora 12-11-6-6, genua 13-11-9-9, tibiae 13-10-8-10; leg IV without any macrosetae.

4. Type material

Holotype female, Amol, Iran, soil and debris, 25 August 2004, collected by H. Sakenin-Chelav, deposited in the National Museum of Natural History, Leiden (RMNH).

5. Etymology

The name »*cossoides*« refers to the close affinity of the new species with *P. cossi* (Duges, 1834).



Figs 1 – 6 *Proctolaelaps cossoides* n. sp. (holotype female), 1) Dorsal view, 2) Ventral view, 3) Tectum, 4) Chelicera, 5) Ventral view of gnathosoma, 6) Leg IV

6. Differential diagnosis

This new species is only known from the holotype female. *Proctolaelaps cossoides* is closely related to *P. cossi* (Duges, 1834). It differs from *P. cossi* in that the fixed cheliceral digit has 9 teeth instead of only 3 and a smaller idiosoma: length and width 368 and 200 instead of 560 and 360. Ventral groove of gnathosoma of *P. cossi* has 6 rows of denticles while *P. cossoides* has 7. Dorsal seta I_3 in *P. cossoides* is 20 µm long while in *P. cossi* it is 33 µm. In *P. cossoides*, the ratios of I_3/I_3-I_4 and Z_5/i_4 are 0.6 and 3 respectively instead of 0.9 and 2 in *P. cossi*.

7. Remarks

Hereunder follow two keys, the first of which is a key to all species closely related to the new species. All of them have the following characters in common: Female with an anal shield, corniculi distally pointed, tectum with 3 prongs, dorsal setae I_1, I_2 and I_3 shorter than the distance to the next setae in series. The second key comprises the new species along with the known Iranian species. HALLIDAY et al. (1998), treated *P. longipilis* (Chant, 1958) as a junior synonym of *P. aurora* (Vitzthum, 1925). However, WESTERBOER (1963) fully re-described *Proctolaelaps aurora* and based on the shape of the tectum and anal shield, and the length of the dorsal setae, *P. longipilis* sensu CHANT (1963) can be distinguished as a separate species.

Key to the species closely related to *Proctolaelaps cossoides*

1(2) Dorsal setae extremely short, i_4 1/6 distance i_4 to i_5, Z_5 thick and pectinate, genital shield caudally broadened, female 325 µm long. *P. myrmestrans* Chant, 1963
– North America.

2(1) Dorsal setae not extremely short, i_4 1/4 to 1/2 distance i_4 to i_5.

3(6) Middle prong of tectum slender and twice the length of the lateral branches.

4(5) Idiosoma of female longer than 500 µm, dorsal setae Z_5 = 2x length of i_4, digitus fixus of chelicerae with three well spaced teeth, female 560 µm long.
P. cossi (Duges, 1834)
– The Netherlands.

5(4) Idiosoma of female shorter than 400 µm, dorsal setae Z_5 = 3x length of i_4, digitus fixus of chelicerae with a close row of 7 large and 2 little distal teeth, female 380 µm long. *P. cossoides* n. sp.
– Iran.

6(3) Middle prong of tectum less than twice the length of the lateral prongs.

7(8) Anal shield broad and oval, anus 1/3 length of anal shield, dorsal setae i_4 20 µm, Z_5 40 – 45 µm long, female 360 – 410 µm long. *P. coffeae* Karg & Rodriguez, 1984
– Cuba.

8(7) Anal shield very slender, anus longer than 1/3 length of anal shield.

9(10) Dorsal setae i_4 = 1/4 distance i_4 to i_5, Z_5 =2x i_4, middle prong of tectum longer than the lateral prongs, female 512 – 524 µm long. *P. novaeguineae* (Oudemans, 1905)
– New Guinea.

10(9) Dorsal setae i_4 = 1/2 distance i_4 to i_5, Z_5 =1 1/2x i_4, prongs of tectum about equal in length, female 450 – 500 µm long. *P. fiseri* (Samšinak, 1960)
– Europe, North America.

Key to the species of *Proctolaelaps* of Iran

1(6) Tectum with three prongs.

2(3) Most of dorsal setae longer than the distance to the next setae in series.
P. longipilis (Chant, 1958)

3(2) Most of dorsal setae shorter than the distance to the next setae in series.

4(5) Dorsal setae I_1, I_2 & I_3 reach to the base of next setae in series.
P. hystricoides Lindquist & Hunter, 1965

5(4) Dorsal setae I_1, I_2 & I_3 shorter than the distance between setae in series.
P. cossoides n. sp.

6(1) Tectum without prongs, but with numerous teeth marginally.

7(8) Dorsal setae long, most of them reach to the next setae in series.
P. bickleyi (Bram, 1956)

8(7) Dorsal setae short (except Z_5), shorter than the distance to next setae in series.

9(10) Dorsal setae I_2 & I_3 about 1/2 distance to next setae in series, i_4 1/4 distance i_4 to i_5, setae I_1-I_4 about 26 µm, Z_5 51 µm. *P. regalis* De Leon, 1963

10(9) Dorsal setae I_2 & I_3 at least 3/4 distance to next setae in series, i_4 1/2 distance i_4 to i_5 setae I_1-I_4 about 30 µm, Z_5 36 µm. *P. scolyti* Evans, 1958

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