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ERYNGIOPUS LANGROUDIENSIS N. SP. (ACARI: STIGMAEIDAE) FROM GUILAN, IRAN

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ABSTRACT — Eryngiopus langroudiensis n. sp. (Acari: Stigmaeidae) is described and illustrated, based on females collected from soil under citrus trees and on citrus leaves in the cities of Langroud, Chaboksar and Vajargan, Guilan province, Iran. The citrus trees where this species was found were also infested by pest mites Panonychus citri (McGregor), Brevipalpus obovatus Donnadieu and by scale insects.

KEYWORDS — citrus; soil; leaves infestation; predatory mites; Iran

INTRODUCTION

Members of the genus Eryngiopus (Acari: Stigmaeidae) were found in soil and on foliage, and are reported to feed on armoured scale crawlers and on spider mites (Ehara 1962; Vacante and Gerson 1989; Farag et al. 1990; Fan and Zhang 2005; Khanjani et al. 2013). Up to now three species of the genus Eryngiopus are recorded from Iran, namely: E. gracilis Summers, 1964, from citrus orchards in Mazandaran (Faraji and Kamali 1993), E. harteni Van-Dis and Ueckermann, 1993, on citrus leaves, trunk and soil under palm trees in Kerman (Dehghan-Dolati et al. 2011) and E. hamedanicus Khanjani, Mohammadi, Nazari and Khanjani, 2013 (Khanjani et al. 2014), from soil under pear trees, Negarkhaton Village, Famenin town, Hamedan province, Iran. The fourth species, herein described, was sampled in soil under citrus trees and on citrus leaves in Guilan province.

MATERIALS AND METHODS

The specimens were collected from soil under citrus trees and on citrus leaves infested by the citrus red mite, Panonychus citri (McGregor); the privet mite, Brevipalpus obovatus Donnadieu and by scale insects, including the yellow scale, Aonidiella citrina (Coquillett); western red scale, Chrysomphalus dictyospermi (Morgan); mussel scale Lepidosaphes beckii (Newman); cottony cushion scale, Icerya purchasi (Maskell) and the soft brown scale, Coccus hesperidum L. The citrus orchards were localized in the cities Langroud, Chaboksar and Vajargah, Guilan province (37°16'38.64"N, 49°35'20.4"E), Northern Iran. The mites were mounted directly in Hoyer’s medium on slides, then kept in an oven (45 °C) for...
5-6 days. The specimens were measured, identified and drawn by means of an Olympus BX53 differential interference contrast microscope (DIC), under 1000X magnification, and equipped with a drawing tube. Body length measurements represent the distance between the base of the gnathosoma and the posterior end of the idiosoma; width was measured at the level of setae c2. Setae were measured from the setal base to their tips; distances between setae were measured between setal bases. Leg measurements are from base of coxa to the tip of the pretarsus.

The terminology and abbreviations used in the description follow Kethley (1990). All measurements are given in micrometers and the measurements of the paratype are in parentheses.

RESULTS

Family Stigmaeidae Oudemans, 1931.
Genus Eryngiopus Summers1964.

Type species: Eryngiopus gracilis Summers 1964, by original designation.

Diagnosis — female (based on Fan and Zhang, 2005): Chelicerae hinged at base. Palp tibial claw almost as long as palp tarsus; accessory claw slender, seta-like or spine-like; terminal eupathidia on palp tarsus mostly fused and split into 2-3 vestigial prongs; counts of setae and solenidia, from palp tarsus mostly fused and split into 2-3 vestigial prongs; including gnathosoma) 424 (415 – 440); width 176 (184 – 208); length of leg I 140 (140 – 160); leg II 110 (110 – 120); leg III 108 (109 – 120) leg IV 120 (110 – 130).

Dorsum (Figure 1a). Prodorsal shield reticulate longitudinally; bearing three pairs of setae (ci, ve, sci), setae sce and eyes present. Dorsal hysterosomal area between setae C-E with fine, longitudinal striae, area between setae f1 with transverse striae, f1 on small platelets. Suranal shield (H) entire, with 2 pairs of setae (h1 and h2). Dorsal hysterosoma with 8 pairs of setae, with slightly ciliated. Lengths of dorsal setae: vi 16 (16 – 17), ve 26 (21 – 24), sci 24 (18 – 22), sce 28 (24 – 26), ci 20 (18 – 20), c2 24 (23 – 30), h1 20 (19 – 20), h2 22 (21 – 22), c1 14 (14 – 16), c2 14 (14 – 18), f1 16 (14 – 16), h1 20 (20 – 21), h2 20 (20 – 22). Distances between dorsal setae: vi-vi 12 (12 – 16), ve-ve 32 (32 – 34), vi-ve 14 (14 – 16), sci-sci 54 (56 – 58), sce-sce 108 (108-130), ve-sci 20 (22-24), sci-ve 30 (30-38), sce-cl 68 (65-70), ci-cl 46 (58 – 63), c2-c2 154 (160 – 180), c1-d1 74 (68 – 80), d1-d1 98 (90 – 104), d1-d2 44 (44 – 50), d1-e2 40 (43 – 60), d2-e2 72 (70 – 80), d2-d2 160 (160 – 180), e1-e1 44 (42 – 46), d1-e1 60 (56 – 60), f1-f1 52 (48 – 50), f1-h1 38 (34 – 40), h1-h1 18 (16 – 20), h2-h2 50 (56 – 59), h1-h2 18 (18 – 20); ratio: vi/vi 1.3 (1.0-1.3), c1/c1 0.46 (0.31-0.32), d1/d1 0.22 (0.19 – 0.21), e1/e1 0.33 (0.33 – 0.35), f1/f1 0.35 (0.29 – 0.31), h1/h1 1.11 (1.05 – 1.25), h2/h2 0.40 (0.36 – 0.37), h1/h2 1.0 (0.94 – 1.0), c1-c1: d1-d1: e1-e1: f1-f1 : 0.89 (1.21 – 1.26): 1.88 (1.88 – 2.08): 0.85 (0.88 – 0.92): 1.

Venter (Figure 1b). Ventral cuticle striate transversely between coxisternal regions II-III; coxisternal regions I-II and III-IV are surrounded by
**Figure 1:** *Eryngiopus langroudiensis* n. sp. (female): a – Dorsal view of idiosoma; b – Ventral view of idiosoma; c – Chelicerae; d – Palp; e – Subcapitulum.
Figure 2: Eryngiopus langroudiensis n. sp. (female): a – Leg I; b – Leg II; c – Leg III; d – Leg IV.
longitudinal striae (Figure 2). Lengths of setae 1a 60 (57–60), 1b 14 (14–15), 1c 14 (13–14), 2c 20 (20–21), 3a 44 (50–51), 3b 16 (15–20), 3c 14 (13–14), 4a 40 (40–46) and 4c 12 (12–13), $ag_1$ 14 (14–16), $ag_2$ 16 (14–17), $ag_3$ 22 (24–28), $g1$ 25 (26–27), $ps1$ 14 (13–14), $ps2$ 12 (14–15), $ps3$ 12 (12–14). Aggenital setae $ag_3$ longer than $ag_1$-2 and pseudanal seta $ps1$ almost as long as setae $ps_2$-3. Distances: $ag_1$-$ag_2$ 16 (16–20), $ag_2$-$ag_3$ 28 (26–30), $ag_3$-$ag_3$ 46 (44–54), $g1$-$g1$ 10 (9–10).

Gnathosoma — (Figures 1c-e). Ventral infracapitulum with two pairs of subcapitular setae, m 32 (31-50) and n 30 (45-50), two pairs of dorsal setae, $or_1$ 11 (8–110), $or_2$ 12 (10–12); distances: $or_1$-$or_1$ 4 (4–5), $or_2$-$or_2$ 10 (8–11), m-m 28 (25–29), n-n 20 (21–22) (Fig. 5). Chelicerae free 65 (55–60), movable digit 30 (30–32) (Figure 3). Palp five segmented, palp tarsus with 3 simple setae + one simple euthidiathium + one solenidion($\omega$), palp tibia with two setae + one well developed claw, palp genu with one seta and palp femur with three setae (Figure 4).

Legs — (Figure 2). Legs about half length of body. Leg segments’ setal formulae: coxae 2-1-2-1; trochanters 1-1-1-1; femora 3-3-2-2, genua 3-0-0-0; tibiae 5+1$\varphi$-5+1$\varphi$-5+1$\varphi$; tarsi 11+1$\omega$-9+1$\omega$-7+1$\omega$-7+1$\omega$. Specialized setae $\varphi$ on tibia I one and half times longer than on tibia II and two times of tibiae III-IV. Solenidion $\omega$ on tarsus I longer than on tarsus II-IV.

Etymology — The species is named after the locality where most of specimens were collected, Langroud city, in Guilan province, Iran.

Type materials — Holotype and one paratype female from the soil under of citrus trees, Chabok-sar (36°58'0"N, 50°35'0"E, 216 m), 5 October 2012; 2 paratype females from citrus leaves infested by citrus red mite, *Panonychus citri* (McGregor) and scale insects, Langroud (37°11'0"N, 50°9'0"E, 25 m), 5 October 2012; 2 paratype females from citrus leaves infested byprivet mite, *Brevipalpus obovatus* and scale insects, Vajargah (37°02'27"N, 50°24'31"E, –10 m), 4 November 2012; 1 paratype female from the soil under citrus trees, Langroud (37°11'0"N, 50°9'0"E, 25 m), 4 Novembers 2012, collected by J. Hajizadeh. The holotype female and one paratype are deposited as slide-mounted specimens in the Collection of the Acarology Laboratory, University of Bu-Ali Sina, Hamadan, Iran and five paratype females are deposited in the mites Collection of the Acarology Laboratory, University of Guilan, Rasht, Iran.

Remarks — The new species *Eryngiopus langroudiensis* sp. nov. resembles *E. citri* Rakha and McCoy 1984 by its long ventral setae and the same setal formulae on the palp segments, but differs from *E. citri* in: 1) prodorsum longitudinally striated instead of reticulated, 2) coxae II with 1 seta instead of two, 3) femora 3-3-2-2 in *E. langroudiensis* as opposed to 4-4-2-2 in *E. citri*, 4) genua I-IV 3-0-0-0 versus genua 2-0-0-0, 5) tarsi 12($\omega$)-10($\omega$)-8($\omega$)-8($\omega$) whereas 9($\omega$)-8($\omega$)-7($\omega$)-6($\omega$) in *E. citri*. Also the new species closely resembles *E. bifidus* Wood, 1967 in that the chaetotaxy of coxae, tibiae and tarsi I-IV differs from the latter by: 1) femora 3-3-2-2 in *E. langroudiensis* as opposed to 4-4-2-2 in *E. bifidus*, 2) trochanter IV with 2 seta as opposed to with 0, 3) ventral setae 1a, 3a and 4a longer than the latter, 4) adoral setae 0r1-2 longer those of *E. bifidus*.

Male and immature stages: Unknown.

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