

First Record of Genus *Ledermuelleriopsis* Willmann (Acari: Stigmaeidae), with a New Species from Pakistan

Muhammad Kamran,^{1,*} Fahad J. Alatawi¹ and M.H. Bashir²

¹Acarology Laboratory, Department of Plant Protection, College of Food & Agriculture Sciences, King Saud University, 11451, P.O. Box 2460, Riyadh, Saudi Arabia

²Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan

Abstract- The Genus *Ledermuelleriopsis* Willmann is recorded for the first time from Pakistan with the description of a new species *L. punjabensis* n. sp. collected from fallen leaves and debris under *Albizia lebbek* L. trees. The new species can be distinguished easily from other species by 3 pairs of genital setae, coxisternal shields between coxae I, II and III, IV reticulated, length of dorsal setae (18-37), length of setae *fl* (36-38), ratio of distances between *c1-c1: d1-d1: e1-e1: fl-fl* 1.03: 1: 1.83: 1.03.

Key Words: *Ledermuelleriopsis punjabensis*, new species, mites, Stigmaeidae.

INTRODUCTION

Mites of family Stigmaeidae (Acari: Prostigmata) are predatory in nature, feeding on a variety of phytophagous mites and small insect pests. After Phytoseiidae, they are second most abundant group of predatory mites present on plant leaves (Haddad and Irani-Nejad, 2010) and many species are of considerable importance in biological control (Fan *et al.*, 2003). This family includes 32 genera (Khanjani *et al.*, 2012). The genus *Ledermuelleriopsis* Willmann (Prostigmata: Stigmaeidae) can be easily distinguished by prodorsum covered with a large shield with 4 pairs of setae and a pair of eyes; hysterosoma covered with 3 shields (CD, EF and suranal); CD and EF each with 3 pairs of setae and suranal shield with 2 pairs of setae (Fan and Zhang, 2005). This genus comprises 27 species so far, which occur worldwide, however most species were reported from Asia and majority were found in soil and leaves debris (Khanjani and Ueckermann, 2002; Khanjani 2004; Fan *et al.*, 2003; Fan and Zhang, 2005; Khanjani *et al.*, 2012).

MATERIALS AND METHODS

Soil and leaf debris under siris trees (*Albizia lebbek* L.) were collected from the field and brought to the laboratory. Mites were extracted from the soil with Tullgren funnels. Mite specimens were collected by means of a stereomicroscope (SZX10, Olympus®, Japan). The specimens were cleared in “Nesbitt’s” solution for 10–12 h and mounted on glass slides in Hoyer’s medium, and dried in an oven at 40°C for one week. Mite specimens were examined and drawn under a phase-contrast microscope (DM2500, Leica®, Germany) provided with a drawing tube (Olympus®, Japan) and Auto-montage Software System (Syncroscope®, Cambridge, UK). Adobe Illustrator (Adobe Systems Incorporated, USA) (based on scanned images) was used to draw the figures. The terminology and setal nomenclature follow Fan and Zhang (2005). All specimens have been deposited in the King Saud University Museum of Arthropod (KSMA), College of Food and Agriculture Sciences, King Saud University.

Genus *LEDERMUELLERIOPSIS* Willmann

Ledermuelleriopsis Willmann, 1953:487

Type species

Ledermuelleriopsis triscutata Willmann, 1951b.

* Correspondence: kamran1513@gmail.com
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***Ledermuelleriopsis punjabensis*, new species**

(Fig. 1)

Description***Holotype female***

Measurements of 7 paratypes in parenthesis), Color in life red. Idiosoma oval, length of body excluding gnathosoma 305 (298-310), width at broadest level 235 (230-239)

Dorsum

Dorsum divided into four shields: prodorsal, metapodosomal, opisthosomal and suranal shield. Dorsal shields ornamented with pits, numerous vacuoles ranging from 13-36 in each pit (Fig. 1). Prodorsal shield almost triangular, entire and with four pairs of setae (*vi*, *ve*, *sci*, *sce*) and a pair of eyes present between *ve* and *sci* laterally on prodorsal shield (Fig. 1A); metapodosomal shield (CD) rectangular, bearing 3 pairs of setae (*c1*, *d1*, *d2*), opisthosomal shield (EF) almost rectangular bears 3 pairs of setae (*e1*, *e2*, *fl*). Suranal shield very small, postero-ventrally bearing two pairs of setae *h1*, *h2* on prominent tubercles. Dorsal setae clavate and strongly spinose (Fig. 1A). Humeral shields large, present ventro-laterally between coxae II-III, 50 wide, 97 long, and bears setae *c2*. Lengths of dorsal setae: *vi* 22 (21-23), *ve* 23 (22-24), *sci* 18 (18-19), *sce* 21 (20-22), *c1* 19 (18-20), *c2* 24 (22-24), *d1* 19 (18-20), *d2* 17 (16-17), *e1* 25 (23-26), *e2* 23 (21-23), *fl* 37 (35-38), *h1* 28 (26-29), *h2* 28 (26-30) (*h1* & *h2* situated ventrally); distances between dorsal setae: *vi-vi* 38 (36-39), *ve-ve* 88 (85-90), *vi-ve* 38 (37-40), *sci-sci* 145 (140-148), *sce-sce* 186 (184-191), *sci-sce* 44 (43-45), *ve-sci* 39 (38-41), *c1-c1* 67 (64-68), *c1-c2* 80 (78-83), *c2-c2* 185 (153-188), *c1-d1* 66 (64-68), *d1-d1* 65 (63-66), *d1-d2* 82 (78-82), *d1-e1* 87 (87-90), *d2-e2* 70 (69-73), *d2-d2* 205 (200-207), *e1-e1* 119 (116-120), *e2-e2* 165 (165-169), *e1-e2* 49 (48-51), *e1-fl* 38 (37-41), *fl-fl* 67 (66-69), *fl-h1* 19 (18-20), *h1-h1* 36 (35-37), *h1-h2* 20 (20-22), *fl-h2* 5 (4-7), *d1-e2* 64 (63-66), *h2-h2* 71 (69-73), *vi/vi-vi* 0.57 (0.58), *c1/c1-c1* 0.28 (0.28-0.29), *d1/d1-d1* 0.29 (0.28-0.30), *e1/e1-e1* 0.21 (0.19-0.21), *fl/fl-fl* 0.55 (0.53-0.55), *h1/h1-h1* 0.77 (0.74-0.78), *h2/h2-h2* 0.39 (0.37-0.41), *h1/h2* 1 (0.96-1), *c1-c1: d1-d1: e1-e1: fl-fl* 1.03 (1.01-1.03): 1 (1): 1.83 (1.81-1.82): 1.03 (1.04-1.04) (Fig. 1A).

Venter

Coxisternal shields between coxae I-II, III - IV fused at midline and reticulated. Area between coxae II and III with transverse striae (Fig. 1B). Length of setae *1a* 16 (16-17), *1b* 19 (18-19), *1c* 13 (12-13), *2b* 13 (12-13), *2c* 15 (14-16), *3a* 14 (14-15), *3b* 14 (14), *3c* 13 (14), *4a* 15 (15), *4b* 14 (14) and *4c* 13 (12). Aggenital shields with three pairs of setae, *ag1-3*, *ag1-11*, *ag2-11*, *ag3-14*, which are slightly shorter than pseudanal setae; pseudanal setae (*ps*) 3 pairs, each 17 (16-17). All aggenital and pseudanal setae finely serrated, smooth and with pointed tips. Distances between ventral setae: *1a-1a* 28 (26-29), *3a-3a* 40 (38-41), *4a-4a* 24 (23-26), *1a-3a* 65 (63-66), *3a-4a* 45 (42-46); *ag1-ag1* 35 (34-35), *ag2-ag2* 53 (50-53), *ag3-ag3* 44 (43-45), *ps1-ps1* 11 (11), *ps2-ps2* 23 (23-24), *ps3-ps3* 24 (25). Ratio: *1a-1a: 3a-3a: 4a-4a* = 1.16: 1.66 (Fig. 1B).

Gnathosoma

Finely vacuolated, palp five segmented, palp femur with three setae, palp genu with one nude and one barbed seta, palp tibia with two simple nude setae, a stout claw and one accessory claw, palp tarsus with one solenidion and two eupathidia distally (one simple and one tridentate) and three simple setae (Fig. 1C). Chelicerae 62, stylets 26 long as shown in Figure 1C. Subcapitular setae *m* 14 (15), *n* 12 (13), adoral setae *or1* 11 (11), *or2* 14 (13); distances: *m-m* 21 (22), *n-n* 22 (21), *m-n* 12 (11), *or1-or1* 13 (12), *or2-or2* 16 (17), *or1-or2* 3 (2-3) (Fig. 1C).

Legs

Four pairs of legs. Measurements of legs I-IV: 199 (19-205), 167 (164-170), 160 (158-165), 201 (193-208) respectively. Setae and solenidia on leg segments as follows: coxae 2-2-2-2; trochanters 1-1-2-1; femora 5-4-3-2; genua 3+1κ-3-1-1; tibiae 5+1φ+1φp-5+ +1φp-5+1φp -5+1φp; tarsi 13 +1ω-8+1ω-7+1ω-7. Length of solenidia as follows: tarsi, I ω 19 (18-19), II ω 14 (13-14), III ω 5 (4); tibiae: tibia I with 2 solenidia, each of tibiae II-III with one slender solenidion; length: I φ 7 (7-8), I φp 15 (14-15), II φp 11 (10-11), III φp 7 (7-8), IV φp 6 (6-7) (Figs. 1D-G).

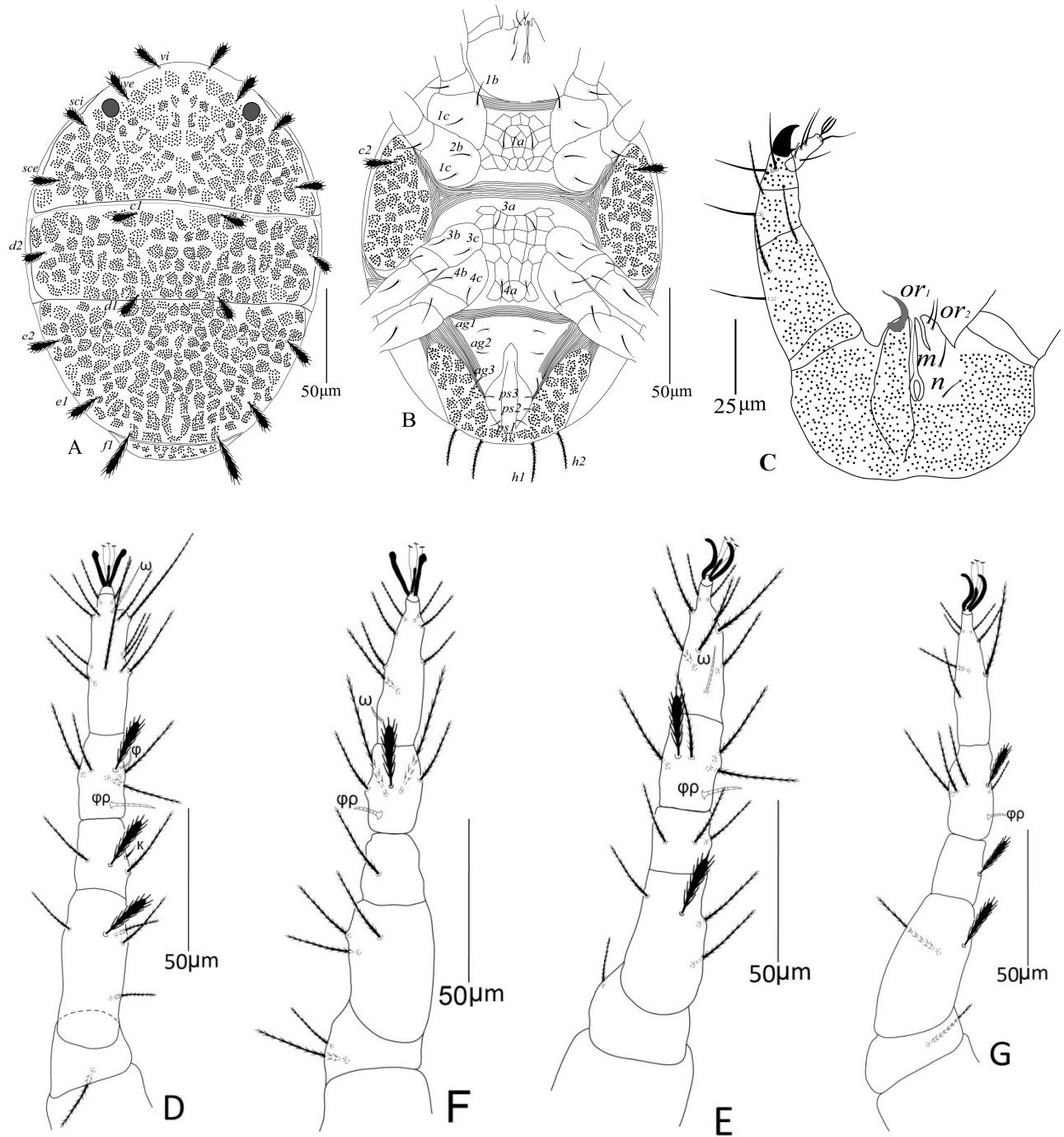


Fig. 1. *Ledermuelleriopsis punjabensis* new species A, dorsum; B, venter; C, gnathosoma and palp; D, leg I; E, leg II; F, leg III; G, leg IV.

Type material

Holotype female and 7 paratypes (adult females), soil debris under the siris tree, *Albizia*

lebbeck L., Jampur city, district Rajanpur, Punjab, Pakistan, 29°641'N, 70°602'E, 13, February, 2013, coll. Khalid Ali Khan Talpur.

Etymology

Name of new species refers to Punjab, the province of Pakistan.

Remarks

Genus *Ledermuelleriopsis* Willmann comprises of 27 species hitherto. *Ledermuelleriopsis punjabensis* sp. nov. belong to the group of species having dorsal shields with pits decorated with vacuoles, aggenital shield with 3 pairs of setae, dorsal body setae more or less bushy, distance between *e1-e1* at least 1.3 as wide as *f1-f1*, distance between *c1-c1* shorter or equal to *d1-d1*. The new species can be separated from other species in this group by the length of dorsal setae (18-37), length of setae *f* (35-38), endopodal shields reticulated between coxae I & II and coxae III & IV, ratio of distances between *c1-c1*: *d1-d1*: *e1-e1*: *f1-f1* 1.03: 1:1.83: 1.03.

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