

Description of a new predatory mite species of the genus *pseudostigmaeus* (*pseudo stigmaeus solanumus*) acari: prostigmata: stigmatheide from Pakistan

Abstract

Mites are tiny arthropod, biologically most varied and universally adopted in all types of habitats. Mites of family *Stigmatheidae* are well-known predators of phytophagous mites, lepidopteran eggs, and small soft-bodied insects. An arbitrary study was planned to discover mite fauna of the family *Stigmatheidae* from Punjab province (Pakistan). The said species (*Pseudostigmaeus solanumus*) is considered here as new which was collected from the city Muzaffargarh, Punjab from (*Solanum melongena*). Twelve (12) paratypes females were collected from the same locality and three (3) from bitter melon crop from the city of Jhang, Punjab. The specimen (collected mites) was mounted on glass slides with aid of solution of Hoyer's. The sketches of mite body were organized with the help of optical microscopic grids. The report and drawing of idiosomal parts, host ranges and evaluating comments are also agreed in this document.

Keywords: acari, *Pseudostigmaeus*, new species, predatory mite

Volume 9 Issue 1 - 2019

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Received: June 02, 2018 | **Published:** February 04, 2018

Introduction

The family *Stigmatheidae* was established by Oudemans.¹ The mites of this family are main predators within Raphignathoidea, include a diversity of almost 577 species that assembled into 34 valid genera (July 31, 2016). The *Stigmatheidae* among most studied families in Acarology and the rate of described species has increased by almost 45 percent in last twenty years. More than three quarters of species (almost 50 %) are distributed in the Palaearctic and Indo-Malaya region. Wood² created the genus *Pseudostigmaeus* based on type as *Pseudostigmaeus striatus* and *Pseudostigmaeus collyerae* simultaneously. Meyer³ designated *P. capensis* from the areas of South Africa and redefined the genus with a novel judgment. But later, Meyer species detached and chosen as the genotype of a new genus *parastigmaeus*.⁴ Momen⁵ described a species from trees of apple from Ireland and one new species designated as *P. ueckermanni* from China. Wood⁶ designated one species from Island (Campbell). Later, Wood from New Zealand provided a key to species in 1971.⁷

Diagnosis

Previously, the genus only included two species, *P. collyerae*, and *P. striatus* Wood. Wood,² genus *Pseudostigmaeus* was described; characteristically by the incidence of 3 pair of setae on middle propodosomal plate area, central hysterosomal shield absent or very poorly seen able in few cases, presence of inter-coxal plates; 1-2 setae on second coxa. The body lenient and faintly reticulated, chelicerae are separated/ detached, Palptibia with 2 modest setae, main claw sometimes provided with accessory claw, palp-tarsus bearing 3-4 setae, 1 soledion, spine present or sometimes absent, 01 trifideupathidium. Dorsal setae 12-13 pairs. Dorsum enclosed by 1 propodo-somal shield and one pair of minor suranal platelets/ shield, sometimes absent. Eyes 1 pair on propodosoma. Typically, genital part with a single genital pore, 2-3 pairs of anogenital setae & 3 pair of paraproctal setae. The specimens of this genus often collected from aerial living plants or soil leaf litter from New Zealand, China, Ireland, South Africa, respectively. Three (3) new species have been collected

by writer from Punjab, Pakistan and one (1) is described here in this document which is compared with *P. jhangensis* and *P. capensis*.

Materials and methods

The genus *Pseudostigmaeus* (Acari: Stigmatheidae) was collected from the aerial plant parts of brinjal (eggplant) (*Solanum melongena* L.) in the area of Muzaffargarh city by the first author. The permanent slides were prepared by using Hoyer's medium with the help of binocular. The species identification was done with the assistance of literature and taxonomic keys. The terminology developed by Grandjeans⁸ with some amendments by Gonzalez,⁹ summer¹⁰ & Kethley¹¹ has been used here. The measurements were made in μm .

Results and discussion

Pseudostigmaeus solanumus n.sp.

Female: Dorsum: (Figure 1A-1D): Description of female dorsum (n=2). The measurement of holotype followed by two paratypes in parentheses

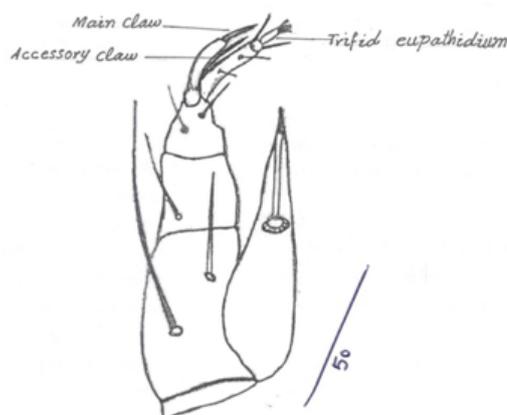


Figure 1A *Pseudostigmaeus solanumus* n.sp. Gnathosoma

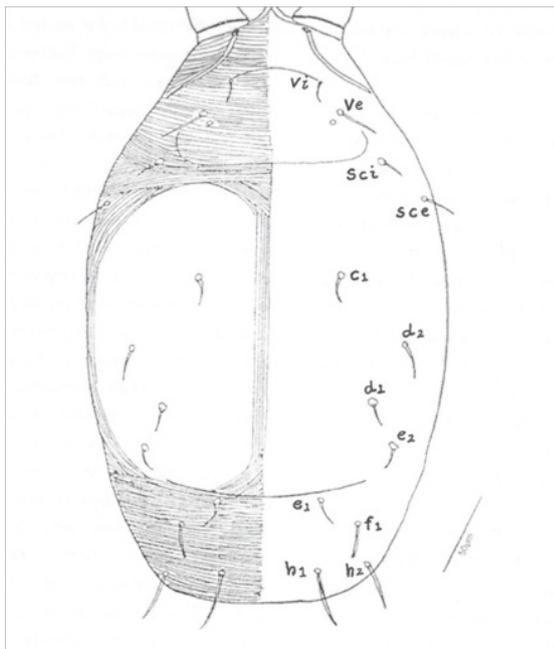


Figure 1B *Pseudostigmaeus solanumus* n.sp. (Dorsum)

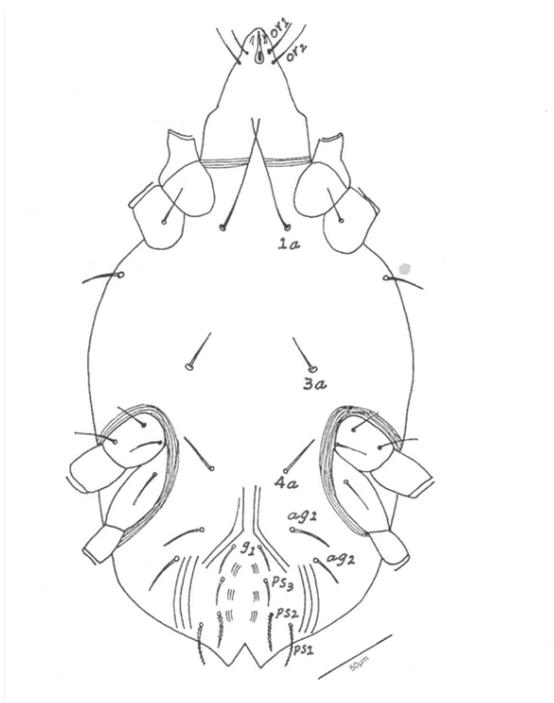


Figure 1C *Pseudostigmaeus solanumus* n.sp. (Venter)

Body long having the length of 362 (361-364)µm (without gnathosoma), 192µm (191-93) wide. Gnathosoma length 112 (112-115), Cheliceral length 78 (77-79), stylets 37 (36-38). Padipalp 102(100-104), palptarsus slightly longer than main tibial claw, palptarsus provided with 4 setae and trifidsensillum. Solenidian and spine absent. Palpfemur provided with 2 setae, palpgenu with 1 seta and palptibia with 2 setae. Peritreme prominent 52 (52-54). Eyes 1 pair, postocular body absent (Fig.1A). Propodosomal shield incomplete in appearance provided with rounded corners. The base of seta *ve* on propodosomal plate present in front of eyes. The third pair seta *sci* shorter in length than *ve*; seta *sci* and *sce* approaching outside

the propodosomal plate corners. Humeral seta *he* absent dorsally. The area of metapodal shield covered with dense striations; an incomplete line of metapodal shield visible just above the seta *e1*. All the dorsal seta shorter in length than the length of *h1* and *h2*. The particular distances between seta *vi-vi* 30 (28-32), *ve-ve* 52 (52-55), *sci-sci* 107 (105-108), *c1-c1* 60 (60-63), *e1-e1* 42 (41-43), *e1-f1* 30 (28-30), *d1-d1* 98 (96-99), *c1-d1* 87 (87-90), *d1-e1* 57 (55-57), *d2-d2* 150 (147-151), *e2-e2* 130 (130-134), *f1-f1* 75 (74-75). Dorsal setae length as *vi* 15 (15-16), *ve* 25 (24-26), *sci* 20 (18-20), *sce* 20 (20-21), *c1* 18 (17-19), *d1* 18 (18-19), *e1* 20 (20-22), *d2* 15 (15-16), *e2* 13 (13-15), *f1* 17 (17-19), *h2* 27 (26-28) and *h1* 32 (32-33).

Venter: Ventrally gnathosoma provided 2 pair of sub capitular setae i.e or 1, or 2. three pair of ventral idiosomal setae (1a, 3a, 4a), 1st pair greatly longer than others. Area between coxae III and coxae IV covered with striations. Humeral seta *he* seen able. Smooth 2 pairs of anogenital setae *ag1*, *ag2*, genital setae *g1* pair, and three pair of setae *ps3*, *ps2* and *ps1* slightly barbed (Figure 1C).

Legs: The arrangement and numbers of setae legs I=IV i.e., Chaetotaxy includes solinidion on tarsus (Figure 1D): coxae 2-01-2-2; trochanters 01-01-01-2; femora 04-04-2-2; genua 03-1-0-0; tibiae 04-5-4-4; tarsi 10-7-7-6.

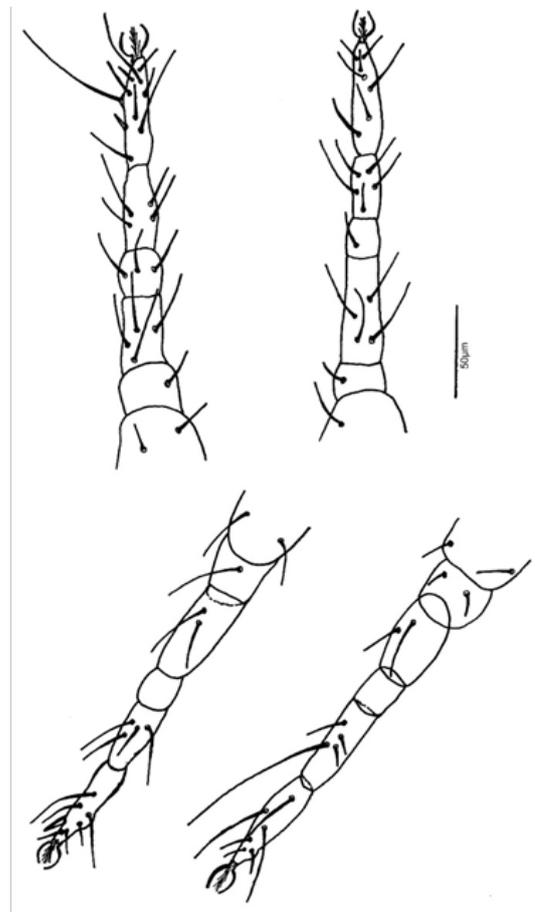


Figure 1D *Pseudostigmaeus solanumus* n.sp. Legs I-IV

Etymology: The new species name is agreed according to the crop from where it was collected.

Adult Male: Yet unknown

Type: The female (Holotype) collected from Muzafarghar (South

Punjab) by Bilal Saeed Khan on Brinjal crop (*Solanum melongena*). 12 para type females collected from same locality and 3 paratypes collected from Jhang city on Bitter gourd. All collected individuals were placed in laboratory of Acarology, Department of Entomology, University of Agriculture, Faisalabad.

Key to genus *Pseudostigmaeus* form Punjab, Pakistan (females)

- A. Tridentate spine absent on tarsalpeg; palptibia with 1 seta; palp tarsalpeg equal with main claw; dotted striations on propodosomal shield; 11-pairs dorsal setae...*angensis* (n.sp)
- B. Tridentate spine present; palptibia with more than 1 seta; palp tarsalpeg longer than main claw; propodosomal shield without dotted striations; 12-13 pairs dorsal setae..... 2
- C. Propodosomal shield incompletely visible; the base of metapodal shield visible; ventral idiosoma partially striated; paraproctal setae serrate/ barbed..... *solanumus* (n.sp)
- D. Propodosomal shield completely visible; the base of metapodal shield not visible; ventral idiosoma completely striated; paraproctal setae not serrate.....3
- E. Dorsal setae smooth; humeral seta ventrally present; anogenital plate not rounded in shape; smooth paragenital setae; barbed anogenital setae; 3 setae on tibia-I.....*sorghumus* (n.sp)
- F. Dorsal setae not smooth; humeral seta ventrally absent; anogenital plate rounded shape; paragenital setae not smooth; anogenital setae not barbed; more than 3 setae on tibia-I.....4
- G. Palpgenu with 2 setae; postocular body absent; seta fl present; 4 pairs of anogenital setae; ventral idiosoma provided with 5 setae..... *ueckermani* (Ueckermann)
- H. Palpgenu without setae; postocular body present; seta fl absent; 3 pairs of anogenital setae; ventral idiosoma provided with 6 setae*capensis* (Meyer).

Note: (Male and immatures were not in collection and yet unknown.)

Remarks: I

This new species is closely resembled with *P. jhangensis* 2014 but can be differentiated due to following morphological points:

- a) Peritremal length 52µm in this n.sp. while 75µm in *Pseudostigmaeusjhangensis*.
- b) Propodosomal shield incompletely visible while completely visible in *Pseudostigmaeusjhangensis*.
- c) Humeral seta ventrally visible while absent in *Pseudostigmaeusjhangensis*.
- d) *Sci-sci* 107µm while 132µm in *Pseudostigmaeusjhangensis*.
- e) Venter of gnathosoma provided with 2 pairs of setae while 3 pairs in *Pseudostigmaeusjhangensis*.

- f) 4 pairs of setae (g1, ps1-ps3) within genital chamber in this n.sp. provided ps2 and ps1 barbed while 3 pairs in *Pseudostigmaeusjhangensis*.
- g) Chaetotaxy of leg I-IV differ remarkably in both species.
- h) Ventral idiosomal setae 3 in this new species, while 4 in *Pseudostigmaeusjhangensis*.

Remarks: 2

This new species also having some similar characters with *P. ueckermani*, but can be separated due to following characters:

- a) The number of setae remarkably different on leg I-IV.
- b) Dorsal setae vary in length and distances/ ratio in both of species.

Acknowledgments

None.

Conflicts of interest

The authors declared there is no conflict of interest.

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