

A NEW PREDATORY MITE SPECIES OF THE GENUS PSEUDOSTIGMAEUS WOOD (ACARI: STIGMAEIDAE) FROM PAKISTAN

Bilal Saeed Khan^{1*}, Muhammad Hamid Bashir¹, Muhammad Afzal², Sabyan Faris Honey¹, Irshad Ahmad Tabassum³ and Muhammad Asif Qayyum¹

¹ Department of Entomology, University of Agriculture, Faisalabad

² University College of Agriculture, University of Sargodha, Sargodha

³ Department of Pest Warning & Quality Control of Pesticides

ARTICLE INFORMATION

Received: February 5, 2013

Received in revised form: August 10, 2014

Accepted: October 20, 2014

*Corresponding Author:

Bilal Saeed

bilalentomologyuaf@gmail.com
bsk_1703@yahoo.com

ABSTRACT

Pseudostigmaeus jhangensis sp. n. is described and illustrated here as adult female, collected from a weed, *Convolvulus arvensis* L. from Jhang, Punjab, Pakistan. The genus *Pseudostigmaeus* can be distinguished from other genera it by the presence of 3 pairs of setae on median propodosomal plate, the presence of inter coxal plates and 1-2 setae on coxa II. Body soft and weakly reticulated, chelicerae separated, Palptibia with 2 simple setae, main claw sometimes with 1 accessory claw, palptarsus sometimes bearing 2-4 setae, 1 soledion, 1 spine and 1 trifid eupathidium. Dorsal setae 11-13 pairs. Dorsum covered by 1 propodosomal shield and rarely 1 pair of small surandal shield. Propodosoma 1 pair of eyes. Mostly the genital area provided with a single genital pore, 3 pairs of anogenital setae and 2-3 pairs of paraproctal/ paragenital setae. This new species is compared with *Pseudostigmaeus capensis* and *Pseudostigmaeus ueckermanni* in this manuscript.

Keywords: *Pseudostigmaeus*, Stigmaeidae, Acari, Predatory mite

INTRODUCTION

Mites belonging to family stigmaeidae constitute a large cosmopolitan group of almost 300 species grouped into 29 genera. Stigmaeid mites are well known predators against the phytophagous mites, small soft bodied insects and frequently collected from aerial plant parts and soil leaf litter.

Wood 1967 erected the genus *Pseudostigmaeus* based on type species as *Pseudostigmaeus collyerae* and *Pseudostigmaeus striatus* at the same time. Meyer and Ryke (1969) described *P. capensis* from South Africa and redefined the genus with a new diagnosis. But later on, the species *P. capensis* Meyer and Ryke (1969) designated as the genotype of a new genus *Parastigmaeus* (Kuznetzov, 1984). Wood (1970) described 1 species from Campell Island. Wood provided a key to species from New Zealand in 1971. Momen (1987) described a species from apple tree in Ireland. A new species *P. ueckermanni* was also described from China in 1987. Six (6) species of this genus already described named as *Pseudostigmaeus collyerae* Wood, *Pseudostigmaeus arboricolus*, *Pseudostigmaeus longisetis*, *Pseudostigmaeus*

schizopeltatus, *Pseudostigmaeus striatus* and *Pseudostigmaeus ueckermanni* Fan & Liu.

Diagnosis

The genus *Pseudostigmaeus*, can be distinguished from other genera it by the presence of 3 pairs of setae on median propodosomal plate, the presence of inter coxal plates and 1-2 setae on coxa II. Body soft and weakly reticulated, chelicerae separated, Palptibia with 2 simple setae, main claw sometimes with 1 accessory claw, palptarsus sometimes bearing 2-4 setae, 1 soledion, 1 spine and 1 trifid eupathidium. Dorsal setae 11-13 pairs. Dorsum covered by 1 propodosomal shield and rarely 1 pair of small surandal shield. Propodosoma 1 pair of eyes. Mostly the genital area provided with a single genital pore, 3 pairs of anogenital setae and 2-3 pairs of paraproctal/ paragenital setae. The mites of this genus were recorded from New Zealand, China, Ireland, South Africa, respectively. A new species has been collected by the author from Punjab, Pakistan and described here in this manuscript which is compared with *Pseudostigmaeus capensis* and

Pseudostigmaeus ueckermanni. The genus *Pseudostigmaeus* is closely resemble with the members of the genus *Apostigmaeus* but they differ on the basis of the presence/absence of post ocular bodies and shape of dorsal shields in said species.

MATERIALS AND METHODS

Mite of the genus *Pseudostigmaeus* (Stigmaeidae: Acari) were collected from Jhang on Lehli weed (*Convolvulus arvensis*) (Bilal Saeed Khan) by adopting sieve collection method. Permanent slides were prepared by using Hoyer's medium under binocular microscope. The identification of species was done with the help of existing keys and literature. Grandjean's system of terminology (1944) with modifications and additions made by Summers (1960) and Gonzalez (1965) has been used in this work. All measurements were made in micrometres (μm).

Results and Discussion

Pseudostigmaeus jhangensis n.sp.

Female (Dorsum)

Body robust 350 (without gnathosoma), 220 wide, chelicerae 78, stylets 37. Padipalp 107, peritreme 75, palptarsus equal in length with tibial claw. Palptarsus provided 3 minute setae without trifold sensillum (Fig. 1). Eyes 1 pair. Post ocular body sometimes present. Propodosomal shield very prominent and complete with 2 pairs of setae *ae* and *be* (Fig. 1). Seta *ce* outside from propodosomal shield. Few dotted striations within the propodosomal shield. The third pair of seta *ce* shorter in length than *be*. A distinct line is present, separating the area between propodosomal and metasomal shields. Metapodal shield incomplete near the setae *c* and *lm* (Fig.1). Humeral seta *he* absent, seta *be* is the longest seta among all dorsal setae. The respective distances between *ae-ae* 40, *be-be* 77, *ce-ce* 132, *a-a* 67, *b-b* 89, *c-c* 94, *la-la* 162, *lm-lm* 171, *c-li* 49, *a-b* 75, *b-c* 45, *li-li* 81. The respective length of dorsal setae *ae* 17, *be* 30, *ce* 20, *a* 15, *b* 15, *c* 15, *la* 13, *lm* 13, *li* 20, *le* 13 and *e* 27.

Venter

Venter gnathosoma with 3 pairs of setae. 4 pairs of idiosomal setae, 1st pair much longer than others. Humeral seta *he* absent. paragenital 2 pairs, barbed setae. setae 3 pairs. Anogenital plate smoothly striated. Whole ventral idiosoma covered with straight and transverse striations (Fig. 2).

Legs

Chaetotaxy of leg I-IV (Fig. 3): coxae 2-2-2-2; trochanters 1-1-1-1; femora 3-3-1-3; genua 2-1-0-0; tibiae 5-5-5-5; tarsi 7-8-7-7.

Etymology

This new species is named according to locality from where it was collected.

Adult Male (Unknown)

Type

Holotype, female collected from Jhang from a weed *Lehli* (*Convolvulus arvensis* L.) on 15-03-2006. Seven paratypes were collected from the same locality and six were collected from Khanewal on Cotton crop *G. hirsutum* on 17-03-2006. All specimens were deposited in Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad (Table 1).

Remarks: 1

This new species closely resembled with *Pseudostigmaeus ueckermanni* Fan and Liu, 1999 but it can be easily separated from *P. ueckermanni* by following characters:

1. Propodosomal shield bearing 3 pairs of dorsal setae in *Pseudostigmaeus ueckermanni* while 2 pairs of dorsal setae in *Pseudostigmaeus jhangensis*.
2. Propodosomal shield without post ocular bodies in *Pseudostigmaeus ueckermanni* while present in *Pseudostigmaeus jhangensis*.
3. Dorsal setae situated on small platelets in *Pseudostigmaeus ueckermanni* while these platelets are not such prominent in this new species.
4. Cheliceral length 97 μm in *Pseudostigmaeus ueckermanni* while 78 μm in this new species.
5. One trifold eupathidium/ sensillum present in *P. ueckermanni* while absent in this new species.
6. Chaetotaxy of leg 1-4 different in both species.
7. *ag2* and *ag3* on agential shield in *P. ueckermanni* while these shields on venter absent in this new species.

Remarks: 2

This new species closely resembled with *Pseudostigmaeus capensis* Meyer but separated it due to following points:

1. Chaetotaxy of leg I-IV differ remarkably in both species.
2. Sub equal length of dorsal setae and distance ratio in both species.

KEY TO GENUS PSEUDOSTIGMAEUS FORM PUNJAB, PAKISTAN (Females)

1. Propodosomal shield incompletely visible; metapodal shield visible; ventral idiosoma partially striated; anogenital setae serrate *solanum* (n.sp)
Propodosomal shield completely visible; metapodal shield not visible; ventral idiosoma completely striated; anogenital setae not serrate 2
2. Dorsal setae smooth; humeral seta ventrally present; anogenital plate not rounded in shape; smooth paragenital setae; barbed anogenital setae; 3 setae on tibia-I *sorghum* (n.sp)
Dorsal setae not smooth; humeral seta ventrally absent; anogenital plate rounded in shape; paragenital setae not smooth; anogenital setae not barbed; more than 3 setae on tibia-I 3

3. Tridentate spine absent on tarsal peg; palptibia with 1 seta; palp tarsal peg equal with main claw; dotted striations on propodosomal shield; 11-pairs dorsal setae..... *P. jhangensis* (n.sp)
 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 4
4. Palpgenu with 2 setae; postocular body absent; seta fl present; 4 pairs of anogenital setae; ventral idiosoma provided with 5 setae
*ueckermanni* Fan and Liu, 1999
 Palpgenu without setae; postocular body present; seta fl absent; 3 pairs of anogenital setae; ventral idiosoma provided with 6 setae
*P. capensis* Meyer,

ACKNOWLEDGEMENT

I am obliged to Dr. Eddi Ueckermann, Dr. Fan, Dr. Salih Dogan and Dr. Shamshad Akbar for their help and providing literature and guidance.

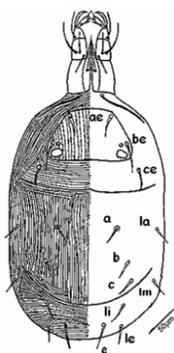


Fig. 1
Pseudostigmaeus jhangensis n.sp. Dorsal view

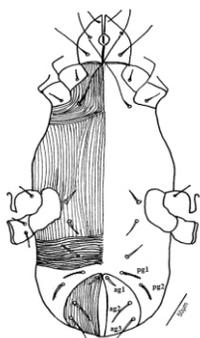


Fig. 2
Pseudostigmaeus jhangensis (n.sp.) B. Ventral side

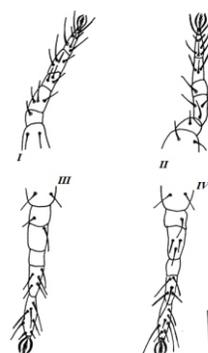


Fig. 3
Pseudostigmaeus jhangensis n.sp. B. Leg I-IV

REFERENCES

Fan, Q.H. and X. Liu, 1999. New species of *Ledermulleriopsis* Willmann and *Pseudostigmaeus* Wood from China (Acari: Prostigmata: Stigmaeidae). Syst. Appl. Acarol., 4: 153-158.

Gonzalez, R.H., 1965. A taxonomic study of the genera *Mediolata*, *Zetzellia* and *Agistemus* (Acari: Stigmaeidae) Univ. Calif. Publ. Ent., 41: 64 pp.

Grandjean, F., 1944. Observations sur les acariens de la famille des stigmaeidae. Arch. Sci. Phys. Nat., 26: 103-131.

Kuznetsov, N.N. and V.M. Petrov, 1984. Predacious mites of the blatic republics (Parasitiformes: Phytoseiidae, Acariformes: Prostigmata). Zinatne, Riga, USSR, 144 pp.

Meyer, M.K.P. and P.A.J. Ryke, 1959b. Mites of the superfamily Raphignathoide (Acari: Prostigmata) associated with South African plants. Ann. Mag. Nat. Hist., 13(2): 209-234.

Meyer, M.K.P. and P.A.J. Ryke, 1969. Some stigmaeid mites from South Africa (Acari: Trombidiformes). Acarologia, 11(2): 207-217.

Momen, F.M., 1987. Three new species of stigmaeid mites (Acari; Prostigmata) from Ireland. Zeitschrift fur Angewandte Zoologie, 74(2): 223-229.

Summers, F.M., 1960. Several stigmaeid mites formerly included in *Mediolata* redescribed in *Zetzellia* Oudemans and *Agistemus*, new genus. Proc. Ent. Soc. Wash., 62(4): 233-247.

Wood, T.G., 1967. New Zealand mites of the family Stigmaeidae (Acari: Prostigmata). Trans. Roy. Soc. N. Z. Zool., 9(9): 93-139.

Wood, T.G., 1968. A new species of *Cheyllostigmaeus* willmann (Acari: Stigmaeidae) from New Zealand. N. Z. J. Sci., 11(2): 276-279.

Wood, T.G., 1970. Stigmaeidae (Acari: Prostigmata) from Campbell Island. Acarologia, 12(4): 677-683.