Pak. j. life soc. Sci. (2011), 9(1): 28-32

Pakistan Journal of
Life and Social Sciences

Description and Distribution of A New Species, *Petrobia chaudhrii* (Acarina: Tetranychidae) from Punjab, Pakistan

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Abstract

Mites belonging to family Tetranychidae are well known pest of crops, vegetables and fruit plants. A new species of genus, *Petrobia* (Acari: Tetranychidae) has been reported first time from Punjab, Pakistan. *Petrobia chaudhrii* n. sp. was collected from *Oxalis corniculata* from Rawalpindi, Punjab, Pakistan. The collected specimens were mounted on the glass sildes using Hoyer's medium and the drawings of various body parts were drawn with the help of ocular grid under a high power microscope. The species were compared with the already described species. The description and illustration of main body parts and collection sites are also given. The type was deposited in the Acarology Research Laboratories, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

Keywords: Acarina; Tetranychidae; *Petrobia chaudhrii*

Introduction

Mites are very small and microscopic organisms belonging to the subclass Acari and the class Arachnida consisting of a group of fauna of the Phylum Arthropoda. The tetranychid mites are present on crops, vegetables, fruit plants, ornamental and forest plants as they are phytophagus in nature. They are also called as spider mites, because many of the spider mites spin webbing on the food plants. The genus *Petrobia* (Acarina: Tetranychidae) was first reported by Murray (1877) and designated *Petrobia latens* Muller as type species. Four species were re-described by Pritchard and Baker (1955). Murray, *Tetranychina* Banks and *Mesotetranychus* Reck using the size of setae and presence or absence of setae on strong tubercles. Baker and Pritchard (1960) added one new species. Mason (1964) and Tuttle and Baker (1964) also added one and two species, respectively. Chaudhri (1972) carried out taxonomic studies of the mites belonging to the genus *Petrobia* and described three new species from Pakistan. Akbar (1990) conducted a survey and recorded two new species, *Tetranychus erastus* and *Tetranychus caro* from the family Tetranychidae infesting sunflower in Pakistan. Tan and Wang (1992) described a new species, *Petrobia xinjiangensis* sp. nov. of the genus *Petrobia* from Xinjiang province of China. Kamran and Azal (2004) described a new species, *Petrobia kleptis* Kamran and Afzal of the family, Tetranychidae from Pakistan. Sabri and Afzal (2007) described a new species, *Perobia afzali* from Layyah (Punjab), Pakistan and also gave its distribution record in the Punjab, Pakistan. Sabri and Afzal (2008) explored another new species, *Petrobia layyahensis* from this family. A little research work has been done concerning the Tetranychidae in Pakistan. Keeping in view the economic importance of the tetranychid mites, the present project was undertaken to study the systematics and biodiversity in order to explore the new species, their abundance, and distribution in different climatic regions of the Punjab, Pakistan. The present authors have recorded and described a new species of this genus from Rawalpindi (Punjab Province), Pakistan.

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Materials and Methods

Collection localities

Different localities were surveyed extensively for the collection of tetranychid mites from the various climatic regions of the Punjab, Pakistan following Ahmad (1951). Collection localities are given in Table 1. **A.** Irrigated low land, (South West Punjab and Thal)
B. Semi-arid (Central Punjab)
C. Sub-humid (Sub mountain North)
D. Eastern un-irrigated Desert
E. Sub-mountain West

Methods of Collection:

The following two procedures were used for the collection of mites.

A. Sieve Method:

This method was used for on the spot collection in the fields. A sieve was held over a piece of white paper and the different plant parts were shaken and beaten on it. The mites, which fell on the piece of paper, were collected and stored in 70% alcohol having a few drops of glycerin. The collection labels were put into the vials.

Table 1 Localities and sources of collection

Locality/Region	No. of Paratypes	Date	Source
Bhakkar/A	5	20-4-2005	*Zizyphus jujuba*
Multan/A	1	19-8-2006	*Gossypium hirsutum*
Toba Tek Singh/B	6	20-6-2005	*Rosa indica*
Rawalpindi/C	7	11-7-2005	*Oxalis corniculata*
Bahawalpur/D	2	11-9-2005	*Saccharum bengalensis*
Rahim Yar Khan/D	2	27-6-2006	*Sorghum vulgare*

B. Berlese's Funnel Method

The samples of leaves of various plants were brought in the laboratory and this material was kept in the funnels for at least 24 hours under the source of light. The mites moving away from light fell down into the beaker having 70% alcohol with a few drops of glycerin. These mites were stored in small vials and collection labels were placed into them.

Preparation and Examination of Permanent Slides

The slides of specimens prepared by using Hoyer's medium were studied with the help of a high power phase contrast microscope. Drawings of different body parts of these mites were prepared out by using an ocular grid. With the help of stage and ocular micrometer, the measurements of different body parts of the collected specimens in each genus were made in µm. The magnification is also given along with each drawing. All the species have been described in detail. Comprehensive keys for all the species recorded from the Punjab under each genus were prepared to include new species described in the present investigations following Chaudhri et al. (1974). Name to the new species was given following the rules of International Code of Zoological Nomenclature (Ride et al., 1985).

Results and Discussions

Description: Description is presented for female, while that of male is not found in the fields surveyed.

Dorsum: Body 470 µm long (without gnathosoma**),** 400 µm wide. Palpus distal segment with 3 sensory and 3 tactile setae, tibia claw well developed with 2 setae reaching the entire length of distal segment of palpus (Fig. 1). Stylophore rounded anteriorly with many papillae (Fig. 2A). Peritreme ends in a heart shaped bulb like enlargement (Fig. 2A). Propodosomal area laterally pebbled and rest with pitted striations but in middle, irregular pitted striations present. Hysterosoma with regular dotted striations; transverse between central Setae 1 and 11, longitudinal in between central setae II, and III; transverse between central setae II and III and also transverse posteriorly up to clunal setae and laterally with longitudinal striations. Eyes, 2 pairs, 1 pair on each side. Dorsal setae on strong tubercles and blunt ended, spines numerous towards the tip. Clunal setae marginal in position. Setae longer than distance between their bases. Dorsal propodosomal setae 1, humeral and clunal setae shorter than other setae on dorsum. Propodosomal setae, 3 pairs, 75 µm, 120 µm, 95 µm long, respectively. Hysterosomal setae, 10 pairs; central setae 3 pairs, 150µm, 150µm, 162µm, respectively; humeral setae, 1 pair, 75µm; lateral setae, 3 pairs, 130µm, 138µm, 138µm; outer and inner sacral setae each 1 pairs, 138µm and 150µm long, respectively. Clunal setae, 1 pair, 100µm. (Fig.1).

Venter: Venter covered with transverse and longitudinal, dotted striations. Genital setae 3 pairs, simple; pregenital setae 2 pairs, simple; anal setae, 2pairs, simple (Fig. 2B).

Legs: Legs 4 pairs not very long, segments of leg with transverse wrinkled striations. Leg 1 longest as 512µm, 42µm more long as the body length. Leg II, 275µm long. Leg III 318µm long and leg IV, 350µm long. Setae and Solenidion on leg I-IV; coxae 2-2-1-1, trochanters 1-1-1-1, femora 6-3-2-2, genua 4-4-3-3, tibiae 12-6-7-7, tarsi 16-8-8-8 (Fig. 2C).

Male: Not known

Key to species of genus *Petrobia* from Pakistan

1. (i) Dorsal setae set on strong tubercles longer than the distance of setae next in line…….…….2
   (ii) Dorsal setae not set on strong tubercles shorter than the distance of setae next in line……...7
2. (i) Midrib of dorsal setae giving raised appearance to the setae.……*Petrobia tribulus* Chaudhri
   (ii) Dorsal setae spiny without raised midrib with or without tubercles……..…..3
3. (i) Dorsal body striations, simple ……
   ..……..……*Petrobia afzali* Sabri and Afzal.
   (ii) Dorsal body striations dotted……...…4
4. (i) Stylophore rounded anteriorly…….....5
   (ii) Stylophore slightly notched medio-anteriorly…
   ……..……...*Petrobia nocitus* Chaudhri
5. (i) Palp tibial claw reaching entire length of palptarsus……
   ....*Petrobia layyahensis* Sabri and Afzal
   (ii) Palp tibial claw not reaching entire length of palptarsus…….……6
6. (i) Peritreme enlarged and hooked distally.……
   ……..*Petrobia kleptes* Kamaran and Afzal.
   (ii) Peritreme ends in heart shaped bulb like enlargement……...…*Petrobia cardi* Chaudhri.
7. (i) Dorsal body striations pitted……..…
   ……...…… *Petrobia chaudhrii* n. sp.
   (ii) Dorsal body striations simple ……
   ……..……*Petrobia latens* (Muller).

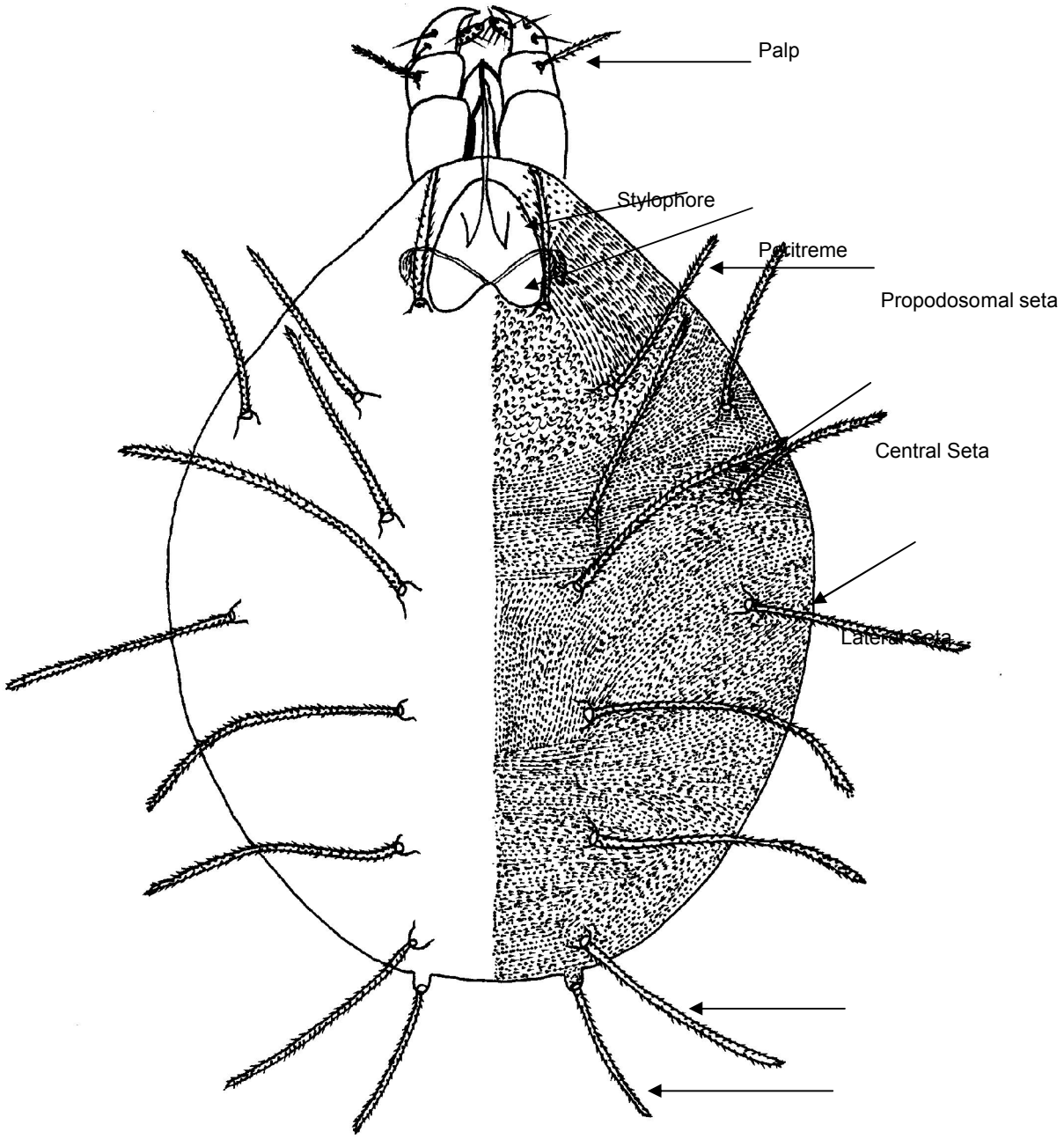

Fig. 1. ***Petrobia chaudhrii;*** **DORSAL SIDE**

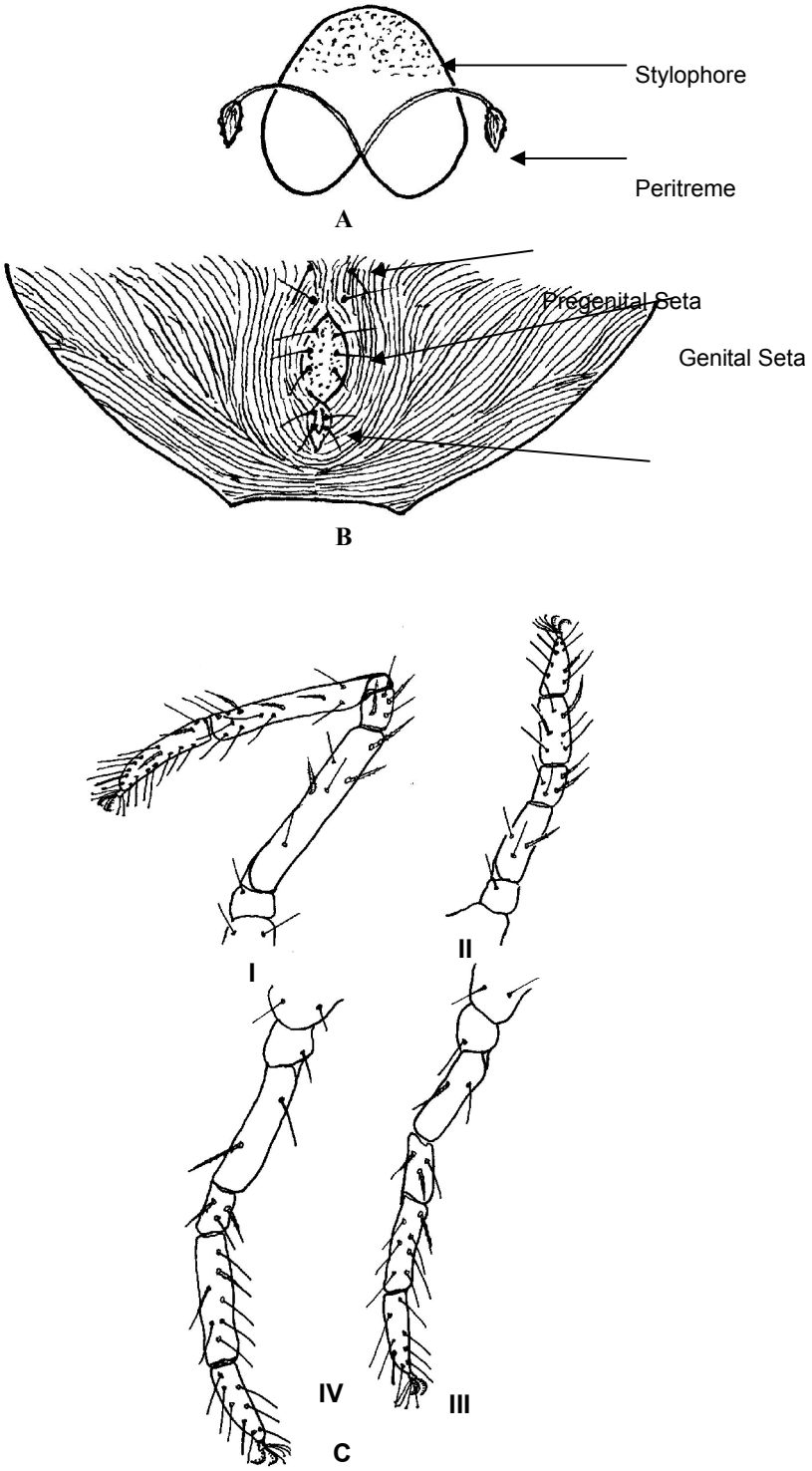

Fig. 2. ***Petrobia chaudhrii;*** **A, STYLOPHORE AND PERITREME; B, VENTER*;* C, LEGS I-IV.**

Remarks

This species closely resembles with *Petrobia cardi* chaudhri but differs due to the following body characters:

1. In this new species, length of legs, I-IV ranges from 275 µm to512 µm, But in *Petrobia cardi*, length of legs I-IV, ranges from 516 µm to 1165µm (leg 1 in this species, 512µm and in *Petrobia cardi,* 1165µm).

2. In this new species, length of tibial claw equal to entire length of palptarsus but in *Petrobia cardi*, tibia claw reaching 2/3 of palptarsus. Setae on legs I-IV differ in both the species.

Etymology

The species name is given after the name of Dr. Wali Muhammad Chaudhri (Late), Acarologist and Professor Emeritus in the Department of Agri. Entomology, University of Agriculture, Faisalabad.

Type

Holotype female was collected from Rawalpindi (Sabri) on 11-07-2005 from Khatti mithi, (*Oxalis corniculata*) and deposited in Acarology Research Laboratory, University of Agriculture, Faisalabad. Twenty-three female paratypes collected from following localities are listed in Table 1.

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