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NEW SPECIES OF THE GENUS *BREVIPALPUS* (ACARINA: TENUIPALPIDAE) FROM PAKISTAN

BY Shamshad AKBAR* and Shakila KHALID**

**SUMMARY:** The genus *Brevipalpus* is a cosmopolitan phytophagous genus of world-wide economic importance. The authors describe four new species, *B. juncus, B. solidus, B. hafizii* and *B. portheo*, belonging to *californicus, obovatus* and *phoenicis* groups from Pakistan.

**INTRODUCTION**

The genus *Brevipalpus* of the family Tenuipalpidae is a cosmopolitan genus containing species of economic importance. Keeping its importance in view, many workers explored the brevipalpid fauna of their respective regions. The most significant contributions are those of BAKER (1949), BAKER & TUTTLE (1964, 1987), BAKER et al. (1975), CHAUDHRI (1974), DeLEON (1961 a, b), MEYER (1979) and MITROFANOV (1973), who have contributed a lot to the knowledge of this genus. MITROFANOV (1973), on the basis of the varying number of dorsocentral and dorsolateral hysterosomal setae, segregated the new genera *Hyste­ripalpus, Brachypalpus, Tauripalpus* and *Pritchardipalpus* from *Brevipalpus*. But, according to MEYER (1979), the species included in these new genera, in spite of the setal differences, are congeneric. The present authors also do not agree with MITROFANOV (1973) concerning the creation of these new genera, on the basis that, when all other characters are uniform, the number of body setae alone is not sufficient to create new genera. BAKER et al. (1975) and MEYER (1979) divided *Brevipalpus* into distinct groups. However, as the authors, do not agree with the synonymizing of genus *Cenopalpus* with *Brevi­palpus* by MEYER (1979), only on the basis of setal differences, the groups harbouring species of genus *Cenopalpus* under *Brevipalpus* have not been adopted.

In Pakistan, the systematic work on the genus *Brevipalpus* carried out by CHAUDHRI et al. (1974), SIDDIQUE et al. (1979), IJAZ & AKBAR (1984) and AKBAR (1985) is worth mentioning. They have added 33 species to this genus. Now, as a result of surveying some areas, four new species have been added to this genus, raising the total to 37 species from Pakistan.

BAKER et al. (1987) proposed a setal nomenclature for tenuipalpid mites, but LINDQUIST (1985) had previously proposed a nomenclature for body setae and dorsum of tenuipalpid mites which was also followed.

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CALIFORNICUS GROUP

_Brevipalpus juncus_ sp. nov.  
(Fig. 1 A–D)

**FEMALE.** Body 229 \( \mu m \) long (without rostrum), 135 \( \mu m \) wide. Rostrum reaching middle of femur I. Rostral shield deeply notched, pitted, with a few vertical lines, 1 conical median, 2 small and 2 well-developed ancillary lobes on one side, 1 large conical median and 3 well-developed ancillary lobes on other side (Fig. 1 C). Palpus 4 segmented, terminal segment with 1 solenidion (\( \omega \)) and 2 setae (Fig. 1 B). Prodorsum entirely reticulated, 3 pairs setae, serrate, \( V2 = 5 \mu m, SC1 = 10 \mu m, SC2 = 13 \mu m \) long. Eyes 2 pairs, 1 pair on each side (Fig. 1 A). Opisthosoma reticulated medially and mediolaterally, lateral area with striations. Reticulations longer than wide medially up to caudal end (Fig. 1 A). Dorsocentral opisthosomal setae 3 pairs, slightly lanceolate, \( c1 = 5 \mu m, dl = e1 = 8 \mu m \) long. Dorsolateral opisthosomal setae, 7 pairs, slightly lanceolate, serrate, \( c3 = d3 = e2 = e3 = f3 = 8 \mu m, h2 = h1 = 5 \mu m \) long, shorter than distance between their bases, except \( h2 \) being longer than distance \( h2-h1 \) (Fig. 1 A).

Venter with reticulations posterior to apodemes of coxae I and II and lateral to apodemes of coxae II. Coxae I and II striated. Reticulations anterior to apodemes of coxae III, posterior to apodemes of coxae IV, in front of coxae III and IV, anterior and lateral to ventral shield. Reticulations anterior to ventral shield broader than long, meeting in the middle. Area between setae \( IC4a \) covered with reticulations extending behind setae \( IC3a \) (Fig. 1 B). Setae \( IC1a \), 1 pair, 36 \( \mu m \) long. Setae \( IC3a \) and \( IC4a \) each 1 pair, 10 \( \mu m \) and 31 \( \mu m \) long, respectively, \( IC4a \) longer than distance to base of setae \( IC3a \). Ventral shield reticulated, setae \( ag \) 1 pair, 5 \( \mu m \) long. Genital shield with broken transverse striations, 2 pairs of setae, simple, \( g1 = g2 = 13 \mu m \) long. Anal shield striated, 2 pairs of setae, \( PS1 = 8 \mu m, PS2 = 10 \mu m \) long, simple (Fig. 1 D).

Leg segments wrinkled. Setae on leg segments: coxae 2-2-1-1, trochanters 1-1-2-1, femora 4-4-2-1, genua 3-3-1-1, tibiae 5-5-3-3. Setae on tarsi not clear. Dorsal setae on femora I and II shorter than width of segment. Tarsus II with 2 sensory pegs.

**MALE.** Unknown.

**TYPE.** Holotype female, collected 3 km S. Karachi on 27 March, 1995 (Shamshad Akbar) from "Niazbo" (Ocimum basilicum) and deposited in the Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

**REMARKS.** This new species can be separated from _Brevipalpus californicus_ (Banks) on the basis of the following points: rostral shield striated in _californicus_, but dotted in this new species; opisthosoma medially with striations in _californicus_, whereas it is reticulated in the new species; area anterior to ventral shield without reticulations medially beyond \( IC4a \) setae in _californicus_ whereas it is reticulated in the new species.

This new species can also be separated from _Brevipalpus disparis_ Akbar on the basis of the following points: rostral shield striated in _disparis_, but dotted in the new species; prodorsal setae I simple in _disparis_, while lanceolate, serrate in the new species; genital shield setae serrate in _disparis_, whereas they are simple in the new species.

OBOVATUS GROUP

_Brevipalpus solidus_ sp. nov.  
(Fig. 2 A–D)

**FEMALE.** Body 239 \( \mu m \) long (without rostrum), 166 \( \mu m \) wide. Rostrum reaching middle of femur I. Palpus 4 segmented, terminal segment with 1 solenidion (\( \omega \)) and 1 seta (Fig. 2 B). Rostral shield pitted, deeply notched with 1 median conical and 3 ancillary lobes on each side (Fig. 2 C). Prodorsum reticulated mediolaterally, median and lateral areas without reticulations. Prodorsal setae 3 pairs, serrate, \( V2 \) minute, \( SC1 = 8 \mu m, SC2 = 5 \mu m \) long. Eyes 2 pairs, 1 pair on each side (Fig. 2 A). Opisthosoma with reticulations...
Fig. 1: *Brevipalpus juncus* n. sp. A. — Dorsal side. B. — Palpus. C. — Rostral shield. D. — Ventral side.
Fig. 2: *Brevipalpus solidus* n. sp. A. — Dorsal side. B. — Palpus. C. — Rostral shield. D. — Ventral side.
mediolaterally, medially striations meeting in the middle, few broken striations on lateral sides directed marginally (Fig. 2 A). Dorsocentral opisthosomal setae: 3 pairs, serrate, measuring $c1 = 7 \mu m$, $d1 = e1 = 3 \mu m$ in length. Dorсолateral opisthosomal setae 6 pairs, slightly lanceolate serrate, $c3 = 4 \mu m$, $d3 = 3 \mu m$, $e2 = e3 = h2 = 5 \mu m$, $h1 = 8 \mu m$ long, shorter than distances between their bases. A pair of pores present (Fig. 2 A).

Venter with reticulations anterior and lateral to apodemes of coxae II, anterior and lateral to coxae III. Coxae I and III with striations. Area in front of coxae III and IV with striations, reticulations anterior and lateral to ventral shield. Anterior reticulations meeting in the middle, covering entire area and extending behind bases of setae $IC3a$ (Fig. 2 D). Setae $IC1a$ 1 pair, 39 $\mu m$ long, setae $IC3a$ and $IC4a$ each 1 pair, 3 $\mu m$ and 39 $\mu m$ long, respectively, $IC4a$ longer than distance to base of setae $IC3a$. Ventral shield reticulated, setae $ag$ 1 pair, 10 $\mu m$ long. Genital shield reticulated, setae 2 pairs, $g1$ and $g2$, each 10 $\mu m$ long. Anal shield reticulated, 2 pairs of setae, $PS1$ 8 $\mu m$ long, serrate, $PS2$ minute (Fig. 2 D).

Leg segments wrinkled. Setae on leg segments: coxae 2-2-1-1, trochanters 1-1-2-1, femora 4-4-2-1, genua 3-3-1-1, tibiae 5-5-3-3. Setae on tarsi not clear. Dorsal seta on femora I and II lanceolate, serrate, smaller than width of segment. Tarsus I with 1 sensory peg (Fig. 2 A).

**MALE. Unknown.**

**TYPE.** Holotype female, collected 3 km N. Karachi on 24 March, 1995 (Shamshad Akbar) from undetermined host plant No. 2691 and deposited in the Acarology Research Laboratory, Department of Agricultural Entomology, University of Agriculture, Faisalabad, Pakistan.

**REMARKS.** This new species comes close to *Brevipalpus amicus* Chaudhri but can be separated from it on the basis of the following points: rostral shield simple in *amicus*, whereas they are $\frac{1}{2}$ the width of segment in *amicus*, but only 3 are present in the new species; palpus terminal segment with 2 setae in *amicus* as opposed 1 seta in new species; a mediolateral ridge present in *amicus*, but absent in new species; dorsal setae on femora I and II more than $\frac{1}{2}$ the width of segment in *amicus*, whereas they are $\frac{1}{2}$ the width of segment in the new species.

This new species can also be separated from *Brevipalpus origanum* Baker et al. on the basis of the following points: rostral shield simple in *origanum*, but dotted in this new species; palpus terminal segment with 2 setae in *origanum* as opposed to 1 seta in the new species; prodorsum punctate mediolaterally in *origanum*, but without ornamentation in the new species.

**PHOENICIS GROUP**

*Brevipalpus haftizii* sp. nov.

(Fig. 3 A–D)

**FEMALE.** Body 232 $\mu m$ long (without rostrum), 156 $\mu m$ wide. Rostrum reaching middle of femur I. Palpus 4-segmented, terminal segment with 1 solenidion ($\omega$) and 2 setae (Fig. 3 B). Rostral shield narrowly notched, striated, 1 median conical and 4 ancillary lobes on each side (Fig. 3 C). Prodorsum reticulated mediolaterally, reticulations fading away near lateral margins. Large, thick-walled areolae mediolaterally (Fig. 3 A). Prodorsal setae: 3 pairs, lanceolate, serrate, measuring $V2$ 8 $\mu m$, $SC7$ 10 $\mu m$, $SC2$ 13 $\mu m$ long. Eyes 2 pairs, 1 pair on each side. Opisthosoma reticulated near central suture, reticulations mediolaterally behind setae $dl$ and $el$, reticulations form wavy lines meeting in middle and caudally. Broken striations laterally on opisthosoma (Fig. 3 A). Dorsocentral opisthosomal setae 3 pairs, simple, $c1$ minute, $dl$ 8 $\mu m$, $e1$ 5 $\mu m$ long. Dorсолateral opisthosomal setae 6 pairs, lanceolate, serrate, $e3 = d3 = 8 \mu m$, $e2 = e3 = h2 = 10 \mu m$, $h1 = 13 \mu m$ long, all shorter than distances between their bases (Fig. 3 A).

Venter with striations at bases of coxae I and II. Reticulations posterior and lateral to apodemes of coxae II. Striations in front of coxae III and IV. Reticulations anterior to apodemes of coxae III and posterior to apodemes of coxae IV. Area anterior and lateral to ventral shield with reticulations, anterior reticulations meeting in middle and extending behind setae $IC3a$ (Fig. 3 D). Setae $IC1a$ 1 pair, 31 $\mu m$ long. Setae $IC3a$ and $IC4a$ each 1 pair, 5 $\mu m$ and 21 $\mu m$ long, respectively, $IC4a$ much shorter than distance.
to base of seta IC3a. Ventral shield reticulated, setae ag 1 pair, simple, 8 μm long. Genital shield with reticulations, setae 2 pairs, g1 and g2 each 13 μm long, simple. Anal shield with zigzag lines, 2 pairs of setae, PSI and PS2, each 8 μm long, simple (Fig. 3 D).

Leg segments wrinkled. Setae on leg segments: coxae 2-2-1-1, trochanter 1-1-2-1, femora 4-4-2-1, genua 3-3-1-1, tibiae 5-5-3-3. Setae on tarsi not clear. Dorsal seta on femora I and 11 lanceolate, serrate, shorter than the width of respective segment. Tarsus II with 2 sensory pegs.

**MALE: Unknown.**

**TYPE:** Holotype female, collected 12 km N. Karachi on 3 September, 1994 (Shamshad AKBAR) from neem (Azadirachta indica) and deposited in the Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

**REMARKS.** This new species can be distinguished from *Brevipalpus karachiensis* Chaudhri on the basis of the following points: rostral shield with 3 ancillary lobes on each side in *karachiensis* (4 in the new species); prodorsum reticulate medially in *karachiensis* (thick-walled areolae in the new species); opisthosoma with wavy striation between central setae dI and eI (reticulate in the new species); genital shield striated in *karachiensis* (reticulated in this new species).

The new species can also be separated from *Brevipalpus phoenicis* (Geijskes) on the basis of ancillary lobes of the rostral shield, the presence of areolae medially on prodorsum and the length of setae IC4a. The ornamentation and number of ancillary lobes of rostral shield, reticulate pattern of dorum, length of setae IC4a and pattern of the anal shield ornamentation separate this new species from *Brevipalpus nocivus* Siddiqui et al.

The new species can be separated from *Brevipalpus phoenicoides* Gonzalez on the basis of the different shape of the rostral shield, the pattern of body reticulation and striation, and the form of the dorseocentral opisthosomal setae (serrate in phoenicoides, but setiform, simple in this new species).

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**Brevipalpus portheo** sp. nov.  
(Fig. 4 A–D)

**FEMALE.** Body 239 μm long (without rostrum), 156 μm wide. Rostrum reaching tip of femur I. Palpus 4-segmented, terminal segment with 1 solenidion (w) and 2 setae (Fig. 4 B). Rostral shield deeply notched, striated, a few reticulate elements at base, 1 median conical and 2 ancillary lobes on each side (Fig. 4 C). Prodorsum with a few reticulate elements mediolaterally, fading away medially and laterally. Prodorsal setae: 3 pairs slightly lanceolate, serrate, measuring V2 8 μm, SCI 10 μm, SC2 13 μm in length. Eyes: 2 pairs, 1 pair on each side. Opisthosoma with reticulations mediolaterally near central setae eI, caudally elements broken, longer than wide meeting in middle (Fig. 4 A). Dorsocentral opisthosomal setae 3 pairs, slightly lanceolate, serrate, each 5 μm long. Dorsolateral opisthosomal setae 6 pairs, lanceolate, serrate, c3 = d3 = e2 = 10 μm, e3 = 8 μm, h2 = h1 = 10 μm long, all shorter than distances between their bases. A pair of pores present (Fig. 4 A).

Venter with reticulations anterior and lateral to apodemes of coxae II. Coxae I and II with striations. Reticulations anterior to apodemes of coxae III, posterior to apodemes of coxae IV, anterior and lateral to ventral shield. Anterior reticulations fading away in the middle, mediolateral reticulations in front of coxae IV extend up to base of setae IC4a (Fig. 4 D). Setae IC1a 27 μm long, IC3a and IC4a each 1 pair, 8 μm and 29 μm long, respectively, IC4a longer than distance to base of seta IC3a. Ventral shield reticulated, setae ag 1 pair, 13 μm long. Genital shield with wavy striations, setae g1 and g2 both serrate, each 10 μm long. Anal shield striated, setae PSI minute, PS2 5 μm long (Fig. 4 D).

Leg segments wrinkled. Setae on leg segments: coxae 2-2-1-1, trochanter 1-1-2-1, femora 4-4-2-1, genua 3-3-1-1, tibiae 5-5-3-3. Setae on tarsi not clear. Dorsal seta on femora I and II shorter than width of respective segment. Tarsus II with 2 sensory pegs.

**MALE.** Unknown.

**TYPE:** Holotype female, collected 2 km S. Karachi on 27 July, 1994 (Shamshad AKBAR) from Thuja orienta-
lis and deposited in the Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

REMARKS: This new species keys out to Brevipalpus hafizii sp. nov., but the following are the points of distinction between the two species: rostral shield with 4 ancillary lobes in hafizii (2 in portheo); prodorsum without reticulations medially in hafizii (stria­tions present in portheo); dorsocentral opisthosomal setae simple in hafizii (lanceolate, serrate in portheo); genital shield reticulated in hafizii (striated in portheo); genital shield setae simple in hafizii (serrate in portheo).

The rostral shield striations, median prodorsum lacking reticulation, ornamentation of opisthosoma, striations on the genital shield and the serrate genital shield setae separate the new species from Brevipalpus tatus Gonzalez.

The genus Brevipalpus is widely distributed in all the climatic regions of Pakistan. Until now, 33 species belonging to the californicus, phoenicis, obovatus and cuneatus groups, have been recorded and described from different regions of Pakistan. The four new species described here in the californicus, phoenicis and obovatus groups of this genus, collected from coastal areas of Karachi, contribute to the knowledge of this genus from Pakistan.

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