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SPECIES OF THE SUBGENUS *PENNASEIUS* PRITCHARD & BAKER (*PHYTOSEIUS*: PHYTOSEIIDAE: ACARINA) FROM PAKISTAN

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**INTRODUCTION**

Subgenus *Pennaseius* Pritchard & Baker of the genus *Phytoseius* of the family Phytoseiidae was erected by Pritchard & Baker in 1962 and *Phytoseius* (*Pennaseius*) amba designated as the type species. These mites are predatory in nature and play an important role in the biological control of phytophagous mites and of small soft bodied insects. A good deal of taxonomic work on these mites have been carried out in the world by Mum & Denmark (1970), Ehara & Lawrence (1971), Ehara (1972), Ehara & Bhandhufalck (1977), Ueckermann & Loots (1985) and Daneshvar (1987).

Chaudhri (1973), Shahid et al. (1982) and Khan et al. (1990) described one new species each and AFZAL et al. (2000) 2 new species in this genus from Pakistan. The authors have now collected and described 3 new species in this subgenus thus raising the total to 8 species from Pakistan.

**SUMMARY:** Three new species of the subgenus *Pennaseius* i.e., *votus*, *rufidulus* and *lapis* have been recorded and described from Pakistan. A key for 8 species, thus far, recorded from Pakistan has also been included.

**PHOTOSEIIDAE**

**PAKISTAN**

**PENNASEIUS**

- **1.** Cheliceral fixed digit with 8 teeth .................. 2
- **1.** Cheliceral fixed digit with less than 8 teeth .......... 3
- **2.** Dorsal shield with 5 pairs pores; a membranous fold present between genital and ventrianal shields ........ ........ ........ ........ 
  - *Phytoseius* (*Pennaseius*) *votus*, n.sp
- **2.** Dorsal shield with 2 pairs pores; no membranous fold present between genital and ventrianal shields ........ ........ 
  - *Phytoseius* (*Pennaseius*) *lyma* Shahid, et al.
- **3.** Cheliceral fixed digit with 2 teeth ................. 4
- **3.** Cheliceral fixed digit with 3 teeth ................. 5
- **4.** Seta *z4* serrate; macrosetae absent on leg IV distitarsus; 4 pairs pores on membrane surrounding ventrianal shield.... 
  - *Phytoseius* (*Pennaseius*) *curvatus* Chaudhri
- **4.** Seta *z4* simple; macrosetae on leg IV distitarsus present; no pore on membrane surrounding ventrianal shield. ........ ........ ........ ........ ........ ........ ........ 
  - *Phytoseius* (*Pennaseius*) *lapis*, n.sp
- **5.** Membranous fold present between genital and ventrianal shields; seta *z4* smooth; sternal setae St1-St1-St2, St2-St2-St3 ........ ........ ........ ........ ........ ........ ........ 
  - *Phytoseius* (*Pennaseius*) *lapis*, n.sp

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6. Cheliceral movable digit with 1 tooth; dorsal shield with 4 pairs pores ........................................ Phytoseius (Pennaseius) olbios Afzal, et al.

6. Cheliceral movable digit with 2 teeth; dorsal shield with 5 pairs pores ........................................ Phytoseius (Pennaseius) rufidulus, n.sp.

7. Cheliceral movable digit with 1 tooth; dorsal shield with 5 pairs pores; metapodal platelets pointed at 1 end .... Phytoseius (Pennaseius) phenaxAfzal, et al.

7. Cheliceral movable digit with 5 teeth; dorsal shield with 3 pairs pores; metapodal platelets pointed at both ends— Phytoseius (Pennaseius) venator Khan, et al.

Phytoseius (Pennaseius) votus, new species

(Fig. 1 A-F)

FEMALE:

DORSUM: Dorsal shield 270µm long, 156µm wide, smooth, deeply concave near seta s6, with 14 pairs setae and 5 pairs visible pores (Fig. 1-A). Chelicera 30 µm long, movable digit with 2 teeth, fixed digit with 8 teeth (Fig. 1-B). Dorsal and sublateral setae measuring j1 35 µm, j3 86 µm, j4 = j5 = j6 minute, J5 5 µm; z2 13 µm, z3 13 µm, z4 8 µm, z5 5 µm, Z4 58 µm, Z5 103 µm; s4 102 µm, s6 10 µm; r3 43 µm, R1 35 µm (on membrane); j3 > j3 - z2, z2 < z2 - z3, z3 = z3 - z4, Z4 > Z4 - Z5. All dorsal setae serrate except j4, j5, j6, J5; z2, z3, z4, and z5 being simple. Peritreme reaching up to seta j1 (Fig. 1-A). Peritremal shield recurved, base with pointer tip (Fig.1-E).

VENTER: Sternal shield with concave lateral margins and 3 pairs simple setae, seta St1 > St1 — St2, St2 < St2 — St3. Metasternal setae 1 pair each on a separate platelet. Genital shield 83 µm wide, wider than ventrianal shield, with 1 pair simple setae. Ventrianal shield longer than wide, 95 µm long, 55 µm wide, 40 µm apart from genital shield, a membranous fold present between genital and ventrianal shields, ventrianal shield with 3 pairs preanal setae almost in a vertical row, 1 pair para anal and 1 post anal seta, all simple, 1 pair pore on membrane surrounding the ventrianal shield. Seta JV5 thick, barbed 28 µm long (Fig. 1-C). Metapodal platelets not clear. Spermatheca bell shaped, atrium knobbed (Fig. 1-D).

LEGS: Macrosetae present on leg IV, genu, tibia, basitarsus and distitarsus measuring 20 µm, 30 µm, 33 µm and 35 µm in length, respectively. Setae on genu, tibia and basitarsus with knobbed tip but on distitarsus with bacillate tip (Fig. 1-F).

MALE: Not came in collection.

TYPE: Holotype female collected Changa Manga from Lantana (Lantana camara) on 29.ix.1995 (AFZAL), paratypes 3 females, same collection data. Three females collected Faisalabad from citrus (Citrus sinensis) on 8.ix. 1995 and 1 from Cheechawatni from Mako (Solanum nigrum) on 7.ix. 1995. All deposited in the Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

REMARKS: This new species of the genus Phytoseius belongs to the subgenus Pennaseius where seta R1 is present. It is closely related to lyma Shahid et al. However the following are the points of differences between the two.

1. — Dorsal shield smooth with parallel lateral margins in lyma whereas it is deeply concave near R1 in this new species.
**Phytoseius (Pennaseius) rufidulus**, new species (Fig. 2 A-F)

**FEMALE:**

**DORSUM:** Dorsal shield 280 μm long, 135 μm wide, smooth, with almost parallel sides with 5 pairs pores and 16 pairs setae (Fig. 2-A). Chelicera 30 μm, movable and fixed digits each with 2 teeth (Fig. 2-B). Dorsal and sublateral setae measuring: j1 30 μm, j3 73 μm, j4=j5=j6=J2 minute, J5 minute; z2 15 μm, z3 45 μm, z4 10 μm, z5 minute Z4 80 μm, Z5 88 μm; s4 105 μm, s6 93 μm; r3 60 μm, R1 50 μm (on membrane) j3 > j3 - z2, z2 > z2 - z3, z3 > z3 - z4, Z4 > Z4 - Z5. All dorsal setae serrate except j4, j5, j6, J2, J5, z2, z4, z5 and R1 being simple. Peritreme reach anterolateral to setae j3 (Fig. 2-A). Peritremal shield recurved, tip pointed (Fig. 2-E).

**VENTER:** Sternal shield not clear. Genital shield 70 μm wide, wider than ventrianal shield with 1 pair simple setae. Ventrianal shield 103 μm long, 45 μm wide, 2.5 times longer than wide, 30 μm apart from genital shield, a membranous fold present between genital and ventrianal shields. Ventrianal shield with 3 pairs preanal setae, almost in a vertical row; 1 pair para anal and 1 post anal seta, all simple, no pore on the shield. Seta JV5 thick, barbed 58 μm long. Metapodal platelets, primary 18 μm long, secondary absent (Fig. 2-C). Spermatheca bell shaped, atrium not discernible, major duct tubular (Fig. 2-D).

**LEGS:** Macrosetae present on leg IV, genu, tibia, basitarsus and distitarsus measuring 30 μm, 33 μm, 25 μm and 30 μm, respectively. Setae on genu, tibia and basitarsus with dentate tips but that on distitarsus with setaceous tip (Fig. 2-F)

**MALE:** Not came in collection.

**TYPE:** Holotype female collected Ghari Habibullah (4000 ft) from fig (Ficus carica) on 26.x.1995 (AFZAL), paratype 1 female, same collection data. All deposited in the Acerology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

**REMARKS:** This new species is related to *Phytoseius (Pennaseius) olbios* Afzal et al., however both can be separated on the basis of following points:

1. Fixed and movable digits with 2 and 1 teeth respectively in *olbios* as against 2 and 2 in this new species.
2. Number of notocephalic pores differ in both the species.
3. Pores behind seta J2 and between setae Z4 and Z5 rounded in *olbios* as against elliptical in this new species.
4. Shape of dorsal shield varies in both the species.
5. Shape of pore posterior to seta z5 differs in both the species.
6. Metapodal platelet pointed at one end in *olbios* as against pointed at both ends in this new species.
7. Shape of peritremal shield base and macrosetae on leg IV differ in both the species.

**Phytoseius (Pennaseius) lapis**, new species (Fig. 3 A-F)

**FEMALE:**

**DORSUM:** Dorsal shield 350 μm long, 203 μm wide, smooth with a few lines near setae j3 and z2, a notch
between z4 and s4 with one pair pore and 15 pairs setae (Fig. 3-A). Chelicera 35 µm, movable digit with 1 tooth, fixed digit with 3 teeth (Fig. 3-B). Dorsal and sublateral setae measuring: j1 35 µm; j3 75 µm; j4=j5 =j6 minute; J5 minute; z2 23 µm, z3 35 µm, z4 8 µm, Z4 88 µm, Z5 82 µm; s4 103 µm, s6 50 µm; r3 65 µm; R1 28 µm (on membrane); j3 >j3-z2, z2 <z2-z3, z3 <z3-z4, Z4> Z4-Z5. All dorsal setae serrate except j4, j5, j6, J5 z2, z4, z5 and R1 being simple. Peritreme reaching beyond seta j1 (Fig. 3-A). Peritremal shield base recurved, tip pointed (Fig. 3-E).

VENTER: Sternal shield with 3 pair simple setae, seta St1 < St1-St2, St2 < St2-St3. Metasternal setae 1 pair each seta on a separate platelet. Genital shield 90 µm wide, equal to ventrianal shield, with 1 pair simple setae. Ventrianal shield longer than wide, 118 µm long, 73 µm wide, 35 µm apart from genital shield, membranous fold absent between genital and ventrianal shields. Ventrianal shield with 3 pairs preanal setae almost in a vertical row, 1 pair para anal and 1 post anal seta, 1 pair pore on the opisthogastric cuticle. Seta JV5 thick, barbed 55 µm long. Metapodal platelets 1 pair, primary 23 µm long (Fig.3-C).

Spermatheca poculiform with long major duct (Fig.3-D).

LEGS: Macrosetae present on leg IV, genu, tibia, basitarsus and distitarsus knobbed at the tip, measuring 50 µm, 43 µm, 70 µm and 43 µm, respectively.

MALE: Not came in collection.

TYPE: Holotype female collected Karachi from Grapevine (Vitis vinifera) on 15.xi.1995 (AFZAL), paratype 1 female, same collection data, one female collected Hyderabad from Papaya (Carica papaya) on 13.xi.1995. All deposited in the Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

REMARKS: This new species of subgenus Pennaseius differs on the basis of the following points from thus far recorded species of this subgenus from Pakistan.

1. — Dorsal shield with a deep notch in between seta z4 and s4.
2. — All the macrosetae with drop like membrane at the tip.

REFERENCES


