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COLLECTION OF NEW SPECIES OF THE SUBGENUS *PHYTOSEIUS* (*PHYTOSEIUS*) RIBAGA FROM COASTAL AND SUBTROPICAL CONTINENTAL LOW LANDS OF PAKISTAN

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Two new species of the subgenus *Phytoseius* (*Phytoseius*) Ribaga viz., *Phytoseius* (*Phytoseius*) *seggilis,* new species and *Phytoseius* (*Phytoseius*) *terebra,* new species were collected as a result of the survey of tropical coastal lands and subtropical continental low lands of Pakistan. These species have been described and illustrated.
Keywords: *Phytoseius*, phytoseiidae, Pakistan

INTRODUCTION

Mites of the genus *Phytoseius* are very important since they are known to act as predators of the phytophagous mites particularly on Tetranychids, Eriophids and small insects. They have also been reported to prey upon aphids, scale insects, thrips, whitefly and other small arthropods (Evans, 1992). This genus was erected by Ribaga with *Gamasus plumifer* Canestrini & Fanzago in 1904 as its type species. The research work of Muma and Denmark (1968,1970), Gupta (1977), McMurtry and Morases (1991), Walter (1992), Chant and McMurtry (1994), Yoshida-Shaul & Chant (1994), Chinniah and Mohanasundaram (2001), Furtado *et al.* (2005) and Ehara (2005) on the genus *Phytoseius* is worth mentioning.

From Pakistan, Chaudhri (1973), Chaudhri *et al.*. (1979) have described 4 and 1 new species in this subgenus respectively. Shahid *et al.* (1982), Khan *et al.*. (1990), Afzal *et al.*. (2000, 2005), Afzal and Akbar (2005), each, added two new species in this genus while 2 new species are being added in this manuscript by the present authors thus, making a total of 17 species of the genus *Phytoseius* from Pakistan.

MATERIALS AND METHODS

Survey and collection of the mites of the subgenus *Phytoseius* (*Phytoseius*) Ribaga was conducted from tropical coastal lands and subtropical continental low lands. Different plants were examined thoroughly for mites of the genus *Phytoseius*. Different plant parts like leaves, soft branches and inflorescence were beaten on white paper. The mites of the family Phytoseiidae were sorted with the help of field lens and preserved in small glass vials having 50% alcohol and few drops of glycerin.

The preserved specimens were permanently mounted on the microscopic slides by using the Hoyer's medium prepared for this purpose in laboratory. These permanent mounts were studied under the phase contrast microscope. The drawings of different parts of the body like dorsal shield; chelicera, sternal, genital and ventrianal shields; spermatheca; peritremal shield base and Leg IV were prepared by using an ocular grid. These specimens were identified with the help of literature and existing keys of Afzal *et al.* (2000, 2005). The Garman System (Garman, 1948) of setal nomenclature was being followed previously, but recently it has been changed to Lindquist-Evans system (Rowell *et al.*, 1978). The authors have followed this system in this manuscript.

1. *Phytoseius* (*Phytoseius*) *seggilis,* new species (Fig. 1 A–F)

FEMALE

DORSUM: Dorsal shield 290μm long, 133μm wide, with reticulation caudally anterior to seta *Z4*. Dorsal shield without pores, setae 15 pairs (Fig. 1-A), concave near seta *s6*. Chelicera 20 μm long, teeth not clear. Dorsal and sub lateral setae measuring: *j1* 35 μm, *j3* 73 μm, *j4* = *j5* = *j6* minute, *J5* minute; *z2* 13 μm, *z3* 35 μm, *z4* 32 μm, *z5* minute, *Z4* 117 μm, *Z5* 88μm; *s4* 143 μm, *s6* 83μm; *r3* 50 μm; *j3* > *j3* - *z2*, *z2* > *z2* - *z3*, *z3* > *z3* - *Z4*, *Z4* > *Z4* – *Z5*. All dorsal setae serrate except *j4*, *j5*, *j6*, *J5*, *s4*, *z2*, and *z5* being simple. Peritreme just reaches upto setae *j1* (Fig. 1-A). Peritremal shield with sharply recurved base and pointed tips (Fig. 1-E).

VENTER: Sternal shield not clear, setae *St1* > *St1-St2*, *St2* < *St2-St3*. Metasternal setae 1 pair on separate platelets. Genital shield 80 μm wide, wider than ventrianal shield, with 1 pair simple setae. Ventrianal shield longer than wide, 80 μm long, 40 μm wide, 35 μm apart from genital shield, a membranous fold present between genital and ventrianal shields, ventrianal shield with 3 pairs pre anal setae 1st slightly displaced inwards, rest two on the margins in a row, 1

pair para anal and 1 post anal seta, all simple, no pore on the shield. Seta *JV5* thick, barbed 34 µm long. Metapodal platelets 1 pair primary, 30µm long (Fig. 1-C). Spermatheca bell shaped, atrium nodulated with long major duct (Fig. 1-D).

LEGS: Macrosetae present on leg IV, tibia, basitarsus and distitarsus measuring 90µm, 60µm and 30µm respectively. All setae simple, bacillate (Fig.1-F).

MALE: Not came in collection.

TYPE: Holotype female collected Lasbela (Baluchistan) from rose (*Rosa indica*) on 26.xi.1996 (Afzal), paratypes 2 females, same collection data 3 females from same locality collected on 28.ix.2004. All deposited in the Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

REMARKS: *Phytoseius (Phytoseius) seggilis*, new species and *Phytoseius* (*Phytoseius*) *terebra*, new species included in that group of species which have peritreme reaching seta *j1* and dorsal shield without pores. They are separated from one another due to many characters:

Phytoseius (*Phytoseius*) *seggilis*, new species can be separated from *Phytoseius terebra*, new species on the basis of following characters:

1. Seta *z4* smooth in *terebra* but serrate in this new species.
2. Shape of spermatheca differs in all the species in this group.
3. Shape of ventrianal shield differs in all the species in this group.
4. Macrosetae on tibia setaceous in *terebra* but bacillate in this new species.

2. *Phytoseius* (*Phytoseius*) *terebra*, new species (Fig. 2. A–E)

FEMALE:

DORSUM: Dorsal shield 280 µm long, 123 µm wide, a few reticulate elements present caudally between setae *j6* and *Z4*, dorsal shield without pores, setae 15 pairs, concave near seta *s6* (Fig. 2-A). Chelicera 20 µm long, movable digit with 1 tooth, fixed digit with 2 teeth (Fig. 2-B). Dorsal and sublateral setae measuring: *j1* 25 µm, *j3* 63 µm, *j4* = *j5* = *j6* minute, *J5* minute; *z2* 25 µm, *z3* 30 µm, *z4* 25 µm, *z5* minute, *Z4* 78 µm, *Z5* 53 µm; *s4* 80 µm, *s6* 68µm; *r3* 50 µm; *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. 2-A). Peritremal shield not clear.

VENTER: Sternal shield not clear, seta *St1* = *St1-St2*, *St2* = *St2-St3*. Metasternal setae 1 pair on separate platelets. Genital shield 70 µm wide, wider than ventrianal shield, with 1 pair simple setae. Ventrianal shield longer than wide, 93 µm long, 55 µm wide, 15 µm apart from genital shield, a membranous fold present between genital and ventrianal shields, ventrianal shield with 3 pairs pre anal setae almost in a semi-circular row on the margins, 1 pair para anal and 1 post anal seta, all simple, one pair pores on the shield. Seta *JV5* thick, barbed 63 µm long. Metapodal platelets 1 pair, primary 28 µm long (Fig. 2-C). Spermatheca poculiform, atrium nodulated with long major duct (Fig. 2-D).

LEGS: Macrosetae present on leg IV, tibia, basitarsus and distitarsus measuring 58µm, 30 µm and 25µm respectively. All setae simple, setaceous (Fig. 2-E).

MALE: Not came in collection.

TYPE: Holotype female collected Kohat from Sukhchain (*Pongamia pinnata*) on 13.viii.1995 (Afzal), paratype 1 female, same collection data. All deposited in the Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

REMARKS: *Phytoseius (Phytoseius) terebra*, new species is closely related to *Phytoseius* (*Phytoseius*) *kallion* Afzal and Akbar on the basis of most of the body characters but the following points separate them from each other:

1. Cheliceral fixed digit with 3 teeth in *kallion* but 2 teeth in this new species.
2. Seta *z3* serrate in *kallion* but smooth in this new species.
3. Ventrianal shield without pores in *kallion* but with 1 pair pores in this new species.
4. Membrane surrounding the ventrianal shield with 3 pairs setae in *kallion* whereas 2 pairs setae in this new species.
5. Ventrianal shield vase shaped in *kallion* but pentagonal in this new species.
6. Macrosetae on tibia with hyaline membrane at tip in *kallion* but setaceous in this new species.

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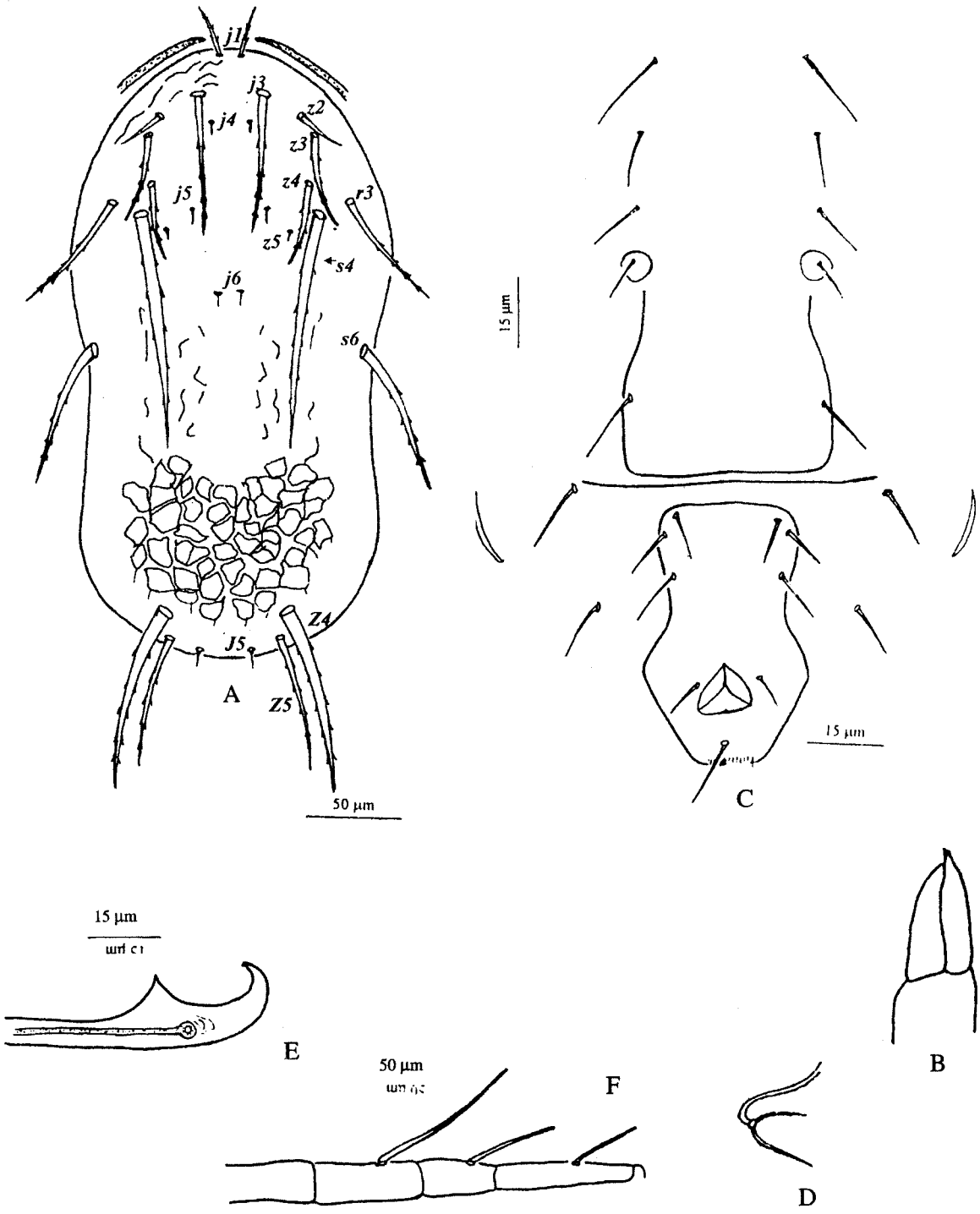

Fig.1 *Phytoseius* (*Phytoseius*) *seggilis*, n.sp.
A-Dorsal Shield; B-Chelicera; C-Sternal, genital and ventrianal shields;
D-Spermatheca; E-Peritremal Shield Base; F-Leg IV

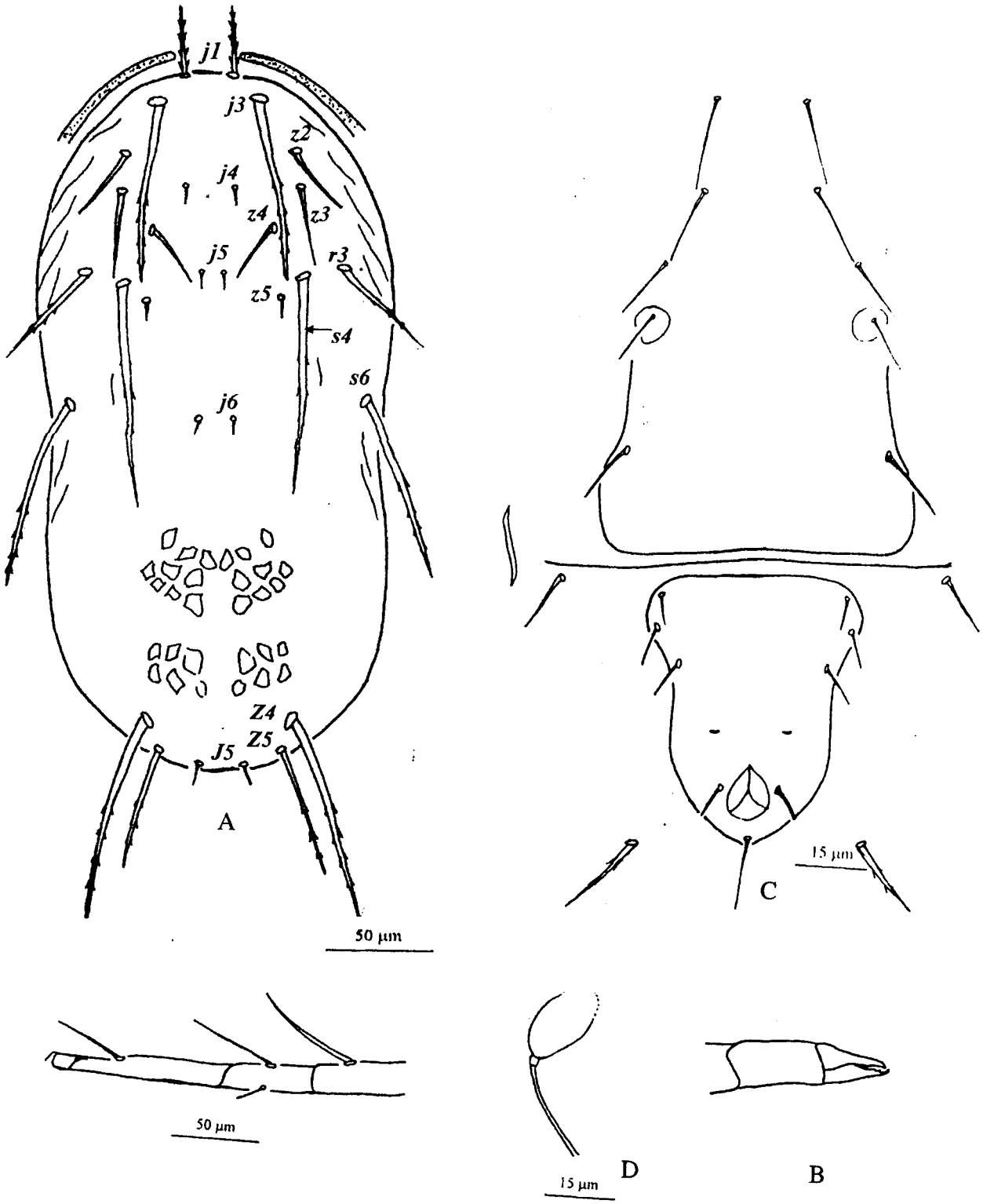

Fig 2. *Phytoseius (Phytoseius) terebra*, n.sp.
A-Dorsal Shield; B-Chelicera; C-Sternal, genital and ventrianal shields; D-Spermatheca; E-Leg IV

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