

## A New Species of the Subgenus *Phytoseius* (*Phytoseius*) Ribaga (Acari: Phytoseiidae) from Panjgur, Baluchistan, Pakistan

Muhammad Afzal\*, Muhammad Hamid Bashir, Shamshad Akbar, Muhammad Kamran and Abu Bakar Muhammad Raza

Department of Entomology, University College of Agriculture, University of Sargodha, Sargodha (MA, MK, ABMR), Department of Agri. Entomology, University of Agriculture, Faisalabad (MHB) and Department of Zoology, G.C. University, Lahore (SA)

**Abstract.**- Phytoseiid mites are efficient predators of phytophagous mites and small soft bodied insects and their eggs. A survey for the taxonomic exploration of the mites of the family Phytoseiidae from the Baluchistan province of Pakistan resulted in collection of one new species of subgenus *Phytoseius* i.e. *Phytoseius* (*Phytoseius*) *erema* from the rose plants.

**Key words:** *Phytoseius*, Phytoseiidae, phytophagous mites.

### INTRODUCTION

Members of family Phytoseiidae have gained maximum attention all over the world being predators of other harmful mites and small insects (Canlas *et al.*, 2006). Afzal *et al.* (2008) reported that the subgenus *Phytoseius* (*Phytoseius*) Ribaga is most abundant in Pakistan. They are known to act as predators of the phytophagous mites particularly on Tetranychids, Eriophids and small insects. They have also been found feeding on aphids, scale insects, thrips, whitefly and other small arthropods (Evans, 1992). This genus was erected by Ribaga (1904) with *Gamasus plumifer* Canestrini & Fanzago as its type species. A lot of taxonomic work on this subgenus has been carried out all over the world (Muma and Denmark, 1968, 1970; Gupta, 1977; McMurtry and Morases, 1991; Walter, 1992; Chant and McMurtry, 1994; Yoshida-Shaul and Chant, 1995; Chinniah and Mohanasundaram, 2001, Furtado *et al.*, 2005; Ehara, 2005).

From Pakistan, Chaudhri (1973) and 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), Afzal and Bashir (2007) each, added two new species, Afzal *et al.*,

(2006) and Afzal *et al.* (2008) each described one new species in this genus, while one new species is being added by the present authors thus, making a total of 20 species of the sub genus *Phytoseius* (*Phytoseius*) Ribaga from Pakistan.

### MATERIALS AND METHODS

Survey and collection of the mites of the subgenus *Phytoseius* (*Phytoseius*) Ribaga was conducted from Baluchistan, Pakistan. 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, 2006, 2007, 2008). Lindquist-Evans system (Rowell *et al.*, 1978) of setal nomenclature has been followed. The authors have followed this system in this

\* Corresponding author: [chafzal64@yahoo.com](mailto:chafzal64@yahoo.com)  
0030-9923/2010/0006-0715 \$ 8.00/0  
Copyright 2010 Zoological Society of Pakistan.

manuscript. All the measurements are given in  $\mu\text{m}$ .

## RESULTS AND DISCUSSION

### *Phytoseius (Phytoseius) erema*, new species

(Fig. 1)

#### Female

##### Dorsum

Dorsal shield 300 long, 145 wide, with reticulate elements posterior to seta  $j6$  caudally up to seta  $Z4$  (Fig. 1-A). Dorsal shield concave near seta  $s6$ , with 1 pair pores and 15 pairs setae (Fig. 1A). Chelicera 23 long, movable digit without a tooth, fixed digit with 2 teeth (Fig. 1-B). Dorsal and sublateral setae measuring:  $j1$  28,  $j3$  63,  $j4 = j5 = j6$  minute,  $J5$  minute;  $z2$  18,  $z3$  30,  $z4$  23,  $z5$  minute,  $Z4$  100,  $Z5$  75;  $s4$  128,  $s6$  65;  $r3$  48;  $j3 > j3 - z2$ ,  $z2 > z2 - z3$ ,  $z3 > z3 - z4$ ,  $Z4 > Z4 - Z5$ . All dorsal setae serrate except  $j4$ ,  $j5$ ,  $j6$ ,  $J5$ ,  $z2$ ,  $z4$  and  $z5$  being simple. Peritreme reaching beyond seta  $j1$  (Fig. 1A). Peritremal shield base recurved with pointed tip (Fig. 1E).

##### Venter

Sternal shield margins not clear setae 3 pairs simple, setae  $St1 < St1-St2$ ,  $St2 < St2-St3$ . Metasternal setae 1 pair on membrane. Genital shield 80 wide, wider than ventrianal shield, with 1 pair simple setae. Ventrianal shield longer than wide, 100 long, 53 wide, 18 apart from genital shield, a membranous fold present between genital and ventrianal shields, ventrianal shield with 3 pairs pre anal 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 83 long. Metapodal platelets 2 pairs primary, 28 long, secondary, displaced to a distance from primary (Fig. 1C). Spermatheca bell shaped, atrium nodulated with long major duct (Fig. 1D).

##### Legs

Macrosetae present on leg IV, tibia, basitarsus and distitarsus measuring 53, 28 and 28 in lengths, respectively, setae stout with rounded tips (Fig. 1F).

#### Male

Not came in collection.

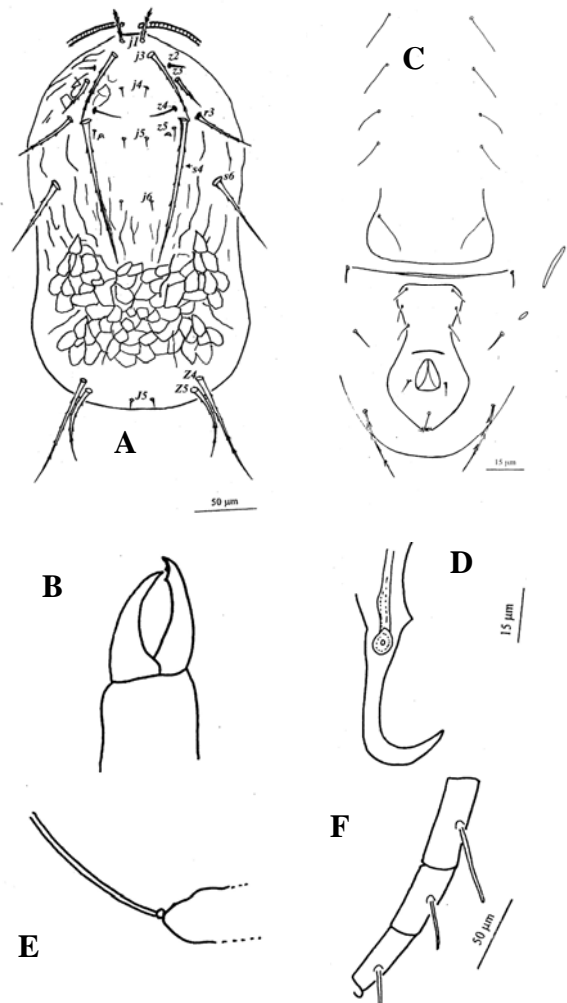


Fig. 1. *Phytoseius (Phytoseius)*, n. sp. (Female); A, dorsal shield; B, chelicera; C, sternal, genital and ventrianal shields; D, spermatheca; E, Peritremal shield base; F, leg IV.

#### Type

Holotype female collected Panjgur (Baluchistan) from rose (*Rosa indica*) on November 26, 1996 (Muhammad Afzal), paratype 1 female, same collection data. All deposited in the Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

#### Remarks

New species *Phytoseius (Phytoseius) erema* is separated from *Phytoseius (Phytoseius) statos*

Afzal, Bashir and Akbar on the basis of following points:

1. Peritreme extending beyond the base of setae *j1* in this new species while it is not reaching the base of setae *j1* in *P. statos*.
2. Peritremal shield base recurved, with pointed tip in this new species as against recurved with rounded tip in *P. statos*.
3. Macrosetae on leg IV pointed in *statos* but blunt ended on in this new species.

This new species can also be separated from *Phytoseius (Phytoseius) adornatus* Afzal, Bashir & Raza on the basis of following characters

1. Dorsal shield with one pair pores in this new species while in *adornatus* there are 5 pair pores.
2. Cheliceral moveable digit with out tooth in this new species as against *adornatus* where 1 tooth is present
3. Spermatheca bell shaped in this new species while it is poculiform in *adornatus*

## REFERENCES

- AFZAL, M. AND AKBAR, S., 2005. Two new species of the subgenus *Phytoseius* Ribaga (*Phytoseius*: Phytoseiidae: Acarina) from hilly areas of Pakistan. *Acarologia*, **45**: 253-256.
- AFZAL, M., BASHIR, M. H. AND SABRI, M. A., 2005. Two new species of the sub genus *Phytoseius (Phytoseius)* Ribaga from Chitral, Pakistan. *Pak. Entomol.*, **27**: 77-81.
- AFZAL, M., BASHIR, M.H. AND KHAN, B.S., 2008. Description of a new species *Phytoseius (Phytoseius) gleba* (Acari: Phytoseiidae) from Punjab. *Pak. Entomol.*, **30**: 95-99.
- AFZAL, M., AKBAR, S. AND QAYYUM, S., 2000. Two new species of the subgenus *Phytoseius* Ribaga (*Phytoseius*: Phytoseiidae: Acarina) from Pakistan. *Pakistan J. Zool.*, **32**:251-255.
- AFZAL, M., BASHIR, M.H., AKBAR, S. AND KHAN, B.S., 2006. Identity and distribution of a new phytoseiid (Acari) mite from Pakistan. *Pak. Entomol.*, **28**: 73-75
- AFZAL, M., BASHIR, M.H. AND KHAN, B.S., 2008. Comparison of life cycle parameters of *Phytoseius gleba* (Acari: Mesostigmata) on three phytophagous host Species. *Integr. Acarol., Proc. 6<sup>th</sup> Congr. Eur. Assoc. Acarol., Montpellier, 21-25 July, 2008*. pp. 415-419.
- AFZAL, M. AND BASHIR, M.H., 2007. Collection of new species of the subgenus *Phytoseius (Phytoseius)* Ribaga from coastal and subtropical continental low lands of Pakistan. *Pakistan J. agric. Sci.*, **44**: 141-145
- CANLAS, L.J., AMANO, H., OCHIAI, N. AND TAKEDA, M., 2006. Biology and predation of Japanese strain of *Neoseiulus californicus* (McGreagor) (Acari: Phytoseiidae). *Syst. appl. Acarol.*, **11**: 141-157
- CHANT, D.A. AND McMURTRY, J.A., 1994. A review of the subfamilies Phytoseiinae and Typhlodrominae (Acari:Phytoseiidae). *Int. J. Acarol.*, **20**: 223-310.
- CHAUDHRI, W.M., 1973. Descriptions of five new species of the genus *Phytoseius* Ribaga from Pakistan (Acarina: Phytoseiidae). *Pakistan J. Zool.*, **5**: 79-86.
- CHAUDHRI, W. M., AKBAR, S. AND RASOOL, A., 1979. Studies on the predatory leaf inhabiting mites of Pakistan. *U.A.F. Tech. Bull.*, **2**: 1-234.
- CHINNIAH, C. AND MOHANASUNDARAM, M., 2001. New species of acarine fauna (Acarina: Mesostigmata) from Shevroy Range of Eastern Ghats of Tamil Nadu, India. *Zoos Print J.*, **16**: 523-531.
- EHARA, S., 2005. A collection of Phytoseiid mites (Acari: Phytoseiidae) from Java with description of a new species. *Acta Arachnol.*, **54**: 31-39.
- EVANS, G.O., 1992. *Principles of acarology*. C.A.B. International, Univ. Press, Cambridge, U.K., pp. 563.
- FURTADO, I.P., KREITER, S., DE MORAES, G.J., TIXIER, M.-S., FLECHTMANN, C.H.W. AND KNAPP, M., 2005. Plant mites (Acari) from northeastern Brazil, with descriptions of two new species of the family Phytoseiidae (Mesostigmata). *Acarologia*, **45**: 131-143.
- GARMAN, P., 1948. Mite species from apple trees in Connecticut. *Connecticut Agric. Expt. Sta. Bull.*, **520**, 1-27.
- GUPTA, S.K., 1977. New species and records of *Typhlodromus* and *Phytoseius* from Eastern India (Acarina: Phytoseiidae). *Ind. J. Acarol.*, **2**: 1-11.
- KHAN, M. H., CHAUDHRI, W. M. AND KHAN, A.S., 1990. Two new species of subgenus *Phytoseius* Ribaga (*Phytoseius*: Phytoseiidae: Acarina) from Pakistan. *Pak. Entomol.*, **12**: 57-59.
- McMURTRY, J. A. AND MORAES, G.J., 1991. Two new Phytoseiidae (Acari: Mesostigmata) from Zimbabwe with new records of other species. *Int. J. Acarol.*, **17**: 21-27.
- MUMA, M. H AND DENMARK, H. A., 1968. Some generic description and new changes in the family Phytoseiidae (Acarina: Mesostigmata). *Fla. Ent.*, **51**: 229-240.
- MUMA, M. H. AND DENMARK, H. A., 1970. Arthropods of Florida and eighbouring land areas, Phytoseiidae of Florida. *Bureau Ent. Contrib. no. 148*, pp. 150.
- RIBAGA, C., 1904. Gamasidi Planticoli. *Riv. Pat. Veg.*, **10**: 175-178.
- ROWELL, H. J., CHANT, D.A., AND HANSELL, R.I.C., 1978. The determination of setal homologies and setal

- patterns on the dorsal shield in the family Phytoseiidae (Acarina: Mesostigmata). *Canad. Entomol.*, **110**: 859-876.
- SHAHID, M., SIDDIQUI, M. N. AND CHAUDHRI, W. M., 1982. Three new predatory mites of the genus *Phytoseius* Ribaga (Acarina: Phytoseiidae) from Pakistan. *Pak. Entomol.*, **4**: 47-56.
- WALTER, D. E., 1992. Leaf surface structure and the distribution of *Phytoseius* mites (Acarina: Phytoseiidae) in South-Eastern Australian Forests. *Aust. J. Zool.*, **40**: 593-603.
- YOSHIDA-SHAUL, E. AND CHANT, D. A., 1995. The Identity of *Phytoseius macropilis* (Banks) (Acari: Phytoseiidae), with a note on its distribution. *Canad. J. Zool.*, **73**: 1199-1206.

(Received 2 March 2009, revised 26 August 2009)