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HOLASPINA (SYN. PARHOLASPULUS) PERSICUM, A NEW SPECIES OF PARHOLOSPIDIDAE FROM IRAN (ACARI: MESOSTIGMATA)

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PARHOLASPIDIDAE IRAN

SUMMARY: A new species in the genus Holaspina (syn. Parholaspulus) is described from Tehran region (Iran). Distribution of the genus is discussed.

PARHOLASPIDIDAE IRAN

RÉSUMÉ: Une nouvelle espèce du genre Holaspina (syn. Parholaspulus) de la région de Téhéran (Iran) est décrite. La distribution du genre est discutée.

INTRODUCTION

ANTONIO BERLESE (1916) described the genus Holaspina syn. of tribe Holostaspini (type: Holaspina pulchella Berlese 1916 from Columbia, North America). Parholaspidae (=Parholaspinae Evans 1956; subfamily of Macrochelidae Vitzthum 1930) was pulled to the family rank by G. W. KRANTZ (1960) (syn. Parholaspidae) (HALLIDAY, 1995). The Parholaspidae are predators in edaphic habitats (litter, compost, and carrion).

This family gathers Eviphidoidea with lacking claw on the first pair of legs (or with reduced vestigial claws), with straight peritremes (vs. looped peritreme) and genital shield without accessory lateral sclerites.

Seven main genera (on the 13 described) are recognized: the genera Neparholaspis Evans 1956 and Holaspulus Berlese 1904 with peritremal and ventral shields fused, Neparholaspis exhibiting separate ventral and epigynial shields; Holaspina Berlese, 1916 (= Parholaspulus Evans, 1956, and Neoparholaspulus Krantz 1960 according to JOHNSTON 1969) with no connected epigynial shields, metasternal plates, anterior dorsal setae (j1) not longer than first laterodorsal setae (z1) that is present; Proparholaspulus Ishikawa 1980, with epigynial and ventral shields fused; setae j1 lack in Gamasholaspis Berlese 1903 and Euparholaspulus; in Parholaspis Berlese 1918, Krantzolaspis Petrova 1967, Parholaspella Krantz 1960, Latinella Krantz 1960 genera, setae (j1) are present but reduced in size. S naveolaspis Johnston 1969 and Hyattolaspina Datta & Battacharjee 1991 complete the list of the described genera (mostly on the base of Oriental (Asia), Eastern European, or American material).

Parholaspidae are characterised by homogenous morphology and are easily recognizable by at least 5 characters (1= dorsal shield entire, 2= with at least 27 pairs of dorsal setae, 3= presternal shields, 4= sternal shield with 3 or 4 pairs of setae, 5= metasternal shields present, free or fused).

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Material and methods

Preserved specimens (7) were collected by M. Latifi in Islamic Republic of Iran, and studied in collaboration. Specimens were mounted in Hoyer’s medium (2) or in lactic acid on temporary slides. One female and one male were dissected for description in dorsal shield, ventral shields, chelicerae, epistome, legs and infracapitulum. Measures were taken by calibrated Motic camera and by micrometer. Drawings were made with a camera lucida on the Wild EB Microscope. Setal nomenclature according to Lindquist & Evans, 1965).

Genus Holaspina Berlese, 1916

[=Parholaspulus Evans, 1956:373] [P. alstoni]
[=Neoparholaspulus Krantz, 1960:410]
[N. coalescens]

Holaspina persicum n. sp.

Description, type Type female from Jamshidieh, Tehran (Iran), collected from soil samples.

Female (Figs 1-6): Dorsal shield: 480-510 µm length, 260-370 µm width. Idiosoma: 550 µm. Extra dorsal shield setae simple. The dorsal setae (median files) are shorter than the distance between their respective bases. Total of 30 pairs of simple setae on the dorsal shield. Setae (z1) slightly shorter or as long as setae (j1).
Sternal shield: The cuticular ornamentation is indistinct in central part, visible near the anterior pair of setae and laterally at the level of the second and third pairs of legs. Sternal shield with 3 pairs of setae, anterior and lateral pairs of pores. Margins of this shield are underlined by sclerification. The prefemoral sclerites are in three rows, with one pair of smaller anterolateral sclerites. The largest sclerites are divided in paraxial and lateral part; each row ends by two minute lateral sclerites, the anterior being larger. Metasternal sclerites present, each of them with a pore and associated seta, smaller than the sternal setae.

Genital shield: enlarged posteriorly, the posterior ridge reaches the anterior edge of the ventrianal shield, with one pair of genital setae. No post-genital sclerite between genital and ventrianal shields.

Ventrrianal shield: with characteristic shape, 170-180 μm long, 140 μm width, with 6 preanal setae (one specimen with 1 additional pair); additional setae were observed in *Holaspina shigahensis* (Ishikawa, 1980).

Legs: Leg I without claw, tarsus I with one strong terminal setae distally curved. Ratio [first tarsal length/first tibial length] >2. Tarsus II with simple and short dorsal distal seta followed by a pair of dorsal simple setae.

Gnathosoma: Movable digit of chelicerae not strongly elongated (150 μm long), not with several minute teeth, but solely two teeth distant of ¼ of the length of the mobile digit, the proximal tooth being the largest. Fixed digit with two distal sharpened teeth, and with a complex dentate process. *Pilus dentilis* before three teeth. Epistome with median and lateral branches divided, deer-horn-like, with at least two branches, with 2x 5-6 teeth on the frontal edge. Palpi (285 μm long) with strong spur-like setae, with usual chaetotaxy (2-5-8-17 from femur to tarsus). Tarsi crowned by 7 simple sensory setae.

**MALE:** (Figs. 7-13) Idiosoma: 500 μm long, dorsal shield: 464 μm long, maximal width: 229 μm. Dorsal chaetotaxy and ornamentation similar to the female (irregular polygonal pattern). Indistinct medially on dorsal fields, this ornamentation is visible anteriorly. Holoventral shield (390 μm long, 142 μm wide between the second pair of legs) with 18 (9x2) simple setae and the 3 perianal setae. Porose areas. The shield is prolonged by jugular sclerites. Each sclerite is subdivided in paraxial and antiaxial sclerites. The presternal sclerites are disturbed by the male orifice if compared to the female. Two additional sclerites are placed antiaxially, less or more on the same line than the two proximal, as in female.

Gnathosoma: the chelicerae are smaller than in the female: movable and fixed digits are not so elongated, (86 and 93 μm vs. 147 and 159 μm respectively), movable digit with unique tooth, two small teeth on fixed digit. The spermatodactyl is composed by a large ampoule in the proximal part, followed by a narrow canal that opens in the distal end strongly curved. Shorter arthrodial brush than in the female. Basal lyriform organ well visible. The metasternal sclerites extend forward and surround the ¾ of the base of the fourth pair of legs.

The second pair of legs is strongly modified. Femur with two ventral spurs, proximal being the strongest facing forward to a smaller expansion bearing a simple seta. Genual with a large and a small teeth, the large bearing a simple seta.
Differential diagnosis:

*Holaspina persicum* and *alstoni* are both small, similar in shape and share homologous epistome. However *H. persicum* can be differentiated by several characters: the terminal setae of PII are not thickened and stout as in *H. alstoni*; the lateral branches of the epistome are more developed, the shape of presternal sclerites differs in shape, the length of the arthrodial brush is shorter than 1/3 of the movable digit, the epigynial shield extends to the anterior part of the ventrianal shield. More conspicuous differences were noted with the description of *H. alstoni* particularly on the relative proportions (see measures given by Ishikawa, 1980).

**DISCUSSION**

The genus *Parholaspulus* (syn.) was first recorded in Europe, i.e. *H. alstoni* (Evans 1956) thus from Russia and Asia or Costa Rica. This genus was found in a large range of habitats (Ishikawa 1980). These predaceous mites are free living. Several species were described from Asian parts, Russia, Hawaii, New Guinea... but few data are available from Western Europe (Plumari 2003) and Canary Islands (Moraza & Peña, 2006). However, the record of the type species (Evans 1956) in a botanical garden might get credible the hypothesis of accidental introductions in Europe, (this species has been collected from USA, Sakhalin, Russia and South Asia). The presence of this new species in Iran is the first record...
for the Middle East Region whereas in Oriental Region, this family is widely distributed (Xiang et al. 2003)

It is difficult in the actual state of knowledge to assess the origin of this genus. However the higher diversity (hot spot?) is in the Oriental Region. These mites are of a great interest: among the Parholaspidae (and as in the genus Holastaspis), at least one species described in the genus exhibits claws on PI (Ishikawa, 1980). This character should signify that the lack of the claw occurred independently, or more probably, that the species with claws on PI could be considered as a “survivor of ancient times”. If this family can be qualified as “primitive”, it could be a good indicator, first from a biogeographic point of view, and then, of great interest to reconstruct the phylogeny of Eviphidioidea. That H. alstoni (Evans, 1956) was found in Europe in Kew (UK), in a botanic garden, that this family was known as invading mites introduced with ornamental plants (the neighbour genus Holaspulus sp. (?) was brought with Camelia spp., an ornamental plant native from Japan but brought from New Zealand, in Canada), that our samples were collected in Iranian gardens, make us hypothesizing that the distribution could be greatly facilitated by human activities and that the actual distribution depends on several introductions.

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