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## A new species of *Holoparasitus* OUDEMANS, 1936 from North Italy (Acari: Gamasida: Parasitidae)

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**ABSTRACT.** A new mite species *Holoparasitus paradisiacus* (Parasitidae) from the neighbourhood of Verona (North Italy) is described. The species has been included into the *Holoparasitus calcaratus* species-group.

**Key words:** acarology, taxonomy, Parasitidae, *Holoparasitus*, new species, Italy.

The genus *Holoparasitus* OUDEMANS, 1936, was recently an object of extensive studies. It comprised three subgenera (*Holoparasitus* s. str., *Heteroparasitus* JUVARA-BALS, 1975 and *Ologamasiphis* HOLZMANN, 1969), but the last two subgenera were redefined by JUVARA-BALS (2002) and all three taxa were upgraded to the generic rank: *Holoparasitus* OUDEMANS, 1936 – with species character sets as defined by HYATT (1987), *Heteroparasitus* JUVARA-BALS, 1975, and *Ologamasiphis* ATHIAS-HENRIOT, 1971. Moreover, several species of *Holoparasitus* originally characterized by Antonio Berlese were redescribed and new species were distinguished using the material deposited in the BERLESE Acaroteca in Florence and obtained from other sources by the authors (JUVARA-BALS & WITALIŃSKI, 2000; WITALIŃSKI & SKORUPSKI, 2002, 2003). As a result, the genus has expanded to 34 species, currently not subdivided into subgenera, although some species are assembled into 4 groups: *caesus* (4 species), *mallorcae* (6), *peraltus* (2), and *calcaratus* (6). For the last group, the diagnosis and species contents were recently redefined (WITALIŃSKI & SKORUPSKI 2002). *Holoparasitus paradisiacus* n. sp., described in this paper, is the seventh species belonging to this group.

***Holoparasitus paradisiacus* n. sp.**

(Figs 1-17)

## ETYMOLOGY

The specific name refers to its locus typicus, Vajo del Paradiso (Paradise Valley) in the northern surroundings of Verona, North Italy.

## DIAGNOSIS

Female: sternal shield complete; anterior margin of presternal plate smooth; endogynium cup-shaped, circular, with two straight main thorns located posteriorly and 5 minute denticles regularly distributed along the remaining perimeter of the endogynium opening; epigynial subapical structure pyriform with two concavities corresponding to small protrusions of paragynia margins; lateral hyaline protrusions three-sided, only moderately extending beyond the epigynium margin; foveolae surrounding gland pores *gv2* absent.

Male: moderately pronounced excipulum with two arcuate shallow concavities, its lateral margins not overlapped by cuticular lamellae; gnathotectum „lobe-type”, central lobe terminally obtuse and ending with 3 minute spines; hypostomatic setae on a separate fragment of cuticle; the cuticle surrounding gland pores *gv2* normally developed; spur on genu II roughly conical with rounded apex at distal margin of segment; spur on tibia with slightly concave edge ending before the distal margin of segment, spur base broad (especially in distal portion).

## DESCRIPTION

Female. Idiosoma well sclerotized, brownish. Approximate length of idiosoma (specimen squashed): 650  $\mu\text{m}$ . Dorsal setae very short, 8-11  $\mu\text{m}$ .

Ventral side (fig. 1). Presternal plate in the form of a smooth ribbon, narrower medially and fused partially (anteriorly) to lateral platelets; its postero-lateral ends pointed (fig. 2). Anterior margin of sternal plate with shallow concavity as long as presternal plate. Sternum reticulation well pronounced except for the posterior portion, demarcated by a line running through the second pair of pores (*pst2*). Setae of sternogenital region from 34  $\mu\text{m}$  (*st1*) to 52  $\mu\text{m}$  (*st3*) in length, setae on opisthogaster ca. 20-22  $\mu\text{m}$  long.

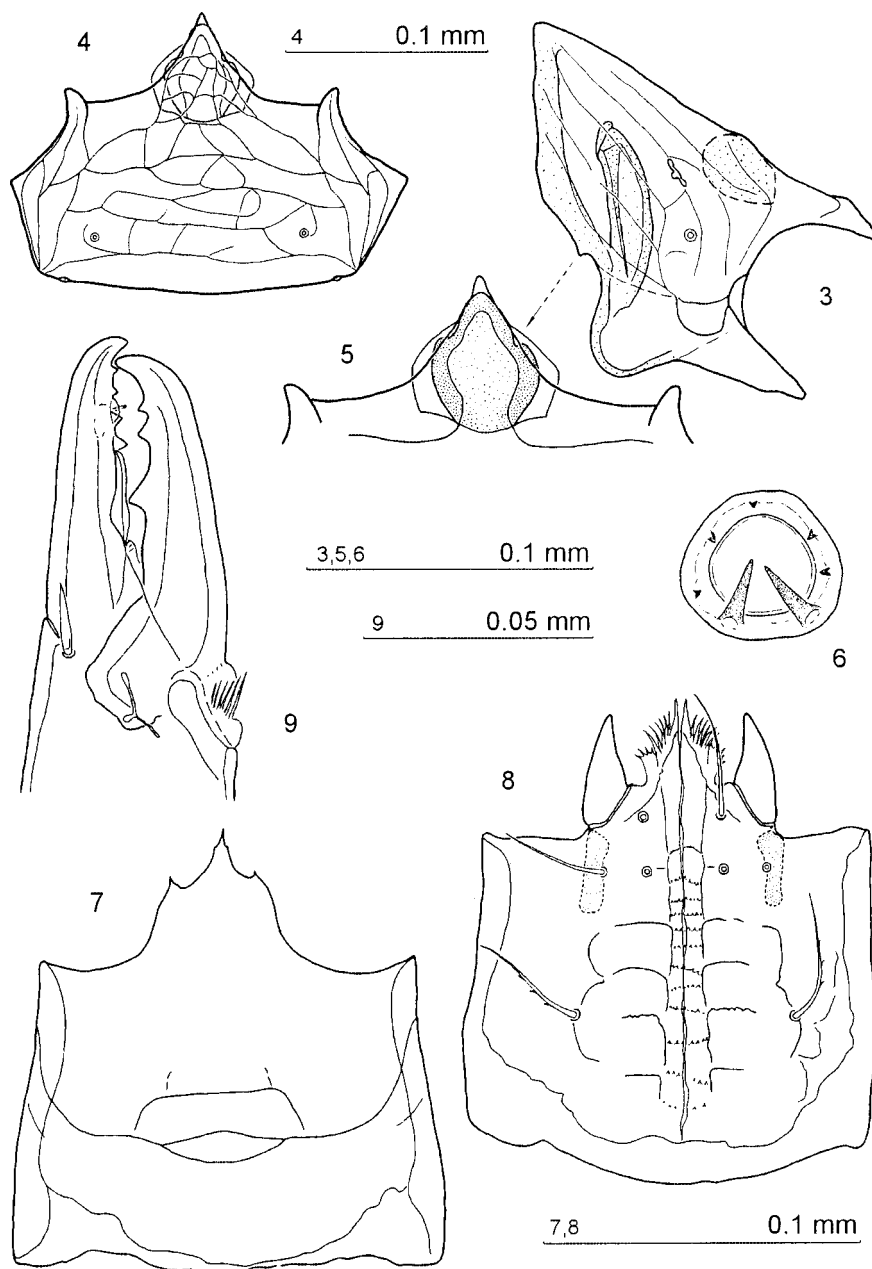
Genital region (figs 3-6). Paragynial shield (fig. 3) with thickened adaxial border; metagynial sclerite arcuate; postero-lateral protrusion “locking” epigynial plate large and semicircular; underside of anterior paragynial edge, facing coxa III, with distinct, roundish thickening. Epigynial shield (figs 4, 5) heptagonal, central apex with concave margins, lateral prongs curved abaxially. Subapical structure pyriform, with lateral incisions corresponding to denticles at adaxial paragynial margins. Each hyaline lateral protrusion three-sided; its anterior side extends beyond the epigynium margin. Endogynium (fig. 6) cup-shaped and circular, with two straight main thorns located posteriorly and 5 minute conical denticles radially distributed on the remaining portion of the endogynial margin.

The endogynial sac circular and toothless. Gland pores gv2 well visible, slit-like, surrounded by normally sclerotized cuticle. Opisthogaster with 8 pairs of setae.

Gnathosoma (figs 7, 8). Gnathotectum trispinate. Corniculi conical. Hypognathal groove with 12 rows of denticles. Palpcoxal setae finely barbed, hypostomatics simple.



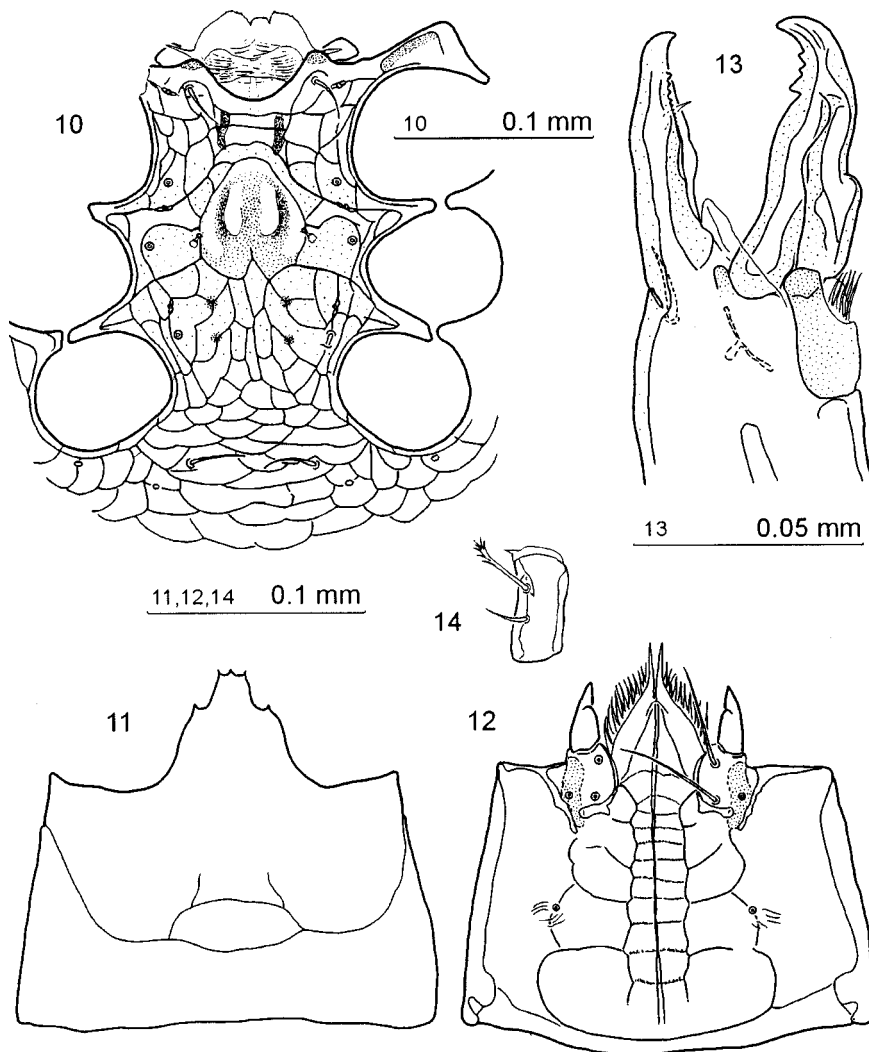
1, 2. *Holoparasitus paradisiacus* n. sp., holotype, female: 1—ventral side of idiosoma, 2—presternal plate



3-9. *Holoparasitus paradisiacus* n. sp., holotype, female: 3 – paragynium, 4 – epigynum, 5 – epigynial subapical thickening, 6 – endogynium, 7 – gnathotectum, 8 – ventral view of gnathosoma, 9 – lateral (abaxial) view of chelicera

Chelicerae (fig. 9). Distal half of the fixed digit with two teeth in front and two larger ones behind pilus dentilis; the latter two denticles located more adaxially. Posterior half of fixed digit with lamellar edge. Movable digit with three teeth; proximal tooth larger and slightly distant.

Pedipalps. Trochanter with finely barbed setae *v1* and *v2* of similar size, anterolateral seta of femur spatulate and finely pectinate on one edge, anterolateral setae of genu spatulate.



10-14. *Holoparasitus paradisiacus* n. sp., paratype, male: 10 – sternogenital region, 11 – gnathotectum, 12 – ventral view of gnathosoma, 13 – adaxial view of chelicera, 14 – palptrochanter, setae *v1* and *v2*

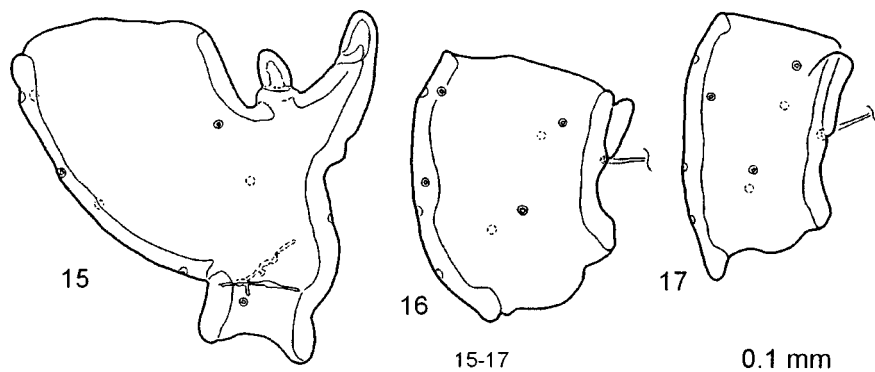
Legs. Leg structure and setation unremarkable.

Male. Idiosoma brownish, well sclerotized. Measurements of idiosoma cannot be taken since the specimen is dissected. Dorsal setae very short, 6-8  $\mu\text{m}$ .

Ventral side (fig. 10). Presternal plates roughly triangular with rounded corners. Three-lobate genital lamina with two lateral acute prongs is located in a deep concavity of the sternum margin. Central lobe much smaller than the lateral ones; their anterior edges dentate. Dumbbell-shaped cuticle thickening located in a more dorsal position. Sternogenital shield with excipulum moderately pronounced in the form of two shallow, arcuate concavities. Sternal reticulation: transverse bands in front of and longitudinal scales behind the excipulum area. Gland pores *gv1* with large dilatation of channel at *st3* level; two pairs of weakly pronounced button-like thickenings at level of *pst3* pores and *st4* setae. Gland pores *gv2* in unmodified cuticle. Sternal setae ca. 46  $\mu\text{m}$  long (*st1*), opisthogastric setae 15-20  $\mu\text{m}$  long.

Gnathosoma (figs 11, 12). Gnathotectum (fig. 11) trispinate: lateral spines acute, central prong lobate and obtuse terminally with three tiny spines on the anterior margin. Hypognathal groove with 11 rows of well-visible denticles (fig. 12); palpcoxal setae missing in this specimen. Hypostomatic setae simple with less sclerotized incisions on cuticle located posteriorly. Corniculus with a protuberance on adaxial border.

Chelicera (fig. 13). Fixed digit with a row of more than 6 very small denticles located on adaxial (internal) side, in front of pilus dentilis, gradually diminishing towards base of digit. A lamella with a slightly undulated edge is situated more externally (abaxially). Movable digit with 3 teeth located in its terminal portion: one large proximal tooth followed by 2 small distal teeth. Ventral margin of digit markedly projected in its basal portion. Arthrodistal membrane formed by a fringe, synarthrodial membrane triangular.



15-17. *Holoparasitus paradisiacus* n. sp., paratype, male, anterior view of leg II (for most setae only location is shown): 15 – femur, 16 – genu, 17 – tibia

Pedipalps. Trochanter (fig. 14) with setae *v1* simple, *v2* evidently longer, barbed at one edge and brushy terminally; anterolateral seta of femur spatulate and finely pectinate on one edge, anterolateral setae of genu spatulate.

Legs. Legs I, III, and IV unremarkable. Leg II spurred as follows (figs 15-17): the main spur on femur moderately large, finger-like, slightly curved towards the segment. Axillary process rounded terminally and also somewhat curved towards the segment. Small tubercle located ventrally at main spur base. Spur on genu roughly conical; its rounded apex located at the distal margin of segment. Spur on tibia with a broad base (especially in distal portion) and slightly concave edge ending just before the distal margin of the segment.

#### TYPE MATERIAL

Holotype female (slide no. 1012-A1, -A2, -A3), paratype male (slide no. 1012-B1, -B2, -B3, -B4), 27.11.1973, Vajo del Paradiso, Verona surroundings, North Italy, grassland.

The types were collected by the staff of the Department of Evolutionary Biology, University of Siena, Italy, and deposited in the Zoological Museum of the Jagiellonian University, Cracow, Poland.

#### REMARKS

*H. paradisiacus* n. sp. belongs to the *calcaratus* species-group due to characters presented in both the female and male. The presternal plate in the female has an anterior margin devoid of any denticles or corrugations; the endogynium is cup-shaped, roundish, with two main thorns located posteriorly. Group-related features in the male include a gnathotectum with a lobate central prong and an excipulum present on the sternum.

The *Holoparasitus calcaratus* group contains seven species, including the one described here: *H. calcaratus* (KOCH, 1839), *H. excipuliger* (BERLESE, 1906), *H. kerkirensis* WITALIŃSKI et SKORUPSKI, 2002, *H. paradisiacus* n. sp., *H. pollicipatus* (BERLESE, 1903), *H. pseudoperforatus* (BERLESE, 1906), and *H. rotulifer* (WILLIAMS, 1940). The female of *H. paradisiacus* possesses an endogynium with a toothless endogynial sac, which together with the absence of a distinct spherular organ and the presence of a minute denticle instead of a large anterior main endogynial thorn, makes it most similar to *H. pollicipatus* (BERLESE, 1903) and *H. calcaratus* (KOCH, 1839). In *H. pollicipatus* (BERL.), however, the epigynial subapical structure is different: its hyaline protrusions are rounded laterally and extend far beyond the epigynium margin, whereas in *H. paradisiacus* each lateral protrusion is three-sided with the anterior side moderately extending beyond the epigynium margin. Females of the new species and of *H. calcaratus* (KOCH) are the most similar, although in the latter the anterior main endogynial thorn is noticeably larger; moreover, the lateral presternal platelets are free.

The male of *H. paradisiacus* differs from *H. rotulifer* (WILLMANN) and *H. excipuliger* (BERL.) in excipulum structure - in the latter two species the excipulum

is much more pronounced. The absence of foveolae surrounding gland pores *gv2* distinguishes *H. paradisiacus* from *H. pseudoperforatus* (BERL.) and *H. pollicipatus* (BERL.). Thus, the males of *H. kerkirensis* WITALIŃSKI et SKORUPSKI and *H. calcaratus* (KOCH) are most similar to *H. paradisiacus*. The most striking differences are as follows: the corniculi in *H. kerkirensis* WITALIŃSKI et SKORUPSKI and *H. calcaratus* (KOCH) are conical, while corniculi in *H. paradisiacus* have a protuberance on their adaxial border. Moreover, in *H. kerkirensis* WITALIŃSKI et SKORUPSKI spurs on genu II and tibia II are very similar, low and ridgelike; in *H. paradisiacus* they differ in shape and size.

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