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Holoparasitus excipuliger (BERLESE, 1906) in Hungary: a second world locality and redescription (Acari: Gamasida: Parasitidae)[1]

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ABSTRACT. *Holoparasitus excipuliger* (BERLESE, 1906) was known to date only from *locus typicus* in the Cansiglio forest (North Italy) and all specimens were deposited in the Berlese Acaroteca (Florence). Recently, new material was obtained from Cansiglio, as well as from a second locality of this species found in the surroundings of Veszprem, Hungary. The aim of this study is to compare specimens from both localities and to update the species description.

Key words: acarology, taxonomy, Acari, Parasitidae, *Holoparasitus excipuliger*, new locality, Hungary.

According to a paper by JUVARA-BALS (2002), the genus *Holoparasitus* OUDEMANS, 1936 is not divided into subgenera. Recent taxonomic studies expanded the number of species up to 34, of which 19 are assembled into 4 groups: *caesus* (4 species), *mallorcae* (6), *peraltus* (2), and *calcaratus* (7) (JUVARA-BALS & WITALIŃSKI, 2000; WITALIŃSKI & SKORUPSKI, 2002; WITALIŃSKI & SKORUPSKI, 2003, 2004). *Holoparasitus excipuliger* (BERLESE, 1906) belongs to the last (*calcaratus*) group. This species was known to date only from *locus typicus* in the Cansiglio forest (North Italy) and its original, rather modest description by

[2] This paper is dedicated to Prof. Jan N. RAFIŃSKI, outstanding evolutionist, naturalist and friend, who passed away on May 15th, 2003. Hungarian specimens of *H. excipuliger* were found when material for his studies on amphibians was being collected.

BERLESE (1906) was supported with additional data by WITALIŃSKI and SKORUPSKI (2002). However, the redescription was made on the basis of BERLESE's alcohol-preserved specimens (1 ♀, 1 ♂, dissected by the author) deposited in the BERLESE collection (Berlese Acaroteca) in Florence, Italy. Therefore, possibilities of an in depth study were limited. Fortunately, the author has obtained his own material from *locus typicus* in Cansiglio (in 2003) and also from a new locality in Hungary (collected in 2002 and 2003), which allows for improving the species description by adding some essential details, and also for comparing both distant populations. The diagnosis contains characters necessary to distinguish this species regardless of locality, whereas the descriptive part is focused largely on features not mentioned previously (WITALIŃSKI & SKORUPSKI 2002) and differences between Italian and Hungarian populations.

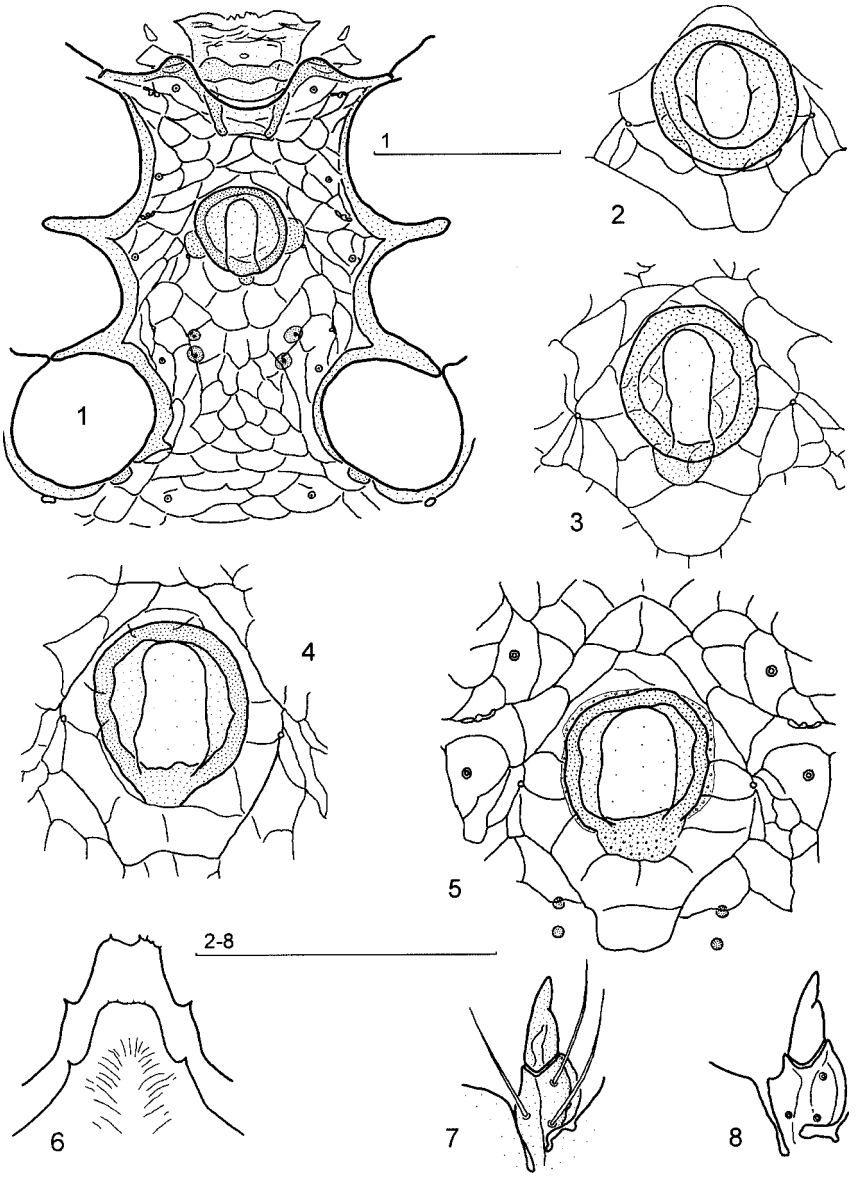
***Holoparasitus excipuliger* (BERLESE, 1906)**

(Figs 1-38)

DIAGNOSIS

Male: Gland pores *gv2* normal. Gnathotectum "lobe-type", its central lobate part obtuse apically, forming a slightly convex to even concave margin carrying 1-5 minute spines. Excipulum robust, with a well pronounced ring-like margin, circular to polygonal in outline, completed or sometimes "open" posteriorly; thin lamellar extensions of marginal cuticle covering the excipulum cavity leave axially elongated central opening. Fixed digit of chelicera narrow, with parallel margins; its one-fourth to one-third distal part more narrow; when observed *in situ* from ventral side at *pilus dentilis* level, it bears a tubercular to tooth-like protrusion directed laterally. Leg II spurred as follows: femoral main spur curved, its terminal portion thinner and blunt apically; main spur base bears a tubercle located ventrally; axillary process asymmetric: proximal margin convex, distal margin straight or slightly concave; spur on genu with rounded apex protruding slightly beyond the distal margin of segment; spur on tibia with a broad base, ventral border straight, distal end nearly reaching tibia margin.

Female: Sternal shield complete. Presternal plate with anterior margin without denticles or corrugations, accreted terminally with lateral platelets. Gland pores *gv2* normal. Endogynium of cup-type; anteriorly, endogynial opening covered from ventral side by a characteristic, bilobate hyaline lamella. Anterior margin of spherular organ convex in central and straight in lateral portions; two main thorns located close to lateral portions. Endogynial opening anteriorly armed with several (4-8) thorns. Thickening of epigynial subapical structure with lateral arcuate elements ending in deep anterior indentations, which flank inverted-V shaped central element; hyaline extensions of epigynial subapical structure subcircular and extending far beyond epigynium margin laterally and sometimes also anteriorly; central prong of epigynium located entirely above anterior, central portion of subapical structure.

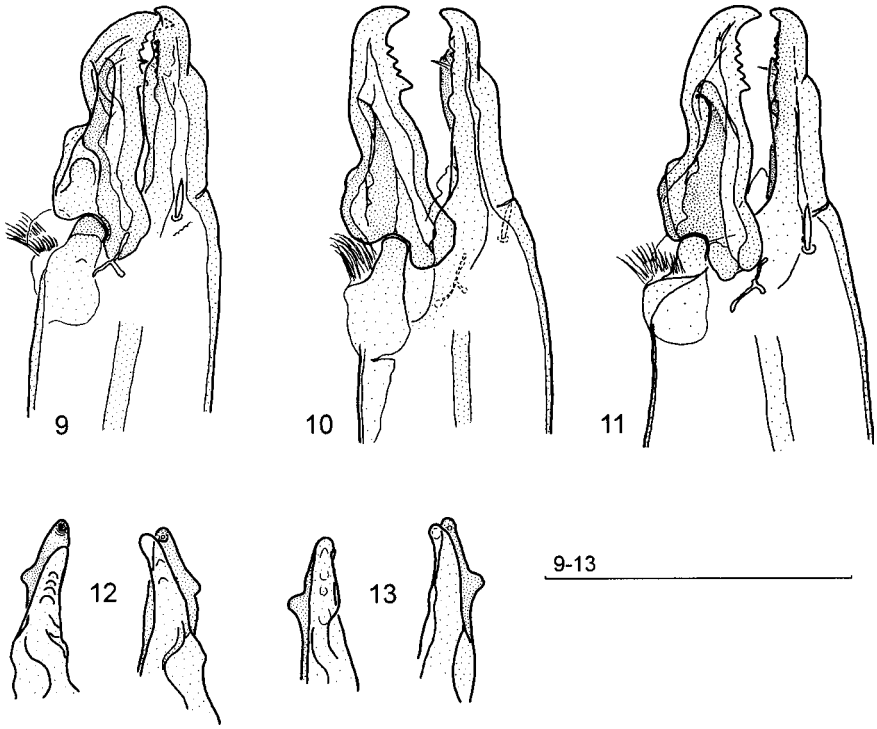


1-8. *Holoparasitus excipuliger* (BERL.), male: 1– genital lamina and sternogenital shield, 2-5 – excipulum, 6 – gnathotecta in two specimens, 7,8 – corniculi. 1-3, 6, 7 – Italy; 4, 5, 8 – Hungary. Scale bar: 0.1 mm

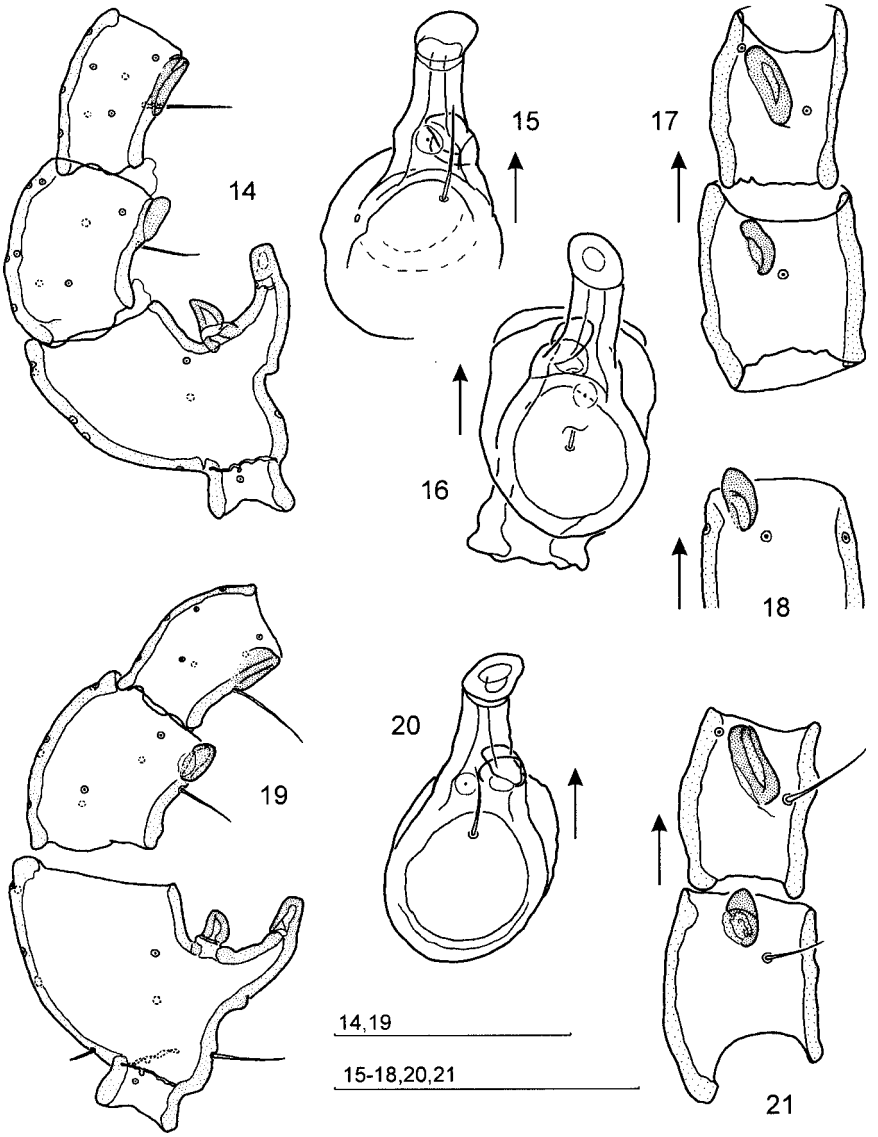
DESCRIPTION - COMPLEMENTARY DATA

Male. Dimensions of idiosoma similar in both localities: 635-685 x 460-475 µm (Hungary; N=3), 650-685 x 450-475 µm (Italy; N=6). Dorsal setae very short, ca. 7-13 µm.

Ventral side – sternogenital region (fig. 1). Presternal plates triangular, asymmetric. Genital lamina located in a deep concavity of sternum margin, flanked by two margin protrusions. Hyaline anterior margin of lamina forms two convex lateral lobes and third, central lobe usually with deep, irregular indentations. Excipulum very well pronounced (figs 1-5): its sclerotized ring-like margin is either circular or (more frequently) polygonal, and usually posteriorly "open" (i.e., sclerotized ring is blurred). The excipulum depression is partly covered with two thin lamellar protrusions extending from lateral margins, leaving the axially elongated opening free. In Italian specimens (figs 1-3), the excipulum is more circular than in Hungarian material (figs 4, 5), showing the polygonal ring "open" posteriorly in many cases. Sternal reticulation not conspicuous. Two pairs of well pronounced roundish thickenings at level of *pst3* pores and *st4* setae (figs 1, 5). Range of sternal setae length from ca. 60 µm (*st1*) to ca. 48 µm (*st4*), opisthogastric setae 28-45 µm long.

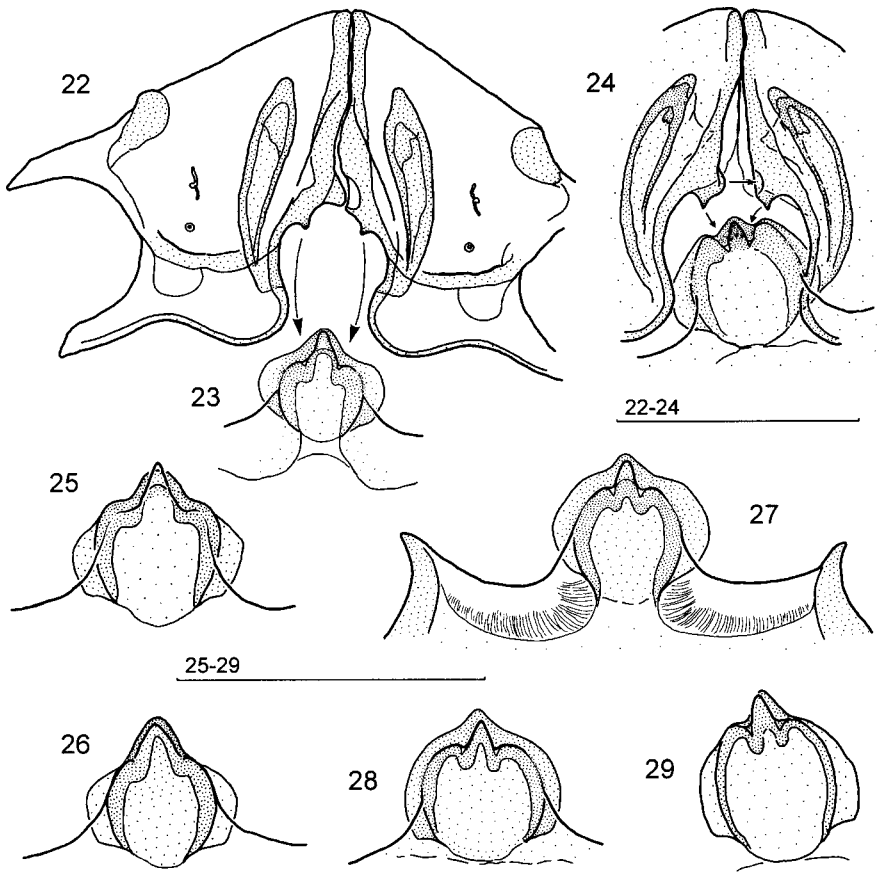


9-13. *Holoparasitus excipuliger* (BERL.), male: 9-11 – chelicerae in three specimens, 12, 13 – tips of chelicerae in four specimens, ventral perspective. 9, 12 – Italy; 10, 11, 13 – Hungary. Scale bar: 0.1 mm



14-21. *Holoparasitus excipuliger* (BERL.), male, leg II (for most setae only location is shown): 14, 19 – femur, genu, and tibia, anterolaterally, 15, 16, 20 – femur, ventrally, 17, 21 – genu and tibia, ventrally, 18 – another aspect of genu spur. Arrows are at anterolateral sides. 14-18 – Italy; 19-21 – Hungary. Scale bar: 0.1 mm

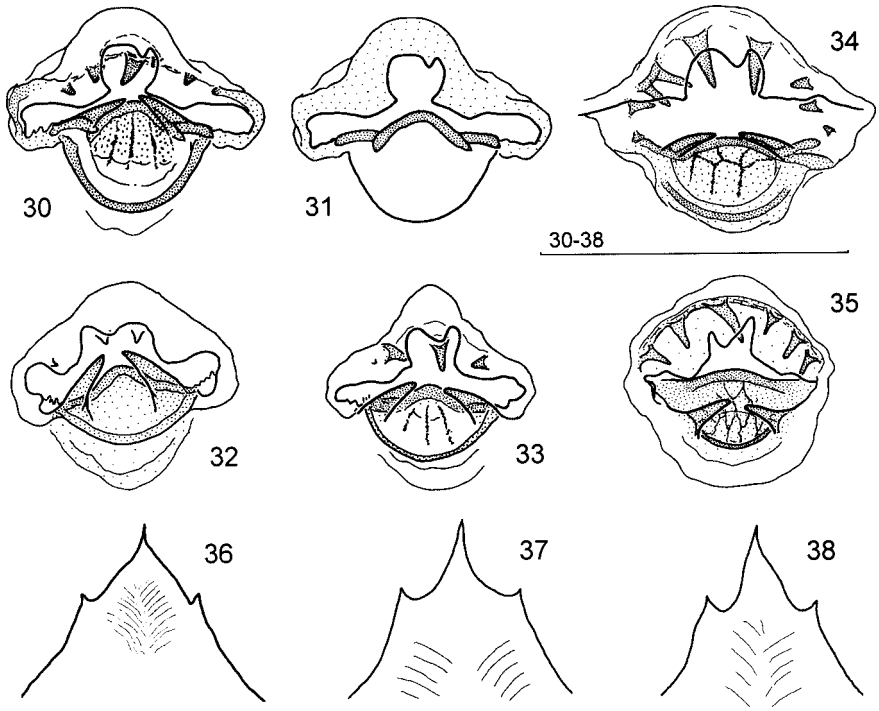
Gnathosoma. Gnathotectum (fig. 6) "lobe-type": lateral spines small and acute, central prong lobate and obtuse terminally with 1-5 tiny spines on anterior margin. Hypognathal groove with 9 or 10 rows (Hungary), or 11 (sometimes 10) rows (Italy) of well visible denticles. Palpcoxal setae finely serrated on one-side. Hypostomatic setae practically simple, located on a piece of cuticle demarcated by incisions of less sclerotized cuticle. Corniculi (figs 7, 8) with an extension of the ventro-adaxial border, either visible as indentation or not visible (depending on corniculus orientation). Indented corniculi, however, are more frequent and evident in Hungarian specimens.



22-29. *Holoparasitus excipuliger* (BERL.), female: 22 – paragynia, 23 – epigynial central prong with subapical structure, 24 – adaxial parts of paragynia showing arcuate metagynial thickenings, as well as protrusions locking one paragynium to the other and each paragynium to the epigynial central prong (arrows), 25, 26, 28, 29 – epigynial central prong with subapical structure, 27 – anterior part of epigynium with central and lateral prongs. 22, 23, 25, 26 – Italy; 24, 27-29 – Hungary. Scale bar: 0.1 mm

Chelicera (figs 9-13). Fixed digit slender and nearly straight, with one-third to one-fourth distal portion thinner. In the place where anterior and posterior parts meet, the external (abaxial) surface of digit forms protrusion directed outward; the protrusions are well visible in totally mounted specimens when observed from the ventral/dorsal side (figs 12, 13). In Italian specimens, the protrusions are lower and blunt apically (fig. 12), whereas in Hungarian ones, they are higher and pointed (fig. 13). The digit bears 2-3 small denticles in front of and one larger, low dent behind *pilus dentilis*. Movable digit arcuate in distal half, especially in Italian specimens, with 4, but sometimes 3 or 5 teeth. Ventral margin of digit markedly broader at its basal part; the anterior curvature of broader part with protuberance, more prominent in Hungarian specimens. Arthrodial membrane formed by a fringe, synarthrodial membrane triangular.

Pedipalps. Trochanter with seta *v1* simple and smaller than *v2* which is barbed on both sides on its distal half; anterolateral seta of femur spatulate and finely pectinate on one edge, anterolateral setae of genu spatulate. Femur with a more or



30-38. *Holoparasitus excipuliger* (BERL.), female: 30, 32-35 – endogynium, 31 – endogynium outline presenting bilobate hyaline lamella covering anterior part of endogynium opening and thick anterior border of spherular organ. Endogynial lamella (endogynial plate) not shown. 36-38 – gnathotectum. 30-33, 36 – Italy; 34, 35, 37, 38 – Hungary. Scale bar: 0.1 mm

less pronounced broad tubercular thickening located ventrally close to the distal margin of the segment.

Legs. Coxa I shows 2-3 ridges on its anterolateral surface; the rest of leg I, as well as legs III and IV, unremarkable. Leg II (figs 14-21): when observed from the side, the ventral surface of the femur shows poorly visible corrugations in its proximal part; the main spur is curved, with a distinct protuberance located ventrally at the base; the terminal portion of the spur thinner and apically blunt. Axillary process asymmetric: proximal margin convex, distal margin straight or even slightly concave. The shape and size of axillary processes vary both between and within the studied populations: somewhat larger and pointed processes are in Italian material, whereas in Hungarian specimens apically more rounded axillary processes are common (figs 14, 19).

Spur on genu with rounded apex protruding slightly beyond the distal margin of segment. Spur on tibia with a long base, ventral border straight and distal end nearly reaching tibia margin. When observed from a ventral perspective, the main spur of femur II is practically straight, its small terminal portion is directed anteriorly, and the axillary process is pointed posteriorly (figs 15, 16, 20). Spurs on genu and tibia II are as in figs 17, 18, and 21.

Female. Dimensions of idiosoma: 700-745 x 525-565 µm (Hungary; N=7), 695-730 x 505-525 µm (Italy; N=8), thus specimens from Italy are slightly smaller. Dorsal setae very short, ca. 8-18 µm and 7-9 µm on podonotal and opisthonotal regions, respectively.

Ventral side. Anterior margin of sternum either with well-pronounced incisions close to bases of *st1* sternal setae (Italy), alternatively, these incisions may be present only occasionally and may be poorly visible (Hungary). In specimens from both localities, the setae are of similar length. Setae of sternogenital region from ca. 50-55 µm (*st1*) to 63-65 µm (*st2, st3*), setae on opisthogaster 18-20 to 34-38 µm depending on region.

Genital region. Paragynium adaxial border thickened, in posterior region forming lobate protrusion of left or right paragynium, which corresponds to the depression in the second paragynium (figs 22, 24); more posteriorly each paragynial border forms a conspicuous, large, tooth-like protrusion fitting into one of the deep incisions located at both sides of the epigynial central prong (figs 22-24). These protrusions are larger in Hungarian than in Italian specimens. Metagynial sclerites moderately arcuate, postero-lateral hyaline protrusions "docking" epigynial plate large, each paragynial edge facing coxa III with distinct thickening underside (fig. 22). Epigynial shield heptagonal, poorly discernible central prong positioned entirely over the anterior portion of the subapical structure and flanked by deep incisions corresponding to protrusions of paragynial margins (figs 23-29). The thickening of the subapical structure comprises two arcuate lateral elements and a central inverted-V thickening. Hyaline lateral protrusions of subapical structure subcircular and extend far beyond the epigynium margin laterally, but also anteriorly, mainly in Hungarian material, where the outline of

subapical structure with protrusions is nearly circular (figs 24, 27-29). Endogynium (figs 30-35) of cup-type, its shape depends on orientation, but usually shows anterior part with entrance to endogynial sac and posterior part occupied by the spherular organ. Sac entrance is covered by a characteristic bilobate hyaline lamella protruding backward from anterior margin of endogynium. The lamella possesses two broad lateral lobes separated by a wide incision, usually containing a triangular, small and asymmetric projection. The well-demarcated anterior margin of the spherular organ is convex centrally and straight laterally. Two main endogynial thorns are located close to that margin. The entrance to the endogynial sac is armed anteriorly with several (4-8) thorns of different size; some of which are large. Two main endogynial thorns are placed at the level of the spherular anterior margin. The rear part of the spherular organ and bases of main thorns are covered from the ventral side by a semicircular hyaline endogynial lamella (endogynial plate).

Gnathosoma. Gnathotectum trispinate, similar in shape regardless of locality (figs 36-38). Hypognathal groove with 10 (rarely 9 or 11) rows of denticles; rear 2-3 rows are represented by marginal denticles only. Palpcoxal setae finely barbed, hypostomatics simple.

Chelicerae. Distal half of the fixed digit with two teeth behind and two smaller ones in front of *pilus dentilis*; between the latter two denticles a small tubercle is sometimes present. Posterior half of fixed digit with lamellar edge. Movable digit with three teeth, proximal one larger and slightly distant.

Pedipalps. Trochanter with setae *v1* and *v2* of similar length, *v1* finely barbed on one side, *v2* barbed bilaterally; femur with broad tubercular elevation ventrally to anterolateral seta, anterolateral seta spatulate and finely pectinate on one edge; anterolateral setae of genu spatulate.

Legs. Leg structure and setation unremarkable, except coxae I, which shows ridges on its anterolateral surface.

MATERIAL EXAMINED

Italian (Cansiglio) population: 25 ♀♀, 29 ♂♂, 9 DNN (slides no. 1736-1739, 1741, 1742, 1809, 1811-1815), 29.07.2003; Cansiglio Forest (Bosco di Cansiglio), beech forest litter and moss on the rocks; GPS coordinates N46° 02.901', E12° 23.912', alt. ca. 1070 m a.s.l. Collected by author and Dr. Maciej SKORUPSKI, Department of Forest and Environmental Protection, Agriculture University, Poznań, Poland.

Hungarian (Márkó) population: 6 ♀♀, 4 ♂♂, 3 DNN (slides no. 1624-1629, 1636), 24.07.2002, and 13 ♀♀, 4 ♂♂ (slides no. 1649-1654, 1656), 25.04.2003; Márkó near Veszprem, north to Balaton, Hungary, deciduous litter in a nature reserve; GPS coordinates N47° 06.686', E17° 49.074', alt. ca. 270 m a.s.l. Collected by Dr. M. LIANA and Dr. W. BABIK, Department of Comparative Anatomy, Institute of Zoology, Jagiellonian University, Kraków.

All materials are in the author's collection.

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