Allocalvolia habrocytus gen. n., sp. n. (Acari, Winterschmidtiidae) a new hypopus phoretic on Habrocytus elevatus (Walker, 1834) (Hymenoptera, Pteromalidae) in Austria

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(With 12 figures)

Abstract

Allocalvolia habrocytus gen. n., sp. n. (Acari, Winterschmidtiidae) is described from the hypopial stage. It was collected from Habrocytus elevatus (Walker, 1834) (Hymenoptera, Pteromalidae) found in Austria. A key is given to the genera of the Calvolia group based on the hypopi. The definition of the genus Calvolia is completed.

Introduction

Most of the species belonging to the family Winterschmidtiidae are biological connected with wasps and bees, for example Crabrovidia Zakhvatkin, 1941 with wasps of the family Sphecidae, Vespacarus Baker & Cunliffe, 1960 with Vespidae, Vidia Oudemans, 1905 with bees of the families Apidae and Chrysidae, Ensliniella Vitzthum, 1925 with wasps of the family Eumenidae.

Krombein (1961, p. 89) who has observed the life history of some saproglyphid mites during his studies of solitary wasps states that "... species belonging to the genera such as Vespacarus, Monobiacarus, Ensliniella, and Kennethiella (Sarcoptiformes, Saproglyphidae) have developed a very complex symbiotic relation with solitary wasps of the family Vespidae. The saproglyphid mites are nearly always host specific, each mite species occurring on only one species of vespid wasp." The adult mites live in the cells of bee larvae and pupae, and the hypopi occupy a specialized area called an acarinarium on or in the body of the adult vespid wasps (Krombein 1961).
The species of the Calvolia group already described show a greater association with other arthropods than with Hymenoptera: Afrocalvolia with Diptera and Coleoptera, Calvolia with Collembola, Dermaptera, Hymenoptera, Coleoptera, Dipter a, Chilopoda, Procvalvolia with Coleoptera (P. zacheri (Oudemans, 1929) found on mould), and Acalvolia with small mammals (Pain & Johnston 1974, Hughes 1962, Türk & Türk 1957, Zakhvatkin 1941). An acarinarium probably does not exist.

We described herein a new heteromorphic deutonymph (hypopus) found attached to a hymenoptera, Habrocytus elevatus (Pteromalidae). This insect was taken from a goll of Tephritidae (Diptera) in the head of a thistle, Carduus nutans L. (Asteraceae), in Austria.

This hypopus represents a new species and new genus in the family Winterschmidtidae Oudemans, 1923. We agree with O'Connor (1984) that this family name has priority over the name Saproglyphidae Oudemans, 1924, which has up to now been used for this family by most of the authors.

In addition, the definition of the genus Calvolia is completed and a key is given to the genera of the Calvolia group, based on the hypopial stages.

Genus Allocalvolia gen. n.

Definition: Based on the hypopus, the only known stage. Dorsum with a pattern of lines mostly longitudinally directed and forming a network in some places. Propodonotum relatively long bearing in its anterior part a pair of para-median pigmented eyes with voluminous lenses. Ventre: Epimera, palposoma and suctorial plate as in Calvolia.

Legs: Tarsi I to III with a long pretarsus bearing a small claw. Tarsus IV longer than wide, lacking an ambulacrum and bearing 2 long and strong setae. Leg chaetotaxy: Tarsi I and II with 6 setae (3 foliate, 2 simple and 1 spoon-like); tarsi III with 8 setae (6 foliate and 2 simple); tarsi IV with 6 setae (3 foliate and 3 simple of which 1 thin and short 2 long and strong). Tibiae I to IV with 2-2-1-1 thin setae. Genua 2-2-0-0, Femora 1-1-0-0. Solenidiotaxy: Tarsus I with ω1 and ω3 situated in the basal half but relatively far from the base of the segment; ω2 close to the base. Tarsus II, tibiae I to IV and genua I and II with one solenidion.

Type species: Allocalvolia habrocytus n. sp. We include in this genus Allocalvolia bisculpturata (Mahunka, 1974) n. comb. (= Calvolia bisculpturata), described from Ghana.
**Alloclavilia habrocytus** sp. n. (figs 1-6)

**Hypopus** (holotype) (figs 1-6): Length 195 μm, width 126 μm. Length and width in 5 paratypes (in μm): 183 x 121; 186 x 120; 186 x 126; 189 x 120; 192 x 138. Dorsum with a pattern of lines mostly longitudinal and partly anastomosed. Hysteronotum with an additional subcuticular structure consisting of small rounded or oval patches. Sejugal furrow well developed. Propodonotum 75 μm long. Eyes very anterior with thick retinae and broad lenses. Dorsal setae short, the vi in front of the eyes. Orifice of oil gland dorso-lateral situated behind ii. Venter: Epimera I fused in a thin relatively long sternum. Epimera III and IV as in Calvilia. Suctorior plate 48 μm wide; diameter of anterior suckers 7, 2, of posterior suckers 11 μm. Palposoma 15 μm long with a base 13 μm wide, the palps are 4 to 5 long and 3.5 μm wide. Solenidion alpha 45 μm long. Setae h ventro-lateral, setae cx I lacking, setae cx III represented by small ringlets. Setae ga long and thin; gm (close to genital slit) short and setiform; gp displaced in front and laterally to gm, they are very short almost vestigial. L e g s: Tarsi I to IV 36-32-17-11 μm long respectively; pretarsi I-Ill 12 μm long; claws I 3.5 μm long. The long setae of tarsi IV are 100 and 57 μm long.

**Host and locality**: Holotype and 8 paratypes, all hypopi, from one female of Habrocytus elevatus (Hymenoptera, Pteromalidae), found in a gall of Tephritidae (Diptera) in the head of a thistle, Carduus nutans (Asteraceae), Eastern Austria, 20.X.1963, H. ZWÖLFER leg. (host now in the collection of the Zoological Museum Hamburg).

Holotype and 4 paratypes in Zoologisches Institut und Zoologisches Museum der Universität Hamburg, 4 paratypes in the Institut royal des Sciences naturelles de Belgique, Bruxelles.

**Remarks**: Alloclavilia habrocytus differs from Alloclavilia bisepturus (MAHUNKA, 1974) by the following characters:

1. Body much smaller (341 to 400 μm long in the latter)
2. Situation of ω1 and ω3 more basal (in the middle of the tarsus I in the latter)
3. Setae sc e as long as sc i (twice as long as sc i in the latter)
4. Solenidia of tibia and genu I much longer than in the latter.

**Alloclavilia** belongs to a small group of genera (Calvilia group) characterized as follows: Suckers and claws of tarsi I to III not modified, eyes well developed with a pigmented retina and distinct lenses, palposoma formed of a distinct base and 2 separated palps each bearing a solenidion (alpha) and a thin seta, epimera III fused in the midline forming a transverse arc, solenidia ω1 and ω3 of tarsus I in the basal half of the tarsus (very rarely in the middle), tarsus IV with 2 long and strong setae and without a thorn like seta (FAIN 1972). This group contains 4 genera: Calvilia OUDEMANS, 1911, Acalvilia FAIN, 1971, Procalvilia FAIN, 1971 and Afrocalvilia FAIN and ELSEN, 1971. We have summarized in a key the main characters separating these genera.
Fig. 1: Allocalvolia habrocytus sp. n. Hypopus in ventral view.
Fig. 2: *Allocalvola habrocytus* sp. n. Hypopus in dorsal view.
Figs 3-6: *Allocalvolia habrocytus* sp. n. Hypopus. Apical segments of leg I (3), leg II (4), leg III (5) and leg IV (6).
Figs 7-12: Figs 7-9: Calvulia hagensis OUDEMANS (specimen from Liège, Belgium), hypopus: Apical segments of leg I (7), leg III (8) and leg IV (9).
Figs 10-12: Calvulia waldorfae FAIN & JOHNSTON, hypopus paratype: Apical segments of leg I (10), leg III (11) and leg IV (12).
Genus Calvolia OUDEMAN, 1911

FAIN (1972) redescribed the holotype (an hypopus) of Calvolia hagensis OUDEMAN, 1911, the type species of the genus Calvolia. In this specimen the tarsi I and II bear 6 setae among which 3 simple setae and 3 foliate setae.

FAIN and JOHNSTON (1974) described a new species in this genus, Calvolia waldorfae which resembled closely the type species except for the following differences: complete absence of pattern of lines on the dorsum, absence of a seta and a solenidion on the tibiae IV and presence of an additional (a seventh) seta on the tarsi I and II, this seta is spoonlike. We give herein new drawings of the legs of this species (figs 10-12).

Recently A. F. received for identification 2 hypopi which had been collected on an unidentified insect in Liège (Belgium). These hypopi are identical to the holotype of C. hagensis except for one character i.e. the presence in our specimens of an additional seta (spoon-like) on the apex of the tarsi I and II (figs 7-9). It appears from these observations that the tarsi I and II in the genus Calvolia bear 7 setae and not 6 as we had described previously. We surmise that the missing setae in the holotype of C. hagensis had been broken off during the remounting of this specimen.

Key to the genera belonging to the Calvolia group (Hypopi)

1. Tarsi IV from 2 to 3 times as long as wide, slightly dilated at apex and bearing 3 simple setae (one short and thin and 2 long and strong). Tarsi I to III with 7-7-6 setae of which 3 (tarsi I-II) and 5 (tarsi III) are narrowly foliate and one is spoonlike (tarsi I-II). Tibiae I-II with one thin seta

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................................. Calvolia OUDEMAN, 1911
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- Tarsi IV relatively shorter and either thickened or attenuated at apex bearing 6 setae. Tarsi I to III with 6-6-8 setae. Other characters variable ................. 2

2. Tibiae I-II with one thin seta. Tarsi IV short, approximately as long as wide with 3 foliate setae. Tarsi I-II with 3 foliate setae and lacking an apical spoonlike seta ......................... Afrocalvolia FAIN and ELSEN, 1971

- Tibia I-II with 2 thin setae. Tarsi IV longer than wide, slightly dilated at apex and with either 3 or no foliate setae. Setae of tarsi I-II variable ..................... 3
3. Tarsi I to IV with only thin simple setae. Tarsi I and II lacking a spoon-like seta. Procalvolia FAIN, 1971
   - Foliate setae present at least on tarsi III and IV.
   - Tarsi I and II with an apical spoon-like seta 4

   - Tarsi I and II with 3 foliate setae. Tarsi III with 6 foliate setae. Epimeral arc of legs III fused with the median pregenital sclerite. Allocalvolia gen. n.

Addendum

The genus Schulzea ZACHVATKIN, 1941 (Acaridae), has been erroneously included in the family Saproglyphidae by DELFINADO and BAKER 1976 (pp. 76 and 81).

References


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