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

ALEX FAIN and GISELA RACK

(With 12 figures)

Abstract

*Allocalvolia habrocytus* gen.n., sp.n. (Acari, Winterschmidtidae) 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 Winterschmidtidae 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, Diptera, Chilopoda, *Procalvolia* with Coleoptera (*P. zacheri* (OUDEMANS, 1929) found on mould), and *Acalvolia* with small mammals (FAIN & 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 gall 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 OCONNOR (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.

**D e f i n i t i o n:** Based on the hypopus, the only known stage. Dorsum with a pattern of lines mostly longitudinally directed and forming a network in some places. Propodotum relatively long bearing in its anterior part a pair of paramedian pigmented eyes with voluminous lenses. **V e n t e r:** Epimera, palposoma and suctorial plate as in *Calvolia*. **L e g s:** 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. **L e g c h a e t o t a x y:** 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  $\omega_1$  and  $\omega_3$  situated in the basal half but relatively far from the base of the segment;  $\omega_2$  close to the base. Tarsus II, tibiae I to IV and genua I and II with one solenidion.

**T y p e s p e c i e s:** *Allocalvolia habrocytus* n. sp. We include in this genus *Allocalvolia bisculpturata* (MAHUNKA, 1974) n.comb. (= *Calvolia bisculpturata*), described from Ghana.

*Allocalvolia habrocytus* sp. n. (figs 1-6)

**Hypopus** (holotype) (figs 1-6): Length 195  $\mu\text{m}$ , width 126  $\mu\text{m}$ . Length and width in 5 paratypes (in  $\mu\text{m}$ ): 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  $\mu\text{m}$  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 *11*. Venter: Epimera I fused in a thin relatively long sternum. Epimera III and IV as in *Calvolia*. Suctorial plate 48  $\mu\text{m}$  wide; diameter of anterior suckers 7, 2, of posterior suckers 11  $\mu\text{m}$ . Palposoma 15  $\mu\text{m}$  long with a base 13  $\mu\text{m}$  wide, the palps are 4 to 5 long and 3,5  $\mu\text{m}$  wide. Solenidion alpha 45  $\mu\text{m}$  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. Legs: Tarsi I to IV 36-32-17-11  $\mu\text{m}$  long respectively; pretarsi I-III 12  $\mu\text{m}$  long; claws I 3,5  $\mu\text{m}$  long. The long setae of tarsi IV are 100 and 57  $\mu\text{m}$  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:** *A. habrocytus* differs from *A. biscalpturatus* (MAHUNKA, 1974) by the following characters:

1. Body much smaller (341 to 400  $\mu\text{m}$  long in the latter)
2. Situation of  $\omega 1$  and  $\omega 3$  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

*Allocalvolia* belongs to a small group of genera (*Calvolia* 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  $\omega 1$  and  $\omega 3$  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: *Calvolia* OUDEMANS, 1911, *Acalvolia* FAIN, 1971, *Procalvolia* FAIN, 1971 and *Afrocalvolia* FAIN and ELSEN, 1971. We have summarized in a key the main characters separating these genera.

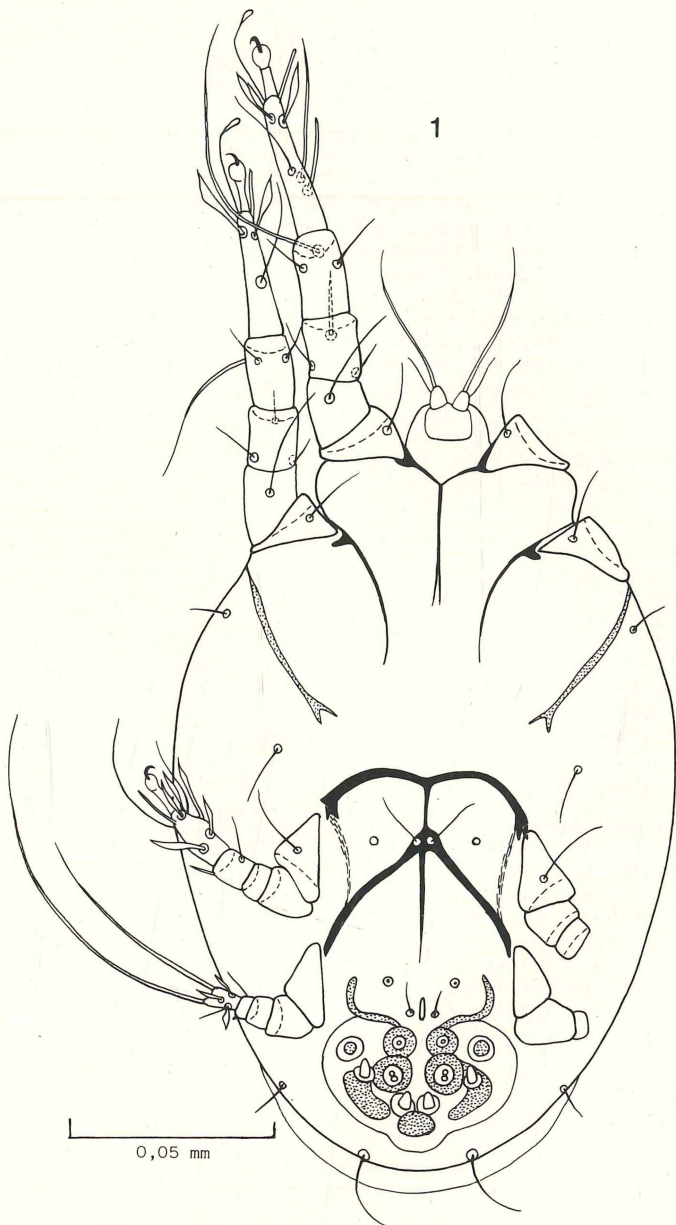


Fig. 1: *Allocalvolia habrocytus* sp. n. Hypopus in ventral view.

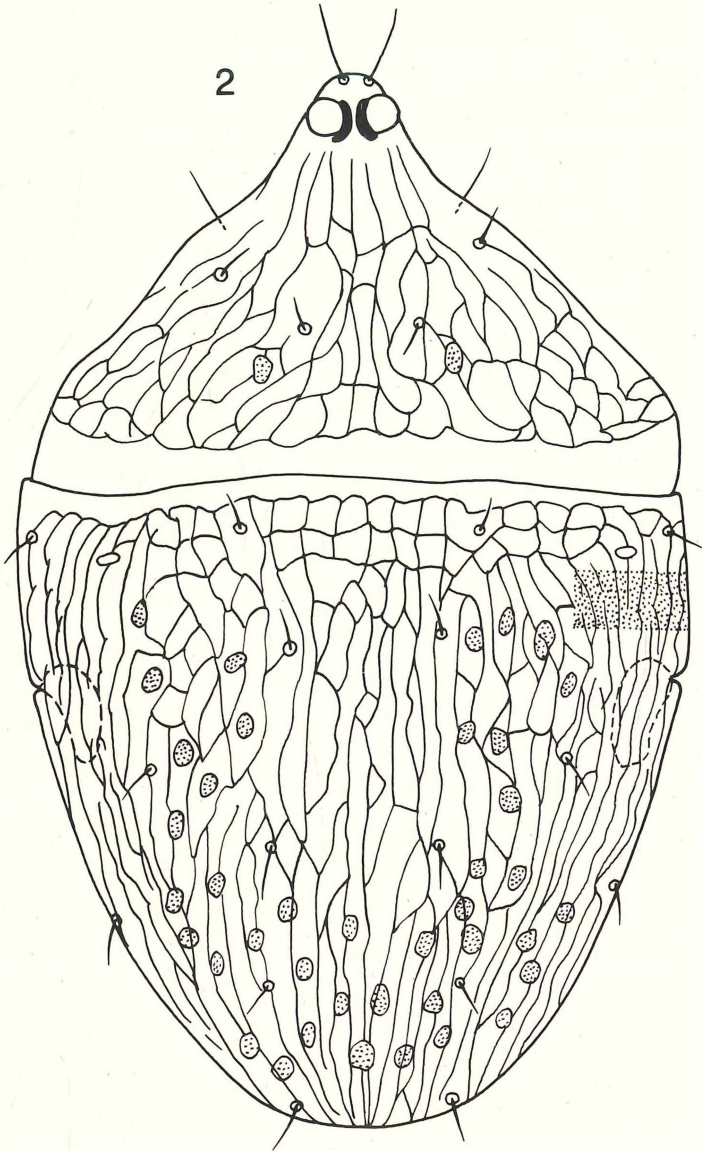
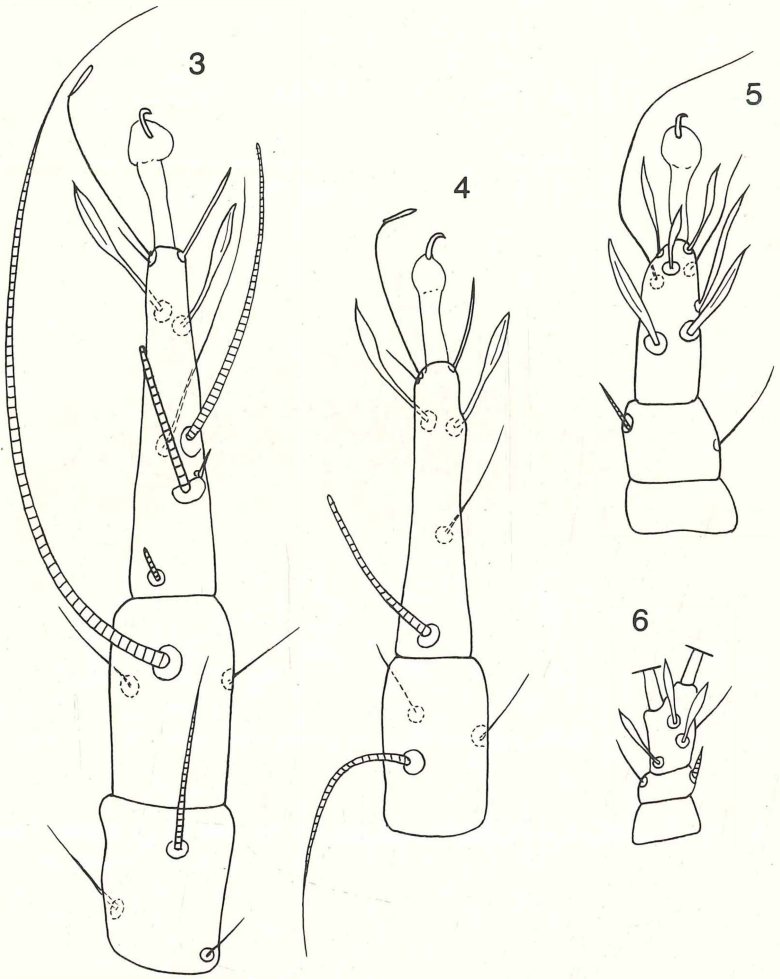
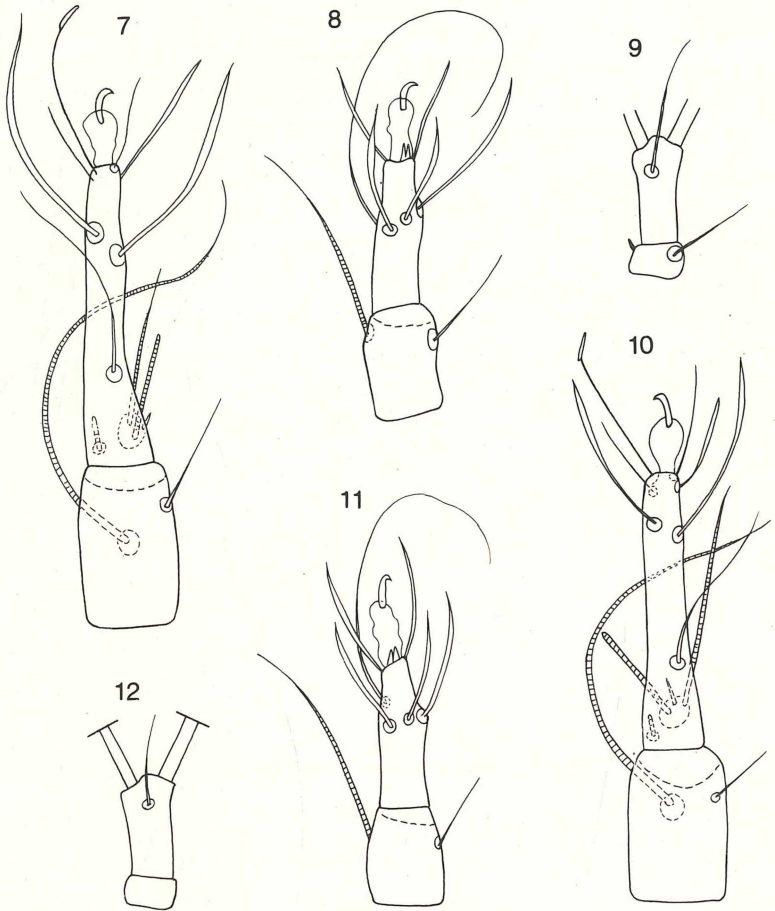


Fig. 2: *Allocalvolia habrocytus* sp. n. Hypopus in dorsal view.



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: *Calvolia hagensis* OUDEMANS (specimen from Liège, Belgium), hypopus: Apical segments of leg I (7), leg III (8) and leg IV (9).  
Figs 10-12: *Calvolia waldorfae* FAIN & JOHNSTON, hypopus paratype: Apical segments of leg I (10), leg III (11) and leg IV (12).

Genus *Calvolia* OUDEMANS, 1911

FAIN (1972) redescribed the holotype (an hypopus) of *Calvolia hagensis* OUDEMANS, 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 ..... *Calvolia* OUDEMANS, 1911
  - 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
4. Tarsi I and II without foliate setae. Tarsi III with 5 foliate setae. Epimeral arc of legs III not fused with the median pregenital sclerite ..... *Acalvolia* FAIN, 1971
- 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 Saprogllyphidae by DELFINADO and BAKER 1976 (pp. 76 and 81).

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