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### Three new species of Hypopi Phoretic on Springtails (Collembola) in England (Acari: Acaridae)

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#### Introduction

Heteromorphic deutonymphs, or hypopi, occur in both host-specific and opportunistic associations with a wide variety of arthropods, especially insects. Until now, however, they have not been recorded from Collembola. Dr. Elizabeth Sims Waldorf, working with soil arthropods in England, found several hypopi on the common springtail, *Sminthurus fuscus*. These specimens represent three new species in three different genera (one new) and are described here.

#### *Acaridae* Murray, 1877

##### *Michaelopus*, gen. nov.

Type species: *Tyroglyphus corticalis* Michael, 1885

The species here designated as type of the new genus has previously been included in *Monieziella* Berlese, 1897. Unfortunately that genus was erected without designation of a type species and it was not until 1936 that Jacot designated one of the three species originally included, *Monieziella entomophaga* (Laboulbène), as type. This species, however, is the type of *Thyreophagus* Rondani, 1874 and *Monieziella* falls as an objective synonym of that genus.

The new genus may be diagnosed as follows (deutonymph): Rhizoglyphine. Idiosoma relatively narrow, with the sides parallel or tapering posteriorly. Palposoma short, cylindrical; palps reduced; setation normal. Eyes well developed, pigmented; placed marginally above legs I. Epimerites (coxal apodemes) I fused medially; II, III, and IV free. Legs IV originating near posterior margin of opisthosoma. Tarsal chaetotaxy 8-8-8-8; foliate (lanceolate) setae of tarsi 4 or 5-4 or 5-6-4 or 5. Tibiae 1 or 2-1 or 2-1-1. Spiniform leg setae lacking. Tarsus I with 3 solenidia. Claws sessile.

Information on adults is summarized in Zachvatkin (1941; as *Monieziella*).

(1) *Michaelopus corticalis* (Michael, 1885)

*Tyroglyphus corticalis* Michael, 1885

*Histiogaster corticalis* Michael, 1903

*Monieziella corticalis* Zachvatkin, 1941

← # →

The following description is made from type material in the British Museum (Natural History). As Michael did not designate a holotype we designate here a hypopus as lectotype.

HYPOPUS (lectotype) figs., 1, 2, 5-7): Length 231  $\mu\text{m}$ , maximum width 130  $\mu\text{m}$ . Dorsum: propodosomal and hysterosomal shields well sclerotized. Propodosoma 78  $\mu\text{m}$  long; hysterosoma 156  $\mu\text{m}$  long (ratio 1 : 2). Eyes large; with globulous lens and basal strongly pigmented retina. Dorsal setae very short. *sc e* absent. *sc x* situated at the level of the eyes. Venter: palposoma rounded and very short and bearing the two solenidia *alpha* and one pair of thin setae. Suctorial plate as long as wide with anterior suckers smaller than the posterior ones and 4 conoids situated in a curved line concave anteriorly. Setae *cx I*, *cx III* and *g p* simple, very short. Legs long, ending into a strong, sessile claw. Tarsi I-IV respectively 36  $\mu\text{m}$ , 30  $\mu\text{m}$ , 22  $\mu\text{m}$ , 24  $\mu\text{m}$  long.

Leg chaetotaxy: Tarsi 8-8-8-8. Tibiae 2-2-1-1. Genua 2-2-0-0. Femora 1-1-0-1. Trochanters 1-1-1-0. Most of the tarsal setae membranous apically, some very narrowly. Tarsi I-II with an apical seta ending into a saucer like formation (sucking setae of Zachvatkin). In the lectotype only 7 setae are clearly visible on tarsi I and II, but in the paratypes 8 setae are present. Solenidiotaxy: *alpha* long. Tarsus I with 3 solenidia situated near the base of the segment ( $\omega_1$ ,  $\omega_2$ ,  $\omega_3$ ). Tibiae 1-1-1-1. Genu I with 1 solenidium.

#### HABITAT

- (1) The typical series was found "under the epidermis of the common reed, *Arundo phragmites*, and some allied plants in a state of fading or incipient decay". The slide examined contains the lectotype and 3 paralectotypes and is deposited in the British Museum, no 1930.8.25.2679.
- (2) In Belgium the senior author found one hypopus of this species in the nest of a bird, *Apus apus*, Brussels, 17.vii.1967.

(2) *Michaelopus sminthurus* sp. nov.

This new species is known only from a single hypopus. It is distinguished from *M. corticalis* (Michael) by the following characters:

- (1) The propodosoma is relatively much longer; the ratio of the length propodosoma : hysterosoma is 1 : 1.4.
- (2) Tibiae I and II bear only one seta.
- (3) Tarsi III and IV are relatively much shorter (14  $\mu\text{m}$ ).
- (4) The eyes are smaller.
- (5) The *g p* setae are modified into suckers.
- (6) The anterior suckers of the suctorial plate are relatively larger.
- (7) The seta of tibia III is barbed.

HYPOPUS (holotype) (figs. 3, 4, 8-10): Length 219  $\mu\text{m}$ , maximum width 102  $\mu\text{m}$ . Dorsal shield well sclerotized. Epimera as in *M. corticalis* but the internal extremities of epimera IV are closer together in the midline. Other characters as in *M. corticalis* except for those mentioned above. Tarsi I-IV are respectively 27  $\mu\text{m}$ , 25  $\mu\text{m}$ , 14  $\mu\text{m}$ , 14  $\mu\text{m}$  long.

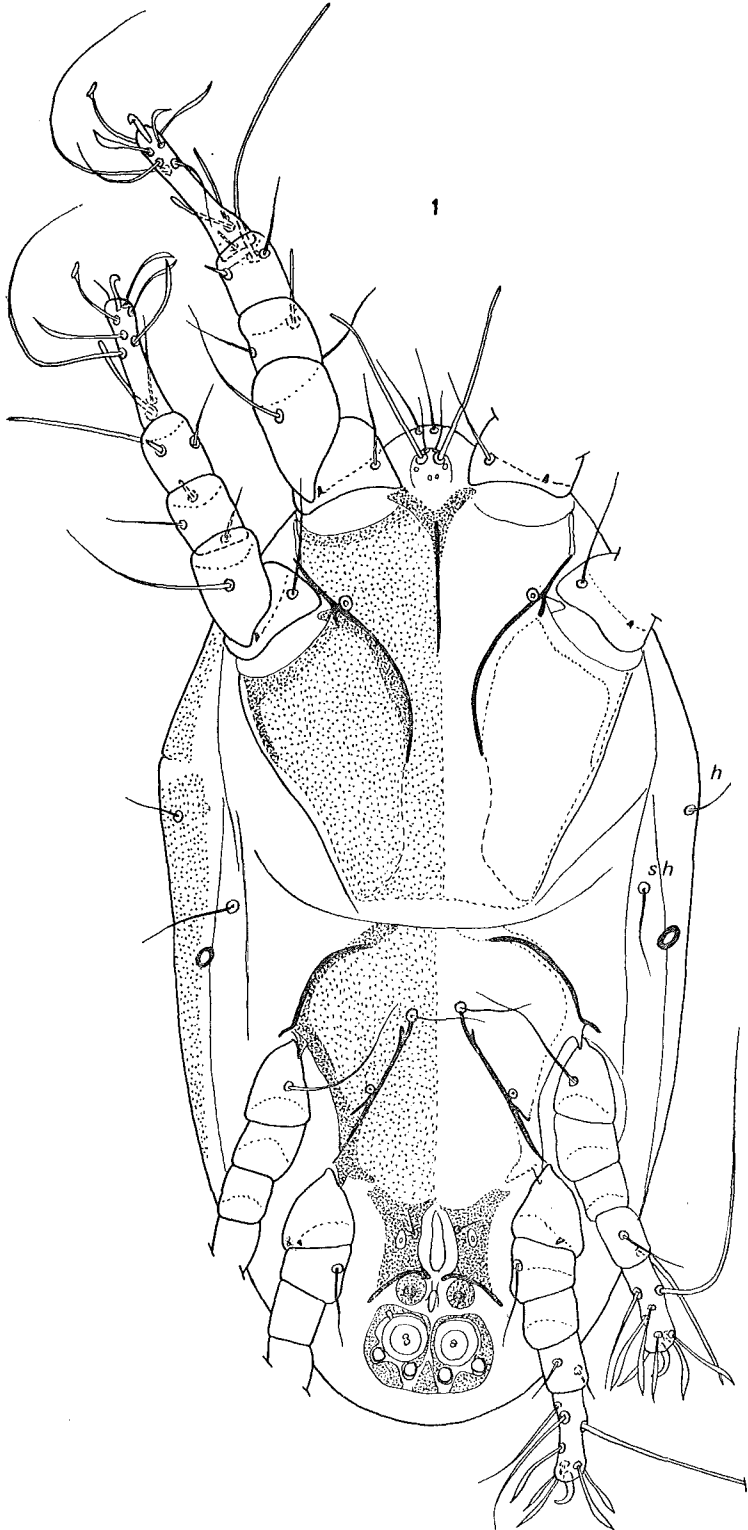
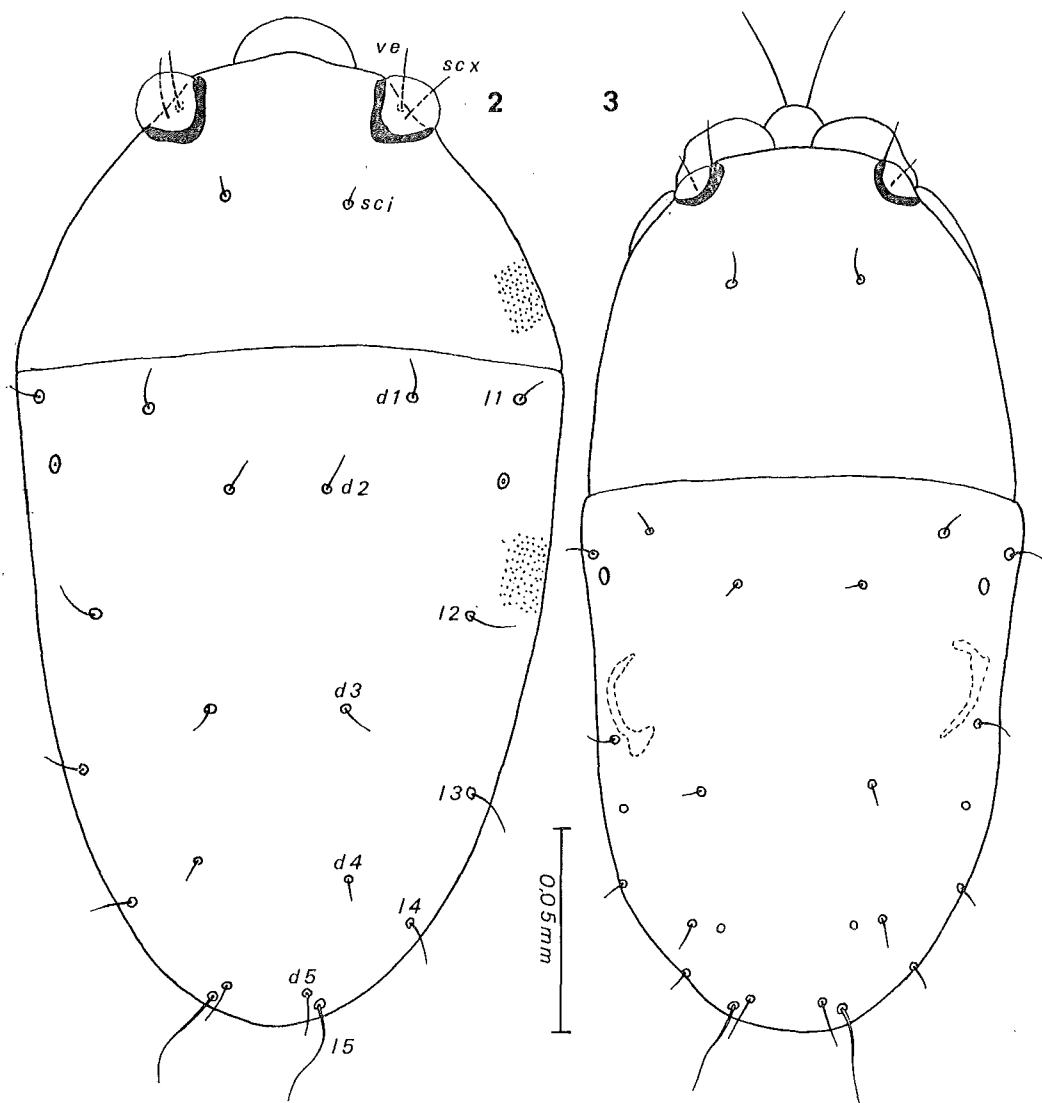


FIG. 1. *Michaelopus corticalis* (Michael): Hypopus in ventral view (lectotype).



FIGS. 2-3. (2) Dorsal view of the hypopi of *Michaelopus corticalis* (Michael) (lectotype) (3) *M. sminthurus* sp. nov.

Chaetotaxy of the legs: as in *M. corticalis* except that tibiae I-II carry only one very thin seta.

*Host and locality*: On *Sminthurus fuscus* L. (Collembola), Domleo, Spinney, Sutton Bonington, England, 19-31 August 1971 (holotype hypopus) (Coll. E. S. Waldorf).

*Type* in the British Museum (Natural History), London. [B.M. (N.H.) reg. no. 1973-582.]

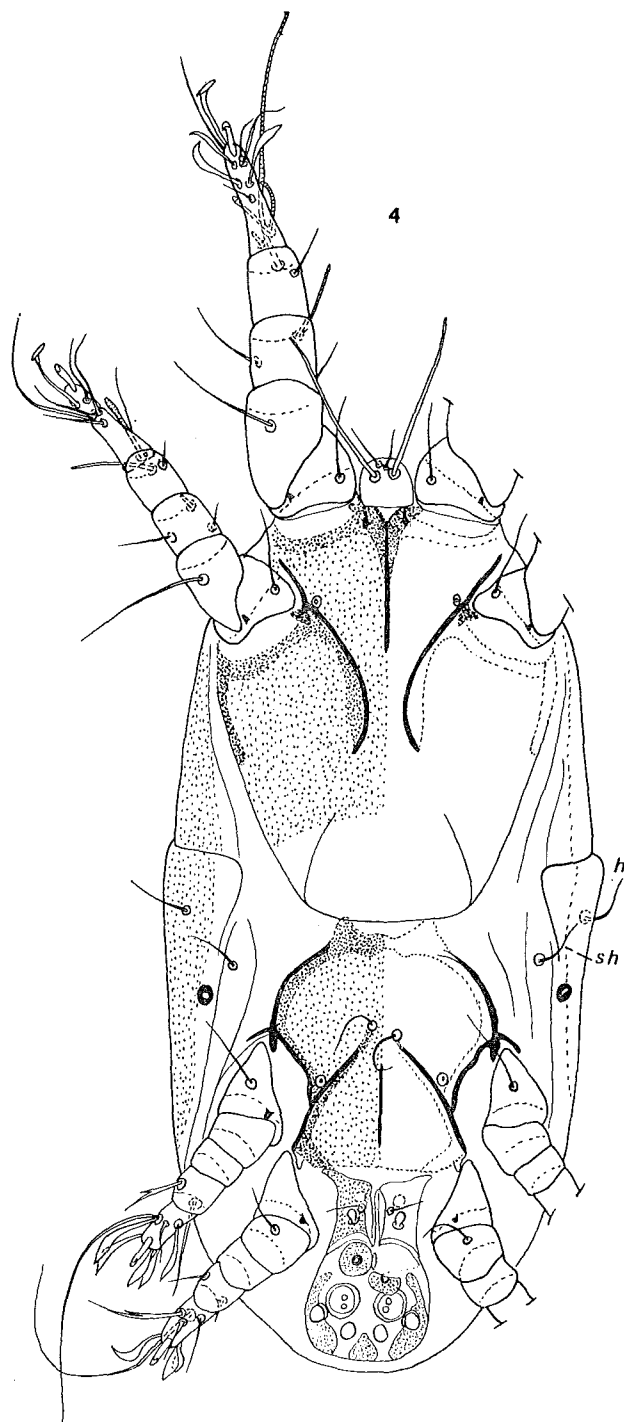
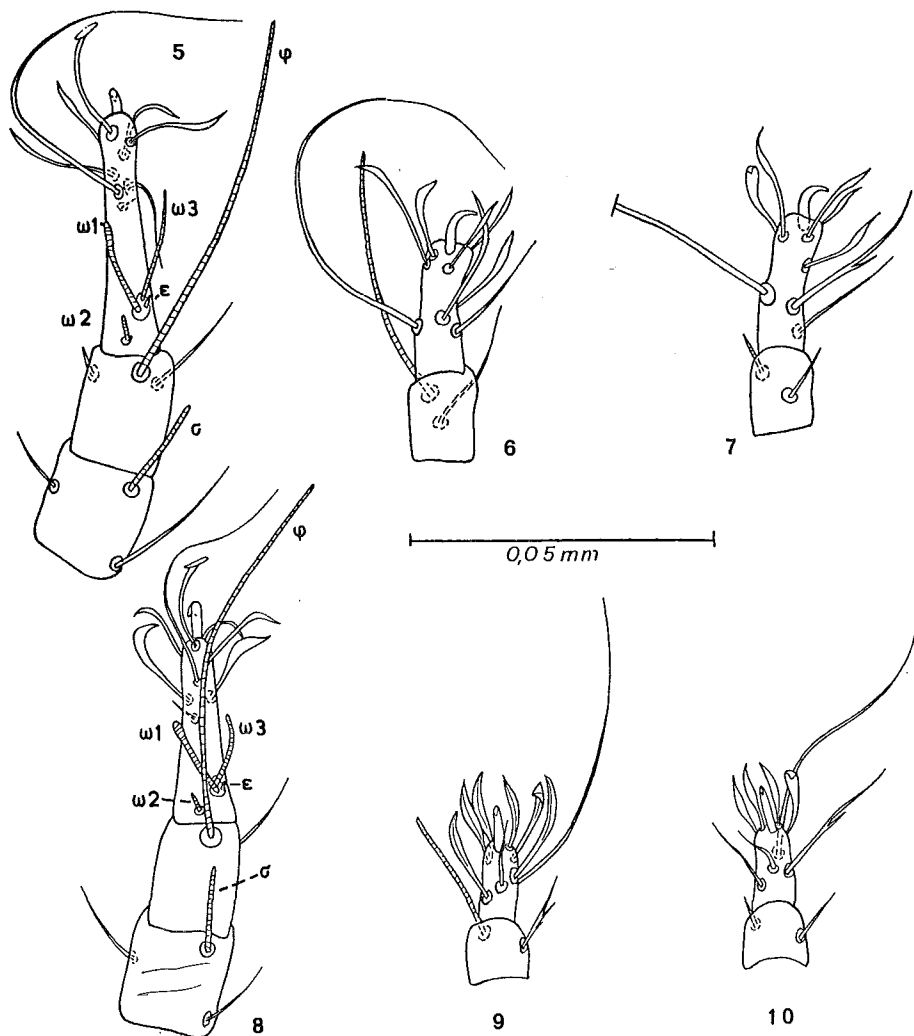


FIG. 4. *Michaelopus sminthruus* sp. nov. Hypopus in ventral view.



FIGS. 5-10. (5) Hypopus of *Michaelopus corticalis* (Michael): Tarsus, tibia and genu I; (6) tarsus and tibia III. (7) IV (lectotype). (8) Hypopus of *Michaelopus sminthurus* sp. nov.: Tarsus, tibia and genu I; (9) tarsus and tibia III and (10) tarsus and tibia IV.

**Saproglyphidae** Oudemans, 1924

Genus *Calvolia* Oudemans, 1911

(1) *Calvolia waldorfae* sp. nov.

This species is distinguished from *C. hagensis* Oudemans, the type species, mainly by the aspect of the dorsum which is completely punctate, without any network pattern. For a redescription of the species of Oudemans, see Fain, 1972. This species is named after Dr. Elizabeth Sims Waldorf who collected the mites described here.

HYPOPUS (holotype) (figs. 11, 12, 15-17): Length 196  $\mu\text{m}$ , maximum width 132  $\mu\text{m}$ . Sejugal furrow well developed. Propodosoma 75  $\mu\text{m}$  long, hysterosoma 123  $\mu\text{m}$  long. Dorsum uniformly punctate. Eyes very anterior with

small lenses and a well distinct retina. Dorsal hairs short. Epimera I-II free. Other epimera as in *C. hagensis*. The longitudinal pregenital sclerite is slightly shorter than in this species. Setae *cx I* and *cx III* absent. Palposoma con-

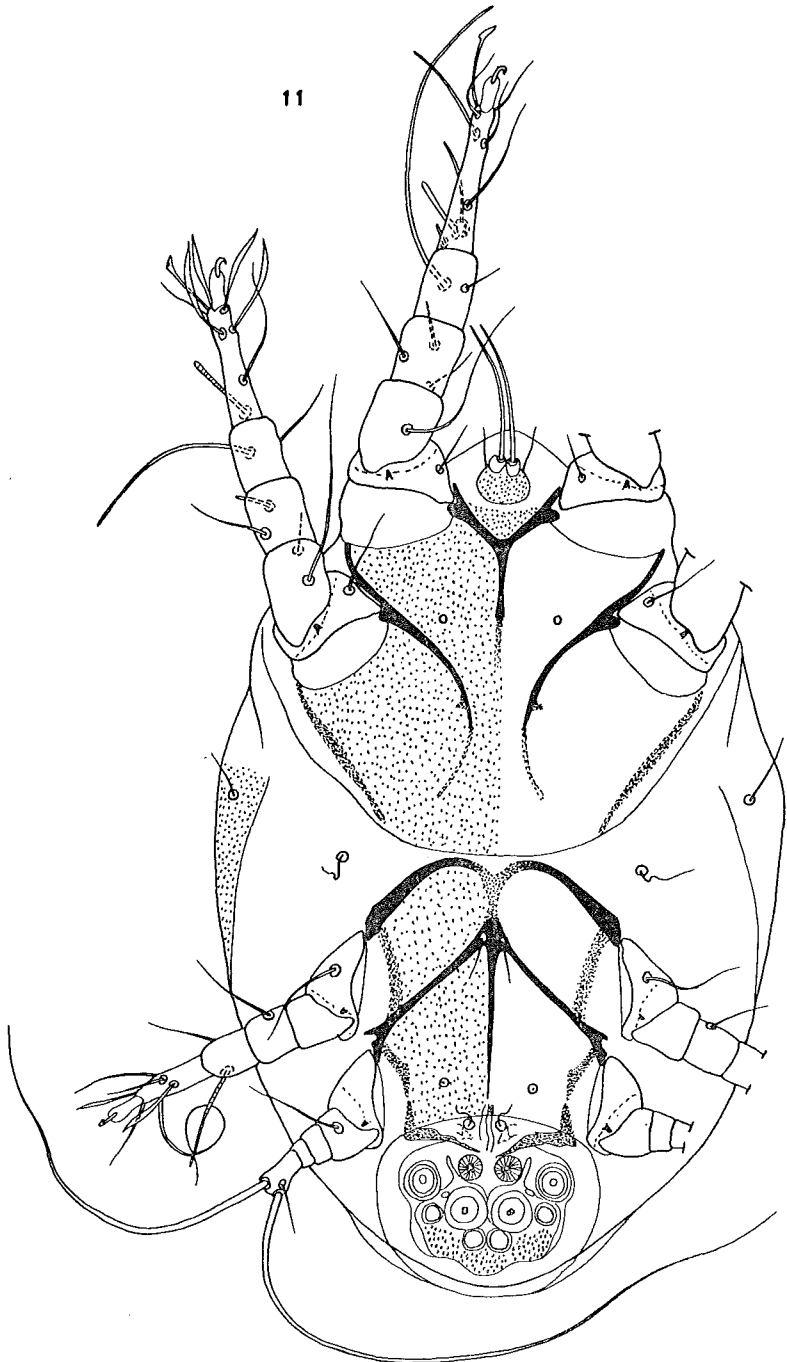
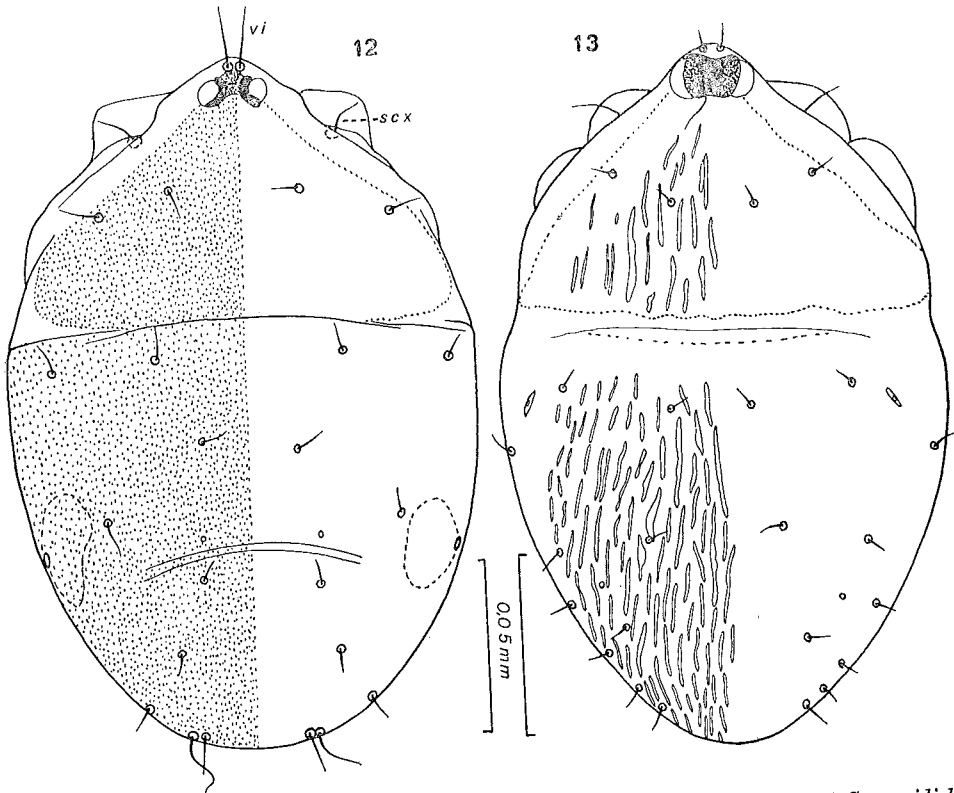


FIG. 11. *Calvolia waldorfae* sp. nov.: Hypopus in ventral view.



FIGS. 12-13. (12) Dorsal view of the hypopi of *Calvolia waldorfae* sp. nov. and (13) *Congovidiella collembolicola* sp. nov.

sisting of a small base ending into two short palpal lobes which carry the long  $\alpha$  solenidia. Tarsus I with the solenidia  $\omega 1$ ,  $\omega 2$ , and  $\omega 3$  in the basal third of the segment.

Chaetotaxy of the legs: Tarsi 7-7-6-3. Tibiae 1-1-1-0. Genua 2-2-1-0. Femora 1-1-0-1.

*Host and locality*: On *Sminthurus fuscus* L. (Collembola), Domleo, Spinney, Sutton Bonington, England, 19-31 August 1971 (holotype and one paratype: hypopi) (Coll. E. S. Waldorf).

*Type* in the British Museum (Natural History), London. [B.M. (N.H.) reg. no. 1973-581].

Genus *Congovidiella* Fain and Elsen, 1972.

(1) *Congovidiella collembolicola* sp. nov.

The genus *Congovidiella* was until now monotypic. The type species, *C. hieroglyphus* Fain and Elsen, was found on a tse-tse fly, in Zaire (formerly Congo).

*C. collembolicola* is distinguished from the type species mainly by the dorsal pattern of numerous regular short lines, directed longitudinally. **HYPOPUS** (holotype) (figs. 13, 14, 18-20): Length 188  $\mu\text{m}$ , maximum width 120  $\mu\text{m}$ . **Dorsum** well sclerotized. Propodosoma 75  $\mu\text{m}$  long, hysterosoma 111  $\mu\text{m}$  long. The dorsal lines are rather thick but short and indistinct in



the lateral regions. Eyes very anterior and with a large retina. All the dorsal setae are very short. Palposoma consisting of two cylindroconical projections. Epimera I-III free. Epimera IV thick, meeting in the midline where they are fused with a median longitudinal sclerite. Anterior legs slender; posterior legs short; structure of the legs as in the type species. Setae *cx I* absent; *cx III* vestigial. Suctorial plate wider than long.

Chaetotaxy of the legs: Tarsi 5-5-3-3. Tibiae 0-0-1-0. Genua 1-1-0-0. Femora 1-1-0-1. Trochanters 1-1-1-0.

Solenidotaxy: on tarsi I  $\omega 1$  and  $\omega 2$  are situated basally and  $\omega 3$  apically. Genu II lacking a solenidion.

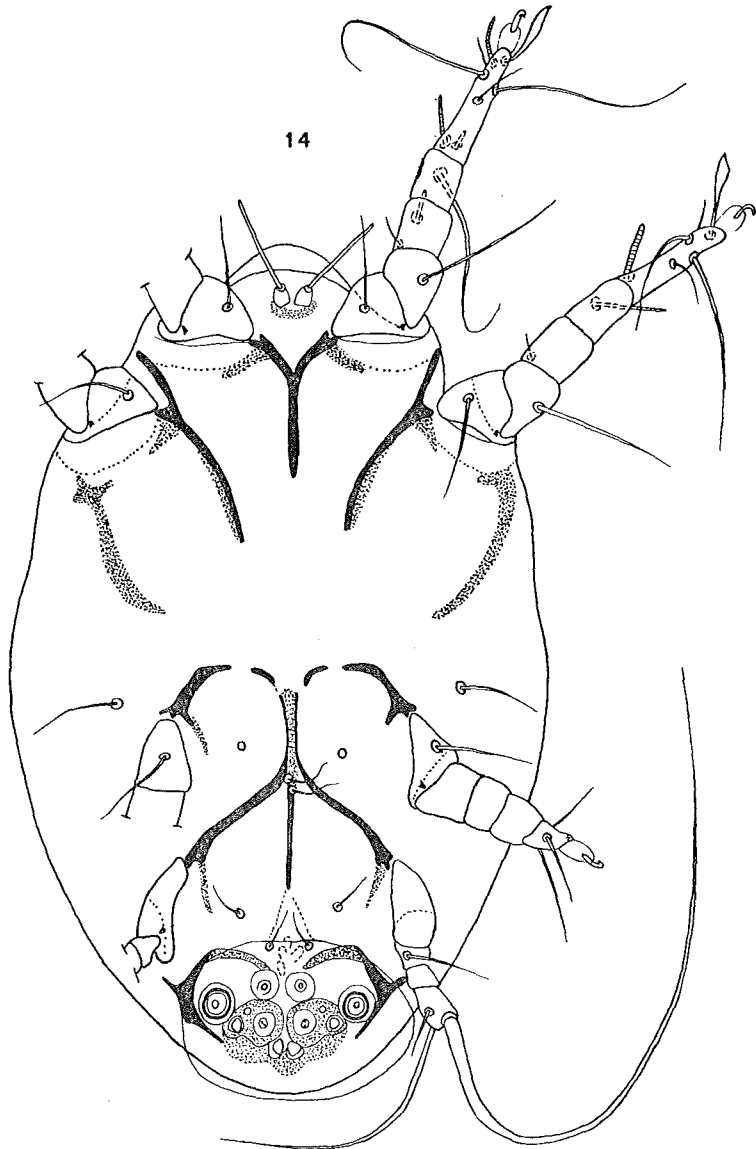
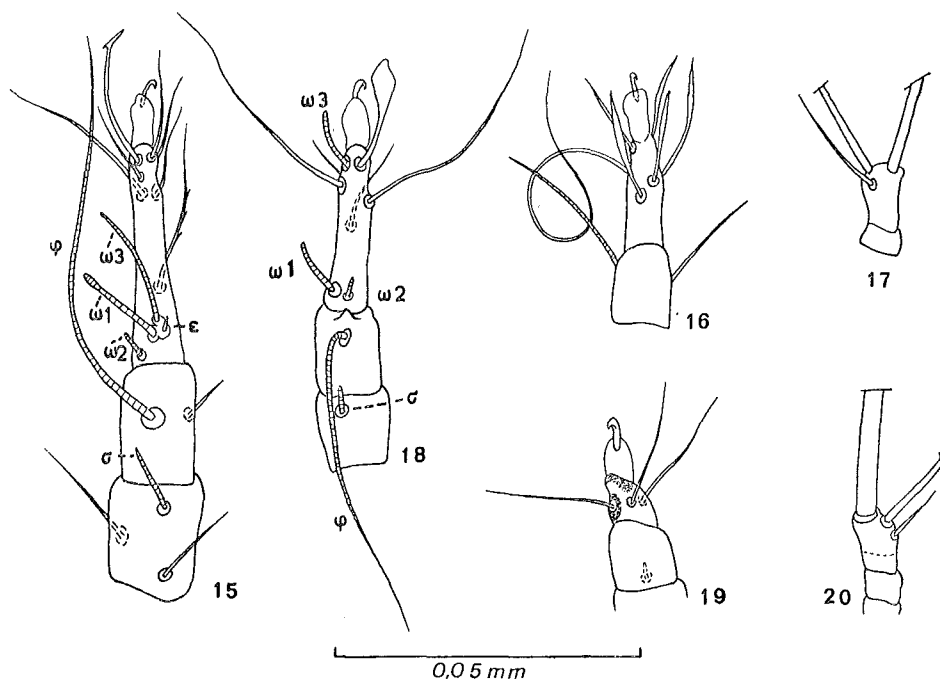


FIG. 14. *Congovidiella collembolicola* sp. nov.: Hypopus in ventral view.



FIGS. 15-20. (15) Hypopus of *Calvolia waldorfae* sp. nov.: Tarsus, tibia and genu I; (16) tarsus and tibia III. (17) tarsus and tibia IV. (18) Hypopus of *Congovidiella collembolicola* sp. nov.: Tarsus, tibia and genu I; (19) tarsus and tibia III. (20) tarsus and tibia IV.

*Host and locality*: On *Sminthurus fuscus* L. (Collembola), Domleo, Spinney, Sutton Bonington, England, 19-31 August 1971 (holotype and one paratype, hypopi) (Coll. E. S. Waldorf).

*Type* in the British Museum (Natural History), London. [B.M. (N.H.) reg. no. 1973-580].

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