

THE PHORETIC HYPOPI OF TWO ACARID MITES DESCRIBED  
FROM ANTS' NEST : *TYROPHAGUS FORMICETORUM* VOLGIN, 1948  
AND *LASIOACARUS NIDICOLUS* KADZHAJA AND SEVASTIANOV, 1967

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| TAXONOMIE<br>HYPOPI  | SUMMARY : The phoretic hypopi of two acarid mites, <i>Tyrophagus formicetorum</i> Volgin, 1948 and <i>Lasioacarus nidicolus</i> Kadzhaja & Sevastianov, 1967 (Acari, Acaridae) are described. A new tribe is erected for the genus <i>Lasioacarus</i> (Lasioacariini tr. n.). These mites were originally described from ant's nests in U.S.S.R. The authors found them again in Poland. |
| TAXONOMIE<br>HYPOPES | RÉSUMÉ : Les hypopes phorétiques de deux espèces d'acariens sont décrits, <i>Tyrophagus formicetorum</i> Volgin, 1948 et <i>Lasioacarus nidicolus</i> Kadzhaja & Sevastianov, 1967 (Acari, Acaridae). Ces deux espèces furent décrites de nids de fourmis d'U.R.S.S. Elles furent retrouvées par les auteurs en Pologne.   |

INTRODUCTION

We describe herein the phoretic hypopi of two species of Acaridae, both recorded from ants' nest in U.S.S.R. Until now, hypopial nymphs were not known in the genera *Tyrophagus* Oudemans, 1924 and *Lasioacarus* Kadzhaja and Sevastianov, 1967, to which these species belong.

The first species, *Tyrophagus formicetorum* Volgin, 1948, was originally described from adult forms found in the nest of an ant, *Formica rufa*, from Katyń. One the us (W. CH.) found adult specimens of this species in a nest of the same host from Wolin National Park in Poland. He succeeded in rearing laboratory monocultures and

obtained all the developmental stages of this species, including numerous hypopi.

Up to now an hypopial stage had never been recorded with certainty in the genus *Tyrophagus*. Curiously enough these hypopi resemble closely those described in the genus *Forcellinia* Oudemans, 1924. It appears from these observations that the same hypopus phenotype is utilized by two different genera of Acaridae. Similar observations were made recently in the family Glycyphagidae for pilicolus hypopi (FAIN *et al.* 1985 and FAIN and SPICKA, 1986).

The second species whose hypopial stage is described herein is *Lasioacarus nidicolus* Kadzhaja and Sevastianov, 1967. The typical series of that species, including females, males, nymphs I and

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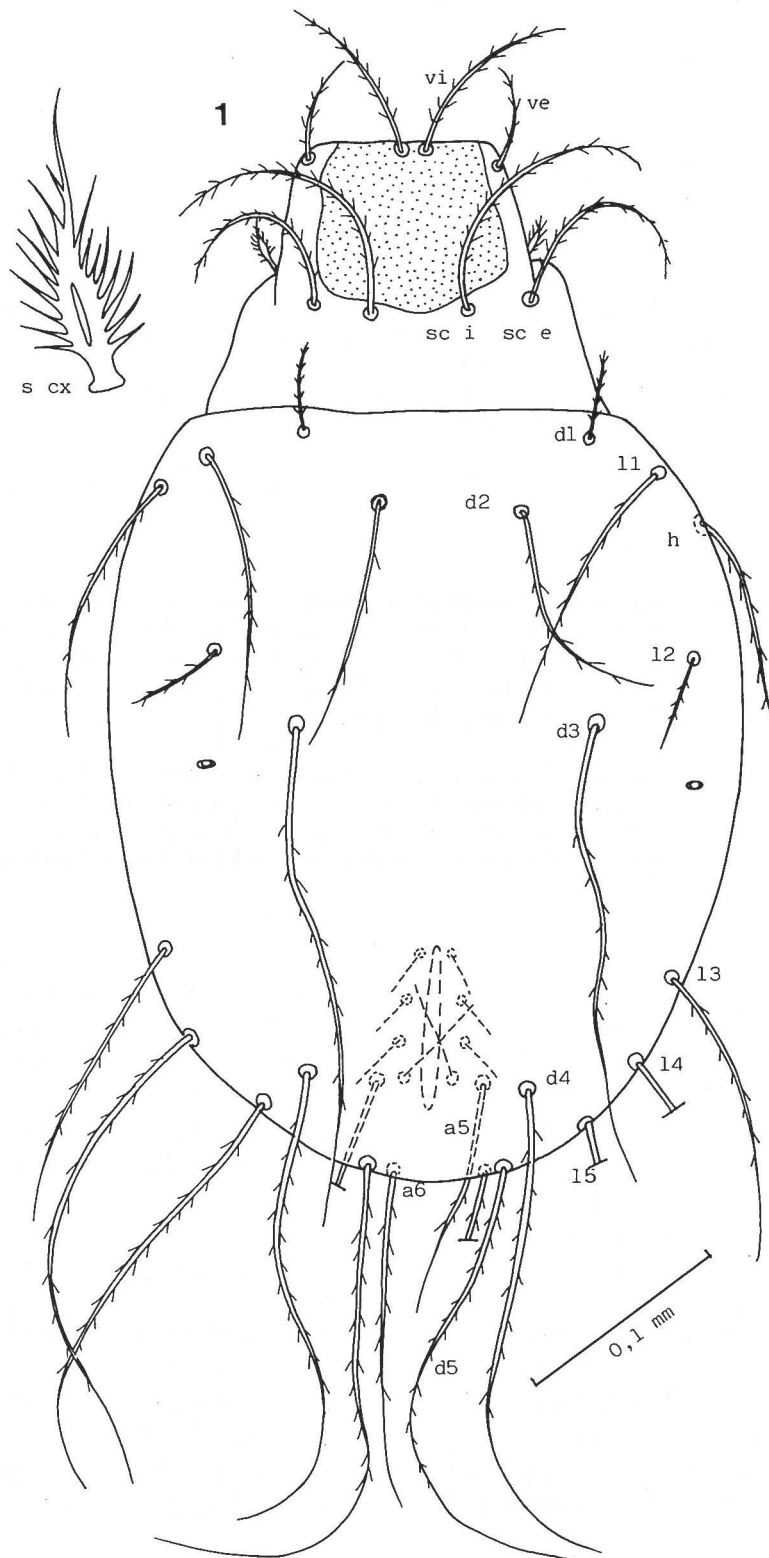


FIG. 1 : *Tyrophagus formicetorum* Volgin. Female in dorsal view (specimen from Poland).

III and larvae, was described from the nest of the ant *Lasius niger* L. in U.S.S.R. Hypopi were not found by the authors. W. CH. found several adult specimens of this species in the litter of a bee hive, *Apis mellifica* in Poland and he succeeded in breeding this species in the laboratory. All the stages were obtained, including hypopi.

The measurements given herein are in micrometers ( $\mu\text{m}$ ).

The setal nomenclature of the idiosoma is that described by FAIN (1963).

Genus *Tyrophagus* Oudemans, 1924

*Tyrophagus formicetorum* Volgin, 1948

VOLGIN described this species without giving figures except that of the penis of the male.

SAMŠIŇÁK (1962) recorded this species from Central Europe and he redescribed the female from a paratype.

This species presents all the characters of the genus *Tyrophagus* and it resembles superficially *T. putrescentiae*, except for the following characters : the dorsal setae are distinctly thicker, the setae *sc i* are relatively shorter compared to the *sc e* (ratio *sc i* : *sc e* = 1,25 in *T. putrescentiae*), the setae *sc i* and *sc e* are distinctly thicker and strongly bent, the *d 1* are closer to *d 2*, the propodotal shield is relatively wider and does not bear pigmented eye spots, the setae *s cx* are thicker and bear more branches, the penis of the male is shorter and thicker and has another shape.

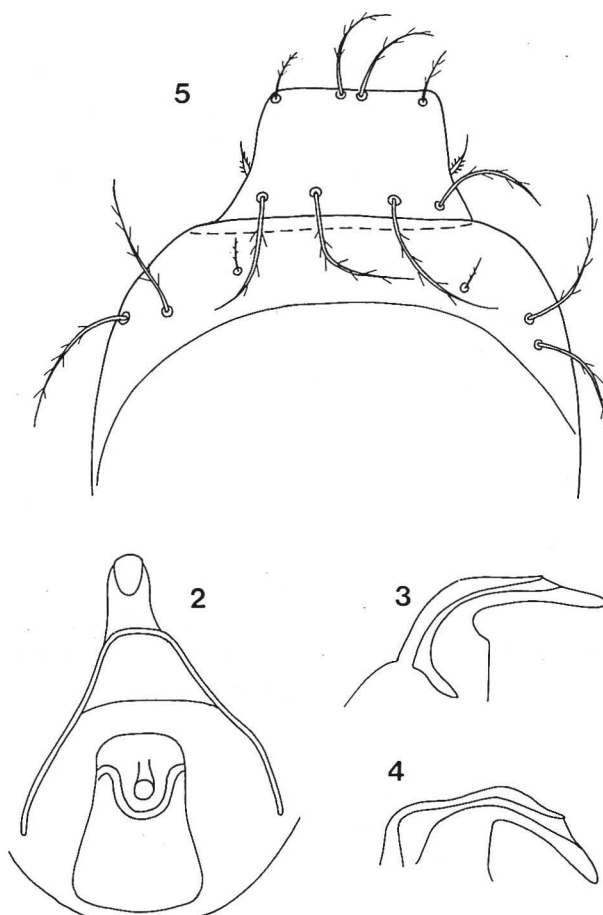
We give hereunder a brief description of this species :

**Female** (fig. 1) : Length and width of idiosoma in 5 females : 360 × 200, 420 × 255, 465 × 260, 470 × 265, 480 × 290, 495 × 275. All these specimens are ovigerous (one to 4 eggs) except the first. Length of the setae : *vi* 105 ; *ve* 57 ; *sc i* 150 ; *sc e* 120 ; *d 1* 45 ; *d 2* 130 ; *d 3* 270 ; *d 4* and *d 5* 300 ; *h* 145 ; *l 1* 165 ; *l 2* 50 ; *l 3* 165 ; *l 4* 300 ; *l 5* 225 to 275 ; *a 1* and *a 2* 27-30 ; *a 3* 35-40 ; *a 4* 48-50 ; *a 5* 130-150 ; *a 6* 180. These setae are pilose and all of them are finely attenuated apically except *d 1* and *l 2* which are more

or less rodlike. The setae *sc i* and *sc e* are thick (*sc i* 2,6 thick) and strongly bent. The pilosity is more marked on the anterior setae than on the hysteronotal setae. Leg I slightly thicker than legs II. Length of tarsi : 60-58-65-85. Setae *p*, *q* and *e* are thin except in the large sclerotized females where they are slightly spinous.

**Male** (figs 2-4) : The penis is short and thick and bent only at its base.

**Protonymph** (fig. 5) : We have two protonymphs containing a completely developed hypopus. The measurements of the anterior setae are as follows : *vi* 40 ; *ve* 26 ; *sc i* 54 ; *sc e* 42 ; *l 1* 60 ; *h* 43. The *sc i* and *sc e* are strongly pilose and bent as in the adult female. The more posterior setae are not observable.



FIGS. 2-5 : *Tyrophagus formicetorum* Volgin.

Male : penis in ventral (2) and in lateral view (3 and 4). — Protonymph containing a completely developed hypopus (5) (specimens from Poland).

*Heteromorphic deutonymph* (hypopus) (figs 6-13) : Length and width of 4 specimens  $204 \times 171$ ;  $205 \times 180$ ;  $207 \times 177$ ;  $210 \times 180$ . Body roughly triangular with base anterior. *Dorsum* : Propodonotum very short. Setae *vi* and *ve* very thin and short (10) and situated on a rounded prolongation of the idiosoma. Setae *sc i* and *sc e* 10-12 long, situated almost on a traverse line; *s cx* thin 25 long. Setae *d 1* and *d 2* almost rodlike 18-20 long; *d 3* and *d 4* 11 to 12 long; *d 5* 12 very thin; *l 1* and *l 3* 12 long; more or less rodlike; *l 2* and *l 4* thin 10 to 12 long; *l 5* 18 long. *Venter* : Sternum very long, almost reaching the same level as epimeres II : coxal fields III closed and separated in midline. Suctorial plate large, posterior suckers larger than the anterior; the lateral conoids are in front of the posterior suckers. Cuticle behind the suctorial plate with numerous and fine striations. Coxal setae I and III are conoids. Setae *gp* are large bilobed conoids. Palposoma longer than wide. Legs : Tarsi I-IV in two specimens 39-30-19-18 and 36-27-18-18 long. Tarsi I with 9 setae including a long saucer-like dorsoapical seta, 5 thin setae and 3 very narrowly foliate setae. Tarsi II as tarsi I but the saucer-like seta is replaced by a large broadly foliate seta, there are 4 thin setae and 4 foliate setae (2 very narrowly). Tarsi III with 5 foliate and 3 thin setae. Tarsi IV with 4 foliate, 3 thin bare and 1 thick and partly barbed setae.

*Habitat* :

Our specimens were found in a nest of an ant, *Formica rufa*, in Wolin National Park, Poland (July 1970). A monoculture of this species was obtained providing numerous specimens of all the developing stages including hypopi.

*Remarks* :

*Tyrophagus formicetorum* is morphologically intermediate between *Tyrophagus* and *Forcellinia*. The adults and the nymphs I and III resemble closely *Tyrophagus* whereas the hypopi are of the *Forcellinia* type. It is interesting to note that this species has been found in the same biotope (nest of ants) as the type species of *Forcellinia* (i. e. *T. wasmanni*).

*Forcellinia* is close to *Tyrophagus*. It differs from the latter, in the adults, by the shape and the length of the dorsal setae, especially the *vi*, *sc i*, *sc e*, *h* and the first dorsals and laterals. In *Forcellinia* these setae are moderately long, subequal and pilose. These setae are either flattened with the apical part dilated or cylindrical with apices dilated or not. The setae *ve* are variable, either pilose or bare, short or relatively long, they are situated anteriorly as in *Tyrophagus* or are more posterior. Setae *s cx* seem also to be variable, either dilated as in *T. putrescentiae* or thin with very short barbs, or bare.

The hypopi of *Forcellinia* are characterized as follows : propodonotum short or very short, sternum long arriving posteriorly at the level of the apices of the epimeres II, lateral conoids of suctorial plate situated in front of the posterior suckers; setae *cx I*, *cx III* are conoids, setae *gp* are large bilobed conoids, tarsus I with a long saucer-like seta, this seta is replaced on tarsus II by a large foliate seta.

Acarinae Murray, 1877

**Lasioacarini** tr. nov.

The genus *Lasioacarus* is monotypic. It differs from all the other genera in the Acarinae by the following characters :

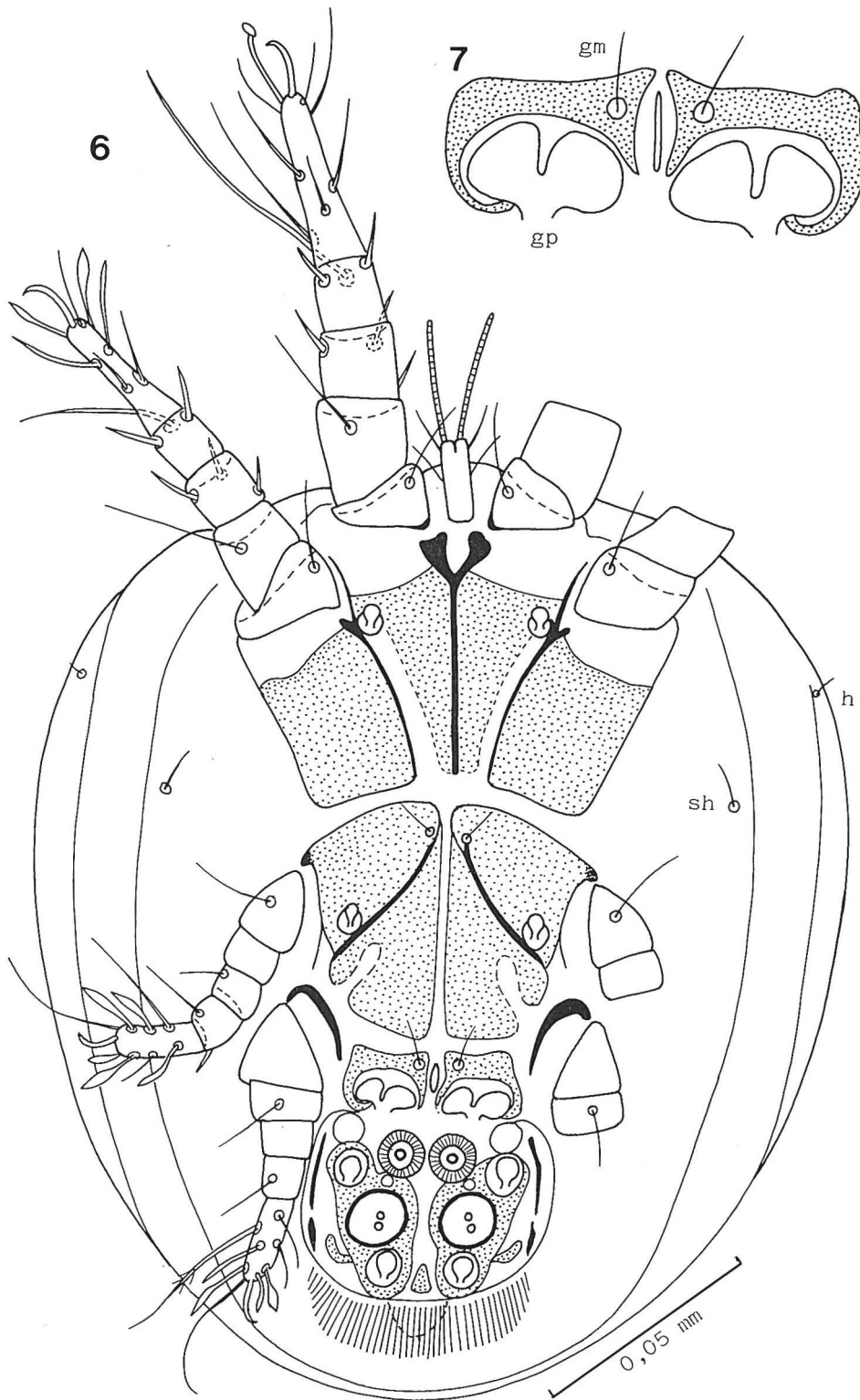
1. *Regressive characters* :

*In female* : setae *ve*, *sc i*, *h*, *d 1*, *a 3*, to *a 6* are lacking. On tibiae I and II only one present. Genua III lacking a seta.

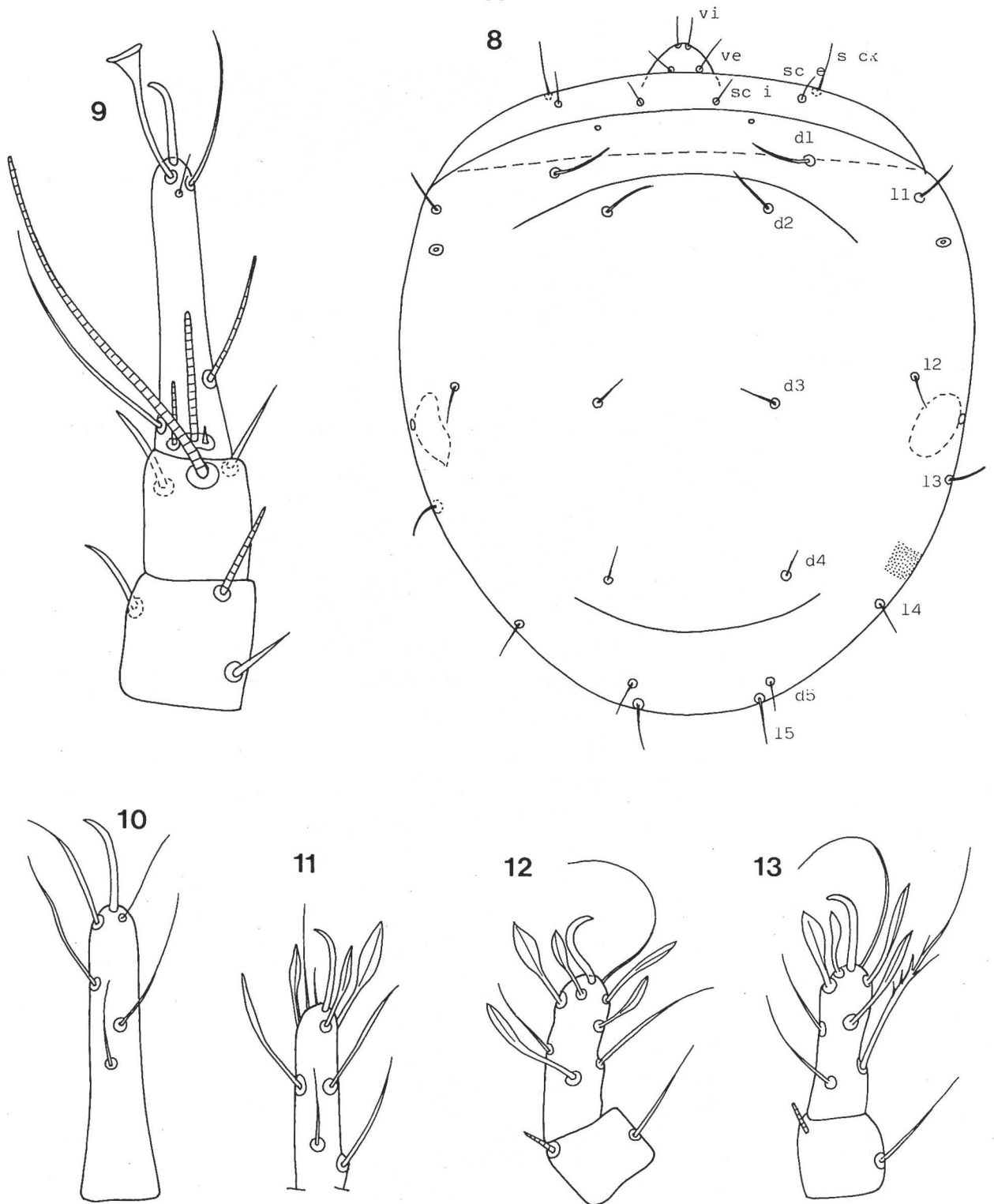
*In hypopi* : Tibiae I and II with only one seta, genua III bare.

2. *Specialized character* : Presence on the opisthogaster of the female of a special organ consisting of a pair of thick setae lying in an elongate cuticular depression. The function of this organ is unknown.

The tarsi in the female bears 5 thick ventroapical spines and the seta *e* is a spine. We think that these unusual characters justify the creation of a new tribe. Type genus : *Lasioacarus* Kadzhaja & Sevastianov, 1967.

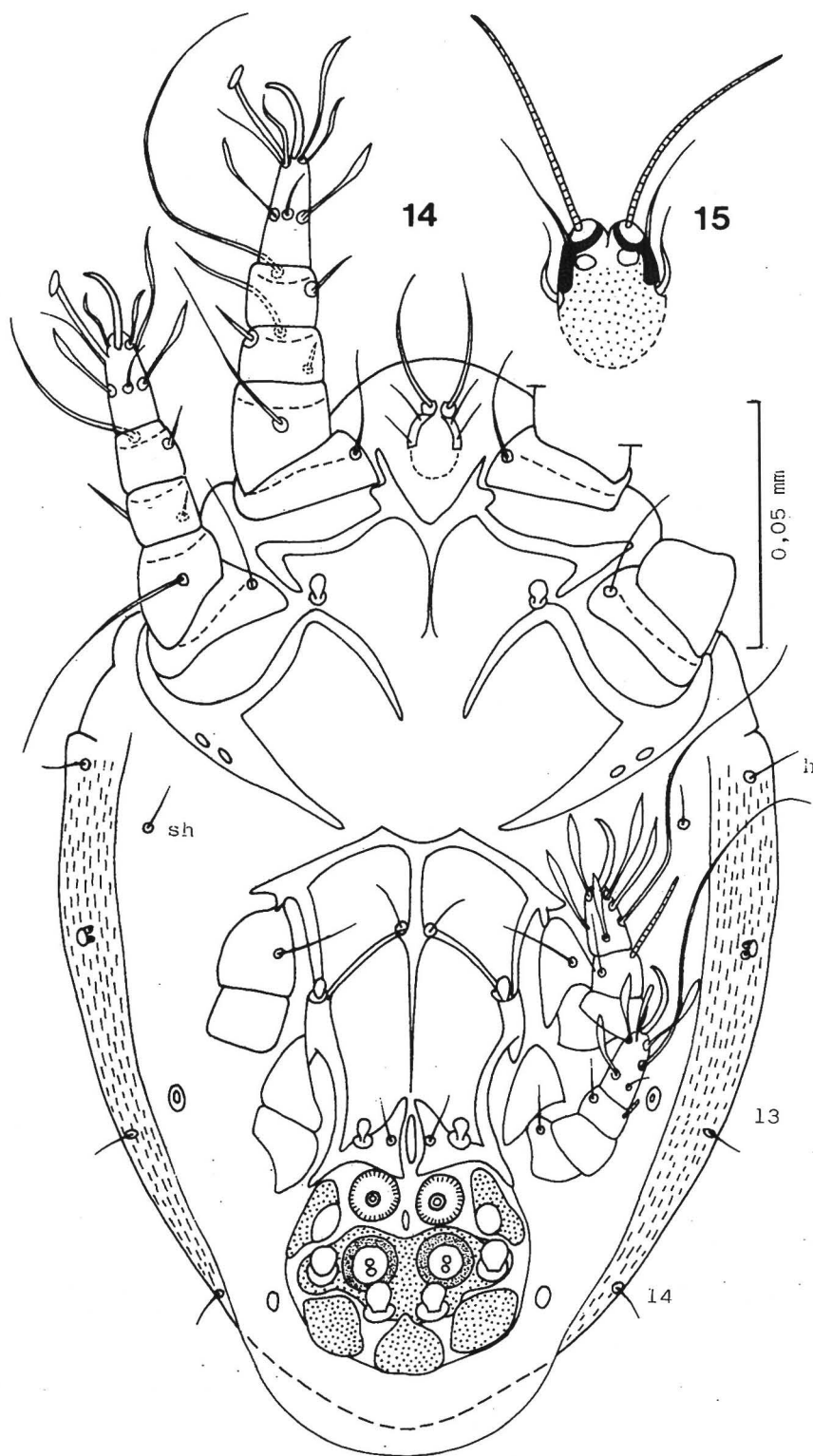


FIGS. 6-7 : *Tyrophagus formicetorum* Volgin.  
Hypopus in ventral view (6) ; area of setae *gm* and *gp* (7) (specimen from Poland).

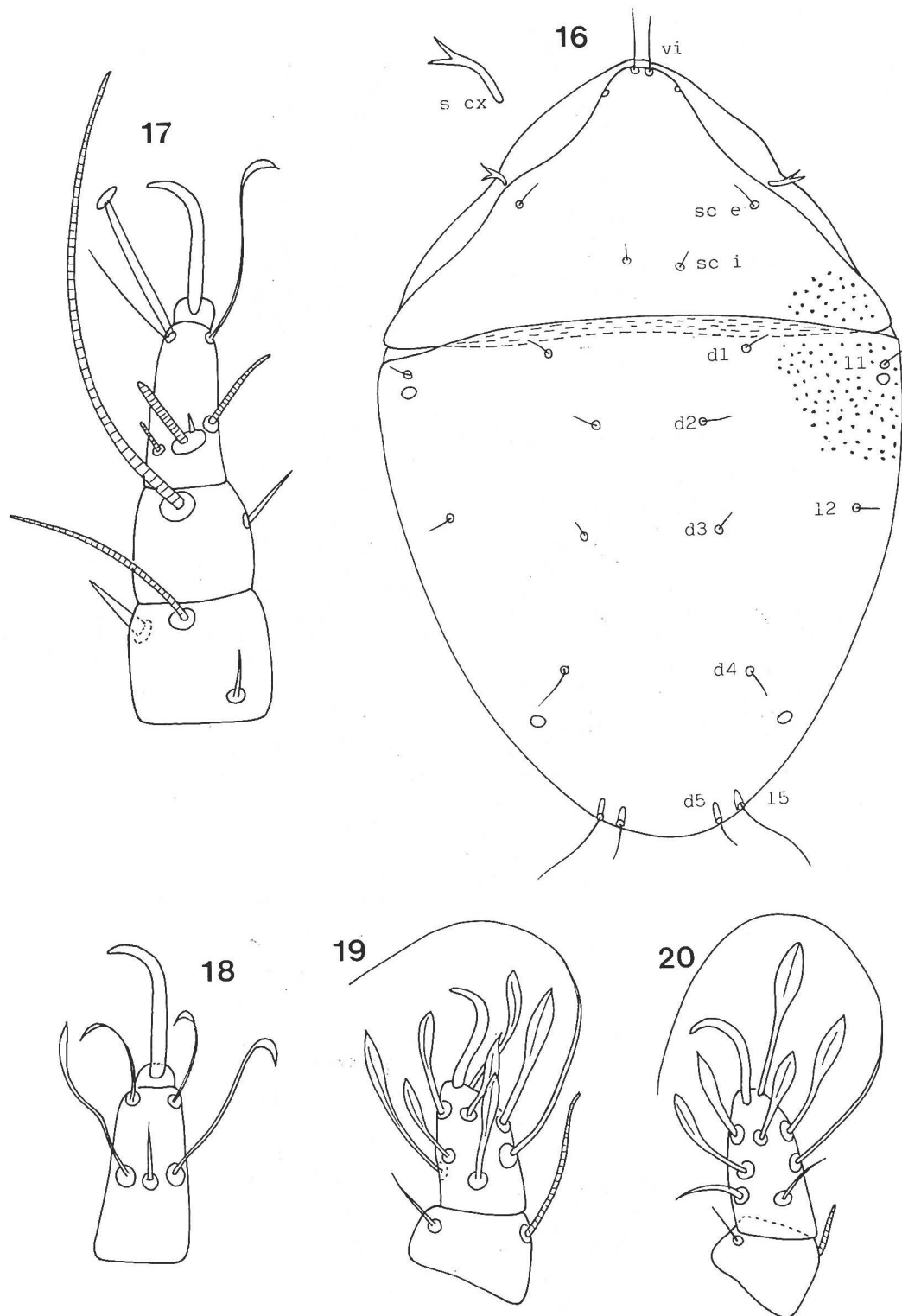


FIGS. 8-13 : *Tyrophagus formicetorum* Volgin.

Hypopus. Dorsal surface (8). Leg I dorsally (9), tarsus I ventrally (10), tarsus II ventrally (11), tarsus III (12), tarsus IV (13) (specimen from Poland).



FIGS. 14-15 : *Lasiocarus nidicolus* Kadzhaja & Sevastianov, 1967.  
Hypopus in ventral view (14) ; palposoma enlarged (15) (specimen from Poland).



FIGS. 16-20 : *Lasiocarus nidicolus* kadzhaja & Sevastianov.

Hypopus. Dorsal view (16). Leg I dorsally (17) ; tarsus I ventrally (18) ; tarsus and tibia III (19) and IV (20) in lateral view (specimen from Poland).



Genus *Lasioacarus* Kadzhaja & Sevastianov, 1967

*Lasioacarus nidicolus* Kadzhaja & Sevastianov, 1967

The hypopus of this species was still unknown. We describe it herunder.

*Hypopus* (figs 14-20) : Length and width of 5 specimens :  $205 \times 135$ ,  $216 \times 146$ ,  $219 \times 135$ ;  $226 \times 153$ ,  $228 \times 149$ . *Dorsum* covered by two sclerotized shields bearing numerous very small clear spots (1 to  $1,2 \mu$  in diameter). Propodotum longer than half the length of the hysteronotum. Chaetotaxy : *vi* thin 18 long, *ve* represented by only two small ringlets. Setae *s cx* bare, thick with bifid apex. Setae *sc i* very small (4 long) situated behind *sc e* (10 long). Hysteronotal setae thin, 8 to 10 long except *l 5* 30-35 long. *Venter* : Sternum shorter than epimeres II. Coxae III forming closed fields fused in the midline by means of a longitudinal sclerite reaching the genital orifice. Suctorial plate large. Posterior suckers slightly larger than anterior suckers. Lateral conoids at the same level as the posterior suckers. Setae *cx I*, *cx III* and *gm* are conoids. Palposoma very short, without distinct palps, as wide as long, bearing 2 long solenidia and 2 pairs of setae. Legs short. Length of tarsi I to IV 21-18-13-13, of claws 15-15-13-13. Chaetotaxy of legs : Tarsi I and II with 8 setae, including 1 saucer-like seta, 5 very narrowly foliate setae and 2 simple setae. Tarsus III with 7 foliate and one long simple seta. Tarsus IV with 5 foliate and 3 simple setae of which one is 60 long. Tibiae I and II with only one seta. Genua I-IV with 2-2-0-0 setae.

#### *Habitat* :

The type specimens were found in the nest of an ant *Lasius niger* in U.S.S.R. Our specimens

were found from the litter of a bee hive (*Apis mellifica*) from Poznan, Poland (1968). From these specimens a culture was obtained in which adults of both sexes and immatures including hypopi were observed.

#### *Remarks* :

The hypopus of this species is characterized by the relatively great length of the tarsal claws, the aspect of the palposoma short and sclerotized, the presence of only one seta on tibiae I-II, the absence of a seta on genua III, the absence of *ve* setae. These setal reductions are also observed in the adults.

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