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Studies on Tarsonemini (Acarina) associated with ants in forests of Poland

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(With 6 figures)

Abstract

Six new species of the families Pygmephoridae and Scutacaridae are described. The species are *Bakerdania kielczewskii, Petalomium rackae, Imparipes comatosimilis, Imparipes parapicolosimilis, Scutacarus myrmecophilus* and *Scutacarus ovoideosimilis.* All were found in nests of ants.

Introduction

This paper, part of a doctoral thesis concerning mites associated with ants in Polish forests, expecially in the forests of Poznań province, deals with some tarsonemoids which are new to science. Six species of the genera *Scutacarus, Imparipes, Petalomium* and *Bakerdania* have been recorded here for the first time. The mites appear to live in connection with ants in a parasitic or commensal way. The species of *Imparipes* appear to be closely associated with ants, more so than other species of Scutacaridae. The association is generally considered harmless to the ants (hosts) and is though to be beneficial to the mites, particularly in the case of phoresy. Full information on the relationship between scutacarids and insects is missing. The holotypes of the described species are deposited in the Zoological Institute and Zoological Museum of the University of Hamburg, West Germany.

Description of new species

Family Pygmephoridae CROSS, 1965

Bakerdania kielczewskii n.sp. (Fig. 1a-f)

Female: Length 281µm, width 112 µm; brown-reddish; body oval; gnathosoma with three pairs of setae, one of which is strongly incrassate, lanceolate setae, originating at the base of the palp. -

Dorsum: Propodosoma with two pairs of setae, setae pr minute, simple; setae pi simple, smooth, the two pairs arising anteriorly to sensillus. Sensillus bearshaped. Hysterosoma with seven pairs of slightly plumose setae; setae c_1 and c_2

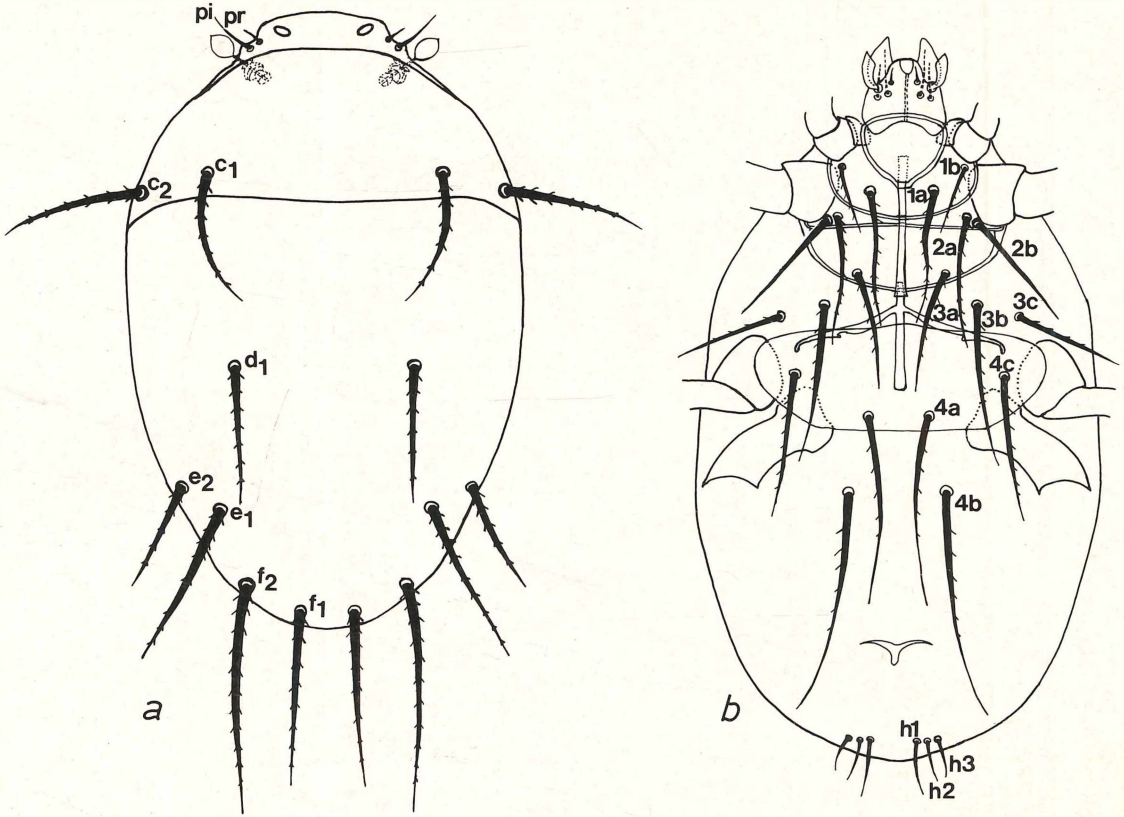

Fig. 1 a-b: *Bakerdania kielczewskii* n.sp., holotype, female; a = dorsal view and sensillus, b = ventral view.

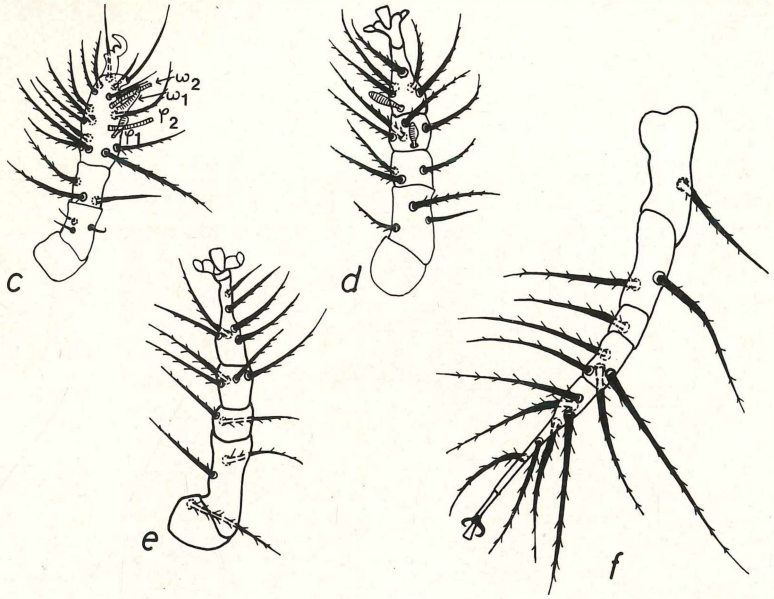

Fig. 1 c-f: *Bakerdania kielczewskii* n.sp., holotype, female; c = leg I, d = leg II, e = leg III, f = leg IV.

both of equal length; d_1 as long as c; e_2 shortest; e_1 and f_1 subequal in length; f_2 longest of all dorsal setae, being twice as long as e_2. Dorsum finely punctated. - Venter: Coxisternal plates strongly developed, with thick apodemes. Apodemes I and II complete, strong; apodeme IV incomplete distally. Epimeres I and II, each with two setae. All ventral setae slightly plumose, with exception of 2b, which are simple and smooth; 1b are the shortest of ventral setae; 4b arising posteriorly to 4a, both with little barbs. 4b are the longest of all ventral setae. Three pairs of caudal setae, simple, originating close to each other. - Legs: Tibiotarus I with weakly developed claw, incomplete distally, and four solenidia, ω_1 spure-shaped, ω_2 rod-shaped, the tallest; ϕ_1 club-shaped, the shortest; ϕ_2 rod like. Tibia II and tarsus II and tarsus II each with a club-shaped solenidion. Tarsus IV with six setae. Configuration and chaetotaxy of leg I, II, III and IV as shown in figures 1c-f.

Male: Unknown.

Remarks: This species is near to *Bakerdania arvalis* SAVULKINA, 1977 but can be distinguished by the gnathosoma which has a pair of lanceolate setae, the setae f_2 which are the longest of all dorsal setae, and the tibiotarsus I with its four solenidia differs in shape and size, the solenidion ω_2 being long and thin.

Holotype: One female collected from a nest of *Myrmica laevinodis* NYL. under the bark of a dead pine at the forest experimental station at Proszkow, Opole on September 6, 1976.

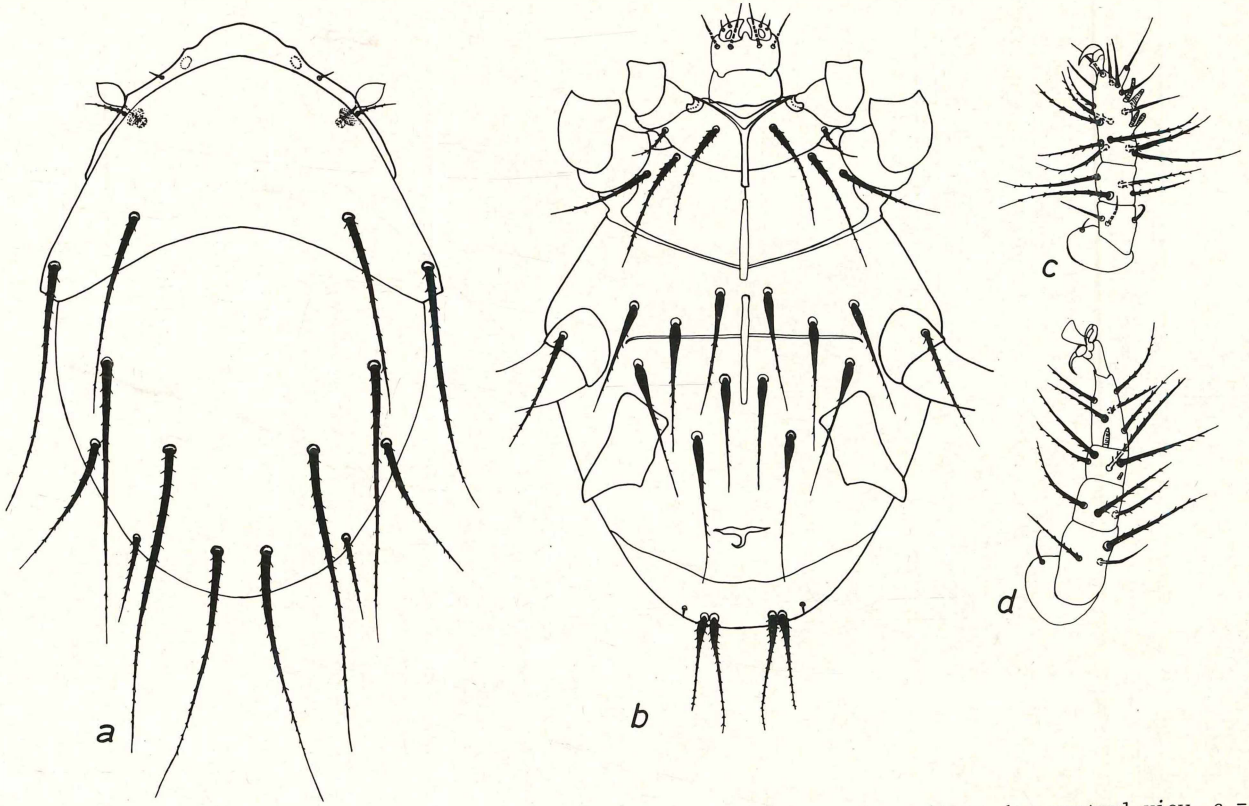

Fig. 2 a-d: *Petalomium rackae* n.sp., holotype, female; a = dorsal view and sensillus, b = ventral view, c = leg I, d = leg II.

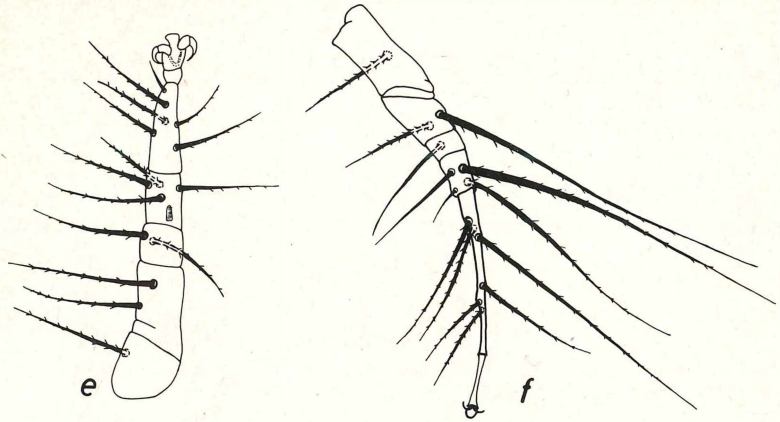

Fig. 2 e-f: *Petalomium rackae* n.sp., holotype, female; e = leg III, f = leg IV.

Petalomium rackae n.sp. (Fig. 2a-f)

Female: Length 293 µm, width 202 µm; pale white colour; body elliptical.

Dorsum: Propodosoma with two pairs of setae, setae pr minute and simple; setae pi slightly plumose, stigmata oval, sensillus elliptical. Hysterosoma with seven pairs of long, slightly plumose setae. Setae c_1 shorter than c_2; d_1 shorter than c_2, but longer than the total length of e_2 and f_2; f_1 and c_2, both of subequal length; f_2 are the shortest of all dorsal setae, but e_1 are the longest of them. - Venter: Coxisteral plate well developed, apodeme I complete and strong; apodeme II thin and weak, hardly visible at its base; apodeme III vestigial; apodome IV thin and incomplete distally; anterior median apodeme (sternum) weakly developed at its median part. Epimeres I and II with two plumose setae each; setae 1a and 2b of subequal length; 2a are longer than the preceding setae. All ventral setae, especially 3a, 3b, 3c, 4a, 4b and 4c are thickened basally and taper off distally; 3c and 4a, both of equal length; 3a shorter than 3b; 4c longer than the latters; 4a originating anterior to 4b; the latter are the longest of all ventral setae. There are three pairs of caudal setae; h_1 and h_2 are plumose and adjacent in their origin; h_1 longer than h_2; h_3 simple, short, hardly visible. - Legs: Tibiotarsus of leg I with weakly developed claw; solenidion ω_1 in form of spur, solenidion ω_2 rod like, thin and longest of all; solenidion ϕ_1 clavate shaped; solenidion ϕ_2 rod like, the two latters of subequal length. Configuration and chaetotaxy of legs I, II, III and IV as shown in figures No. 2c-f.

Male: Unknown.

Remarks: This new species is near to *Petalomium aculeatum* (MAHUNKA, 1975), *P. aleinikovae* (SEVASTIANOV, 1967) and *P. rarum*

(SEVASTIANOV, 1967). It differs from these in having spindleshaped ventral setae, from *aculeatum* in having longer setae h_2, from *aleinikovae* and *rarum* in having longer dorsal setae.

Holotype: One female collected from a nest of *Myrmica laevinodis,* under a stone, at the forest experimental station in Owińska, Poznań province, Poland on July 20, 1977. - Paratype: One female collected from a nest of *Myrmica ruginodis,* under the bark of a dead pine, at the above locality on September 6, 1976.

Family Scutacaridae OUDEMANS, 1916

Imapripes comatosimilis n.sp. (Fig. 3a-f)

Female: Length 167-220 µm (mean of 30 specimens 198 µm), width 165-210 µm (mean of 30 specimens 190 µm); yellowish-red; body circular to obovate.

Dorsum: Clypeus large, its margin broad; all dorsal setae plumose, ciliated;setae c arising along a transverse line,both of equal length, shorter and less robust than d_1, e_1 and f_1. Among the hysterosomatal setae, d_1 longest of all, being longer than the total length of setae e_2 and f_2, the last two of subequal length. Dorsum finely punctated in four regions. - Venter: Anterior and posterior sternal plate with well developed apodemes, the anterior and posterior median apodemes (sternum and ventrum) strong and thick. Secundary transverse apodeme and posterior marginal apodeme associated with each other to form an acute angle. Posterior sternal plate broad, its anterior margin highly convex, the two antero-lateral angle corners acute. Among the ventral plumose ciliated setae, 1b is the shortest of all; 3a and 3b long, both pairs reaching the point of origin of 4a and 4b; the latter shorter, not extending to the posterior end of the body. Setae 4c longest of all ventral setae. Setae 3a, 3b, 3c, 4a and 4c thickened basally and somewhat bowed. Three pairs of caudal setae, the inner and outer ones h_1 and h_3 long, thick, heavily ciliated, h_2 minute, a quarter of the length of the latter, originating adjacent to h_1. - Legs: Tibiotarsus I with well developed claw, solenidion ϕ_1 subclavate, solenidion ω_2 rod like, both of equal length, solenidion ω_1 the biggest. Tarsus and praetarsus of leg IV equally long, tarsus IV with four flagellate ciliated setae. Configuration and chaetotaxy of legs I, II, III and IV as shown in figures No. 4a-f.

Male: Unknown.

Remarks: This species is very near to *Imparipes comatus.* MAHUNKA, 1970, but can be distinguished from it by the flagellate dorsal setae d_1, the length of which is more than total length of setae e_2 and f_2, and by the minute, simple caudal setae h_2. It can also be distinguished by setae 3a, 3b, 3c,4a and 4c which are thickened basally and somewhat

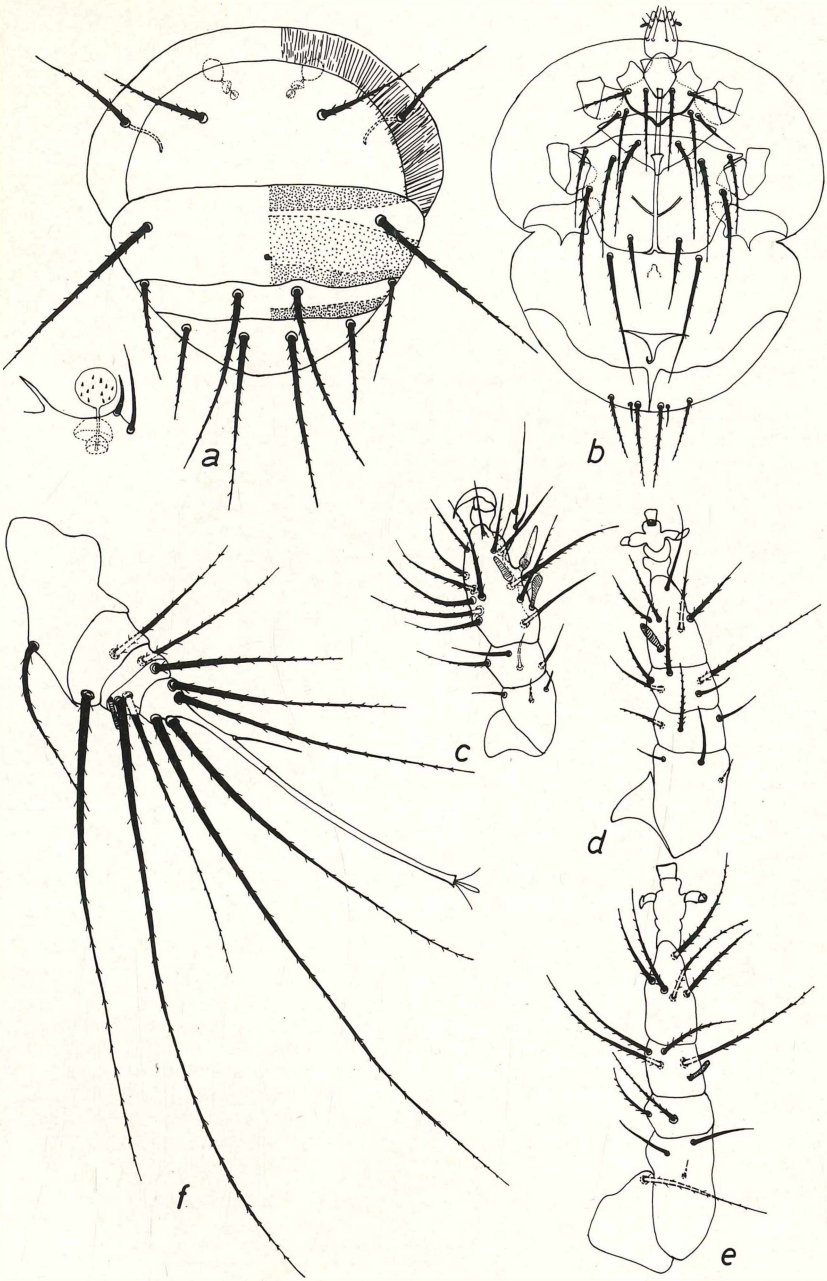

Fig. 3: *Imparipes comatosimilis* n.sp., holotype, female; a = dorsal view and sensillus, b = ventral view, c = leg I, d = leg II, e = leg III, f = leg IV.

bowed, and by tibiotarsus I with solenidion ϕ_1 which is sub-club shaped.

Holotype: One female collected from a nest of *Myrmica ruginodis* NYL., at the forest experimental station at Owińska, Poznań province, under the bark of a dead pine on June 4, 1977. -
Paratypes:Three females collected at the forest division, Proszkow near Opole, Poland, from a nest of *Myrmica laevinodis* NYL., under the bark of a dead pine on June 24, 1977.

Imparipes parapicolosimilis n.sp. (Fig. 4a-f)

Female: Length 205 µm, width 175 µm, brownish-red.

Dorsum: Body ovate, clypeus large, its margin narrow. All dorsal setae from slightly plumose to moderately ciliated; setae c_1 and c_2 arising along a transverse line, the two pairs of subequal length, but shorter than posterior setae d_1, e_1 and f_1; setae f_2 longest. Dorsum finely punctated. - Venter: Coxisternal plate well developed. Apodemes I and II complete, strong; secondary transverse apodeme associated with the posterior marginal apodeme in a trapezoidal shape. Anterior and posterior median apodeme robust, apodeme IV vestigial, in a short, straight line. Posterior sternal plate wide, its anterior margin convex acute with two antero-lateral angle corners. All ventral setae, except setae 2b plumose. Setae 4a shorter than 4b, inserting in front of them, the latter not reaching posterior margin of body. Setae 1a, 3b and 4c longest, all of equal length. Setae h_1 and h_3 long and ciliated, setae h_2 simple and minute. - Legs: Tibiotarsus I with large claw. Solenidion ω_1 large, tapering off distally, solenidion ϕ_2 robust and long, longer than rod-like solenidion ω_2, solenidion ϕ_1 club-shaped, its length equal to that of ϕ_2. Tibia and tarsus of leg IV subequal, tarsus IV with five setae. Configuration and chaetotaxy of legs I, II, III and IV as shown in figures No. 4c-f.

Male: Unknown.

Remarks: This species in near to *Imparipes parapicola* DELFINADO, BAKER & ABBATIELLO, 1976, but differs in having dorsal and ventral setae less barbed than in *I. parapicola;* in having setae f_2 the longest of dorsal setae; in setae 4b being short and not reaching the posterior margin of the body; in setae h_1 being longer than h_3, h_2 minute; solenidia on tibiotarsus I differ in shape and size,and seta t on tarsus IV being minute and simpel, those of *I.parapicola* being much longer.

Holotype: One female collected from a nest of *Tetramorium caespitum* L., under the bark of a dead pine, at the forest experimental station at Owińska, Poznań province, Poland on May 27,1976.

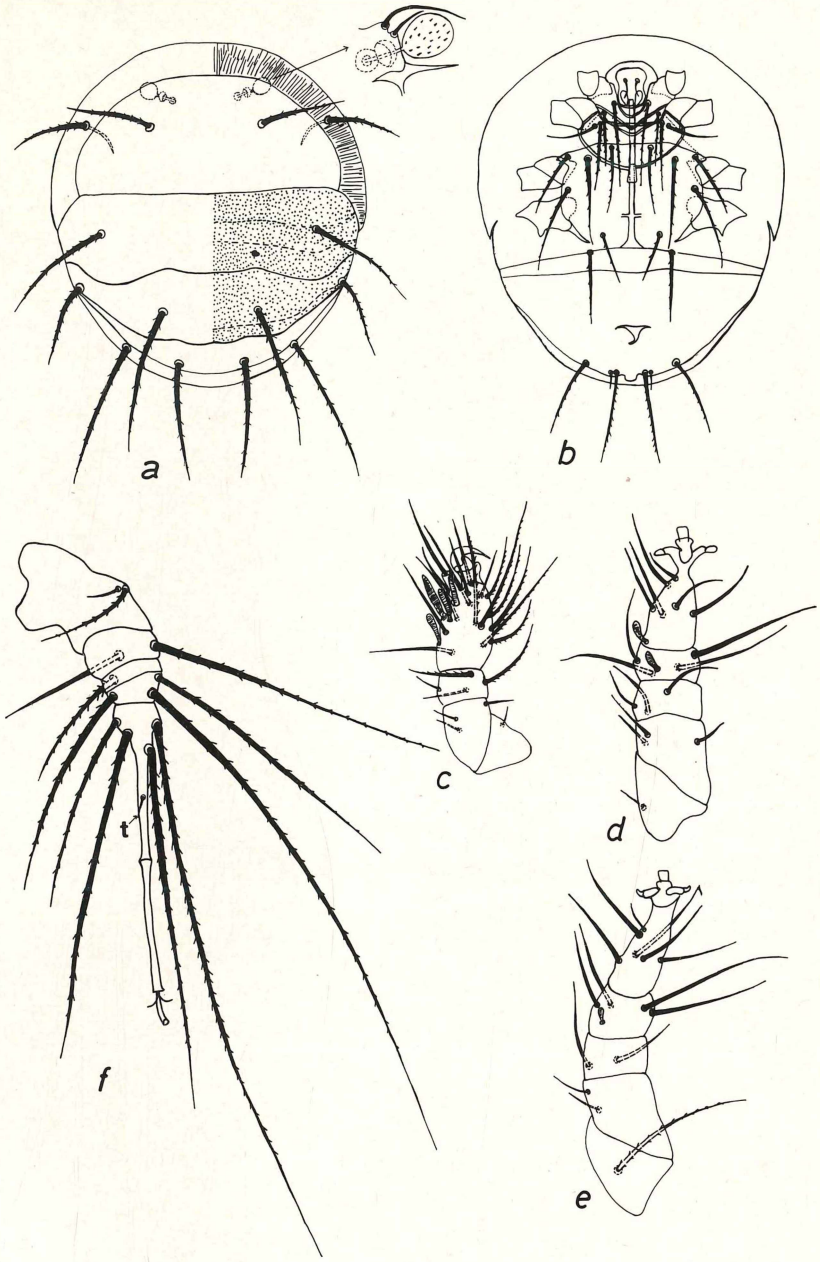

Fig. 4: *Imparipes parapicolosimilis* n.sp., holotype, female; a = dorsal view and sensillus, b = ventral view, c = leg I, d = leg II, e = leg III, f = leg IV.

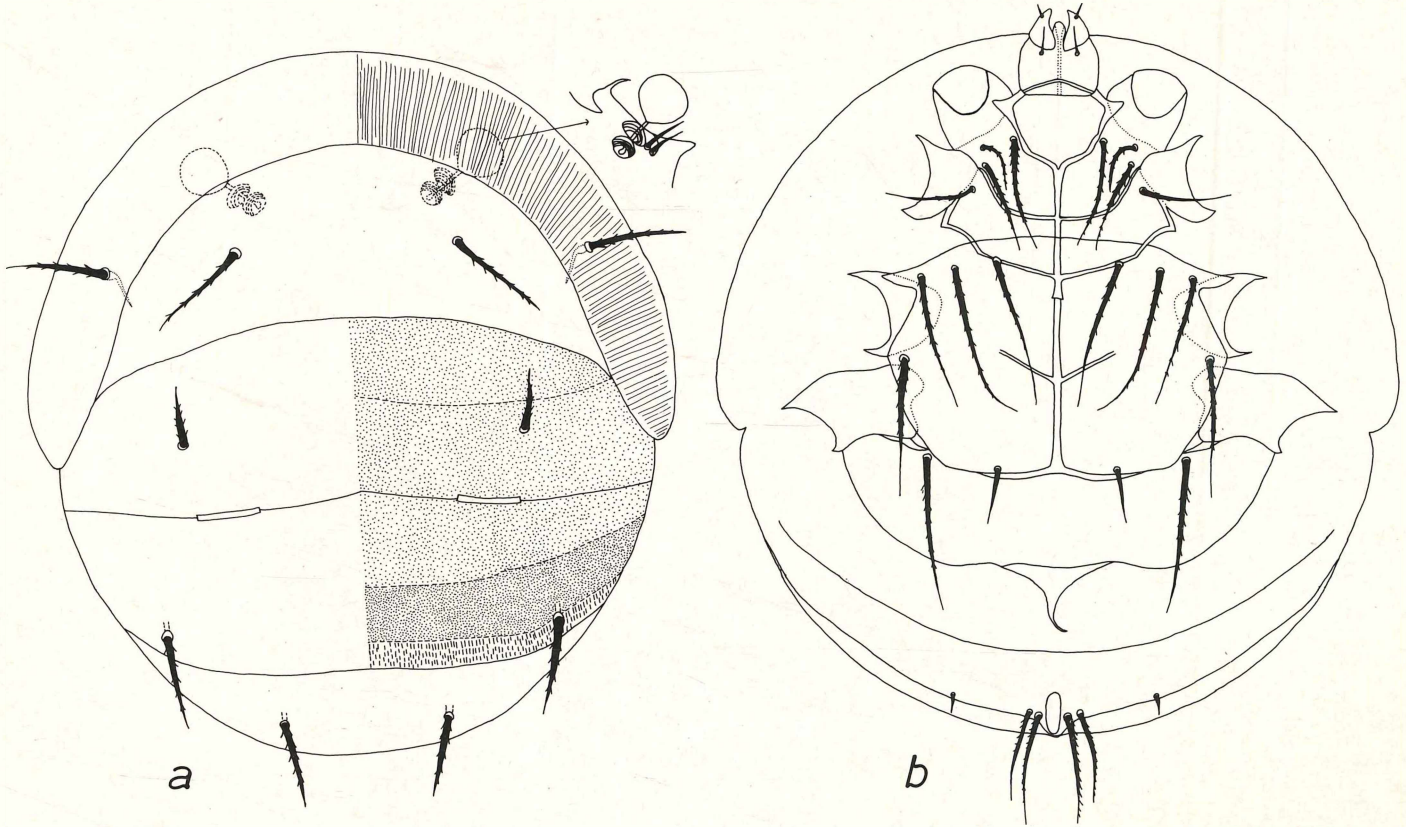

Fig. 5 a-b: *Scutacarus myrmecophilus* n.sp., holotype, female; a = dorsal view and sensillus, b = ventral view.

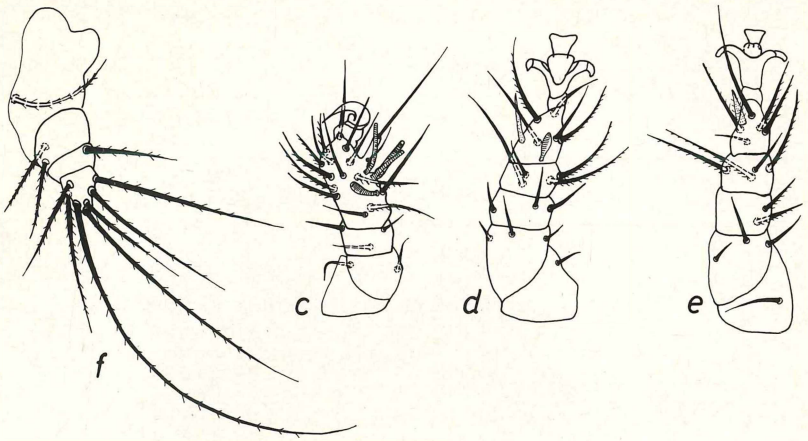

Fig. 5 c-f: *Scutacarus myrmecophilus* n.sp., holotype, female; c = leg I, d = leg II, e = leg III, f = leg IV.

Scutacarus myrmecophilus n.sp. (Fig. 5a-f)

Female: Length 151-171 µm (mean of 10 specimens 160 µm), width 155-179 µm (mean of 10 specimens 160 µm); pale red; body circular to obovate.

Dorsum: Clypeus normal, its free margin wide; sensillus round and smooth. Setae c_1 arising anteriorly to setae c_2 and slightly longer than the latter, both of few barbs; setae c_1 and c_2 longer than the other hysterosomatal setae. Setae d_1 strongly incrassate, apically setose, slightly plumose. Dorsum finely punctated. - Venter: Coxisternal plates well developed, with strong apodemes. Apodemes I and II complete, apodemes IV incomplete; posterior median apodeme thick; posterior sternal plate wide, its anterior margin convexly arcuated, covering a small part of trochanter IV at the base. All ventral setae plumose, slightly barbed, except setae 2b, 4a and h_3, which are simple and smooth. Setae 3b longest of all ventral setae. Setae 4a arising posteriorly to 4b, their length less than half of that of setae 4b. Caudal setae h_1 and h_2 close to each other, more barbed, h_1 longer than h_2; setae h_3 minute and simple. - Legs: Tibiotarsus I with a well developed claw, pedicellate. Solenidion ω_1 a robust spur, solenidion ω_2 in the shape of appendicular angle, solenidion ϕ_2 rod-like, solenidion ϕ_1 club-shaped, solenidion ω_2 the longest of all. Tarsus II with clavate-shaped solenidion. Tibiotarsus of leg IV bears seven plumose setae. Configuration and chaetotaxy of legs I, II, III and IV as shown in figures 5c-f.

Male: Unknown.

Remarks: This species is similar to *Scutacarus tackei* subsp. *ellipticus* KARAFIAT, 1959 in the absence of setae e_2 and f_2, but can be distinguished through the strongly incrassate setae d_1, which are shorter than setae e_1 and f_1, by the club-shaped solenidion ϕ_1 on the first tibiotarsus, and by the chaetotaxy of leg II and leg III.

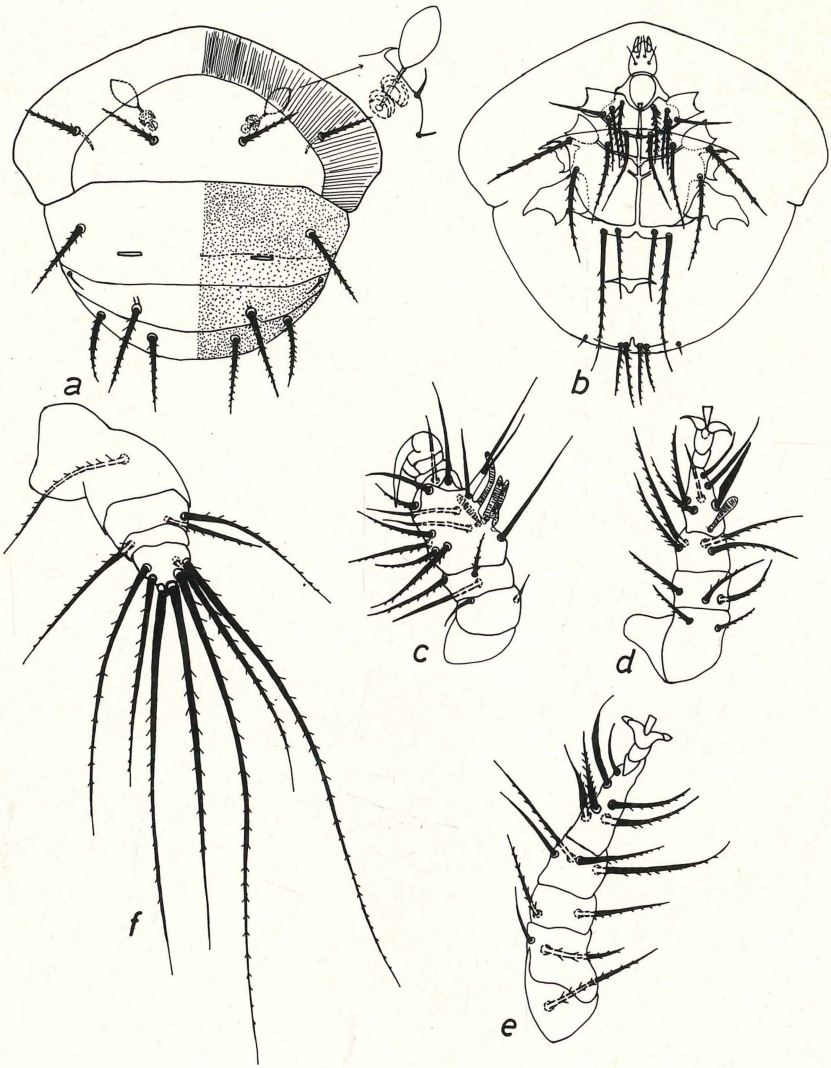

Fig. 6: *Scutacarus ovoideosimilis* n.sp., holotype, female; a = dorsal view and sensillus, b = ventral view, c = leg I, d = leg II, e = leg III, f = leg IV.

Holotype: One female collected from a nest of *Myrmica ruginodis* NYL., under the bark of a dead pine, at the forest experimental station at Owińska, Poznań province, Poland, on May 2, 1976. -
Paratypes: Six females collected from a nest of *Myrmica laevinodis* NYL., under the bark of a dead pine, locality and date as for holotype

Scutacarus ovoideosimilis n.sp. (Fig. 6a-f)

Female: Length 165-195 µm, width 155-190 µm; yellowish red; body oval.

Dorsum: Clypeus large, margin laterally wider than distally. All dorsal setae thickend, plumose. Setae c_1 longer than c_2, arising posterior to c_2 , both shorter than setae d_1, e_1, f_1 and f_2, setae f_2 saber-like, robust and plumose. Setae d_1 and e_1 longest, both of equal length; setae e_2 minute, simple and smooth; setae f_2 curved. Dorsum finely punctated. - Venter: Coxisternal plate well developed; apodeme I strong and thick;apodeme II weak; apodeme IV vestigial. Posterior sternal plate wide, its anterior margin arcuate with two lateral angle corners. All ventral setae plumose, except setae 2b which is robust, saber like and smooth; setae 3c and 4c of equal length, longer than setae 3a and 3b; setae 4a and 4b arising in a transverse line, less barbed, 4b are the longest of all ventral setae their length twice as long as 4a, extending posteriorly beyond the margin of hysterosoma. Caudal setae h_1 and h_2 plumose, h_1 longer than h_2; setae h_3 simple, minute, hardly visible. - Legs: Tibiotarsus I flat and with a large claw; solenidion ω_2 the longest of all solenidia rod like, arcuate, solenidion ω_1 a robust spur, thicker and shorter than ω_2, solenidion ϕ_1 of subclub shape, solenidion ϕ_2 rod like, both of equal length and thickness. Tibiotarsus IV with seven plumose setae. Configuration and chaetotaxy of leg I, II, III and IV as shown in figure 6c-f.

Male: Unknown.

Remarks: This species is similar to *Scutacarus ovoideus* KARAFIAT, 1959, but can be distinguished by the strong and robust dorsal setae, and by the length and shape of the solenidia of tibiotarsus I.

Holotype: One female collected from a nest of *Myrmica ruginodis* NYL., under the bark of a dead pine, at the forest experimental station at Owińska, Poznań province, Poland, on October 6, 1977. -
Paratypes: Six females collected from a nest of *Myrmica ruginodis* and *Myrmica laevinodis* NYL., under the bark of a dead pine, on May 2, 1976 locality as for holotype.

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References

CROSS, E.A., 1965: The generic relationships of the family Pyemotidae (Acarina: Trombidiformes). - Kans.Univ.Sci.Bull., *45* (2): 29-275. Lawrence, Kansas.

DELFINADO, M.D., BAKER, E.W. & ABBATIELLO, M.J.,1976: Terrestrial mites of New York. III. The family Scutacaridae (Acarina). - J. New York Ent.Soc., *84* (2): 106-145. New York.

KARAFIAT, H., 1959: Systematik und Ökologie der Scutacariden. In STAMMER, H.-J.: Beiträge zur Systematik und Ökologie Mitteleuropäischer Acarina. Akad.Verlag Leipzig, *1,* Teil 2: 627-712. Leipzig.

KRCZAL, H., 1959: Systematik und Ökologie der Pyemotidae. In STAMMER, H.-J.: Beiträge zur Systematik und Ökologie Mitteleuropäischer Acarina. Akad.Verlag Leipzig, *1,* Teil 2: 385-625. Leipzig.

MAHUNKA, S., 1970: Considerations on the systematics of the Tarsonemina and the description of new European taxa (Acari: Trombidiformes). - Acta Zool.Hung., *16* (2): 137-174. Budapest.

- , 1972: The first survey of the Tarsonemid (Acari) fauna of New Guinea. I. - Acta Zool.Hung., *18:* 41-92. Budapest.

- , & RACK, G., 1975: Bibliographia Tarsonemidologica. I. (1971-74). - Fol.Ent.Hung., (N.S.) *28* (1): 117-126. Budapest.

RACK, G., 1972: Tarsonemina aus dem Saalkreis bei Halle (Acarina, Trombidiformes). - Ent.Mitt.Zool.Mus.Hamburg, *4:* 277-286. Hamburg.

- , 1974: Neue und bekannte Milbenarten der Überfamilie Pygmephoroidea aus dem Saalkreis bei Halle (Acarina, Tarsonemida). - Ent.Mitt.Zool. Mus.Hamburg, *4:* 499-521. Hamburg.

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