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Pilochaeta rafalskii, a new species of the feather mite subfamily *Magimeliinae* GAUD, 1972 (*Pterolichoidea*: *Pterolichidae*)*

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ABSTRACT. *Pilochaeta rafalskii*, a new species of the feather mite subfamily *Magimeliinae* GAUD, 1972 is described from the plumage of the Semipalmated Sandpiper *Calidris pusilla* (*Scolopacidae*, *Charadriiformes*). All subspecies of *Pilochaeta pilosetae* are elevated to the species rank. Key to all described species is given.

Keywords: acarology, feather mites, taxonomy, *Magimeliinae*, new species, shore birds.

INTRODUCTION

Feather mites of the genus *Pilochaeta* belong to subfamily *Magimeliinae* (*Pterolichidae*). Magimeliin mites inhabit exclusively vane surfaces of the flight feathers of shore birds of the suborders *Charadrii* and *Scolopaci* (*Charadriiformes*). The subfamily includes five genera with about 24 species described.

Mites of the genus *Pilochaeta* live on scolopacid birds of two tribes: *Calidridini* and *Tringini*. The primary subgeneric status of this taxon was changed by GAUD (1972) into the generic rank. One species with 3 subspecies belongs to the genus *Pilochaeta* (DUBININ 1951). In the present paper species rank is given to all of these taxa and the fourth new species is described. The host range for known species is also extended.

Material for the description and the greatest part of the comparative material originate from the collections of Prof. W. T. ATYEO, University of Georgia and Dr. B. M. O'CONNOR, University of Michigan. DUBININ's type material was obtained from

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Dr. S. V. MIRONOV, Zoological Institute, Sankt Petersburg, Russia. I would like to express to all of them my appreciation for making this material available for the present study.

Abbreviations used: AMNH - American Museum of Natural History, USA; ANSP - Academy of Natural Sciences, Philadelphia, USA; BMOC - collection of Dr. Barry M. O'CONNOR; MAPS - Migratory Animal Pathological Survey; NU - University of Nebraska, USA; UAM - Adam Mickiewicz University, Poznań, Poland; UGA - University of Georgia, Athens, USA; UMMZ - University of Michigan, Zoological Museum, Ann Arbor, USA; USNM - US National Museum of Natural History; ZISP - Zoological Institute, Sankt Petersburg, Russia.

All the measurement are given in micrometers. The chaetotaxy nomenclature follows GRIFFITHS et al. (1990).

Pilochaeta DUBININ, 1956

Type species: *Montchadskiana (Pilochaeta) pilosetae pilosetae* DUBININ, 1951.

Both sexes. Body elongated. Dorsal shields well developed. Hysteronotal shield with concave anterior margin. Setae *vi* present. Setae *c3* lanceolate, short. Setae *e1* absent. Setae *e2* at least as long as distance between them. Two pairs of dorsal cupulae present (*im*, *ip*). Sternum Y-shaped. Shields of coxal fields poorly developed. Solenidion δ*2* on genu I absent.

Males. Opisthosomal lobes short with small triangular terminal cleft between them. All terminal setae piliform. Circular supranal concavity and small postlobar membranes may be present. Genital organ reduced to a short papilla, set at the level of leg bases IV. Phalobases parallel. Pregenital apodemes absent. Adanal disc small with radially striated corollas. Adanal shields absent or greatly reduced. Opisthoventral apodemes narrow or highly sclerotized, expanded on the whole ventral side of lobes. All legs similar without apophysis; legs I can be slightly larger than the remaining ones.

Females. Opisthosoma terminus rounded with small terminal cleft. Hysteronotal shield straightened laterally. Supranal concavity well developed, circular. Setae *h1* short, hair-like or awl-like. Setae *f2* short, piliform. Setae *h2* and *h3* as macrochaetae. Epigynum absent.

Pilochaeta rafalskii sp. n.

(figs. 1-4)

DESCRIPTION

Male (figs. 1-2). Gnathosoma rectangular; length 65, width 45. Idiosoma elongated; length 445 (430-450), width 160 (155-160), length to width ratio 2.8. Propodosoma - length 140. Hysterosoma nearly parallel, opisthosoma narrowed terminally, conical with very short opisthosomal lobes. Lobes trapezoid with small

terminal membranes; lobes as long as wide. Terminal cleft triangular with rounded base. Pronotal shield with well defined anteromedial part and posterior part with transversal striation; scapular shields present. Hysteronotal shield with several lacunas in anterior part and two pairs of irregular lacunae between setae *e2*. Lateral sclerites well developed. Supranal concavity with broadened posterior margin reaching terminal cleft. Setae *c3* lanceolate with blunt tip. Setae *e2* hair-like, longer than distance between them. Setae *h1* not reaching tips of the lobes, all terminal setae hair-like. Fused part of sternum nearly as long as free ones. Epimerites IV with rectangular lateral shields. Genital acetabules anteriorly to aedeagus and at the level of legs IV. Aedeagus set between trochanters IV. Aedeagus extremely short. Adanal shields absent. Adanal discs small. Opisthoventral sclerites highly sclerotized, expand on the whole ventral surface of lobes. Setae *ps3* very short, thorn-like. Setae *3a* posteriorly to *3b;* distance *3a-g* shorter than *g-4a*. Setae *g* set half distance between setae *3a* and anterior pair of genital acetabules. Distance between anterior pair of genital acetabules and setae *4a* four times shorter than distance *4a-ps3*. All legs similar in shape, legs I bigger. Ambulacra IV reaching tips of the lobes.

Female (figs. 3-4). Gnathosoma rectangular; length 65 (65-70), width 55. Idiosoma elongated; length 450 (440-460), width 165 (160-175), length to width ratio 2.7. Propodosoma - length 145. Opisthosoma rounded with terminal triangular incision. Anterior half of the hysteronotal shield with some lacunae on the anterior part and two distinct lacunae medially to setae *e2*. Supranal concavity circular, distance to terminal cleft equal to the diameter. Lateral sclerites present. Distance *d1-d2* as long as distance *d2*-gla. Setae *e2* set twice closer to *f2* than to gla. Setae *e2* longer than distance between them. Setae *h1* short, hair-like, set closer to the level of setae *f2* than *e2*. Setae *h2* and *h3* as macrochaetae. Setae *ps1* longer than distance between them. Setae *3a* and *3b* set at the same level. Opisthosoma with narrow ventro-terminal shield posteriorly to anus. Legs shaped as in males. Ambulacra IV not reaching terminal end of the body.

ETYMOLOGY

The species is dedicated to the memory of a great Polish zoologist Prof. Jan RAFALSKI.

TYPE DATA

From the Semipalmated Sandpiper *Calidris pusilla:* holotype male, 3 males, 5 females paratypes, USA, Michigan, Monroe Co., Point Mouilleo State Game Area, 13 August 1982, S. M. GOODMAN (K-995, UMMZ 205339). Types deposited at UMMZ (holotype, paratypes) and UAM (paratypes).

Additional material: From the same host species: 2 males, 2 females, USA, Charlestown, Rhode Island, 24 July 1961, L. TERBUSH (NU 4452). From the Western Sandpiper *Calidris mauri:* 1 male, 1 female, USA, Lower California, Colorado Desert, Lagoon of Salton River, 27 April 1894, E. A. MEARNS (NU 9126, USNM 135506). From the Spotted Sandpiper *Actitis macularia:* 1 male, USA, Matunuck, Rhode Island, 1 August 1961, L. TERBUSH (NU 4459).

DIAGNOSIS

The new species is similar to *Pilochaeta pilosetae* DUBININ 1951 **new status**. Males of both species have highly sclerotized, expanded opisthoventral sclerites. Females of both species have setae *h1* shifted distinctly posteriorly to the level of setae *e2*. Males of *P. rafalskii* differ from *P. pilosetae* in shape of terminal cleft and position of supranal concavity: in the new species the terminal cleft does not reach the adanal discs and the supranal concavity is not a part of the terminal cleft (fig. 2); in *P. pilosetae* the supranal concavity is partly incorporated in the terminal cleft forming its basal part that reaches the adanal discs (fig. 5). Females differ in location of setae *h1*: in the new species setae *h1* are set much closer to *f2* than the *e2* (fig. 4); in *P. pilosetae* setae *h1* are set half distance *e2-f2* (fig. 8).

COMPARATIVE MATERIAL

Pilochaeta pilosetae DUBININ, 1951 new status

(figs 5, 8)

This species was described by DUBININ (1951) from the Ruff *Philomachus pugnax* from Russia. It was reported also by DUBININ (1956) and RADFORD (1958).

Material examined. From the Ruff *Philomachus pugnax:* 4 males, 2 females, Russia, Western Siberia, Chany Lake, 31 July 1937, B. BYKHOVSKIJ (ZISP 145). From the Long-toed Stint *Calidris subminuta* (new host): 3 males, 1 female, Thailand, Smutprakan, Klong Dan, sea level, 7 September 1965 (NU 12526, MAPS 1083).

Pilochaeta microtringae DUBININ, 1951 new status

(figs 6, 9)

This species was described by DUBININ (1951) from the Rufous-necked Stint *Calidris ruficollis* and the Temminck's Stint *Calidris temminckii* from Russia. No single type host was designed. It was reported from both birds also by DUBININ (1956) and RADFORD (1958), and collected again from the Temminck's Stint by MIRONOV (1981).

Material examined. From the Rufous-necked Stint *Calidris ruficollis:* 5 males, 2 females, Russia, Western Siberia, Chany Lake, 16 July 1936, B. BYKHOVSKIJ (ZISP 147). From the Temminck's Stint *Calidris temminckii:* 4 males, 1 female, Russia, Western Siberia, Chany Lake, no data, B. BYKHOVSKIJ (ZISP 149); 4 males, 3 females, India, Rajasthan, Bharatpur, 6 February 1971 (UGA 6445, MAPS XIE 2161).

Pilochaeta tringae DUBININ, 1951 new status

(figs 7, 10)

This species was described by DUBININ (1951) from the Marsh Sandpiper *Tringa stagnatilis* and the Common Redshank *Tringa totanus*. No single type host was

designated. The species was also reported from both these hosts by DUBININ (1956) and RADFORD (1958), and found by GAUD (1972) on *T. stagnatilis* from Africa.

Material examined. From the Marsh Sandpiper *Tringa stagnatilis:* 4 males, 7 females, Russia, Western Siberia, Chany Lake, 9 June 1936, B. BYKHOVSKIJ (ZISP 152); 10 males, 11 females, Russia, Western Siberia, Chany Lake, 12 June 1936, B. BYKHOVSKIJ (ZISP 154); 4 males, 4 females, Thailand, Samutsongkhram, 12 April 1926, H. M. SMITH (NU 8898, USNM 306687). From the Lesser Yellowlegs *Tringa flavipes* (new host): 1 male, 2 females, Columbia, Magdalena Dept., Ciénaga, 23 August 1946, F. M. GAIGE (NU 8871, USNM 44786); 2 males, 2 females, Bahamas, San Salvador Island, 14 August 1923, P. BARSCH (NU 8870, USNM 276348); 2 males, 2 females, Paraguay, 80 km W Puerto Pinasco, 6 September 1920, A. WETMORE (NU 8874, USNM 283704); 1 male, 1 female, Paraguay, Departamento Alto Paraguay, West bank of Rio Paraguay, Estancia Cerrito, 21°27'S, 57°56'W, 6 October 1988, S. M. GOODMAN (UMMZ 226589, SMG 2687); 2 males, 2 females, same data (UMMZ 226590, SMG 2688). From the Stilt Sandpiper *Calidris (=Micropalama) himantopus* (new host): 1 male, USA, Northern Dakota, McHenry Co., 6 miles N Butte, 47°50'N, 100°40',W, 30 May 1953, R. W. STORER (UMMZ 225498).

KEY TO THE *PILOCHAETA* SPECIES

Males

1. Opisthoventral sclerites highly sclerotized, expand on the whole ventral surface of lobes ..... 2.
-. Opisthoventral sclerites very narrow, set on the lateral margin of opisthosomal lobes. ..... 3.
2. Terminal cleft does not reach the adanal discs. Supranal concavity is not a part of terminal cleft ..... *P. rafalskii*
-. Supranal concavity is partly incorporated in the terminal cleft forming its basal part that reaches the adanal discs ..... *P. pilosetae*
3. Terminal cleft three times longer than its maximal width; reaching the level of anterior margin of adanal discs. Setae *ps3* set posteriorly to the level of setae *e2* ..... *P. tringae*
-. Terminal cleft at most twice longer than its maximal width; reaching the level of posterior margin of adanal discs. Setae *ps3* set anteriorly to or at the level of setae *e2* ..... *P. microtringae*

Females

1. Setae *h1* distinctly shifted posteriorly to the level of setae *e2*. Setae *h1* hair-like. ..... 2.
-. Setae *h1* set at the level of setae *e2*. Setae *h1* broadened basally ..... 3.
2. Setae *h1* set much closer to *f2* than *to e2* ..... *P. rafalskii*
-. Setae *h1* set at half distance *e2-f2* ..... *P. pilosetae*

3. Distance *h1-e2* twice longer than *h1-h1* ..... *P. tringae*
-. Distance *h1-e2* as long as *h1-h1* ..... *P. microtringae*

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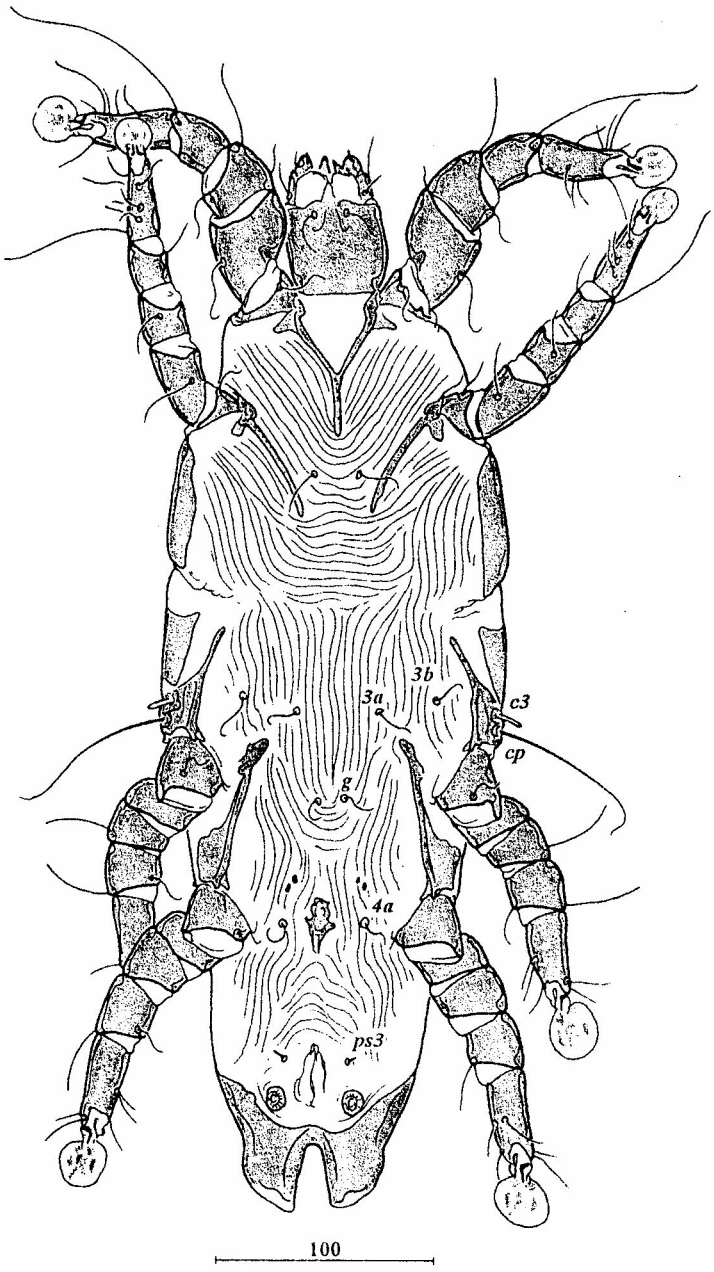
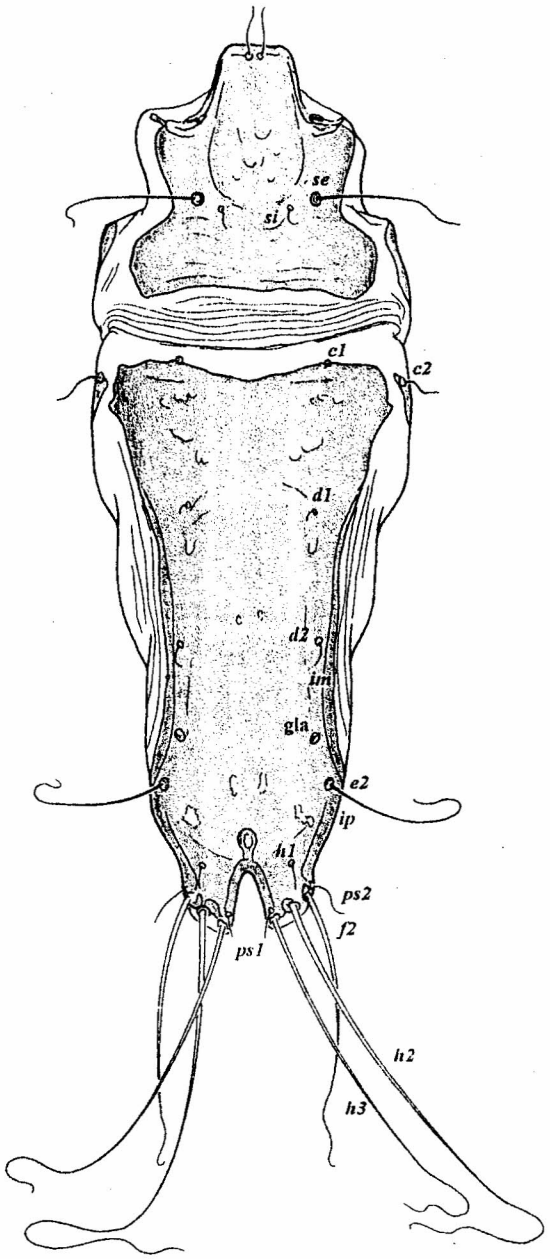
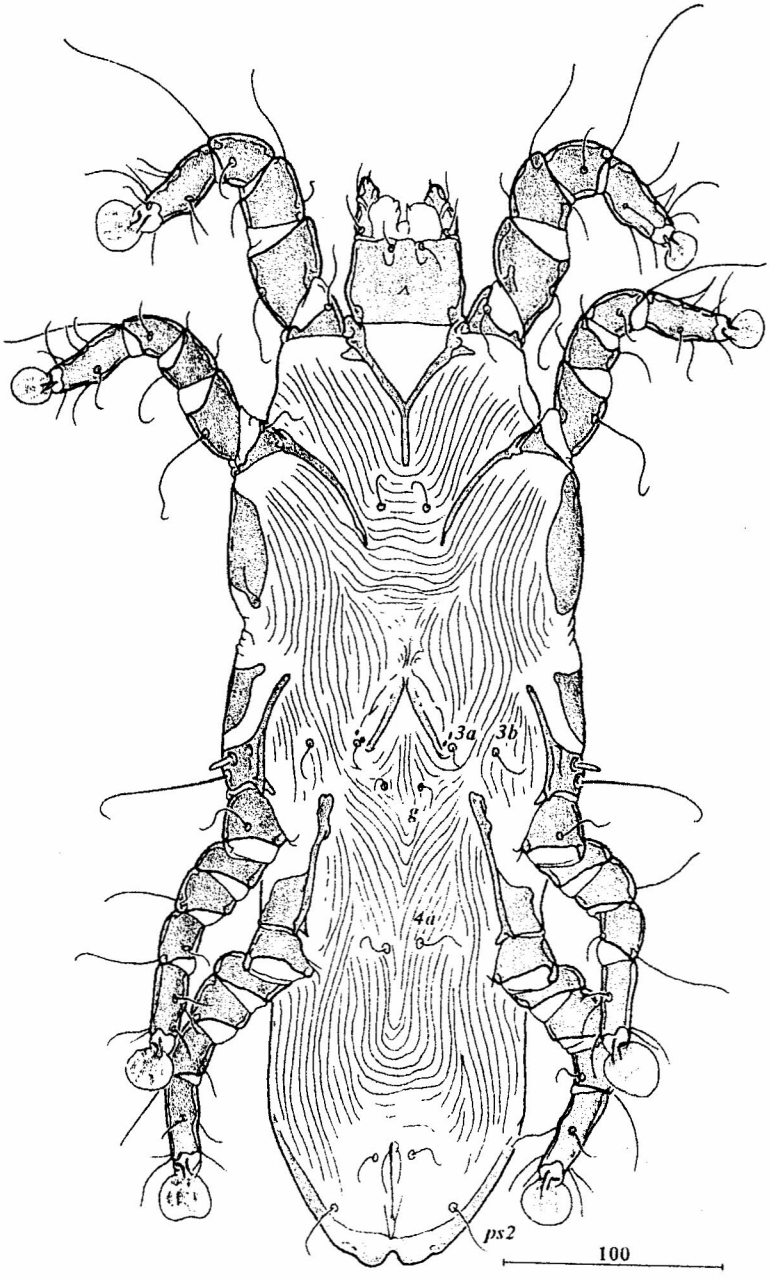


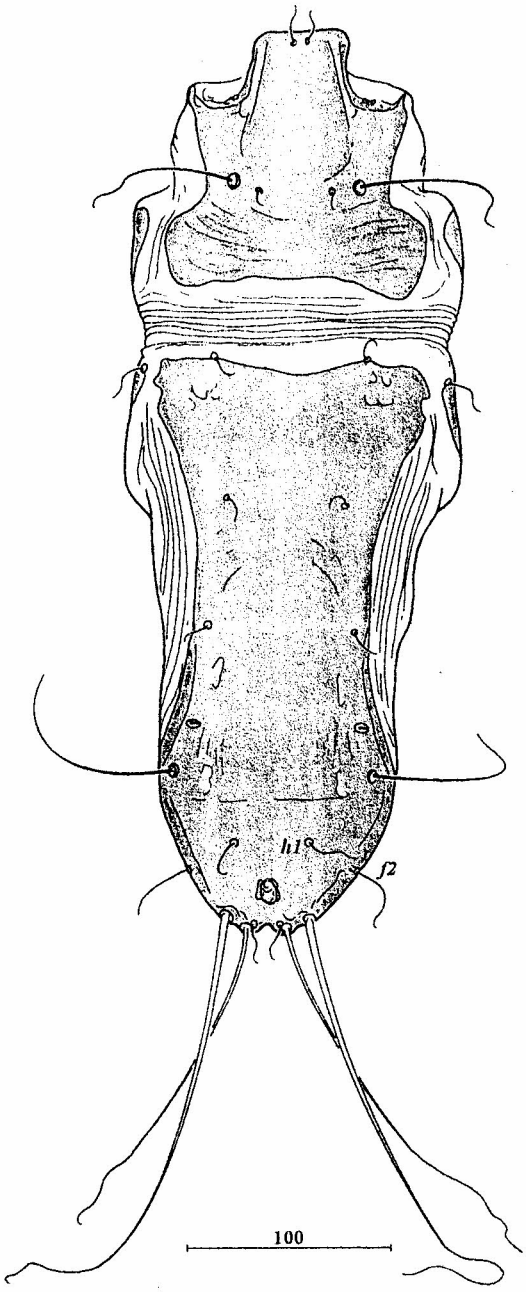
1. *Pilochaeta rafalskii* sp. n., ventral view of male



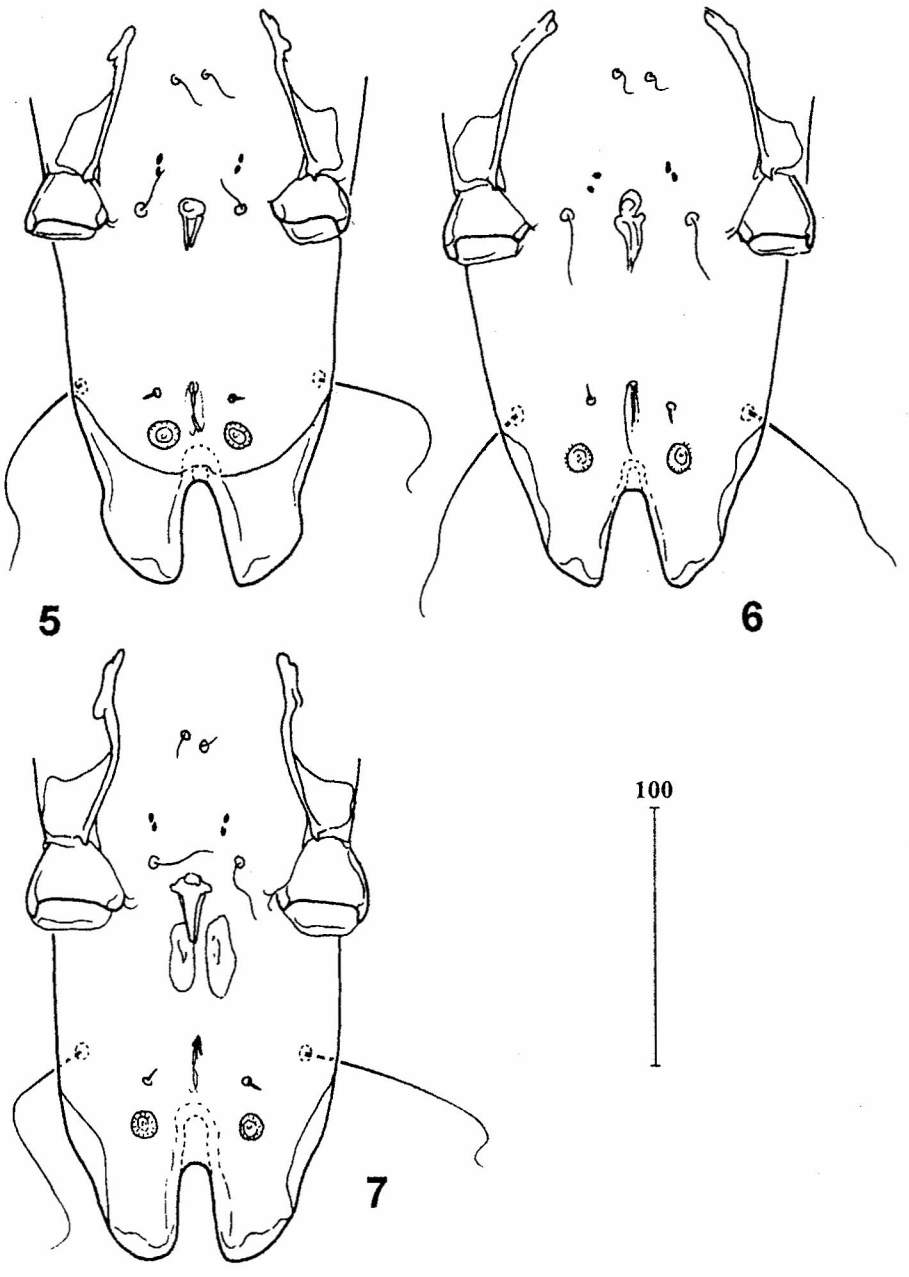
2. *Pilochaeta rafalskii* sp. n., dorsal view of male



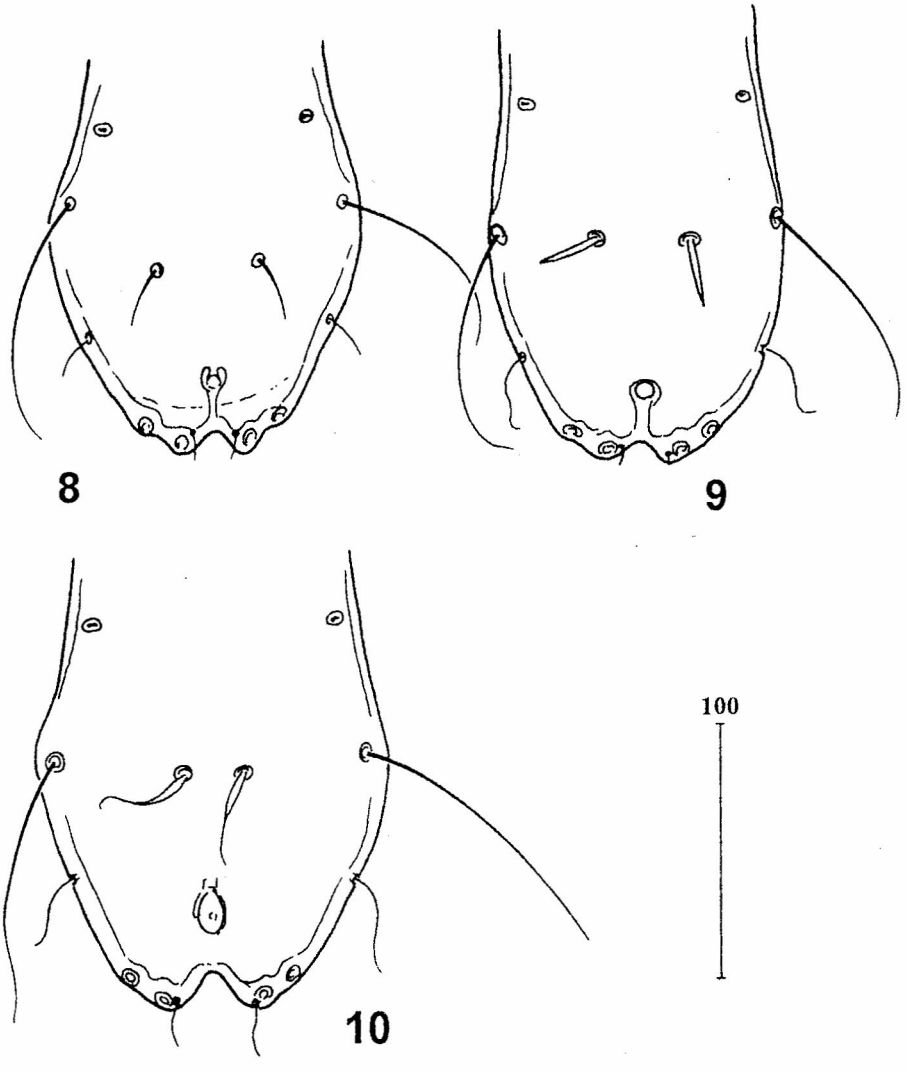
3. *Pilochaeta rafalskii* sp. n., ventral view of female



4. *Pilochaeta rafalskii* sp. n., dorsal view of female



5-7. Posterior part of ventral idiosoma of males. 5 - *Pilochaeta pilosetae*, 6 - *P. microtringae*, 7 - *P. tringae*



8-10. Dorsal opisthosoma of females. 8 - *Pilochaeta pilosetae*, 9 - *P. microtringae*, 10 - *P. tringae*