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# Systematics of the feather mite genus *Montchadskiana* DUBININ, 1951 (Pterolichoidea, Pterolichidae, Magimeliinae) with description of five new species

Jacek DABERT and Rainer EHRNSBERGER

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Abstract: The systematic status of all known species of the feather mite genus *Montchadskiana* DUBININ, 1951 (Magimeliinae) is analyzed. Five new species of the genus are described from the plumage of shore birds (Charadriiformes): *Montchadskiana* (*Montchadskiana*) *prosoboniae* sp. nov. from *Prosobonia cancellata*, *M. (M.) glareolae* sp. nov. from *Tringa glareola*, *M. (M.) tridentata* sp. nov. from *Catoptrophorus semipalmatus*, *M. (M.) guttifer* sp. nov. from *Tringa guttifer*, *M. (Aphyllochaeta)* *dubinini* sp. nov. from *Calidris pusilla*. *M. (M.) heteractitidis* DUBININ, 1956 is synonymized with *M. (M.) totani* DUBININ, 1951. *M. (M.) minutus* DUBININ, 1951 and *M. (M.) phalaropi* DUBININ, 1951 are synonymized with *M. (M.) fascigerus* (MÉGNIN and TROUESSART, 1884). A key to all described species of the genus is provided.

Key words: systematics, ectoparasites, feather mites, shore birds, Acari, *Montchadskiana*, Charadriiformes.

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## I. INTRODUCTION

Feather mites of subfamily Magimeliinae (Pterolichidae) inhabit exclusively shore birds of the suborders Charadrii and Scolopaci (Charadriiformes). These mites are well adapted to live on vanes of flight feathers in conditions of strong air-flow and reciprocal friction of feathers during flight. Both sexes of these mites have an elongated, flat body covered with well developed dorsal shields and legs inserted laterally. Males always possess well developed opisthosomal lobes.

The subfamily Magimeliinae included up to present five genera with 24 species (VASYUKOVA and MIRONOV 1991). The genus *Montchadskiana* is the most numerous one among genera of the subfamily. This genus primarily comprised 12 species (DUBININ 1951b). Three of them were subdivided into 8 subspecies. Then DUBININ (1956) added 3 new species and divided the genus into four subgenera (*Montchadskiana* s.s., *Aphyllochaeta*, *Pilochaeta* and *Triphyllochaeta*). Two of them (*Pilochaeta* and *Triphyllochaeta*) were elevated by GAUD (1972) to the generic rank. One species



(*M. xiphiurus*) was also separated to the new genus *Xiphiurus* (GAUD and MOUCHET 1959). After the taxonomic revisions the genus *Montchadskiana* included 15 species arranged in two subgenera (VASYUKOVA and MIRONOV 1991).

Despite of a number of taxonomic publications the system of the genus *Montchadskiana* is still insufficiently worked out. The primary species diagnoses and illustrations made by DUBININ (1951b, 1956) were never critically reanalyzed. Our examinations of the type material have proved that the descriptions were often incomplete or even wrong, especially those of the females. During our study we have critically checked a systematic status of all known species of the genus *Montchadskiana*. In the present paper a new improved definition of the genus is given. We also describe five new species and redescribe *M. ulitae*, which has actually appeared as a group of closely related species. Several species are recognized as synonyms of formerly described ones. We have also analyzed and corrected the host range of all known species. A key to all described species of the genus is provided. This paper is the first part of our studies on systematics, phylogeny and host-parasite relationships of the subfamily Magimeliinae.

**A c k n o w l e d g e m e n t s.** The material for the description and the greatest part of the comparative material originate from the collections of Prof. Warren T. ATYEO, University Georgia, and Dr. Barry M. OCONNOR, University of Michigan. The DUBININ's type and comparative material we have obtained from Dr. Serge V. MIRONOV, Zoological Institute, Saint-Petersburg, Russia. We would like to express our appreciation to all them for making the material available for the present study. Special thanks we direct to Serge MIRONOV for his thorough reviewing our manuscript and giving many valuable comments.

Abbreviations used:

AMNH – American Museum of Natural History, USA;

ANSP – Academy of Natural Sciences, Philadelphia, USA;

BMOC – collection of Dr. Barry M. OCONNOR;

MAPS – Migratory Animal Pathological Survey;

NU – University of Nebraska, USA;

UAM – Department of Animal Morphology, Adam Mickiewicz University, Poznan, 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, Saint-Petersburg, Russia.

In species descriptions all measurements are given in micrometers. The chaetotaxy nomenclature follows GAUD and ATYEO (1996).

## II. DIAGNOSIS OF THE GENUS *MONTCHADSKIANA* DUBININ, 1951

*Dermaleichus* (in part) CANESTRINI, 1878

*Proctophyllodes* (in part): CANESTRINI, 1879

*Pterolichus* (in part): MIGNIN and TROUESSART, 1884; CANESTRINI, 1886; POPPE, 1888; 1889; BERLESE, 1895; 1898; BANKS, 1907, VITZTHUM, 1924; BEDFORD, 1953

*Pterolichus* (*Eupterolichus*) (in part): CANESTRINI and KRAMER, 1899; TRÄGÄRDH, 1905; OUDEMANS, 1929; 1937; BEDFORD, 1932

*Thecarthra* (in part): OUDEMANS, 1904

*Ptiloxenus* (in part): BEDFORD, 1936; RADFORD, 1953; TURK, 1953

*Grallobia* (in part): DUBININ, 1950

*Triphyllochaeta* (in part): MCCLURE and RATANAWORABHAN, 1973

*Montchadskiana* DUBININ, 1951b; 1952; 1953; 1955; 1956; BELOPOL'SKAYA, 1952; RADFORD, 1958; GAUD and MOUCHET, 1959; 1963; GAUD and TILL, 1961; OERNu, 1971; GAUD, 1972; MIRONOV, 1981; VASYUKOVA and MIRONOV, 1991; DABERT, 1997.

Both sexes: body elongated, narrowed terminally with well-developed dorsal shields. Hysteronotal shield with concave anterior margin; surface often transversally striated. A pair of setae vi present. Dorsal setae of hysteronotum shortened; setae e1 absent. Setae c3 lanceolate, short. Only one pair of dorsal cupulae im visible. Epimeres I fused Y-like. Shields of coxal fields poorly developed. Solenidion *sigma* 2 on genu I absent.

Males: opisthosomal lobes well developed, with postlobar membranes. Setae h3 and ps2 leaf-like; in the subgenus *Aphyllochaeta* setae h3 with hair-like distal part. Genital organ situated at the level or posterior to bases of legs IV. Aedeagus either big, massive with dorsal row of „cells”, that works probably as erection mechanism (Figs 5, 9-12, 18-20, 32-35) or extremely reduced to short cone or ring (Figs 1, 17, 25-26). Phallobases parallel, directed along the body. Pregenital apodemes absent. Genital sclerites near genital acetabules sometimes present. Adanal discs big, circular, with radial striated corollae. Setae ps3 usually lanceolate or club-like. Various shaped adanal shields present, often fused with well developed opisthoventral sclerites. All legs similar in size; legs I sometimes slightly larger than the remaining ones. Tarsus IV with small apical apophysis.

Females: opisthosoma rounded, sometimes with small terminal cleft. Shields of pronotum similar to those in the male. Hysteronotal shield with slightly concave lateral margins. Supranal concavity well developed, circular. Setae h1 short, variable in shape. Lateral setae e2 shorter than distance between them, usually shorter than half of idiosoma width. Setae f2 short, hair-like. Setae h2 and h3 as macrochaetae. Epigynum absent. All legs shaped as in the male but without apophysis.

The genus is recently subdivided into two subgenera, *Montchadskiana* s.s. DUBININ, 1951 and *Aphyllochaeta* DUBININ, 1956, well recognized by the males only. We did not decide to elevate latter taxon to a generic rank, because we have not found any characters in the females that could distinguish this group of mites from typical *Montchadskiana* species. Moreover, the male of *M. dubinini* sp. nov. shows an intermediate shape of terminal setae between *M. eroliae* and the remaining species of *Montchadskiana* s. s.

**D i a g n o s e s o f t h e s u b g e n e r a.** *Montchadskiana* s.s.: both setae ps2 and h2 leaf-like; setae ps3 lanceolate, sometimes with small outgrowth or with split tips; crenate sclerites absent; adanal shields very variously shaped or absent; the hysteronotal shield without lacunes or only with some small ones at the lobe's base.

*Aphyllochaeta*: setae ps2 lanceolate or machete-like; setae h2 broadened paraxially with hair-like distal part; setae ps3 small, club-like; setae 4a set on the crenate sclerites (modified epimerites IVa); aedeagus extremely short; adanal shields paired; the hysteronotal shield covered with various lacunes.

**H o s t s.** Mites of this genus are found on shore birds from suborder Charadriiformes, mainly on the birds of the family Scolopacidae.

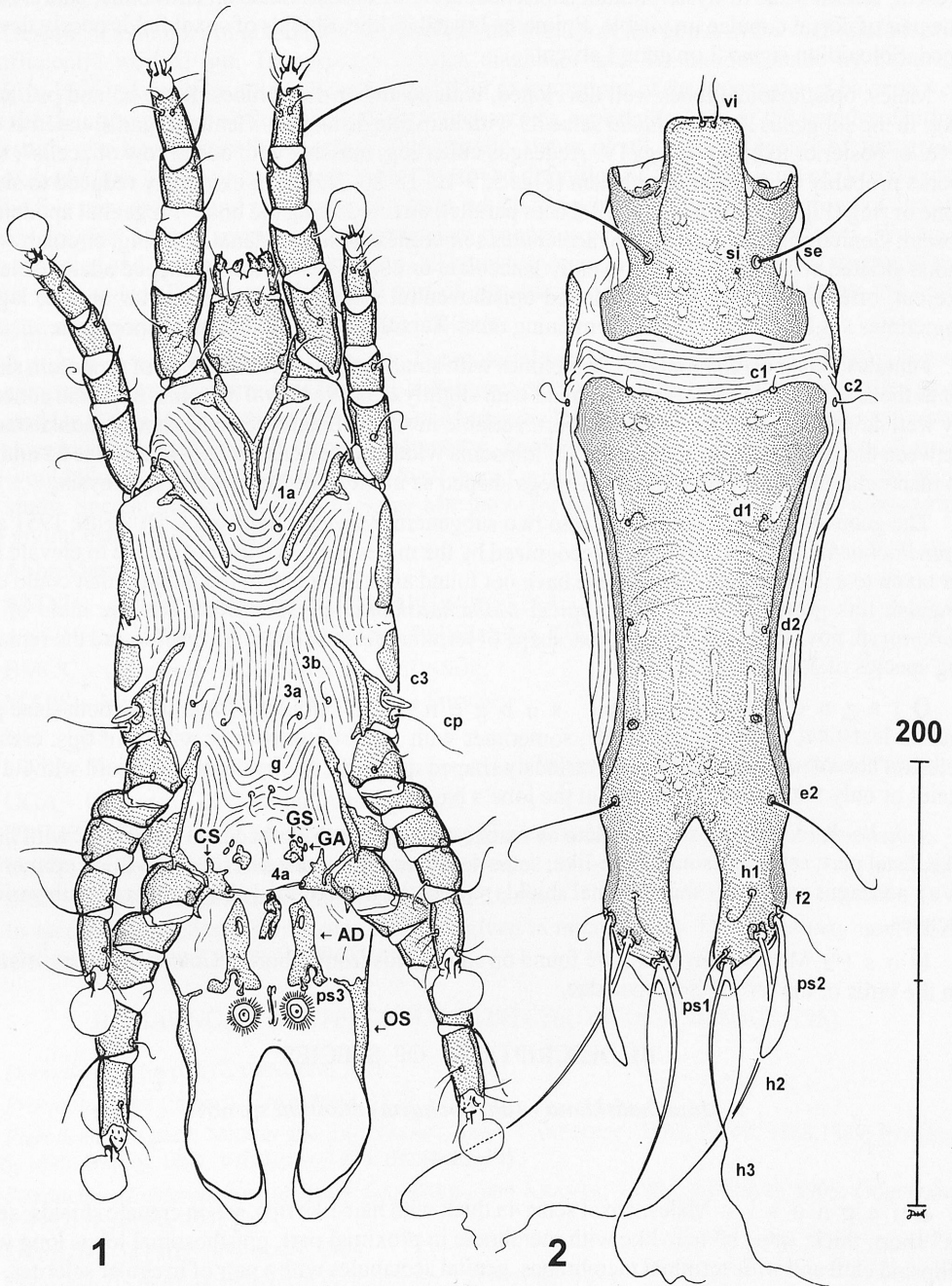
### III. DESCRIPTIONS OF SPECIES

#### 1. *Montchadskiana (Aphyllochaeta) dubinini* sp. nov.

(Figs 1-4)

**D i a g n o s i s.** Males: coxal setae 4a thick with hair-like tips, set on crenate shields; setae ps3 short, thick; setae h3 hair-like with membrane in proximal part; opisthosomal lobes long with ellipsoid cleft and wide terminal membranes, genital acetabules with a pair of irregular sclerites, aedeagus very short. Females: setae h1 thick, sharp, set on level of setae e2.

**T y p e m a t e r i a l.** From the Semipalmated Sandpiper *Calidris pusilla*: holotype, male; paratypes: 1 male, 3 females, USA, New York, Suffolk Ci., Mecox Bay, 13 August 1988, H. MCGUINNESS (BMOC 88-0908-1, UMMZ 225902). Types deposited at UMMZ (holotype, paratypes) and UAM (paratypes).



Figs 1-2. Male of *Montchadskiana (Aphylochaeta) dubinini* sp. nov.: 1— ventral view, 2— dorsal view. Designations of setae follow GAUD and ATYEO (1996). AS – adanal shields, CA – crenate sclerites, GA – genital acetabules, GS – genital sclerites, OS – opisthoventral sclerites.



Additional material. From the Least Sandpiper *Calidris minutilla*: 1 male, USA, Charlestown, Rhode Island, 24 July 1961, L. TERBUSH (NU 4450); 1 male, USA, the same data (NU 4452). From the Stilt Sandpiper *Calidris* (= *Micropalama*) *himantopus*: 1 male, Canada, Manitoba, Churchill, 58°45'N, 94°00'W, 13 July 1965, J. R. JEHL JR., (UMMZ 225501).

**Description.** Males (Figs 1, 2): gnathosoma rectangular, length: holotype 64 (paratype 64), width: 48 (48). Idiosoma length: 445 (410), width: 143 (142), length to width ratio: 2.9-3.1. Propodosoma length: 151 (165). Lobes with concave lateral margins and rounded lateroterminal ends with tongue-like terminal membranes; length of lobes two times longer than their width. Terminal cleft elliptical. Pronotal shield with several rounded lacunes. Anteromedial part of this shield with distinct parallel margins. The middle part of hysteronotal shield with poorly developed transversal striation. The shield is covered with numerous variously shaped lacunes arranged into three groups: 6 big lacunes in anterior part of shield; row of four longitudinal lacunes posterior to setae d2; cluster of irregular lacunes between setae e2. Setae e2 hair-like, longer than half the distance between them. Setae h1 not reaching tips of lobes. Setae ps2 machete-like. Setae h3 hair-like with external, rounded membrane in proximal part; membranous part of setae prolonged to their middle length. Setae h2 as macrochaetae. Sternum almost as long as free part of epimerites I. Genital acetabules set anterior to aedeagus and slightly anterior to bases of legs IV. Genital sclerites represented by a pair of highly sclerotized irregular sclerites, set medially to genital acetabules. Aedeagus extremely short, set between trochanters IV. Opisthoventral sclerites with anteromedial projections; each may be weakly connected with longitudinal adanal shields, extending from the anal setae ps3 to aedeagus base. A pair of crenate sclerites at bases of legs IV bears setae 4a. Setae ps3 very short, thorn-like, situated off adanal shields. Setae 3a set posterior to 3b; distance 3a-g shorter than distance g-4a. Setae g set closer to anterior pair of genital acetabules than to setae 3a. Coxal setae 4a hair-like, expanded proximally, set on crenate sclerites anterior to aedeagus. Distance between anterior pair of genital acetabules and setae 4a three times shorter than distance 4a-ps3. All legs similar in form and size. Ambulacra IV reaching tips of opisthosomal lobes excluding membranes.

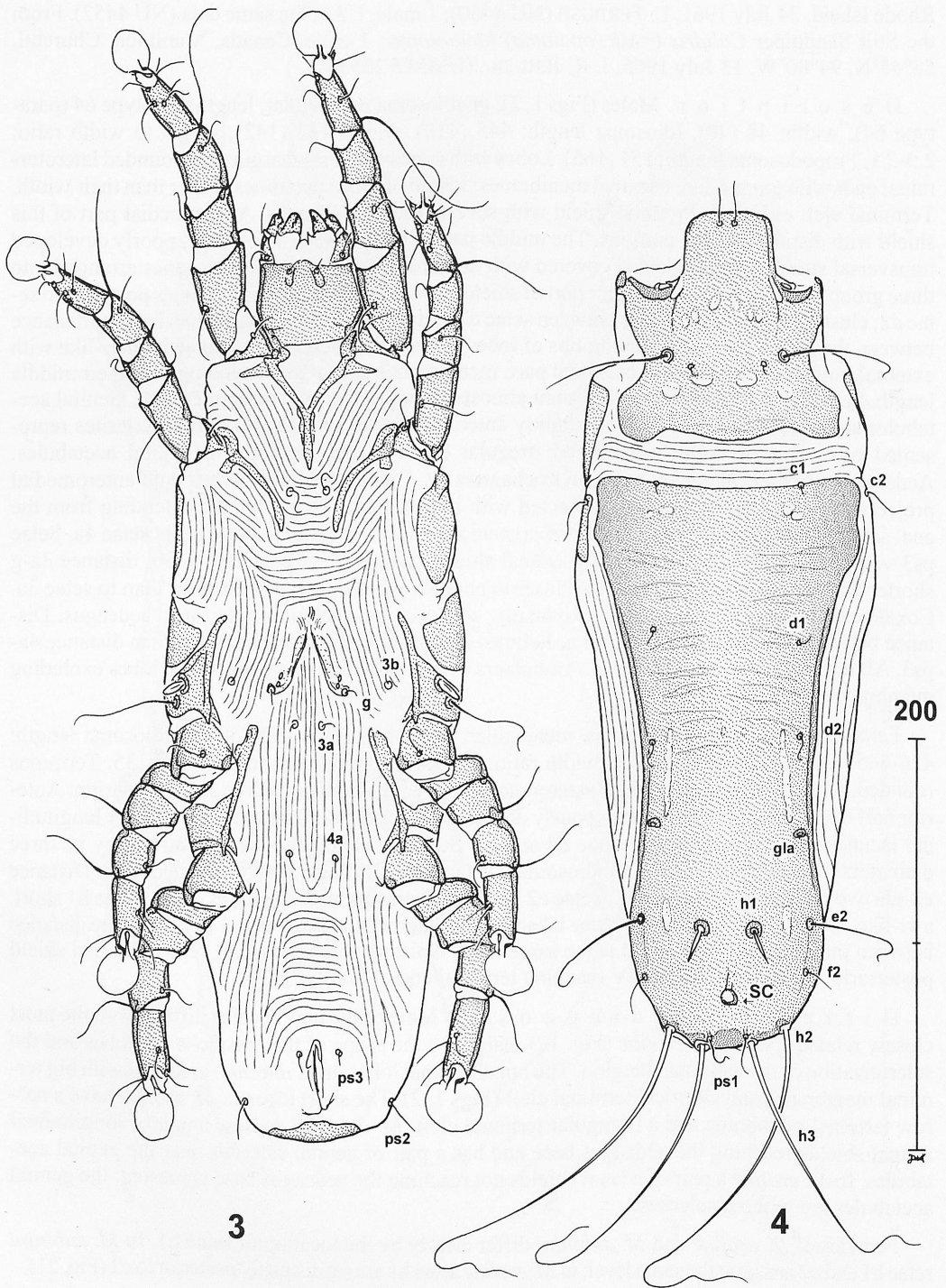
Females (Figs 3, 4): gnathosoma rectangular, length: 72-73, width: 50-64. Idiosoma length: 426-445, width 127-156, length to width ratio: 2.9-3.4. Propodosoma length: 127-135. Terminus rounded, without medial incision. Hysteronotal shield with slightly concave anterior margin. Anterior half of hysteronotal shield with poorly developed transversal striation. Two pairs of longitudinal lacunes situated medially to setae d2 and e2. Supranal concavity circular, distant by its three diameters from terminal margin of idiosoma. Distance c1-d1 longer than distance d2-gla. Distance e2-gla two times longer than e2-f2. Setae e2 hair-like, their tips reaching bases of h2. Setae h1 short, awl-like, set almost at level of e2. Setae h2 and h3 as macrochaetae. Setae ps1 as long as the distance between them. Setae g and 3b set at the same level. Opisthosoma with small ventroterminal shield posteriorly to anus. Ambulacra IV reaching terminal end of body.

**Differential diagnosis.** Male of the new species differs from the most closely related species *M. eroliae* (Fig. 17) mainly by the shape of the opisthosomal lobes and the sclerotization of the genitoanal region. The opisthosomal lobes in *M. dubinini* are long, with big terminal membranes and elliptical terminal cleft (Figs 1, 2). The short lobes in *M. eroliae* have a narrow terminal membrane and a triangular terminal cleft. *M. dubinini* possess a pair of longitudinal adanal shields reaching the aedeagus base and has a pair of genital sclerites near the genital acetabules. In *M. eroliae* a pair of adanal shields not reaching the aedeagus base is present; the genital acetabules are without sclerites.

Females of *M. eroliae* and *M. dubinini* differ clearly by the location of setae h1. In *M. dubinini* setae h1 and e2 are set at the same level; in *M. eroliae* setae h1 are set distinctly posterior to e2 (Fig. 21).

**Etymology.** The species is dedicated to the memory of Russian acarologist W. B. DUBININ, who had established the genus *Montchadskiana* and described the greatest part of the known species.





Figs 3-4. Female of *Montchadskiana (Aphylochaeta) dubinini* sp. nov.: 3 – ventral view, 4 – dorsal view, SC – supranal cavity.

## 2. *Montchadskiana (Aphyllochaeta) eroliae* DUBININ, 1951

(Figs 17, 21)

*Montchadskiana eroliae* DUBININ, 1951b

*Montchadskiana (Aphyllochaeta) eroliae*: DUBININ, 1956; RADFORD, 1958; VASYUKOVA and MIRONOV, 1990; 1991; DABERT, 1997

**D i a g n o s i s.** Males: coxal setae 4a lanceolate, set on crenate shields, setae ps3 short and thick, setae h3 hair-like with enlarged proximal part, opisthosomal lobes short with triangular terminal cleft and small terminal membranes, genital acetabules without sclerites, aedeagus very short. Females: setae h1 short, spine-like, set posterior to e2.

**H o s t s.** Rufous-necked Stint *Calidris ruficollis* (type host), Little Stint *C. minuta*, Temminck's Stint *C. temminckii*, Curlew Sandpiper *C. ferruginea*.

**M a t e r i a l.** From the Curlew Sandpiper *Calidris ferruginea*: 3 males, 2 females, Poland, Słomsk Wild-life Reserve, 23 July 1987, J. DABERT (UAM 952); 2 males, 1 female, Poland, Słomsk Wild-life Reserve, 9 August 1988, G. LOREK (UAM 1119); 3 males, 1 female, Poland, the same data (UAM 1126). The type material is apparently lost (MIRONOV pers. comm.).

## 3. *Montchadskiana (Montchadskiana) prosoboniae* sp. nov.

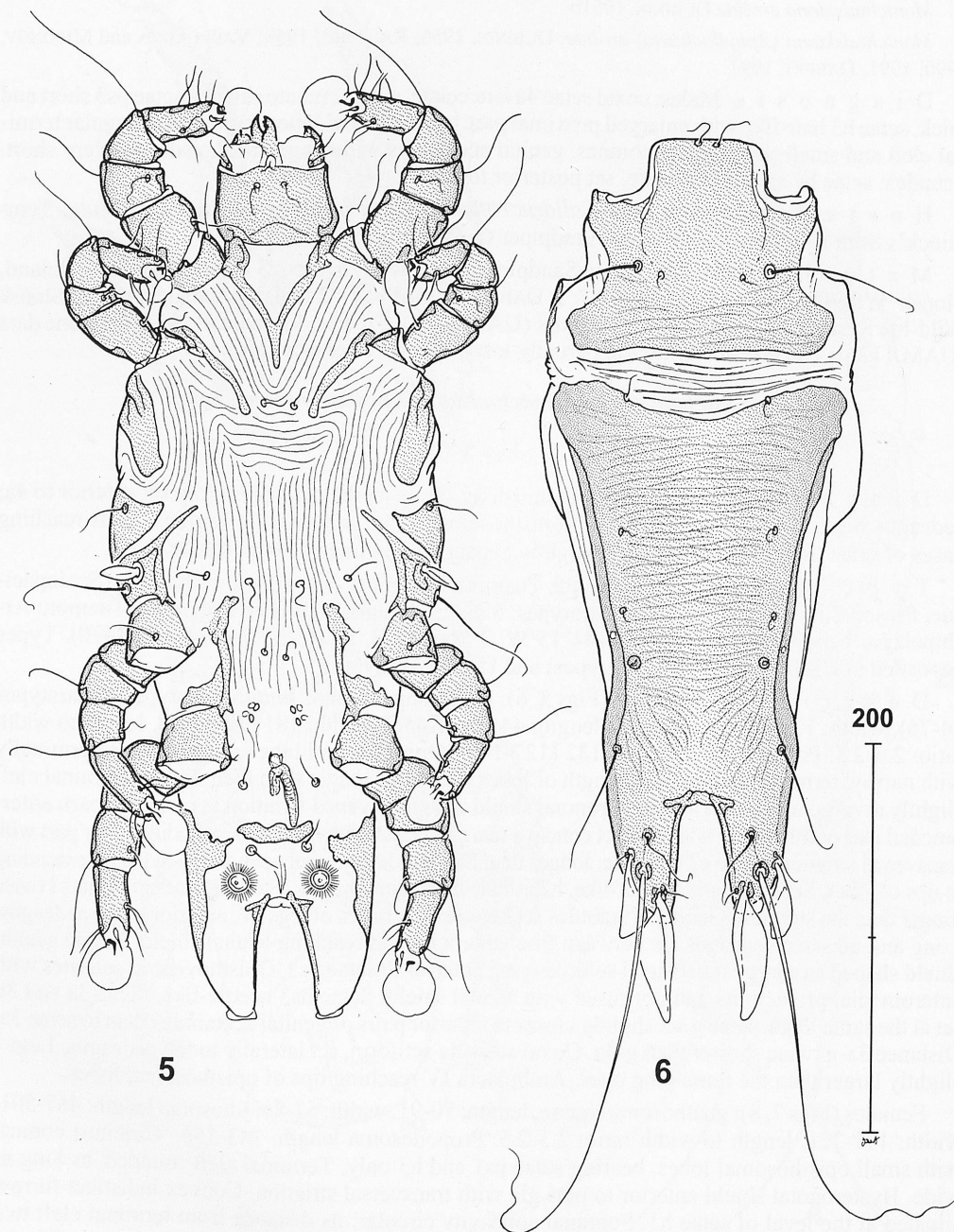
(Figs 5-8)

**D i a g n o s i s.** Males: setae ps3 hair-like; single medial adanal sclerite set anterior to 4a; aedeagus big, massive. Females: small opisthosomal lobes present with terminal cleft reaching bases of setae ps1; setae h1 hair-like, slightly expanded proximally, set posterior to e2.

**T y p e m a t e r i a l.** From the Tuamotu Sandpiper *Prosobonia cancellata* (Scolopacidae, Prosobonini): holotype, male; paratypes: 6 males, 9 females, French Polynesia, Tuamotu Archipelago, Tepoto Island, 16°45'S, 144°15'W, 2 May 1923, R. H. BECK (UMMZ 63670). Types deposited at UMMZ (holotype, paratypes) and UAM (paratypes).

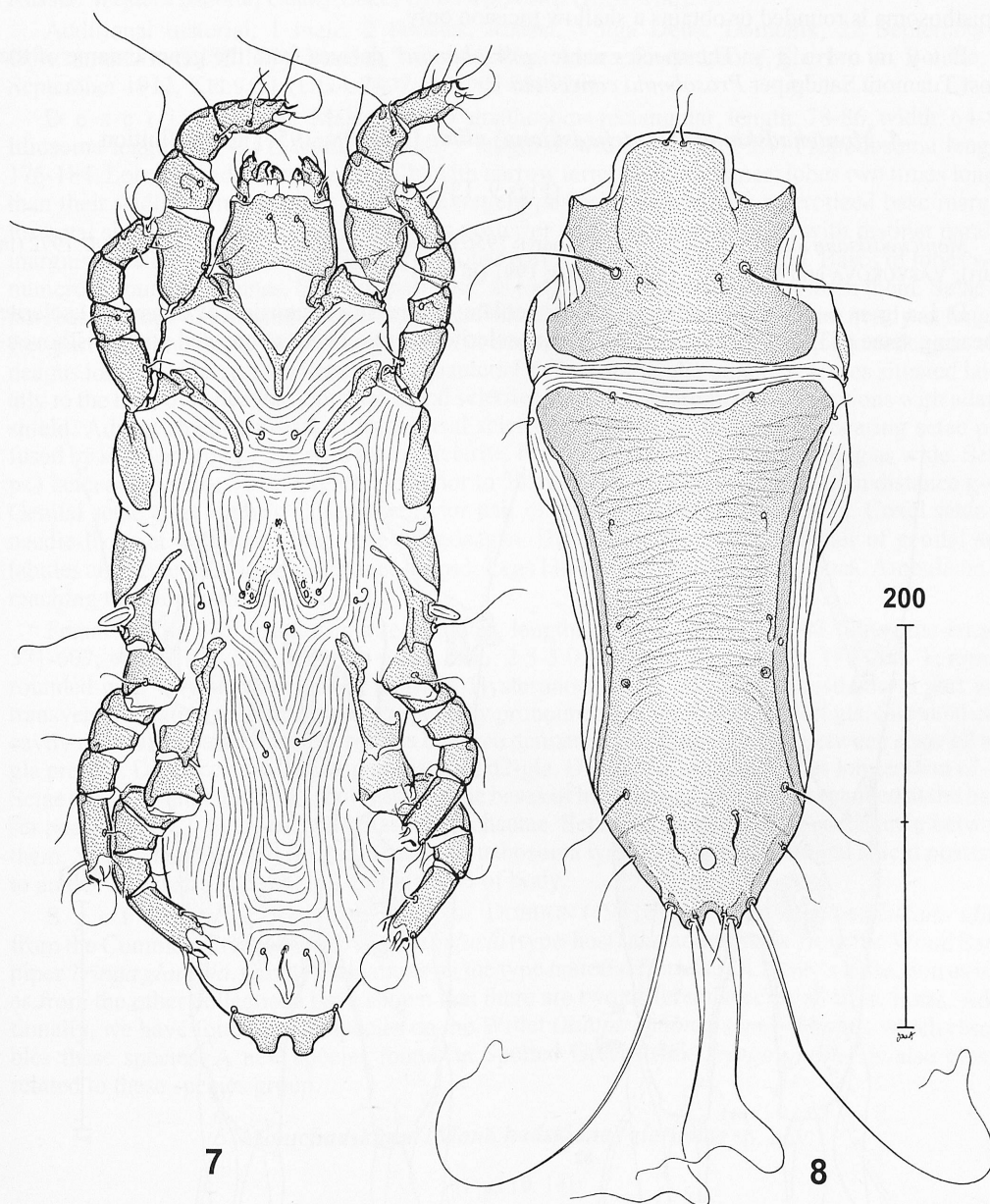
**D e s c r i p t i o n.** Males (Figs 5, 6): gnathosoma square, length: holotype 68 (paratypes 64-76), width: 72 (68-75). Idiosoma length: 445 (421-456), width: 181 (178-191), length to width ratio: 2.3-2.5. Propodosoma length: 132 (127-146). Opisthosomal lobes rounded laterotermally with narrow terminal membranes; length of lobes two times longer than their width. Terminal cleft slightly divergent to posterior end. Pronotal shield with transversal striation in posterior part; anteromedial part of this shield with distinct concave margins. Hysteronotal shield excluding lobar part with transversal striation. Setae e2 hair-like, longer than half the distance between them. Setae h1 extending to tips of lobes. Setae ps2 and h3 leaf-like, h2 as hair-like macrochaetae. Free parts of epimerites I twice longer than the sternum. Genital acetabules set between the bases of legs IV, anterior to the aedeagus. Long and massive aedeagus set between trochanters IV and reaching adanal shield. Single adanal shield shaped as a large transversal sclerite lying anterior to setae ps3. Opisthoventral sclerites with anteromedial projections, but not fused with adanal shield. Setae ps3 needle-like. Setae 3a and 3b set at the same level; setae g set slightly closer to anterior pairs of genital acetabules than to setae 3a. Distance 3a-g twice shorter than g-4a. Coxal setae 4a setiform, set laterally to the aedeagus. Legs I slightly larger than the remaining ones. Ambulacra IV reaching tips of opisthosomal lobes.

Females (Figs 7, 8): gnathosoma square, length: 70-91, width: 67-86. Idiosoma length: 467-501, width: 191-221, length to width ratio: 2.3-2.5. Propodosoma length: 143-156. Terminus conical with small opisthosomal lobes, bearing setae ps1 and h3 only. Terminal cleft rounded, as long as wide. Hysteronotal shield anterior to pori gla with transversal striation. Convex indistinct furrow situated at the level of setae h1. Supranal concavity circular; its distance from terminal cleft two times longer than diameter of the concavity. Distance c1-d1 two times longer than distance d2-gla. Distance e2-gla two times longer than e2-f2. Setae e2 set anterior to h1, their tips reaching bases of h2. Setae h1 hair-like, slightly expanded at base; h2 and h3 as macrochaetae, h3 distinctly broader. Setae ps1 longer than distance between them. Setae g set slightly anterior to 3b. Opisthosoma with small ventroterminal shield posterior to anus. Legs IV not reaching terminal end of body.



Figs 5-6. Male of *Montchadskiana (Montchadskiana) prosoboniae* sp. nov.: 5 – ventral view, 6 – dorsal view.





Figs 7-8. Female of *Montchadskiana* (*Montchadskiana*) *prosoboniae* sp. nov.: 7 – ventral view, 8 – dorsal view.



**Differential diagnosis.** The new species differs from all recently known *Montchadskiana* species by the form of setae ps3 in males. In *M. prosoboniae* the setae are hair-like. In all other species the setae ps3 are variable in shape, but always thick. Females differ from all other species of the genus by the form of the opisthosoma terminus: in *M. prosoboniae* the end of opisthosoma has small sclerotized lobes with distinct terminal cleft. In all other species the opisthosoma is rounded or obtains a shallow incision only.

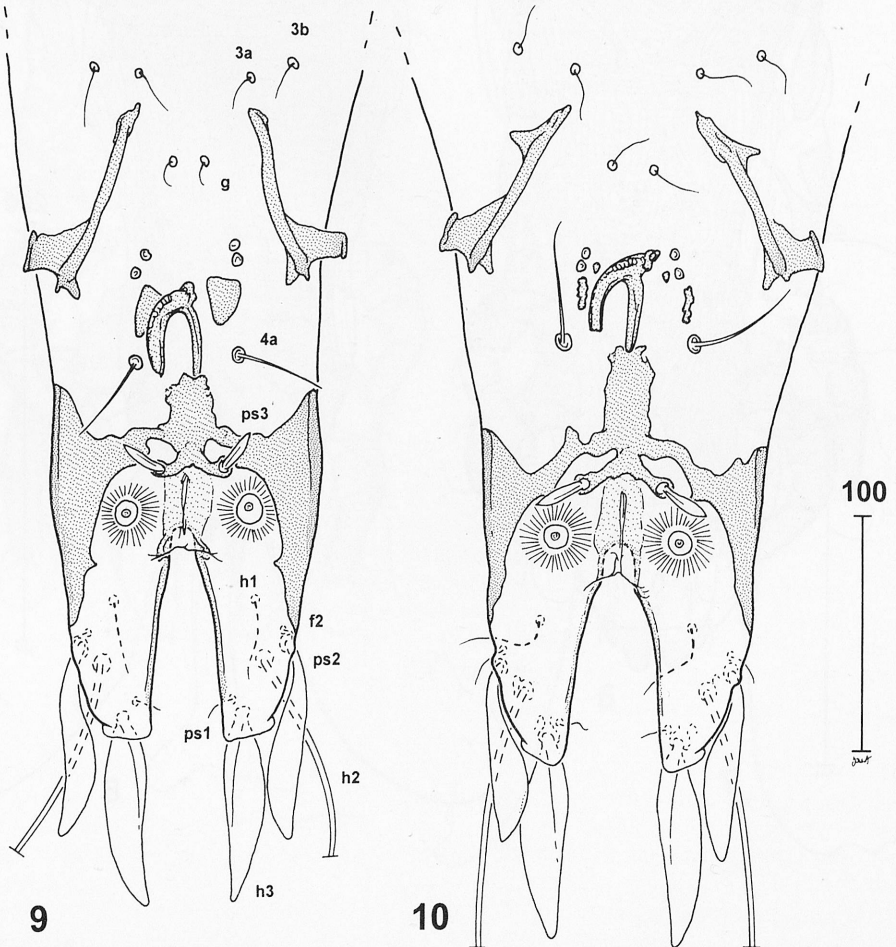
**Etymology.** The species name „*prosoboniae*” derives from the generic name of the host Tuamotu Sandpiper *Prosobonia cancellata*.

**4. *Montchadskiana (Montchadskiana) ulitae* DUBININ, 1951; new definition**

(Figs 9, 13)

*Montchadskiana ulitae* DUBININ, 1951b (in part); 1956 (in part); RADFORD, 1958 (in part); GAUD, 1972 (in part); VASYUKOVA and MIRONOV, 1990 (in part); 1991 (in part)

**D i a g n o s i s.** Males: setae ps3 lanceolate; adanal shield consists of transversal sclerite (bearing setae ps3) fused with medial irregular sclerite and two bands connected with opisthoven-



Figs 9-10. Male opisthoventrum: 9 – *Montchadskiana (Montchadskiana) ulitae* DUBININ, 1951, 10 – *M. (M.) glareolae* sp. nov.

tral sclerites; medial sclerite of adanal shield as long as wide; genital sclerites triangular, situated laterally to aedeagus base; aedeagus big, massive. Females: hysteronotal shield with especially pronounced striation between gla; setae h1 hair-like, expanded at base, set posterior to awl-like setae e2.

**Type material.** From the Common Greenshank *Tringa nebularia*: lectotype, male, Russia, Western Siberia, Chany Lake, B. BYKHOVSKIY (ZISP 188).

**Additional material.** 1 male, 2 females, Russia, Volga Delta, Damchik, 22 September ?, GINETSINSKAJA (ZISP 187); 2 males, 1 female, West Africa, Sierra Leone, Sherbro Is., Bonthe, 30 September 1912, KELSALL (UGA 2407, AMNH 738926).

**Description.** Males (Fig. 9): gnathosoma rectangular, length: 78-86, width: 64-84. Idiosoma length: 507-552, width: 178-207, length to width ratio: 2.7-2.9. Propodosoma length: 176-184. Lobes rounded laterotermally with narrow terminal membranes; lobes two times longer than their width. Terminal cleft slightly divergent posterior with highly sclerotized base margin. Pronotal shield with transversal striation in posterior part; anteromedial part with distinct parallel margins. Hysteronotal shield excluding the lobar part with transversal striation. Bases of lobes with numerous rounded lacunes. Setae e2 hair-like, as long as half the distance between them. Setae h1 not reaching tips of lobes, setae ps2 and h3 leaf-like; h2 as macrochaetae. Sternum nearly as long as free part of epimerites I. Genital acetabules set between bases of legs IV, anterior to aedeagus. Aedeagus long and massive set between trochanters IV. Two triangular genital sclerites situated laterally to the base of aedeagus. Opisthoventral sclerites fused by anteromedial projections with adanal shield. Adanal shield consists of transversal sclerite shaped as an inverted V, bearing setae ps3, fused by slender conjunctive with medial sclerite. Free part of medial sclerite as long as wide. Setae ps3 lanceolate. Setae 3a set slightly posterior to 3b; distance 3a-g twice shorter than distance g-4a. Genital setae g set slightly closer to anterior pair of genital acetabules than to 3a. Coxal setae 4a needle-like, set posterior to the base of aedeagus. Distance between anterior pair of genital acetabules and setae 4a as long as distance 4a-ps3. Legs I larger than the remaining ones. Ambulacra IV reaching tips of opisthosomal lobes.

Females (Fig. 13): gnathosoma rectangular, length: 95-111, width: 87-103. Idiosoma length: 571-607, width: 191-239, length to width ratio: 2.5-3.0. Propodosoma length: 180-200. Terminus rounded with very shallow medial incision. Hysteronotal shield excluding opisthonotal part with transversal striation pattern; striation especially pronounced in area between pori gla. Supranal concavity circular, separated from terminus by three diameters. A pair of lacunes between setae e2 and gla present. Distance c1-d1 as long as distance d2-gla. Distance e2-gla two times longer than e2-f2. Setae e2 thick, short and acute, not reaching the bases of h2. Setae h1 hair-like, expanded at the base, set posterior to e2. Setae h2 and h3 as macrochaetae. Setae ps1 short, as long as distance between them. Setae g and 3b set at the same level. Opisthosoma with small ventroterminal shield posterior to anus. Ambulacra IV reaching terminal end of body.

**Systematic remarks.** DUBININ (1951b) described *Montchadskiana ulitae* from the Common Greenshank *Tringa nebularia* (type-host) and additionally from the Wood Sandpiper *Tringa glareola*. Our investigations on the type material from the DUBININ's collection as well as from the other collections have shown that there are two different species on these hosts. Additionally, we have found a new species on the Willet *Catoptrophorus semipalmatus*, which resembles these species. A new species found on Spotted Greenshank *Tringa guttifer* is also closely related to these species group.

### 5. *Montchadskiana (Montchadskiana) glareolae* sp. nov.

(Figs 10, 14)

*Montchadskiana ulitae* DUBININ, 1951b (in part); 1956 (in part); RADFORD, 1958 (in part); VASYUKOVA and MIRONOV, 1990 (in part); 1991 (in part) syn. nov.

*Triphyllochaeta ulitae*: MCCLURE and RATANAWORABHAN, 1973 (in part) syn. nov.

**Diagnosis.** Males: setae ps3 lanceolate; adanal shield consists of transversal sclerite (with setae ps3) fused with medial irregular sclerite and two bands connected with opisthoventral sclerites; medial part of adanal shield two times longer than their width; 1-2 pairs of irregular genital

sclerites situated laterally to aedeagus base, aedeagus big, massive. Female; hysteronotal shield with especially pronounced striation between pori gla; setae h1 hair-like, expanded at base, divided into two branches, the longest branch at least two times longer than the shorter one; seta h1 set almost at the same level as hair-like setae e2.

**Type material.** From the Wood Sandpiper *Tringa glareola*: holotype, male; paratypes: 2 females Poland, Mechelniki, 3 May 1996, M. CZYŻAK (UAM 01667). Types deposited at UAM.

**Additional material.** From the same host species: 3 males, 2 females, Ceylon, Western Prov., Dehiwala, 17 January 1945, S.D. RIPLEY (NU 9004, USNM 385751). 1 male, 1 female, India, Bharalipur, Rajarlhan, 1 February 1970 (AB-32511, XII2 420); 3 males, 3 females, Russia, Western Siberia, Chany Lake, 22 July 1936, B. BYKHOVSKIJ (ZISP 189); 1 male, Thailand, Chiang Saen Kao, Chiangrai, 13 February 1953, H. G. DEIGNAN (NU 9007, USNM 449846); 1 female, Poland, Słońsk Wild-life Reserve, 24 July 1987, J. DABERT (UAM 01051).

**Description.** Males (Fig. 10): gnathosoma square or rectangular, length: holotype 80 (paratypes 89-91), width: 80 (76-81). Idiosoma length: 549 (528-580), width: 207 (205-221), length to width ratio: 2.6-2.7. Propodosoma length: 172 (154-186). Lobes rounded laterotermally, with narrow terminal membranes, lobes two times longer than their width. Terminal cleft slightly divergent posterior with heavy sclerotized anterior margin. Pronotal shield with transversal striation in posterior part. Anteromedial part of the shield with distinct parallel margins. Hysteronotal shield excluding lobar part with transversal striation. Lobes with many rounded lacunes at their base. Setae e2 hair-like, as long as half the distance between them. Setae h1 not reaching tips of opisthosomal lobes. Setae ps2 and h3 leaf-like, h2 as macrochaetae. Sternum nearly as long as free part of epimerites I. Genital acetabules set anterior to aedeagus between bases of legs IV. Aedeagus set between trochanters IV, long and massive. One-two pairs of small irregular genital sclerites situated laterally to the base of aedeagus. Opisthoventral sclerites with anteromedial projections fused with adanal shield. Adanal shield represented by transversal sclerite bearing setae ps3 and fused with medial irregular sclerite. Medial sclerite of adanal shield two times longer than its width. Setae ps3 lanceolate. Setae 3a set posterior to 3b; distance 3a-g 1.5 times shorter than distance g-4a. Setae g set slightly closer to anterior pair of genital acetabules than to 3a. Coxal setae 4a needle-like, set posterior to aedeagus. Distance between anterior pair of genital acetabules and setae 4a distinctly shorter than distance 4a-ps3. Legs I larger than the remaining legs. Ambulacra IV reaching tips of opisthosomal lobes.

Females (Fig. 14): gnathosoma square, length: 73-95, width: 78-95. Idiosoma length: 533-572, width: 197-211, length to width ratio: 2.7. Propodosoma length: 170-176. Terminus rounded with shallow medial incision. Hysteronotal shield with transversal striation, excluding the area between setae d2 and opisthonotal part. Striation especially pronounced in area between pori gla. Supranal concavity circular, distance from terminal cleft three times longer than its diameter. Distance c1-d1 larger than distance d2-gla. Distance between e2-gla two times longer than e2-f2. Setae e2 hair-like, not reaching bases of h2. Setae h1 expanded proximally, divided into two branches, the longest branch at least two times longer than the shorter one. Setae h1 set almost at the same level as e2. Setae h2 and h3 as macrochaetae. Setae ps1 longer than the distance between them. Setae g and 3b set at the same level. Opisthosoma with small ventroterminal shield posterior to anus. Ambulacra IV reaching terminal end of the body.

**Differential diagnosis.** The new species is very closely related to *Montchadskiana ulitae* and up to now both species were not distinguished from each other. The differences between males of these species concern mainly the sclerotization of the genitoanal region. *M. glareolae* has two pairs of reduced genital sclerites; medial sclerite of adanal shield is two times longer than its width. *M. ulitae* possess a pair of well developed triangular genital sclerites and relatively short medial part of adanal shield, which is as long as wide. Females of both species are easy distinguishable: in *M. glareolae* setae h1 are divided into two parts and situated almost at the same level as e2; in *M. ulitae* setae h1 are simple, set distinctly posterior to e2.

**Etymology.** The species name „*glareolae*” derives from the specific name of the host Wood Sandpiper *Tringa glareola*.



6. *Montchadskiana* (*Montchadskiana*) *tridentata* sp. nov.

(Figs 11, 15)

**D i a g n o s i s.** Males: setae ps3 lanceolate, divided apically; adanal shield consists of transversal sclerite (bearing setae ps3) fused with medial irregular sclerite; medial sclerite of adanal shield as long as wide; two big irregular genital sclerites situated laterally to aedeagus, aedeagus big, massive. Females: hysteronotal shield with especially pronounced striation between pori gla; setae h1 short and thick, divided into three branches, set posterior to hair-like setae e2.

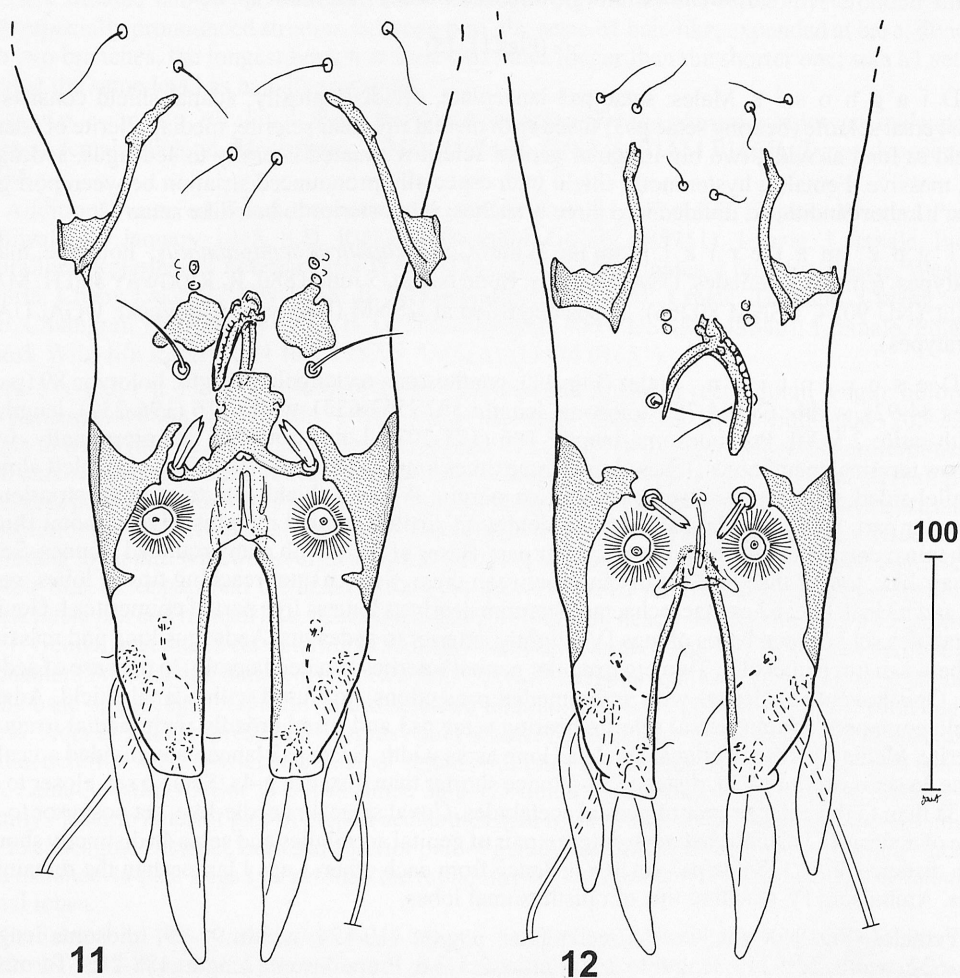
**T y p e m a t e r i a l.** From the Willet *Catoptrophorus semipalmatus*: holotype, male; paratypes: 6 males, 4 females, USA, Virginia, Bone Island, 5 June 1880, R. RIDGWAY and H. MARSHALL (NU 9054, USNM 80266). Types deposited at USNM (holotype, paratypes), UGA, UAM (paratypes).

**D e s c r i p t i o n.** Males (Fig. 11): gnathosoma rectangular, length: holotype 89 (paratypes 84-92), width: 68 (64-75). Idiosoma length: 587 (563-633), width 216 (196-239), length to width ratio: 2.5-3.0. Propodosoma length: 186 (178-207). Lobes rounded lateroterminally, with narrow terminal membranes; lobes almost three times longer than their width. Terminal cleft almost parallel-sided, with heavy sclerotized anterior margin. Pronotal shield with transversal striation in posterior part. Anteromedial part of this shield with distinct parallel margins. Hysteronotal shield with transversal striation, excluding its lobar part. Bases of lobes with many rounded lacunes. Setae e2 hair-like, longer than half the distance between them. Setae h1 not reaching tips of lobes, setae ps2 and h3 leaf-like; h2 as macrochaetae. Sternum nearly as long as free part of epimerites I. Genital acetabules set between bases of legs IV, slightly anterior to aedeagus. Aedeagus long and massive, set between trochanters IV. Two big irregular genital sclerites situated laterally to the base of aedeagus. Opisthoventral sclerites with anteromedial projections, not fused with adanal shield. Adanal shield composed of transversal sclerite bearing setae ps3 and fused broadly with medial irregular sclerite. Medial sclerite of adanal shield as long as its width. Setae ps3 lanceolate, divided apically. Setae 3a set posterior to 3b; distance 3a-g twice shorter than distance g-4a. Setae g set closer to setae 3a than to the anterior pair of genital acetabules. Coxal setae 4a needle-like, set posterior to the base of aedeagus. Distance between anterior pair of genital acetabules and setae 4a distinctly shorter than distance 4a-ps3. Setae ps3 set at a distance from each other. Legs I larger than the remaining ones. Ambulacra IV reaching tips of opisthosomal lobes.

Females (Fig. 15): gnathosoma rectangular, length: 110-124, width: 91-99. Idiosoma length: 601-622, width: 229-246, length to width ratio: 2.5-2.6. Propodosoma length: 188-213. Terminus conical with very small medial incision. Hysteronotal shield excluding area between setae d2 and opisthonotal part with transversal striation. Striation especially pronounced in area between pori gla. Supranal concavity circular, distance from terminal cleft exceeds more than two times its diameter. A pair of lacunes between setae e2 and gla present. Distance c1-d1 as long as distance d2-gla. Distance e2-gla two times longer than e2-f2. Setae e2 hair-like, slightly thickened, reaching bases of h2. Setae h1 short, divided into three branches, with medial branch being the longest, and adaxial branch the shortest one. Setae h1 set posterior to e2. Setae h2 and h3 as macrochaetae. Setae ps1 two times longer than the distance between them. Setae g and 3b set on the same level. Opisthosoma with small ventroterminal shield posterior to anus. Ambulacra IV reaching terminal end of body.

**D i f f e r e n t i a l d i a g n o s i s.** *Montchadskiana tridentata* is very similar to *M. ulitae* and *M. glareolae*. Males of the new species have the longest lobes among this species group. The new species differs from the most similar *M. ulitae* by the sclerotization of the anal region in males. In *M. tridentata* the anteromedial projections of opisthoventral sclerites are never fused with medial part of adanal shields. In *M. ulitae* the connections between opisthoventral sclerites and medial sclerite are present. In *M. tridentata* the distance between setae 4a is similar to the distance between setae ps3. In *M. ulitae* (also in *M. glareolae*) the distance between setae ps3 is shorter than distance between 4a. Differences in sclerotization of the genitoanal region between *M. tridentata* and *M. glareolae* are well displayed. Males of *M. tridentata* possess a pair of well developed genital sclerites and relatively short medial sclerite of adanal shields, as long as wide; opis-





Figs 11-12. Male opisthoventrum: 11 – *Montchadskiana (Montchadskiana) tridentata* sp. nov., 12 – *M. (M.) guttifera* sp. nov.

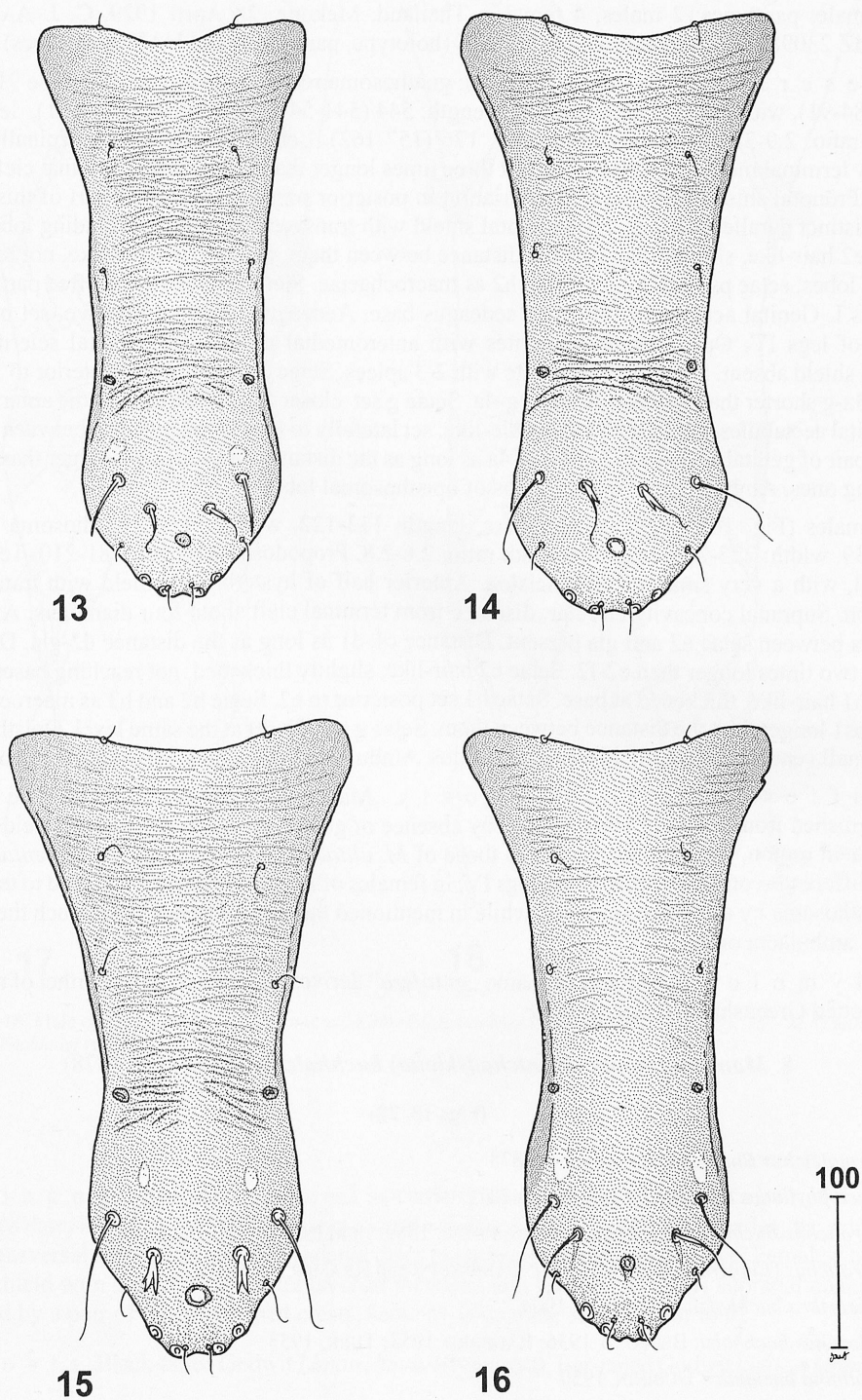
thoventral sclerites are not connected with adanal shields. In *M. glareolae* two pairs of greatly reduced genital sclerites are present, the medial sclerite is two times longer than its width; opisthoventral sclerites are fused with adanal shields. Females of *M. tridentata* differ from all known females of the genus *Montchadskiana* by tridentate setae h1.

**E t y m o l o g y.** The species name “*tridentata*” (Lat. *tri* – three, *dentatus* – dentate) refers to the shape of setae h1 in females.

#### 7. *Montchadskiana (Montchadskiana) guttifera* sp. nov.

(Figs 12, 16)

**D i a g n o s i s.** Males: setae ps3 lanceolate, with 2-3 apices; genital sclerites and adanal shield absent in the genitoanal region; aedeagus big, massive. Females: setae h1 hair-like, expanded at bases, set posterior to hair-like setae e2; tips of tarsi IV reaching opisthosoma terminus.



Figs 13-16. Female hysteronotal shield: 13 – *Montchadskiana (Montchadskiana) ulitae* DUBININ, 1951, 14 – *M. (M.) glareolae* sp. nov., 15 – *M. (M.) tridentata* sp. nov., 16 – *M. (M.) guttifera* sp. nov.

**Type material.** From the Spotted (Nordman's) Greenshank *Tringa guttifer*: holotype, male; paratypes: 2 males, 4 females, Thailand, Mekong, 28 April 1929, C. J. AAGAARD (UMMZ 230989). Types deposited at UMMZ (holotype, paratypes) and UAM (paratypes).

**Description.** Males (Fig. 12): gnathosoma rectangular, length: holotype 91 (paratypes 84-91), width: 76 (81-88). Idiosoma length: 544 (541-547), width: 191 (173-191), length to width ratio: 2.9-3.1. Propodosoma length: 176 (157-162). Lobes rounded laterotermally, with narrow terminal membranes, lobes almost three times longer than their width. Terminal cleft triangular. Pronotal shield with transversal striation in posterior part. Anteromedial part of this shield with distinct parallel margins. Hysteronotal shield with transversal striation, excluding lobar part. Setae e2 hair-like, shorter than half the distance between them. Setae h1 needle-like, not reaching tips of lobes; setae ps2 and h3 leaf-like; h2 as macrochaetae. Sternum shorter than free part of epimerites I. Genital acetabules set at the aedeagus base. Aedeagus long and massive, set between bases of legs IV. Opisthoventral sclerites with anteromedial projections. Genital sclerites and adanal shield absent. Setae ps3 lanceolate with 2-3 apices. Setae 3a set slightly posterior to 3b; distance 3a-g shorter than half the distance g-4a. Setae g set closer to setae 3a than to the anterior pair of genital acetabules. Coxal setae 4a needle-like, set laterally to aedeagus. Distance between the anterior pair of genital acetabules and setae 4a as long as the distance 4a-ps3. Legs I larger than the remaining ones. Ambulacra IV reaching tips of opisthosomal lobes.

Females (Fig. 16): gnathosoma square, length: 113-122, width: 111-121. Idiosoma length: 607-639, width: 223-235, length to width ratio: 2.6-2.8. Propodosoma length: 181-210. Terminus conical, with a very small medial incision. Anterior half of hysteronotal shield with transversal striation. Supranal concavity circular, distance from terminal cleft about four diameters. A pair of lacunes between setae e2 and gla present. Distance c1-d1 as long as the distance d2-gla. Distance e2-gla two times longer than e2-f2. Setae e2 hair-like, slightly thickened, not reaching bases of h2. Setae h1 hair-like, thickened at base. Setae h1 set posterior to e2. Setae h2 and h3 as macrochaetae. Setae ps1 longer than the distance between them. Setae g and 3b set at the same level. Opisthosoma with small ventroterminal shield posterior to anus. Ambulacra IV reaching the terminal end of body.

**Differential diagnosis.** Males of the new species are easily distinguished from males of other species by absence of genital sclerites and adanal shields in the genitoanal region. Females are similar to those of *M. ulitae*, *M. glareolae* and *M. tridentata*. The main difference concerns the length of legs IV: in females of *M. guttifer* legs IV extend to terminus of opisthosoma by distal tips of tarsus, while in mentioned three species these legs reach the terminus by ambulacra only.

**Etymology.** The species name „*guttifer*” derives from the specific epithet of the host the Spotted Greenshank *Tringa guttifer*.

#### 8. *Montchadskiana (Montchadskiana) buchholzi* (CANESTRINI, 1878)

(Figs 18, 22)

*Dermaleichus Buchholzi* CANESTRINI, 1878

*Proctophyllodes Buchholzi*: CANESTRINI, 1879

*Pterolichus Buchholzi*: CANESTRINI, 1886; POPPE, 1889; BERLESE, 1898; BANKS, 1907

*Pterolichus (Eupterolichus) buchholzi*: CANESTRINI and KRAMER, 1899

*Thecarthra buchholzi*: OUDEMANS, 1904

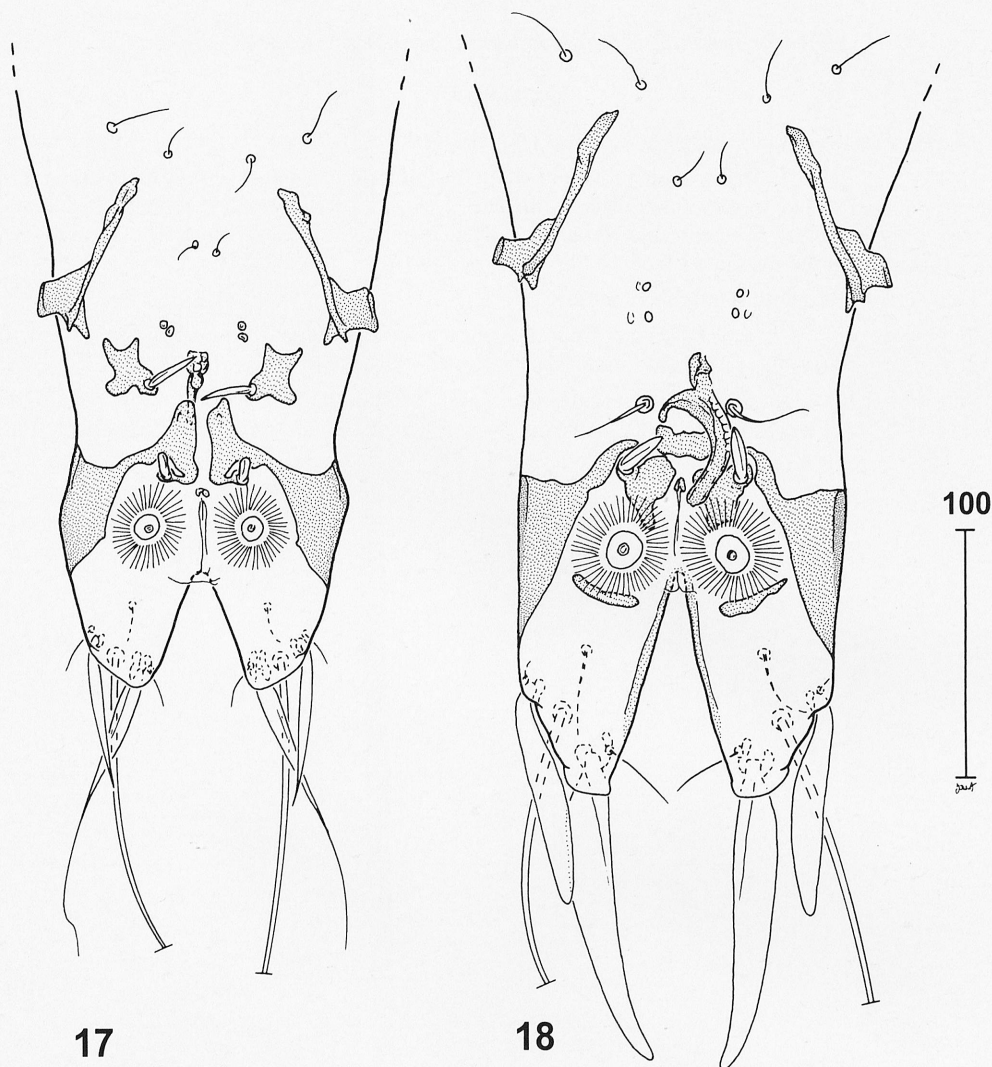
*Ptiloxenus buchholzi*: BEDFORD, 1936; RADFORD, 1953; TURK, 1953

*Grallobia buchholzi*: DUBININ, 1950

*Montchadskiana buchholzi*: DUBININ, 1951a; 1951b; 1955

*Montchadskiana (Montchadskiana) buchholzi*: DUBININ, 1956; CERNÝ, 1971; GAUD and MOUCHET, 1963; GAUD, 1972; VASYUKOVA and MIRONOV, 1990; 1991; DABERT, 1997





Figs 17-18. Male opisthoventrum: 17 — *Montchadskiana (Aphyllochaeta) eroliae* DUBININ, 1951, 18 — *M. (Montchadskiana) buchholzi* (CANESTRINI, 1878).

**D i a g n o s i s.** Males: setae ps3 lanceolate; adanal shields consist of a pair of triangular sclerites carrying setae ps3 and one transversal sclerite situated posterior to aedeagus; additional two transversal sclerites posterior to adanal discs present; aedeagus big, massive. Females: hysteronotal shield with a pair of lateral transversal incisions at a level of setae h1; supranal concavity is flanked by a pair of tongue-shaped crests; setae h1 lanceolate set posterior to e2.

**H o s t s.** Black-tailed Godwit *Limosa limosa* (type host), Bar-tailed Godwit *Limosa lapponica*.

**M a t e r i a l.** From Black-tailed Godwit *Limosa limosa*: 3 males, 4 females, Poland, Zagórow, 7 May 1988, J. DABERT (UAM 1105). From Bar-tailed Godwit *Limosa lapponica*: 3 males, Rositten, Kursk Spit, 25 August 1906 (UAM 1082).



9. *Montchadskiana (Montchadskiana) calidridis* DUBININ, 1956

(Figs 19, 23)

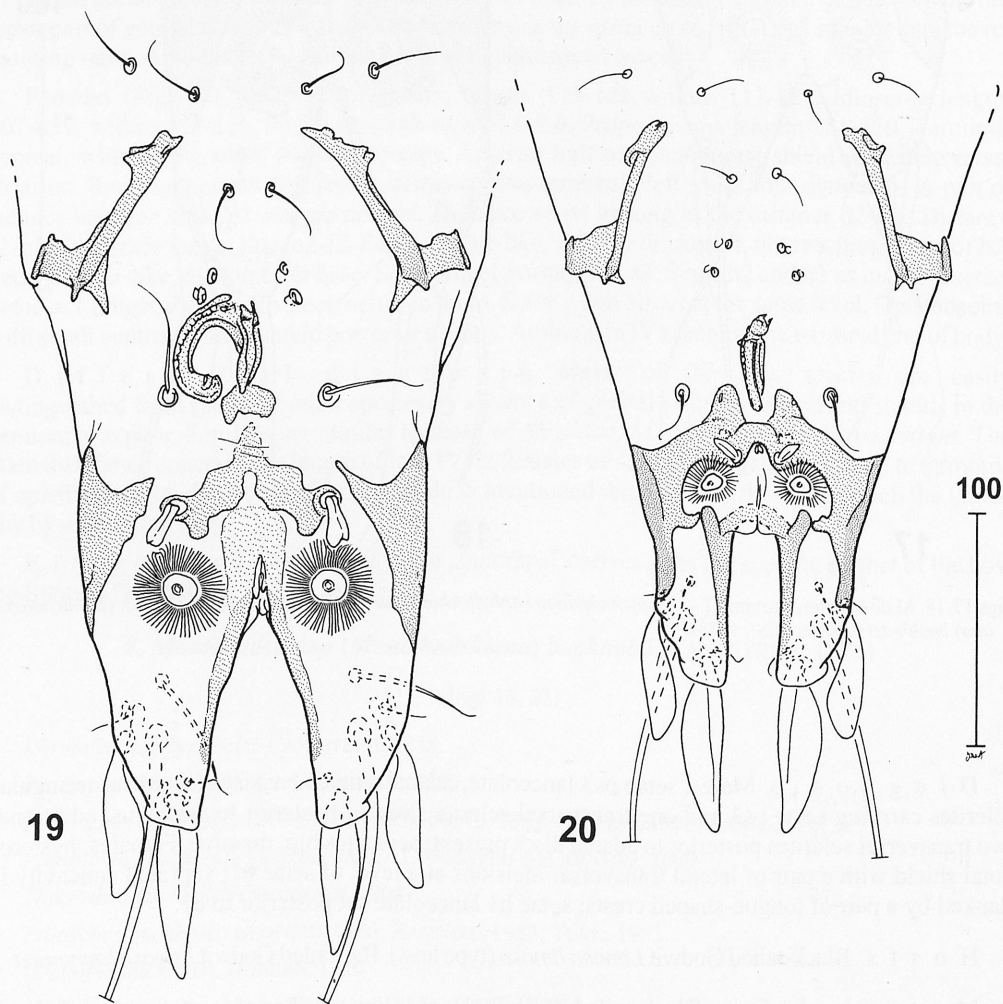
*Montchadskiana (Montchadskiana) calidridis* DUBININ, 1956

**D i a g n o s i s.** Males: adanal shield shaped as inverted V, not fused with opisthoventral sclerites; setae ps3 bifide, expanded distally; aedeagus big, massive. Females: setae h1 lanceolate, set distinctly posterior to needle-like setae e2; distance between h1 and supranal concavity two times shorter than the distance h1-h1.

**H o s t s.** Red Knot *Calidris canutus*.

**T y p e m a t e r i a l.** From the Red Knot *Calidris canutus*: lectotype, male; paralectotypes: 6 males, 10 females, Russia, Wrangel Islands, Roger's Bay, 2 July 1939, PORTENKO (ZISP 195).

Additional material. 2 males, 1 female, Denmark, West Jutland, 2 August 1936 (NU 9103, USNM 424554); 1 male, 1 female, USA, Texas, Neuces Co., N. ené Padre Ié., 19 September 1940,



Figs 19-20. Male opisthoventrum: 19— *Montchadskiana (Montchadskiana) calidridis* DUBININ, 1956, 20— *M. (M.) fascigerus* (MÉGNIN & TROUESSART, 1884).

W. B. DAVIS (NU 1664); 3 females, South Africa, Cape Prov., Velddrif, 30 November 1991, A. J. BAKER (UAM 1354). From the Great Knot *Calidris tenuirostris* (NEW HOST): 5 males, 1 female, Palau Islands, Peleliu Island, 16 September 1945, C. O. DAVISON (NU 9101, USNM 385558); 2 males, 2 females, the same data (NU 9102, USNM 385560); 2 males, China, Hebei Prov., Pei-tai-ho (Beidaihe), 39°52'N, 119°26'E, 21 July 1927 (UMMZ 64083); 1 female, Russia, Far East, Sudzukhin Wild-life Reserve, 30 August 1945, M. VOLKOVA (ZISP 2126).

**S y s t e m a t i c r e m a r k s.** The original description (DUBININ, 1956) contains a serious error in the description of the male genitoanal region. There are actually no two big lateral shields connected medially with anterior edges. The proper reconstruction based on remounted slides from the DUBININ's collection and other material is shown in the Fig. 19.

# 10. *Montchadskiana (Montchadskiana) fascigerus* (MÉGNIN and TROUESSART, 1884)

(Figs 20, 24)

*Pterolichus Buchholzi* var. *fasciger* MÉGNIN and TROUESSART, 1884; POPPE, 1888

*Pterolichus buchholzi* var. *fascigera*: BERLESE, 1895; VITZTHUM, 1924

*Pterolichus (Eupterolichus) buchholzi* var. *fascigera*: CANESTRINI and KRAMER, 1899; TRÄGÅRDH (1905)

*Pterolichus (Eupterolichus) buchholzi* var. *fasciger*: OUDEMANS, 1929

*Pterolichus buchholzi fascigera*: BEDFORD, 1932

*Pterolichus buchholzi* var. *fasciger*: OUDEMANS, 1937

*Ptiloxenus fasciger*: BEDFORD, 1936

*Ptiloxenus buchholzi* var. *fascigera*: RADFORD, 1953

*Ptiloxenus fascigera*: TURK, 1953

*Montchadskiana fascigerus fascigerus*: DUBININ, 1951b; 1951a; 1952; BELOPOL'SKAYA, 1952

*Montchadskiana (Montchadskiana) fascigerus fascigerus*: DUBININ, 1956; GAUD, 1972; MIRONOV, 1981

*Montchadskiana (Montchadskiana) fascigerus*: VASYUKOVA and MIRONOV, 1991; DABERT, 1997

*Montchadskiana fascigerus minutus*: DUBININ, 1951b; 1951a; 1952; BELOPOL'SKAYA, 1952 syn. nov.

*Montchadskiana (Montchadskiana) fascigerus minutus*: DUBININ, 1956; GAUD, 1972 syn. nov.

*Montchadskiana (Montchadskiana) minutus*: VASYUKOVA and MIRONOV, 1991 syn. nov.

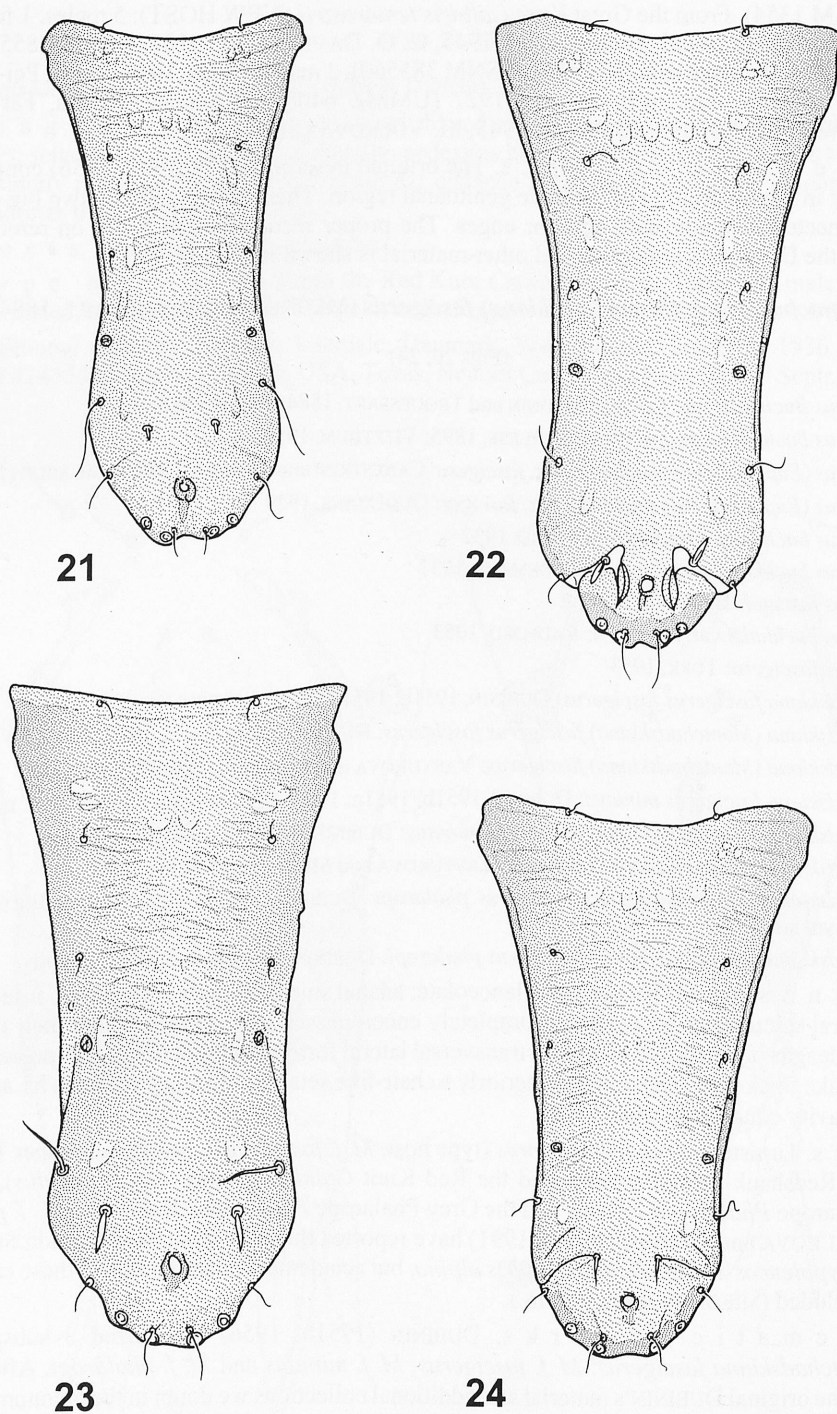
*Montchadskiana (Montchadskiana) fascigerus phalaropi*: DUBININ, 1951b; 1951a; 1952; BELOPOL'SKAYA, 1952 syn. nov.

*Montchadskiana (Montchadskiana) fascigerus phalaropi*: DUBININ, 1956; GAUD, 1972 syn. nov.

**D i a g n o s i s.** Males: setae ps3 lanceolate; adanal shield strongly sclerotized, fused with opisthoventral sclerites by wide bands, completely encompasses adanal discs except their medial margins, aedeagus big, massive. Females: transversal lateral furrows at level of setae h1 present; setae h1 hair-like thickened at base, set posteriorly to hair-like setae e2; distance between h1 and supranal concavity equal to distance h1-h1.

**H o s t s.** Turnstone *Arenaria interpres* (type host, *M. f. fascigerus*), Marsh Sandpiper *Tringa stagnatilis*, Redshank *Tringa totanus* and the Red Knot *Calidris canutus* (*M. f. minutus*), Red-necked Phalarope *Phalaropus lobatus* and the Grey Phalarope *Phalaropus fulicarius* (*M. f. phalaropi*). VASYUKOVA and MIRONOV (1990, 1991) have reported this mite from the Common Sandpiper *Actitis hypoleucos* and the Dunlin *Calidris alpina*, but accidental contamination in these cases is here not excluded (MIRONOV, pers. comm.).

**S y s t e m a t i c r e m a r k s.** DUBININ (1951b, 1956) recognized 3 subspecies within *Montchadskiana fascigerus*: *M. f. fascigerus*, *M. f. minutus* and *M. f. phalaropi*. After re-examining the original DUBININ's material and additional collections we doubt in the taxonomic validity of these subspecies. All discriminating features given by DUBININ (1951b, 1956) are rather weak and scattered among all „subspecies”. For example the differences in the body dimensions (males) are not significant in the case of *M. f. fascigerus* and *M. f. phalaropi*: 481 (472-487, SD=4.42, N=12) and 484 (479-487, SD=3.23, N=4), respectively. The case of *M. f. minutus* is more



Figs 21-24. Female hysteronotal shield: 21 – *Montchadskiana (Montchadskiana) ulitae* DUBININ, 1951, 22 – *M. (M.) buchholzi* (CANESTRINI, 1878), 23 – *M. (M.) calidridis* DUBININ, 1956, 24 – *M. (M.) fascigerus* (MÉGNIN & TROUESART, 1884).



difficult to be solved. We have failed to recollect this "subspecies" on the hosts mentioned by DUBININ (1956). The type material was also not available and probably is lost. The single male of *Montchadskiana* found on the Surfbird *Aphriza virgata* is most similar by body dimensions (length 456, width 192) to *M. f. minutus*. However, it has no differences in qualitative characters from other „subspecies". Therefore we synonymize both *M. f. phalaropi* and *M. f. minutus* with *M. fascigerus*.

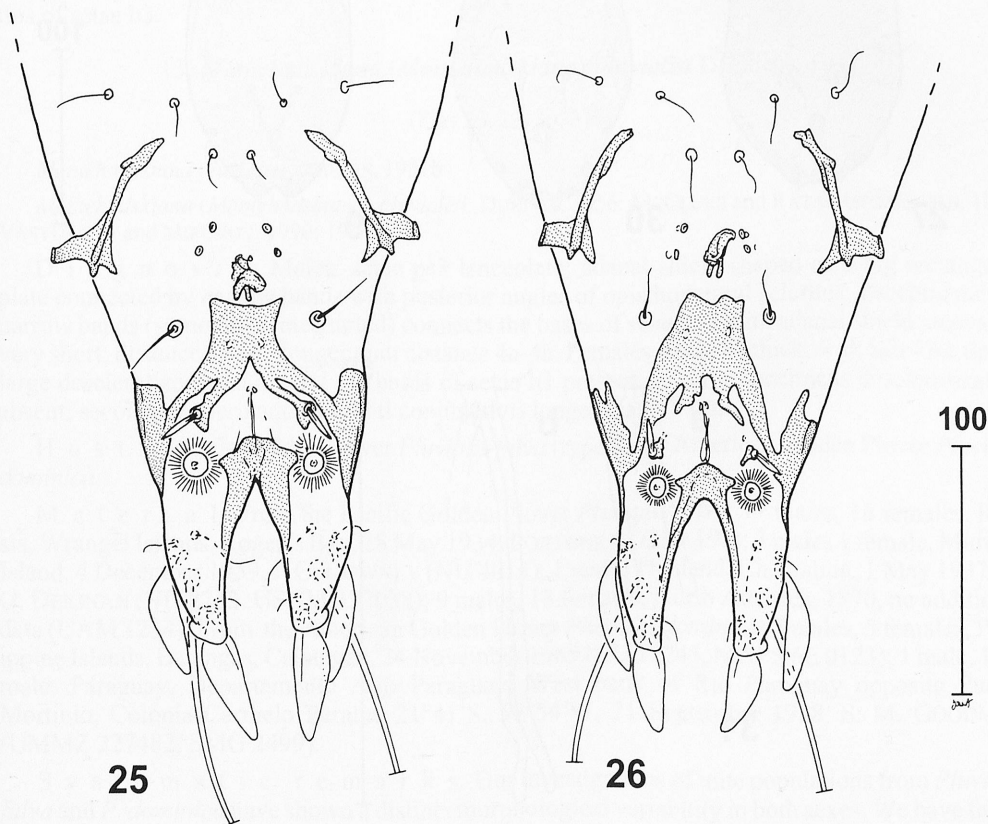
**Material.** From the Turnstone *Arenaria interpres*: 1 male, 1 female, USA, Texas, Neuces Co., 5 miles SW Port Adams, 29 November 1946, W. F. BLAIR (NU 1369); 3 males, 1 female, Poland, Vistula Delta, 25 August 1985, P. MICHALAK (UAM 0827); 16 males, 25 females, Russia, Barents Sea, Harlov Isl., 5 June 1948, (ZISP 1621); 2 females, Russia, Far East, Sudzukhin Wild-life Reserve, 25 August 1945, M. VOLKOVA (ZISP 201); 8 males, 5 females, Russia, Taimyr, 8 July 1991, R. SUMMERS (UAM 1312). From the Surfbird *Aphriza virgata* (NEW HOST), USA, Washington, Pacific Co., Long Beach, 23 May 1941, S. G. JEWETT (NU 9070, USNM 363617). From the Grey Phalarope *Phalaropus fulicarius*: 6 males, 1 female, Russia, Wrangel Islands, 26 June 1934, PORTENKO (ZISP 203).

# 11. *Montchadskiana (Montchadskiana) hastigera* (MÉGNIN and TROUESSART, 1884)

(Figs 25, 27, 28, 31a)

*Pterolichus Buchholzi* var. *hastiger* MÉGNIN and TROUESSART, 1884; POPPE, 1888

*Pterolichus (Eupterolichus) buchholzi* var. *hastigera*: CANESTRINI and KRAMER, 1899



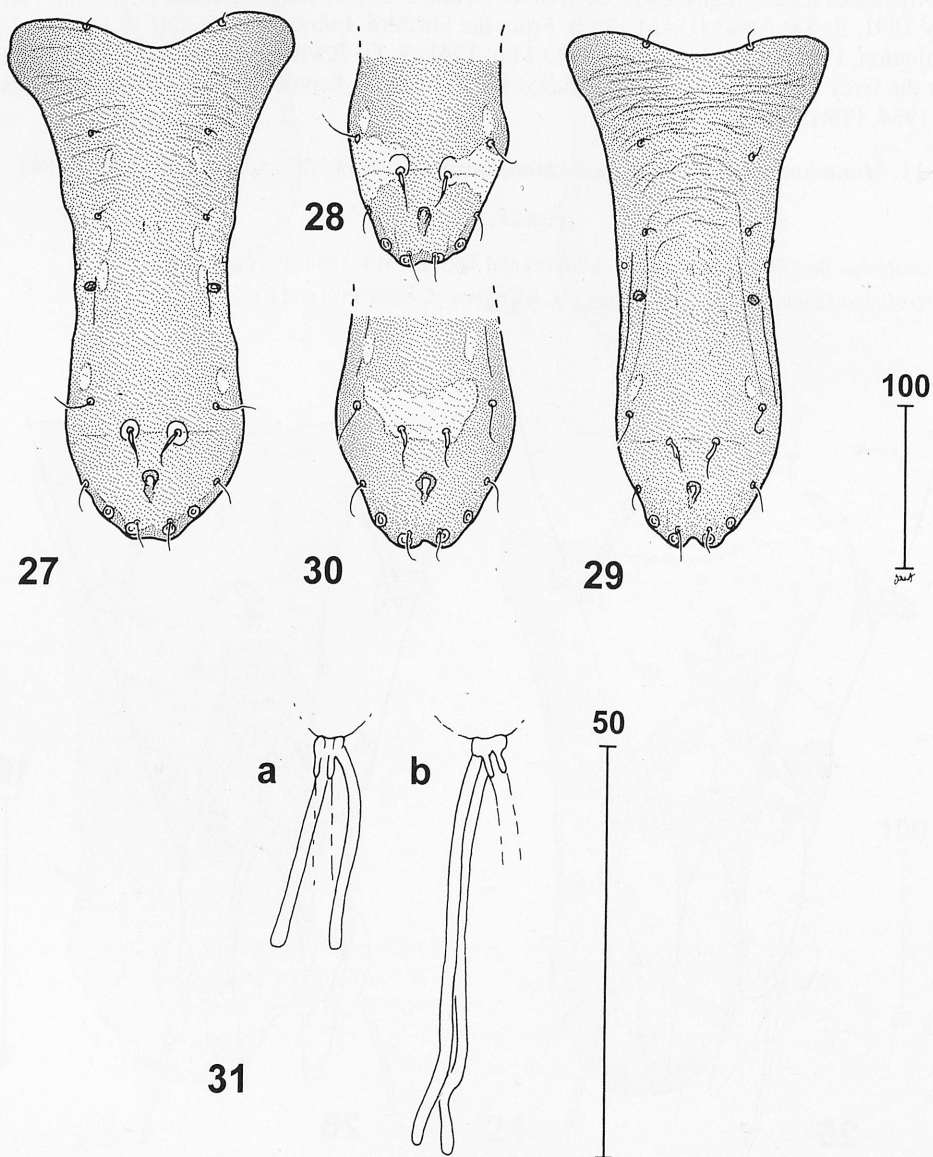
Figs 25-26. Male opisthoventrum: 25 – *Montchadskiana (Montchadskiana) hastigera* (MÉGNIN & TROUESSART, 1884), 26 – *M. (M.) pluvialis* DUBININ, 1951.

*Montchadskiana hastigera*: DUBININ, 1951b; 1952

*Ptiloxenus buchholzi* var. *hastigera*: RADFORD, 1953

*Montchadskiana (Montchadskiana) hastigera*: DUBININ, 1956; GAUD, 1972; VASYUKOVA and MIRONOV, 1990; 1991; DABERT, 1997

**D i a g n o s i s.** Males: setae ps3 lanceolate; adanal shield shaped as a big rectangular plate connected by narrow lateral bands with anterior angles of opisthoventral sclerites; a second pair of narrow bands connects the bases of setae ps3 with adanal shield; aedeagus very short; distance 4a-ps3 less than distance 4a-4a. Females: setae h1 hair-like, thickened at base, surrounded by



Figs 27-31. Variability of female hysteronotal shield: 27, 28 – *Montchadskiana (Montchadskiana) hastigera* (MÉGNIN & TROUËSSART, 1884), 29, 30 – *M. (M.) pluvialis* DUBININ, 1951; ducti conjunctivi: 31a – *M. (M.) hastigera*, 31b – *M. (M.) pluvialis*.

small, circular, desclerotized areas (sometimes these areas are expanded laterally); secondary spermaducts (ducti conjunctivi) shorter than 30  $\mu\text{m}$ .

**H o s t s.** Dunlin *Calidris alpina* (type host), Grey Plover *Pluvialis squatarola*.

The occurrence of *Montchadskiana hastigera* on the hosts from two different families of Charadriiformes (Charadriidae and Scolopacidae) was also confirmed by our observations. This polyxenous host-parasite relationship is unusual for the members of the genus *Montchadskiana*.

**M a t e r i a l.** From the Grey Plover *Pluvialis squatarola*: 4 males, 4 females, Poland, Vistula Delta, 3 September 1985, M. GIERTYCH (UAM 0766); 1 male, 1 female, USA, Texas, Dallas, Lake Dallas, 27 August 1946 (NU 1086). From the Dunlin *Calidris alpina*: 1 female, Poland, Vistula Delta, 29 August 1985, P. MICHALAK (UAM 0834).

## 12. *Montchadskiana (Montchadskiana) pachusetae* DUBININ, 1951

*Montchadskiana pachusetae* DUBININ, 1951b

*Montchadskiana (Montchadskiana) pachusetae*: DUBININ, 1956

**D i a g n o s i s.** Females: setae h3 thick, fish-bone-like.

**H o s t s.** Pacific Golden Plover *Pluvialis fulva*.

**S y s t e m a t i c r e m a r k s.** The description of this species by DUBININ (1951b) was based only on females taken from the Pacific Golden Plover *Pluvialis fulva* from Siberia. This species was never recollected. The types are lost (MIRONOV, pers. comm.). The taxonomic status of this species is uncertain. We believe that it is only a damaged female of *M. pluvialis* with broken tips of setae h3.

## 13. *Montchadskiana (Montchadskiana) pluvialis* DUBININ, 1951

(Figs 26, 29, 30, 31b)

*Montchadskiana pluvialis* DUBININ, 1951b

*Montchadskiana (Montchadskiana) pluvialis*: DUBININ, 1956; MCCLURE and RATANAWORABHAN, 1973; VASYUKOVA and MIRONOV, 1990; 1991

**D i a g n o s i s.** Males: setae ps3 lanceolate; adanal shield shaped as a big rectangular plate connected by narrow bands with posterior angles of opisthoventral sclerites; a second pair of narrow bands (sometimes interrupted) connects the bases of setae ps3 with adanal shield; aedeagus very short; distance 4a-ps3 longer than distance 4a-4a. Females: setae h1 thick, with hair-like tips; a large desclerotized area around the bases of setae h1 present, in some specimens desclerotization absent; secondary spermaducts (ducti conjunctivi) longer than 45  $\mu\text{m}$ .

**H o s t s.** Pacific Golden Plover *Pluvialis fulva* (type host), American Golden Plover *Pluvialis dominica*.

**M a t e r i a l.** From the Pacific Golden Plover *Pluvialis fulva*: 17 males, 16 females, Russia, Wrangel Islands, Roger's Bay, 28 May 1934, PORTENKO (ZISP 192); 3 males 1 female, Midway Island, 4 December 1959, J. C. DOWNEY (NU 4015); 1 male, Thailand, Chantabun, 1 May 1937, H. G. DEIGNAN (NU 8732, USNM 337038); 9 males, 13 females, North America, 1870, no additional data (UAM 1234). From the American Golden Plover *Pluvialis dominica*: 5 males, 5 females, Philippine Islands, Batangas, Calatagan, 24 November 1965 (NU 12245, MAPS 6E 0123); 1 male, 1 female, Paraguay, Departamento Alto Paraguay, West bank of Rio Paraguay opposite Puerto Mortinio, Colonia Carmelo Peralta, 21°41'S, 57°54'W, 21 September 1988, S. M. GOODMAN (UMMZ 227482, SMG 2499).

**S y s t e m a t i c r e m a r k s.** Our investigations of mite populations from *Pluvialis fulva* and *P. dominica* have shown a distinct morphological variability in both sexes. We have failed to find specific differences between mite populations from both hosts. A more numerous material and careful identification of the hosts are necessary to prove the speciation hypothesis or to find other explanations of the observed polymorphism.



The proper host-parasite associations are hard to rely upon. Both host species, *Pluvialis fulva* and *P. dominica*, are treated by ornithologists as separate species for latter 10 years only. Additionally, these birds are extremely hard to distinguish in the non-breeding and non-wintering areas. Generally 25% of population is impossible to be distinguished. Because of small overlapping area of both species (western Alaska) the best proof of species is the geographical location (CHYLARECKI, pers. comm.).

14. *Montchadskiana (Montchadskiana) securicata* (MÉGNIN and TROUESSART, 1884)

(Figs 32, 36)

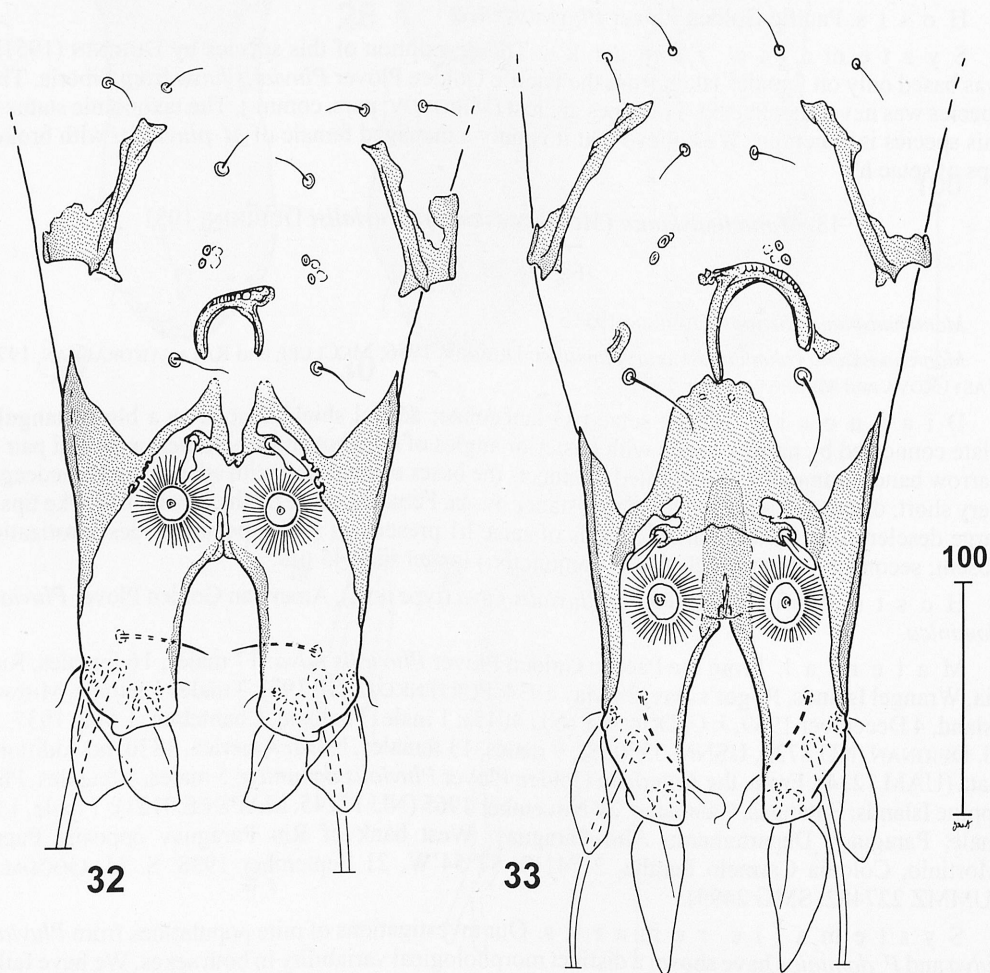
*Pterolichus Buchholzi* var. *securicatus* MÉGNIN and TROUESSART, 1884; POPPE, 1889

*Pterolichus (Eupterolichus) buchholzi* var. *securicata*: CANESTRINI and KRAMER, 1899

*Pterolichus buchholzi* var. *securicata* BEDFORD, 1953

*Ptiloxenus buchholzi* var. *securicata* REDFORD, 1953

*Montchadskiana securicatus securicatus* DUBININ, 1951b; 1952; 1956



Figs 32-33. Male opisthoventrum: 32 – *Montchadskiana (Montchadskiana) securicata* (MÉGNIN & TROUESSART, 1884), 33 – *M. (M.) terekiae* DUBININ, 1951.

**D i a g n o s i s.** Males: setae ps3 lanceolate with small lateral outgrowth, set on basal extensions of M-shaped adanal shield; opisthosomal lobes rectangular; setae ps2 triangular; setae ps1 short, two times longer than their width; aedeagus big, massive. Females: anterior part of hysteronotum with net-like pattern; pygidial transversal furrow present; setae h1 lanceolate, set posterior to needle-like setae e2.

**H o s t s.** *Calidris ferruginea* (type host), Sanderling *Calidris alba*, Little Stint *C. minuta*, Rufous-necked Stint *C. ruficollis* and the Great Knot *C. tenuirostris*. According to our observations the latter host record seems to be erroneous. This bird species is typically infested with *M. calidridis*.

**M a t e r i a l.** From the Sanderling *Calidris alba*: 1 male, 4 females, Russia, Far East, Sudzukhin Wild-life Reserve, 3 August 1945, M. VOLKOVA (ZISP 213); 1 male, 3 females, USA, Louisiana, Lafourche Parish, E. Timbalier Island., 15 November 1940, T. D. BURLEIGH (NU 2068). From the Curlew Sandpiper *Calidris ferruginea*: 1 female, India, SW Madras, Muttupet, 27 February 1970 (UGA 6542); 1 female, India, SE Madras, Point Calimere, 3 April 1970 (UGA 6540). From the Western Sandpiper *Calidris mauri* (NEW HOST): 2 males, 2 females, USA, Lower California, Colorado Desert, Lagoon of Salton River, 27 April 1894, E. A. MEARNs (NU 9126, USNM 135506). From the Semipalmated Sandpiper *Calidris pusilla* (NEW HOST): 1 male, USA, Michigan, Monroe Co., Point Mouillee State Game Area, 41°56'N, 83°21'W, 13 August 1982, S. M. GOODMAN (UMMZ 205339). From the Rufous-necked Stint *Calidris ruficollis*: 11 males, 17 females, Russia, Far East, Sudzukhin Wild-life Reserve, 21 May 1945, M. VOLKOVA (ZISP 204); 4 males, 5 females, Russia, Far East, Hasan Lake, 24 July 1946, M. GORTSCHAKOVSKAJA (ZISP 212); 3 males, 2 females, Thailand, Smutprakan, sea level, Klong Dan, [no other data], (NU 12530, MAPS 1065); 4 females, Japan, Honshu Island, Rokugo near Tokyo, 35°30'N, 139°45'E, 27 May 1926 (UMMZ 64325). From the Long-toed Stint *Calidris subminuta* (NEW HOST): 3 males, 2 females, Thailand, Smutprakan, sea level, Klong Dan, 23 September 1965 (NU 12522, MAPS 1059). From Broad-billed Sandpiper *Limicola falcinellus* (NEW HOST): 3 males, 1 female, India, SE Madras, Point Calimere, 13 April 1970 (UGA 6573, MAPS XIE 914).

#### 15. *Montchadskiana (Montchadskiana) terekiae* DUBININ, 1951

(Figs 33, 40)

*Montchadskiana terekiae* DUBININ, 1951b

*Montchadskiana (Montchadskiana) terekiae*: DUBININ, 1956; RADFORD, 1958; VASYUKOVA and MIRONOV, 1990; 1991

**D i a g n o s i s.** Males: setae ps3 lanceolate set on extensions of adanal shield; adanal shield represented by a large sclerite occupying almost whole genitoanal region and connected by narrow bands with opisthoventral sclerites; genital sclerites situated anterior to bases of setae 4a, aedeagus big, massive. Females: setae h1 and e2 awl-like; distance between e2-e2 almost as long as h1-h1.

**H o s t s.** Terek Sandpiper *Xenus cinereus*

**M a t e r i a l.** From the Terek Sandpiper *Xenus cinereus*: 2 males, 1 female, Russia, Far East, Sudzukhin Wild-life Reserve, 13 August 1945 (ZISP 194); 5 males, 1 female, Russia, Far East, Sudzukhin Wild-life Reserve, 26 August 1945 (ZISP 193); 2 males, 1 female, India, Nicobar Islands, Car Nicobar Island, 9°10'N, 92°47'E, 22 March 1976, H. Abdulali (UMMZ 225430).

#### 16. *Montchadskiana (Montchadskiana) totani* DUBININ, 1951

(Figs 34, 37)

*Montchadskiana securicatus totani* DUBININ, 1951b

*Montchadskiana (Montchadskiana) securicatus totani*: DUBININ, 1956; RADFORD, 1958; GAUD, 1972

*Montchadskiana (Montchadskiana) securicatus heteractitidis*: DUBININ, 1956 syn. nov.

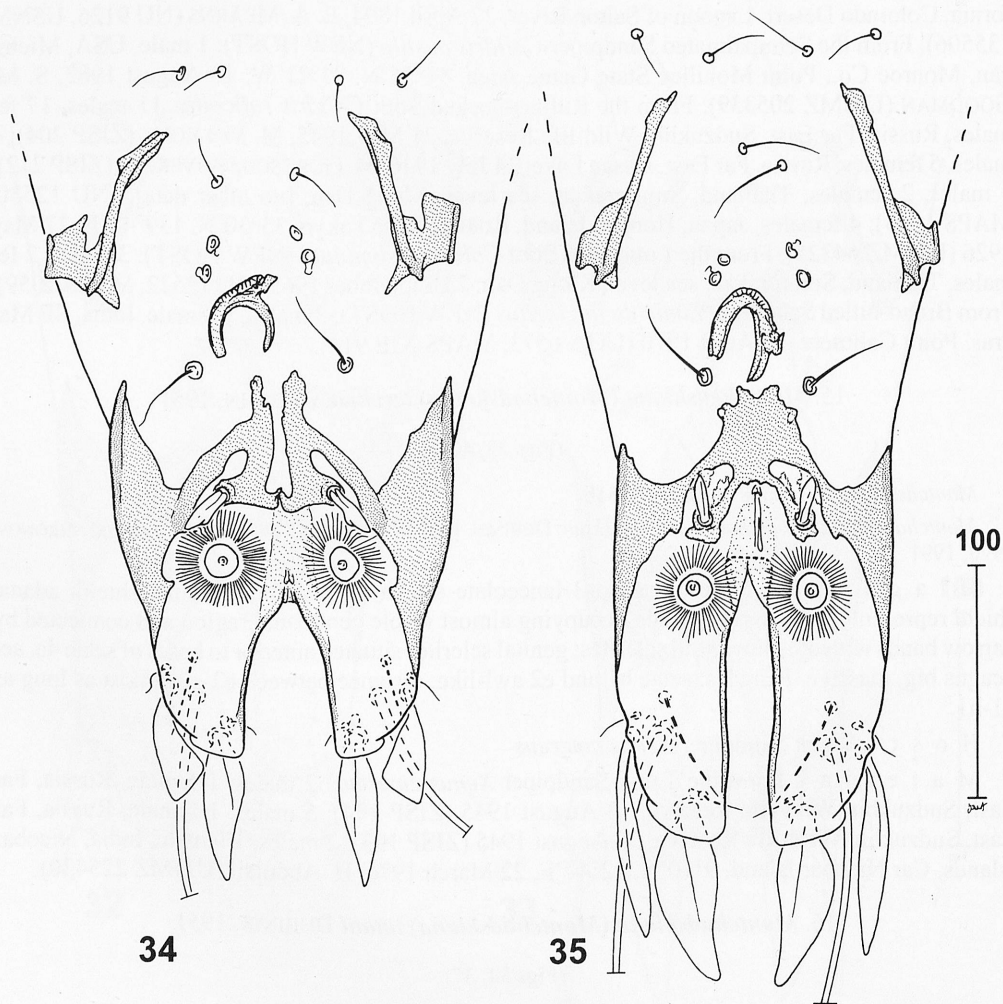
*Montchadskiana (Montchadskiana) heteractitidis* VASYUKOVA and MIRONOV, 1990 syn. nov.

**D i a g n o s i s.** Males: setae ps3 lanceolate with small lateral outgrowth, inserted on paired adanal shield as inverted T, central part of these sclerites connected by narrow band with opisthoventral sclerites; opisthosomal lobes with narrowed ends; setae ps2 triangular; setae ps1 long, their length four times longer than wide; aedeagus big, massive. Females: posterior part of hysteronotum with net-like pattern; pygidial furrow absent; setae h1 needle-like set far posterior to needle-like setae e2.

**H o s t s.** Common Redshank *Tringa totanus* (type host), Grey-tailed Tattler *Heteroscelus brevipes* (*Montchadskiana heteractitidis*).

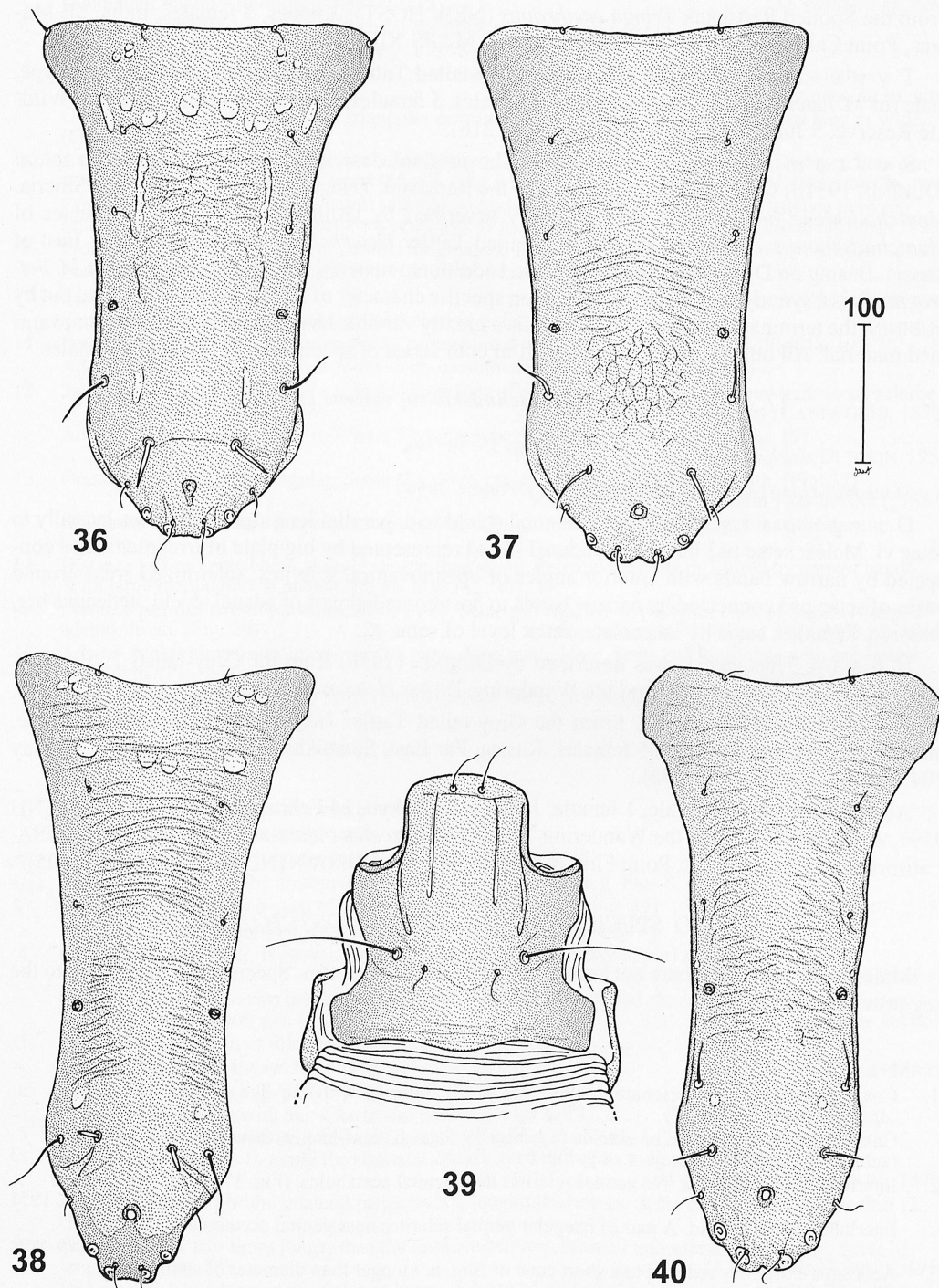
**T y p e m a t e r i a l.** From the Redshank *Tringa totanus*: lectotype, male; paralectotypes: 12 males, 15 females, Russia, Western Siberia, Chany Lake, 16 June 1936, B. BYKHOVSKI (ZISP 214).

Additional material. 2 males, 2 females, China, Tibet Prov., U-Long-Si, 28 July 1930, D. C. GRA-



Figs 34-35. Male opisthoventrum: 34 – *Montchadskiana (Montchadskiana) totani* DUBININ, 1951, 35 – *M. (M.) volkovi* DUBININ, 1956.





Figs 36-40. Female hysteronotal shield: 36 – *Montchadskiana (Montchadskiana) securicata* (MÉGNIN & TROUESSART, 1884), 37 – *M. (M.) totani* DUBININ, 1951, 38 – *M. (M.) volkovi* DUBININ, 1956, 39 – *M. (M.) terekiae* DUBININ, 1951; 40 – Pronotal shield of female of *M. (M.) volkovi*.

HAM (NU 8886, USNM 325181).

From the Spotted Redshank *Tringa erythropus* (NEW HOST): 3 males, 3 females, India, SE Madras, Point Calimere, 14 April 1970 (UGA 6122, MAPS XIE 877).

**Type material** from the Grey-tailed Tattler *Heteroscelus brevipes*: lectotype, male (of *M. heteractitidis*); paralectotypes: 19 males, 5 females, Russia, Far East, Sudzukhin Wild-life Reserve, 5 June 1944, M. VOLKOVA (ZISP 216).

**Systematic remarks.** The original description of *Montchadskiana totani* (DUBININ 1951b) was based on males only of the Redshank *Tringa totanus* from Western Siberia. *Montchadskiana heteractitidis* was primarily described by DUBININ (1956) as a subspecies of *Montchadskiana securicata* from the Grey-tailed Tattler *Heteroscelus brevipes* from Far East of Russia. Basing on DUBININ's type material and additional material we have concluded that *M. heteractitidis* is a synonym of *M. totani*. The main specific character of *M. heteractitidis* pointed out by DUBININ, the terminal expansion of sternum, is a greatly variable character as it was found in examined material. All other features are identical in both series of specimens, in males and females.

### 17. *Montchadskiana (Montchadskiana) volkovi* DUBININ, 1956

(Figs 35, 38, 39)

*Montchadskiana (Montchadskiana) volkovi* DUBININ, 1956

**Diagnosis.** Both sexes: pronotal shield with parallel longitudinal furrows laterally to setae vi. Males: setae ps3 lanceolate; adanal shield represented by big plate of irregular shape connected by narrow bands with anterior angles of opisthoventral sclerites; sclerotized areas around bases of setae ps3 connected by narrow bands to posteromedial part of adanal shield; aedeagus big, massive. Females: setae h1 lanceolate, set at level of setae e2.

**Hosts.** This species was described by DUBININ (1956) from the Grey-tailed Tattler *Heteroscelus brevipes* (type host) and the Wandering Tattler *Heteroscelus incanus*.

**Type material.** From the Grey-tailed Tattler *Heteroscelus brevipes*: lectotype, male; paralectotypes: 6 males, 5 females, Russia, Far East, Sudzukhin Wild-life Reserve, 19 May 1945, M. VOLKOVA (ZISP 196).

**Additional material.** 1 male, 1 female, Japan, near Tokyo, 14 February 1929, N. KURODA (NU 9597, ANSP 88283). From the Wandering Tattler *Heteroscelus incanus*: 2 males, 2 females, USA, California, Los Angeles Co., Point Firman, 9 May 1919, W. J. BROWN (NU 9045, USNM 256805).

## V. KEY TO SPECIES OF THE GENUS *MONTCHADSKIANA*

Males of *M. pachusetae* are not known. Females of this doubtful "species" are included into the key provisionally only.

### Males

1. Coxal setae 4a set on the crenate shields (Figs 1, 17). Setae h3 with hair-like distal part (subgenus *Aphylochaeta*, Figs 2, 17) . . . . . 2
- Coxal setae 4a not situated on shields (e.g. Fig. 5). Setae h3 leaf-like, without hair-like distal part (subgenus *Montchadskiana* s. s., e.g. Fig. 6) . . . . . 3
2. Interlobar cleft triangular. No genital sclerites near genital acetabules. (Fig. 17) . . . . . *M. eroliae* DUBININ, 1951
- Interlobar cleft ellipsoid. A pair of irregular genital sclerites near genital acetabules. (Figs 1, 2) . . . . . *M. dubinini* sp. nov.
3. Aedeagus extremely reduced to a short cone or ring, not longer than diameter of adanal discs . . . . . (Figs 25, 26) . . . . .
- Aedeagus big, massive, with dorsal row of „cells”, longer than diameter of adanal discs (e.g. Fig. 5) . . . . . 5
4. Distance 4a-ps3 longer than distance 4a-4a (Fig. 26) . . . . . *M. pluvialis* DUBININ, 1951
- Distance 4a-ps3 shorter than the distance 4a-4a (Fig. 25) . . . . . *M. hastigera* (MÉGNIN and TROUESSART, 1884)

5. Various shaped sclerites on genitoanal region present (e.g. Fig 11) . . . . . 6
- Genitoanal region without sclerites (Fig. 12) . . . . . *M. guttifera* sp. nov.
6. 1-2 pairs of genital sclerites near genital acetabules present (Figs 9-11) . . . . . 7
- No sclerites near genital acetabules (e.g. Fig 18) . . . . . 9
7. Genital sclerites small, reduced. Medial part of adanal shield two times longer than its width. (Fig. 10) . . . . . *M. glareolae* sp. nov.
- Genital sclerites well developed, triangular or rounded. Medial part of adanal shield as long as wide. (Figs 9, 11). . . . . 8
8. Anteromedial projections of opisthoventral sclerites not fused with adanal shields. Distance between setae 4a equal to distance between setae ps3. (Fig. 11) . . . . . *M. tridentata* sp. nov.
- Connections between opisthoventral sclerites and adanal shields always present. Distance between setae 4a longer than distance between setae ps3. (Fig. 9) . . . . . *M. ulitae* DUBININ, 1951
9. Pronotal shield with two pairs of parallel longitudinal furrows (Fig. 39) . . . . . *M. volkovi* DUBININ, 1956
- Pronotal shield without two pairs of longitudinal furrows (e.g. Fig. 8) . . . . . 10
10. Setae ps3 simple, hair-like (Fig. 5) . . . . . *M. prosoboniae* sp. nov.
- Setae ps3 variously shaped, always thickened (e.g. Fig. 18) . . . . . 11
11. Fragments of adanal shields bearing setae ps3 not fused with opisthoventral sclerites (Figs 18, 19). . . . . 12
- Adanal shields fused by narrow bands with opisthoventral sclerites (e.g. Fig. 32) . . . . . 13
12. Setae ps3 set on two separated triangular fragments of adanal shields. One additional transversal sclerite of this shield present. (Fig. 18). . . . . *M. buchholzi* (CANESTRINI, 1878)
- Adanal shields bearing setae ps3 fused into one sclerite shaped as inverted V. (Fig. 19) . . . . . *M. calidridis* DUBININ, 1956
13. Opisthosomal lobes rectangular. Setae ps1 short, two times longer than their width. (Fig. 32) . . . . . *M. securicata* (MÉGNIN and TROUESSART, 1884)
- Opisthosomal lobes with narrowed ends. Setae ps1 long, at least four times longer than their width. (e.g. Fig. 33) . . . . . 14
14. Distance ps3-ps3 equal to or slightly shorter than 4a-4a. Sclerites carrying ps3 fused by narrow bands with large medial part of adanal shields (e.g. Fig. 33). . . . . 15
- Distance ps3-ps3 two times shorter than 4a-4a. Setae ps3 situated on posterior ends of large, H-shaped adanal shield. (Fig. 20). . . . . *M. fascigerus* (MÉGNIN and TROUESSART, 1884)
15. Adanal shields almost separated into two parts along medial line. Setae ps3 lanceolate with one lateral outgrowth. (Fig. 34) . . . . . *M. totani* DUBININ, 1951
- Adanal shields represented by large medial sclerite. Setae ps3 lanceolate, simple. (Fig. 33) . . . . . *M. terekiae* DUBININ, 1951

## F e m a l e s

1. Setae h3 thick, fish-bone-like, medium sized . . . . . *M. pachusetae* DUBININ, 1951
- Setae h3 not modified macrochaetae, very long. . . . . 2
2. Setae e2 set at level or slightly anterior to setae h1 (Figs 4, 38). . . . . 3
- Bases of setae e2 and h1 arranged in trapezium or rectangle (e.g. Figs 8, 40) . . . . . 5
3. Pronotal shield with two pairs of parallel longitudinal furrows (Fig. 39) . . . . . *M. volkovi* DUBININ, 1951
- Pronotal shield without two pairs of longitudinal furrows (e.g. Fig. 4) . . . . . 4
4. Setae h1 simple, thick. Hysteronotal shield smooth in area between pori gla. (Fig. 4). . . . . *M. (Aphylochaeta) dubinini* sp. nov.
- Setae h1 divided into two branches, thickened at base. Hysteronotal shield with distinct transversal striations between pori gla. (Fig. 14) . . . . . *M. glareolae* sp. nov.
5. Setae h1 simple, thin or thick (e.g. Figs 16, 23). . . . . 6
- Setae h1 trifurcate, always thick (Fig. 15). . . . . *M. tridentata* sp. nov.
6. Setae h1 lanceolate (Figs 21, 22, 23) . . . . . 7
- Setae h1 hair-like or with hair-like apical part (e.g. Figs 8, 13) . . . . . 9
7. Hysteronotal shield with deep transversal incisions at level of setae h1 and a pair of longitudinal tongue-shaped crests flanking the supranal concavity. Setae e2 as long as f2. (Fig. 22). . . . . *M. buchholzi* (CANESTRINI, 1878)
- Hysteronotal shield without lateral incisions and longitudinal crests. Setae e2 two times longer than f2. (Figs 21, 23) . . . . . 8
8. Distance h1-h1 two times longer than the distance between setae h1 and supranal concavity. Setae h1 lanceolate. (Fig. 23) . . . . . *M. calidridis* DUBININ, 1956
- Distance h1-h1 as long as the distance between setae h1 and supranal concavity. Setae h1 very short, spine-like. (Fig. 21). . . . . *M. (Aphylochaeta) eroliae* DUBININ, 1951
9. Tips of tarsi IV reaching opisthosoma terminus . . . . . *M. guttifera* sp. nov.
- Ambulacra of legs IV reaching opisthosoma terminus. . . . . 10
10. Terminal cleft distinct, reaching bases of setae ps1 (Fig. 8) . . . . . *M. prosoboniae* sp. nov.



- . Terminal cleft very small, if present, not reaching bases of setae ps1 (e.g. Fig. 13). . . . . 11
- 11. Distance h1-h1 two times longer than the distance between setae h1 and supranal concavity (Figs 36, 37, 40) . . . . . 12
- . Distance h1-h1 as long as the distance between setae h1 and supranal concavity (Figs 13, 24, 27, 29) . . . 14
- 12. Distance between setae e2-e2 two times longer than h1-h1 (Figs 36, 37) . . . . . 13
- . Distance between setae e2-e2 almost equal to the distance h1-h1 (Fig. 40). . . . . *M. terekiae* DUBININ, 1951
- 13. Anterior part of hysteronotum with net-like pattern. Opisthosoma with bow-like furrow at the level of setae h1. (Fig. 36) . . . . . *M. securicata* (MÉGNIN and TROUESSART, 1884)
- . Posterior part of hysteronotum with net-like pattern. Transversal furrow in opisthosoma absent. (Fig. 37) . . . . . *M. totani* DUBININ, 1951
- 14. Lateral margins of hysteronotal shield with distinct transversal furrows at level of setae h1 (Fig. 24) . . . . . *M. fascigerus* (MÉGNIN and TROUESSART, 1884)
- . Hysteronotal shield without lateral furrows at level of setae h1 or a very weak transversal furrow not reaching lateral margins of shield present (Figs 13, 27-30) . . . . . 15
- 15. Hysteronotal shield between pori gla with distinct transversal striation. Setae e2 thick, needle-like. (Fig. 13). . . . . *M. ulitae* DUBININ, 1951
- . Hysteronotal shield without any striation between pori gla. Setae e2 hair-like. (Figs 27-30) . . . . . 16
- 16. Bases of setae h1 surrounded by circular desclerotized areas (Fig. 27) or hysteronotal shield with big desclerotized areas between setae h1 and lateral margins of this shield (Fig. 28). Secondary spermaducts (ducti conjunctivi) shorter than 30 µm. (Fig. 31a) . . . . . *M. hastigera* (MÉGNIN and TROUESSART, 1884)
- . Bases of setae h1 without desclerotized areas (Fig. 29) or hysteronotal shield with big desclerotized area around setae h1 (Fig. 30). Secondary spermaducts (ducti conjunctivi) longer than 45 µm. (Fig. 31b) . . . . . *M. pluvialis* DUBININ, 1951

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