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NEW SPECIES OF GALL MIDGES OF THE TRIBE STOMATOSEMATINI (DIPTERA, CECIDOMYIIDAE) FROM THE RUSSIAN FAR EAST

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Didactylomyia arcana Fedotova et Sidorenko, **sp. n.**, *Stomatosema zaitzevi* Fedotova, **sp. n.** and *S. taiga* Fedotova, **sp. n.** from Primorskii krai are described. Diagnoses of genera and distribution data of species are given.

KEY WORDS: Diptera, Cecidomyiidae, Gall Midges, new species.

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Описаны *Didactylomyia arcana* Fedotova et Sidorenko, **sp. n.**, *Stomatosema zaitzevi* Fedotova, **sp. n.** и *S. taiga* Fedotova, **sp. n.** из Приморского края. Приводятся диагнозы родов и сведения о распространении видов.

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INTRODUCTION

B.M. Mamaev (1968) described subtribe Stomatosematina in the tribe Oligotrophini. Two cosmopolitan genera: *Didactylomyia* Felt, 1911 and *Stomatosema* Kieffer, 1904 were redescribed and included to supertribe Stomatosematidi by R.J. Gagné (1975). He considered these genera closer to Cecidomyiidi than Oligotrophidi.

The tribe Stomatosematini is worldwide distributed. The genus *Stomatosema* includes three Nearctic species (Foot, 1965; Gagné, 1975, 1981), nine Palaearctic ones (Skuhrová, 1986; Mamaev, Zaitzev, 1997), including two new ones described here and one Neotropical species (Gagné, 1994). *S. obscura* (Mamaev) has holarctic distribution (Gagné, 1975, 1994). About 10 Oriental species (Grover, 1964, Gagné, 1973) are needed in the revision. Larvae of *Stomatosema* are xylophilous (Skuhrová, 1997). Genus *Didactylomyia* includes single cosmopolitan species, *D. longimana*, kleptoparasite of spider webs (Gagné, 1994). In connection with descriptions of new species supplementary diagnoses of tribe and genera are given.

The gall midges were collected in 2001 in the vicinity of Kamenushka village near Ussuriyskii Reserve (Primorskiy krai, Russia). Holotypes and some paratypes of new species are deposited in the Zoological Institute, St. Petersburg, other paratypes in the collection of Samara Academy of Agriculture, Ust-Kinelskiy, Samarskaya oblast and Institute of Biology and Soil Science, Vladivostok.

The abbreviations used in the descriptions and figure legends are as follows: F1, F2, ... F15 – length of flagellomeres 1, 2, ... 15; LT – light trap; MT – Malaise trap; WT – window trap.

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TRIBE STOMATOSEMATINI MAMAEV, 1968

DIAGNOSIS. Antenna with 12-13 flagellomeres. F1 and F2 fused with each other, F13 with long terminal nipple; female flagellomeres with 2 circumfila and 2 vertical connectives. Male flagellomeres with more long neck than in female ones, with basal circumfilum and a vertical stripe. Vein *C* broken at junction with R_{4+5} ; *Sc* presents; R_5 as strong as other veins; R_{4+5} curved apically to join *C* behind wing apex; R_{m+m} in same direction as R_5 ; M_{3+4} fold apparent; *Cu* forked. Tarsal claws toothed, empodium different length. Cerci and hypoproct bilobed. Aedeagus bare, flask-shaped, narrowed apically. Apex slightly widened and bent dorsally. Gonocoxite large, with long setae, especially ventrally, with large basiomesal lobe, apically divided into various shape dorsal and ventral parts. Gonostyle thin, elongate. Sternite VIII of female abdomen bare; area immediately in front of cerci sclerotized. Cerci 1-2-segmented, separated. Sternite IX setose, divided mesally.

Tribe includes 2 genera: *Didactylomyia* Felt and *Stomatosema* Kieffer.

Genus *Didactylomyia* Felt, 1911

Didactylomyia Felt, 1911: 39.

Type species: *Colpodia longimana* Felt, 1908.

DIAGNOSIS. Antenna with 2+12-13 flagellomeres, last flagellomeres with long terminal protrusion. Labrum and hypopharynx long, pointed, setaceous laterally; 2nd segment of labrum large, ovoid in lateral view. Tarsal claw dentated, empodium equal length. Male genitalia of peculiar shape: gonocoxites and gonostylus greatly elongated; aedeagus slender, with apical swelling, strongly enlarged basally; aedeagal sheath and lamellae greatly reduced. Cerci cordiform. Hypoproct with emargination. Basal outgrowth of gonocoxites thin, elongated, straight or curved. Ovipositor with two-segmented lamella.

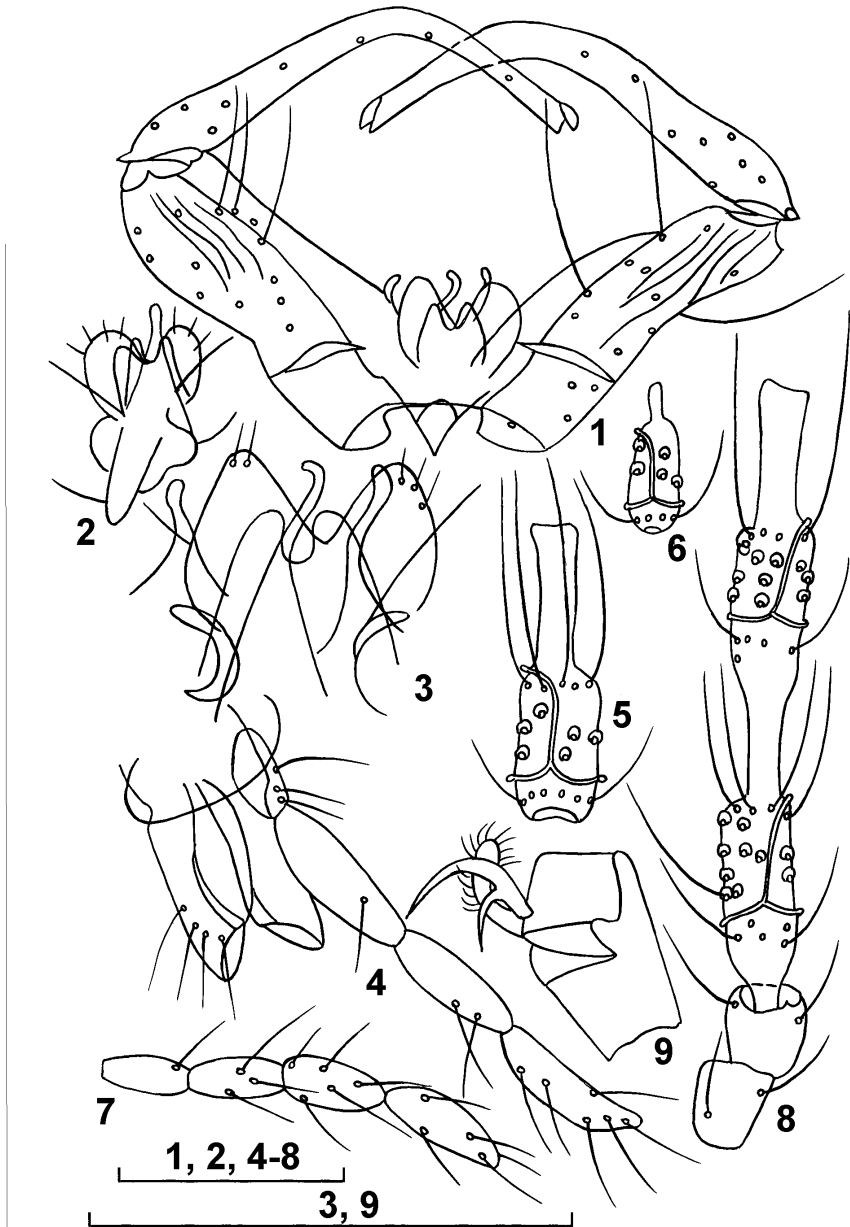
Genus includes one widely distributed species *D. longimana* (Felt, 1908) with five synonyms. We supposed that *D. longimana* is complex of closely related species. The species described below is similar with typical one, but has a number of differences. Gagné (1975) mentioned about wide morphological variation in *D. longimana*. *D. longimana* was recorded from France, Netherlands, Poland, Lithuania, Latvia, Caucasus, Russia: Moskovskaya oblast (Skuhravá, 1986). According Gagné (1975, 1994) it widespread in North America, West Indies, Korea, Philippines.

Didactylomyia arcana Fedotova et Sidorenko, sp. n.

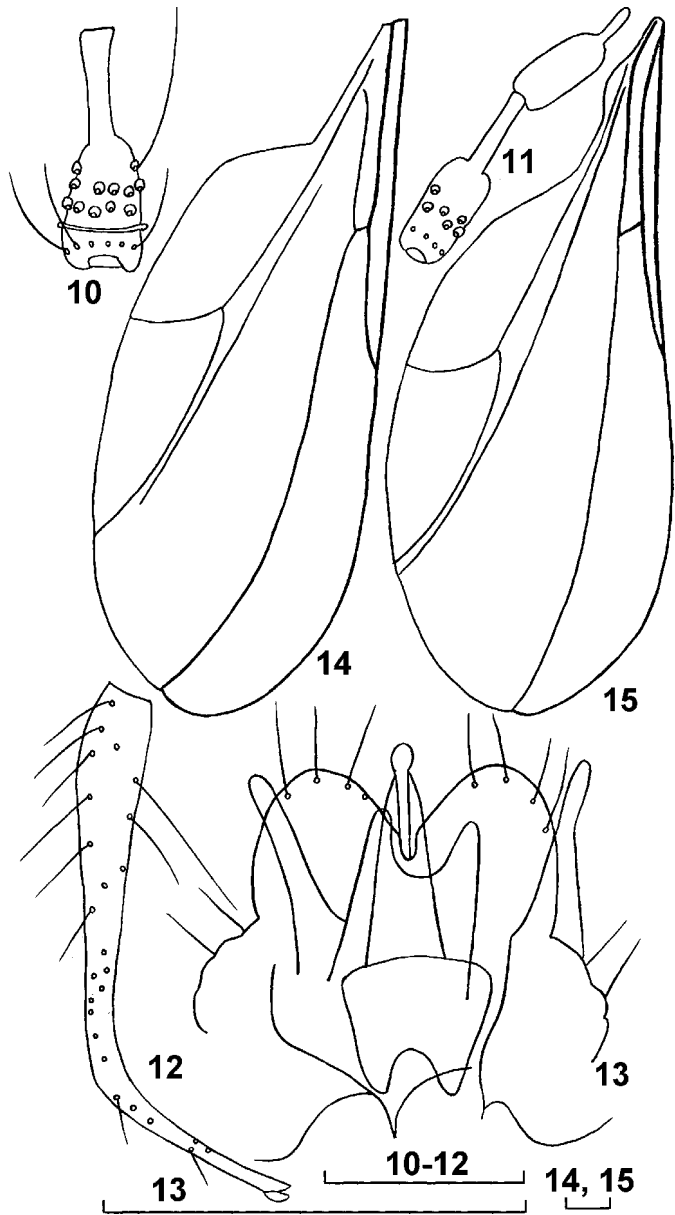
Figs 1-14, 16-23

MATERIAL. Holotype – ♂ (slide 24 LT 5B/1): Russia, Primorskii krai, 30 km SE Ussuriysk, Kamenushka, 23.VIII 2001 (V. Sidorenko). Paratypes – 1 ♂ (slide 24 LT 5B/2), the same locality, 23.VIII 2001; 1 ♂ (slide 25 LT 6/1), the same locality, 23.VIII 2001; 2 ♂ (slide 25 LT 5B/2), 23.VIII 2001; 2 ♂ (slide 25 LT 11/3), the same locality, 26.VIII 2001; 1 ♂ (slide 25 LT 1/4), the same locality, 14.VII 2001; 2 ♀ (slide 25 LT 4/5), the same locality, 16.VII 2001; 1 ♂ (slide 25 LT 2H/5), the same locality, 27.VIII 2001; 2 ♀ (slide 25 LT 14 B/6), the same locality, 23.VIII 2001; 1 ♀ (slide 25 LT 1/7), the same locality, 16.VII 2001; 19 ♀ (slide 25 MT 9/8-10), the same locality, 16.VII 2001; 2 ♀ (slide 25 MT 4/11), the same locality, 14.VII 2001; 3 ♀ (slide 25 MT 17 B/12), the same locality, 24.VIII 2001; 1 ♀ (slide 25 MT 12/13), the same locality, 18.VII 2001 (V. Sidorenko).

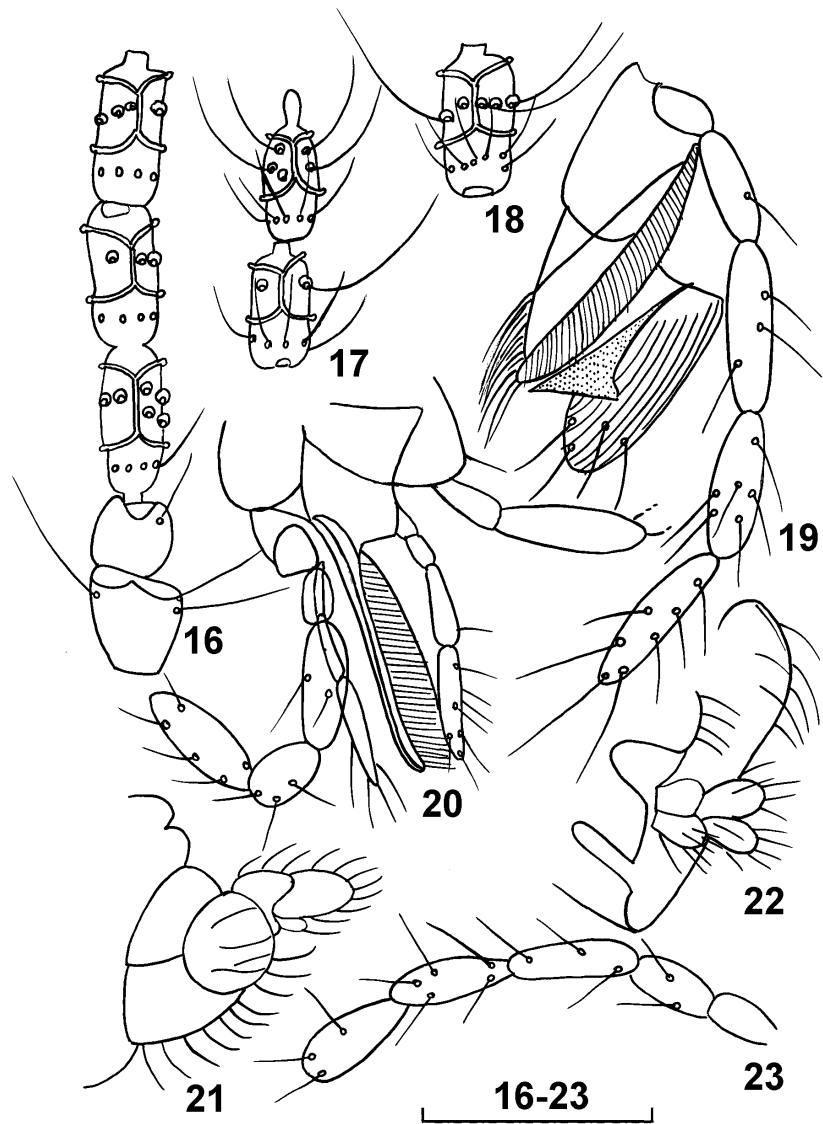
DESCRIPTION. MALE. Body length 1.1-1.4 mm, wing length 1.3-1.7 mm, width 0.5–0.7 mm. Antennae 2+12-13-segmented, scape 1.2 times as long as pedicel, F1 equal in length with F2. F5 3.4-3.5 times as long as its width, node as long as neck. F13 with short protrusion, 1.3-1.4 times as long as F12. Palpi 4-segmented, its ratio 1:1.1:1.1:1.5 or 1:2:1.6:1.9, segment 4 with conical apex. Tarsal claw bent medially, empodium longer than claw. Wings almost parallel-sided, 2.7 times as long as its width. Vein R_{1+2} joining C not far before wing middle, R_{4+5} joining C behind wing apex. Thorax with dark strip of various length beginning at base fore coxae, continuing across proepimeron, metanepisternum and base of hind coxa, and continuing along abdominal pleura.



Figs 1-9. *Didactylomyia arcana* sp. n., male: 1) genitalia; 2, 3) cerci, hypoproct and aedeagus (variations of shape); 4) mouth parts; 5) F5, 6) F13; 7) palpus; 8) scape, pedicel, F1, F2; 9) tarsal claw. Scale line – 0.1 mm.



Figs 10-15. *Didactylomyia arcana* sp. n. (10-14 – male) and *Stomatosema zaitzevi* sp. n., (15 – male): 10) F10; 11) F12, F13; 12) gonostylus; 13) cerci, hypoproct, aedeagus and medio-basal outgrowths (variations of shape); 14, 15) wing. Scale line – 0.1 mm.



Figs 16-23. *Didactylomyia arcana*, sp. n., female: 16) scape, pedicel, F1-F3; 17) F12, F13; 18) F5; 19, 20) mouth parts; 21, 22) ovipositor (variations of shape); 23) palpus. Scale line – 0.1 mm.

Gonocoxite always strongly recurved laterally, 2.6-2.9 times as long as its width. Gonostylus 7.7-8.3 times as long as its width, swollen basally, strongly bent far behind middle, 1.4-1.7 times as long as gonocoxite. Cerci cordiform; with wide, triangular emargination, non-sclerotized, 1.7-1.8 times as wide as hypoproct. Hypoproct with semicircular emarginated apex, slightly widened basally. Genital base wide, strongly sclerotized. Aedeagus wide, strongly enlarged basally and narrowed apically, with round swelling on the tip.

FEMALE. Body length 1.3-1.6 mm. Antennae 2+12-13-segmented, scape 1.4 times as long as pedicel, F1 1.1 times as long as F2. F5 1.8 times as long as width, node with very small stem. F13 with small protrusion and rounded apex, 1.2 times as long as F11. Mouth parts very setose. Palpi 4-segmented, its ratio 1:1.7:1.5:1.2 or 1:1.3:1.2:1.3, segment 4 with conical or rounded apex. Tarsal claw larger than in male. Ovipositor consists of pair two-segmented apical plates, almost equal in length, or second one 1.2 times longer than first, covered by long setae. Second apical plate with rounded apex, 1.2 times as long as its width.

RELATIONSHIP. New species differs from *Didactylomyia longimana* by basally enlarged, more recurved gonostyles; by wide, always bent laterally gonocoxites; by absence of pubescent lobes at base of paramere; by elongated male and female flagellomeres and by long vein R_{1+2} joining C not far behind of fork Cu_1 and Cu_2 ; by vein R_{4+5} more curved apically than in *D. longimana*. The length of node and neck of middle flagellomeres of new species always equal (different in *D. longimana*).

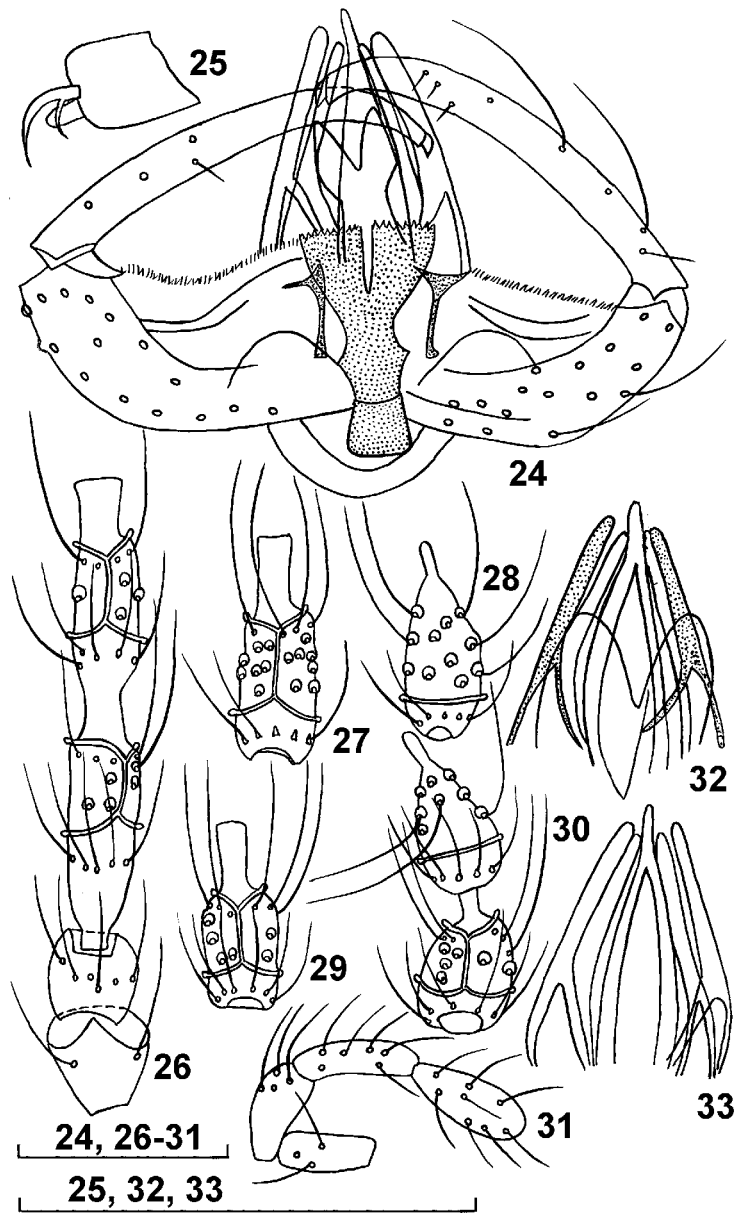
ETYMOLOGY. Specific name originates from Latin adjective *arcanus* – secret, with reference to complicated structure of male genitalia.

Genus *Stomatosema* Kieffer, 1904

Stomatosema Kieffer, 1904:380.

Type species: *Stomatosema nemorum* Kieffer, 1904.

DIAGNOSIS. Eyes confluent. Palpi 4-segmented. Antenna ♂ and ♀ with 2+13 segments, less than half length of the body, male flagellomeres elongate and oval with short or long stem, female flagellomeres with short stem, each with two whorls of setae, basal flagellomeres with short and stout setae, apical ones with long setae and 1-2 low circumfila with commissure. F1 and F2 fused, scape subquadrate, pedicel globose. F13 with protrusion. Wing hyaline, length 2.5-2.6 times as long as width, vein R_{4+5} angulate with R_{1+2} , joining C much before the middle of wing. R_{4+5} slightly curved distally and joining C beyond the apex of wing, Cu forked. Tarsal claw teeth located basally, almost twice longer than empodium. Gonocoxite almost cylindrical or very wide rounded laterally, 1.7-2.7 times as long as width. Gonostyles longer and slender than basal segments, 7-10 times as long as maximal middle thickening, evenly curved apically and ended by blunt tooth. IX tergite broad, as long as hypoproct, deeply and broadly incised, lobes broadly triangular or rounded. Hypoproct spinulose ventro-basally, narrower than IX sternite and with small, stout, straight and recurved setae, broadly incised medially or almost straight. Basal outgrowths of gonocoxites finger-like (*S. kamalii* (Grover), *S. zaitzevi* sp. n.) or entire (*S. spinellosa* Mamaev et Zaitzev and *S. taiga* sp. n.), longer than aedeagus and gonocoxites, slightly widened or broad dorsally, with apical hairs. Aedeagus long, thin, cylindrical whole or apically, broad basally, longer than basal outgrowth, tapering. Ovipositor with one-segmented pair of terminal lamellae.



Figs 24-33. *Stomatosema zaitzevi* sp. n., male: 24) genitalia; 25) tarsal claw; 26) scape, pedicel, F1, F2; 27) F5; 28) F13; 29) F10; 30) F12, F13 (variations of shape); 31) palpus; 32, 33) cerci, hypoproct, aedeagus and medio-basal outgrowths (variations of shape). Scale line – 0.1 mm.

***Stomatosema zaitzevi* Fedotova, sp. n.**

Figs 15, 24-33

MATERIAL. Holotype – ♂ (slide 26 LT 1/1): Russia, Primorskii krai, 30 km SE Ussuriysk, Kamenushka, 14.VII 2001 (V. Sidorenko). Paratypes – 1 ♂ (slide 25 LT 1/2), the same locality, 14.VII 2001 (V. Sidorenko).

DESCRIPTION. MALE. Body length 1.2, wing length 1.7 mm, width 0,7 mm. Antennae 2+13-segmented. F1 1.3 times as long as F2. F5 2.8 times as long as width, node 1.9 times as long as neck. F13 with short protrusion, 1.2 times as long as F11. Palpi 4-segmented, its ratio 1:1:1.3:1.4, segment 4 enlarged apically, with rounded apex. Tarsal claw dentated, bent medially, empodium shorter than claw. Wings almost semicircular, 2.5 times as long as width. Vein R_{1+2} joining *C* not far behind wing middle, R_{4+5} joining *C* near wing apex. Gonocoxite strongly dilated basally, 1.4 times as long as width. Gonostylus 1.7 times as long as gonocoxite, slightly narrowed and recurved apically, not swollen basally, 9.8 times as long as width. Cerci cordiform; with deep, triangular emargination between oval lobes, non-sclerotized, 2.0 times as wide as hypoproct. Hypoproct unsclerotized, V-formed, with pointed apex, gradually narrowed basally. Genital base wide, strongly sclerotized. Aedeagus wide, strongly enlarged basally and narrowed apically. Parameres sclerotized, very long, consist of two plates, bent basally and almost straight apically, apically without setae.

FEMALE unknown.

RELATIONSHIPS. New species is closely related to *Stomatosema kamalii* (Grover, 1964) from India (Grover, 1964), but differs by very rounded gonocoxites (lateral view); by wide spot of sclerotization in middle part of gonocoxites, by longer wings and necks of F1 and middle flagellomeres; by finger-like protrusions on the top of F13; by elongated, enlarged basally gonostyles and by enlarged segment 4 of palpi.

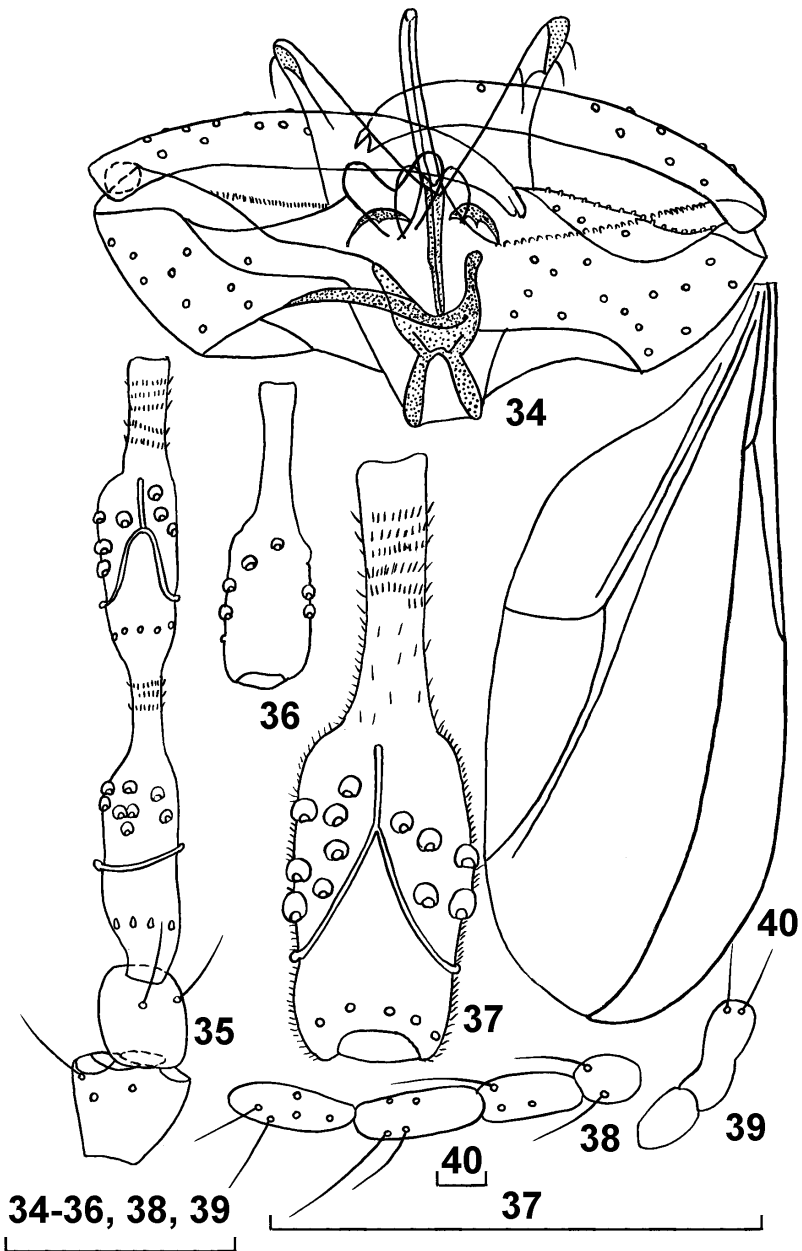
ETYMOLOGY. This species is named in honour of Russian dipterist Alexander I. Zaitzev (Moscow).

***Stomatosema taiga* Fedotova, sp. n.**

Figs 34-40

MATERIAL. Holotype – ♂ (slide 27 WT 1/1): Russia, Primorskii krai, 30 km SE Ussuriysk, Kamenushka, 30.VI 2001 (V. Sidorenko).

DESCRIPTION. MALE. Body length 1.4 mm, wing length 1.7 mm, width 0.4 mm. Last segments of antennae lost, scape 1.2 times as long as pedicel. F1 equal in length with F2. F5 3.2-3.4 times as long as width, node 1.2 times as long as neck. Flagellomeres with microtrichiae on the apex of necks. Palpi 4-segmented, its ratio 1:1.7:1.7:2, segment 4 enlarged medially, with rounded apex. Tarsi lost. Wings almost parallel-sided, 2.6 times as long as width. Vein R_{1+2} joining *C* not far before wing middle, R_{4+5} joining *C* far behind wing apex. M_{3+4} and *pCu* present. Gonocoxite strongly dilated, 2.0 times as long as width. Gonostylus 1.2 times as long as gonocoxite,



Figs 34-40. *Stomatosema taiga* sp. n., male: 35) genitalia; 36) scape, pedicel, F1, F2; 37, 38) F5 (variations of shape); 39) palpus; 40) 4th segment of palpus; 40) wing. Scale line – 0.1 mm.

slightly narrowed and recurved basally and apically, 8.6 times as long as width. Cerci V-form; with deep, triangular emargination between oval lobes, unsclerotized, 1.3 times as wide as hypoproct. Hypoproct unsclerotized, almost rounded, with oval emargination. Parameres entire, V-formed, subapically with slightly sclerotized plate, covered by setae. Genital base wide, strongly sclerotized. Aedeagus very thin, almost parallel-sided, strongly enlarged basally and rounded apically.

FEMALE unknown.

RELATIONSHIPS. New species is closely related to *Stomatosema spinellosa* Mamaev et Zaitzev, 1997 from Italy (Mamaev, Zaitzev, 1997), but differs by very wide gonocoxites, not rounded basally; by almost parallel-sided gonostyles; by very small sclerotized plate on the apex of parameres (not along lateral margin); by shorter stem of flagellomeres (not longer than basal enlargement); by absence of apical hook on aedeagus.

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