

A new species of *Arctodiamesa* Makarchenko (Diptera: Chironomidae: Diamesinae) from the Russian Far East, with a key to known species of the genus

EUGENYI A. MAKARCHENKO

Institute of Biology and Soil Sciences, Russian Academy of Sciences, Far East Branch, 100 let Vladivostoku Avenue, Vladivostok 690022 Russia; email: emakar@ibss.dvo.ru

Abstract

The male, pupa, and larva of a new species, *Arctodiamesa marinae*, from the Russian Far East are described and figured. Keys to males, pupae, and fourth-instar larvae of known species of the genus are presented.

Key words: Diptera, Chironomidae, *Arctodiamesa*, new species, key, Russian Far East

Introduction

The genus *Arctodiamesa* Makarchenko, 1983 includes one Holarctic and one East Palaearctic species. *Arctodiamesa appendiculata* (Lundström) occurs in the Arctic areas of Russia, Chukotka, the upper reaches of the Kolyma River (Makarchenko 1985), and Alaska (as *Diamesa* Alaska sp. 1) (Hansen & Cook 1976, Tilley 1978). The male, pupa, and larva are known for this species. *Arctodiamesa breviramosa* Makarchenko was described from males collected from streams near the mouth of the Lena River in the Arctic Region of East Siberia (Makarchenko 1995). The immature stages of an unidentified *Arctodiamesa* species were described from the Khabarovsk Territory in the Russian Far East (Makarchenko 1995).

I describe the male, pupa, and larva of *Arctodiamesa marinae* sp. n. The species is known only from Kedrovaya Pad, which is situated in the southern part of the Russian Far East and is the oldest nature reserve in Russia. Keys to adult males, pupae, and fourth-instar larvae of the known species of the genus are provided.

Materials and methods

The terminology follows that of Hansen & Cook (1976) and Sæther (1980). The material was fixed in 70% ethanol and later mounted on slides, following the procedure outlined by Makarchenko (1985).

The holotype and paratypes of the new species are deposited in the Institute of Biology and Soil Sciences, Far East Branch of the Russian Academy of Sciences, Vladivostok, Russia (IBSS FEBRAS).

***Arctodiamesa marinae* sp. n.**

(Figs. 1–17)

Material. Holotype: male, Russia, Kedrovaya River, Kedrovaya Pad Nature Reserve, Khasansk District, Primorye Territory, N 43°05'874", E 131°33'412", 4.VI. 2005, light trap, leg. E. Makarchenko. Paratypes: 3 males reared from pupae, 4 pupae, 1 pupa reared from larva, 5 fourth-instar larvae, same data as holotype except 2–4.VI. 2005, leg. E. Makarchenko.

Male imago ($n = 4$, except when otherwise stated). Total length 3.9–4.3 mm. Wing length 3.12–3.28 mm. Total length/wing length 1.25–1.31. Coloration brown.

Head. Eyes hairy. Temporal setae including only 14–16 postorbitals, verticals absent. Clypeus with 6 setae. Antenna with 13 flagellomeres and well-developed plume; pedicel with 2 or 3 setae. Length of subapical seta of terminal flagellomere 40–44 μm . AR 1.29. Lengths (μm) of palpomeres 1-5: 44–48: 108–120: 124–160: 124–160: 150–172; second palpomere with sensilla capitata (diameter about 4 μm) in distal part. Head width/palp length 1.34.

Thorax. Antepnotum with 11–13 lateral setae. Acrostichals absent, dorsocentrals 16–21, prealars 13–16. Scutellum with 34–37 setae.

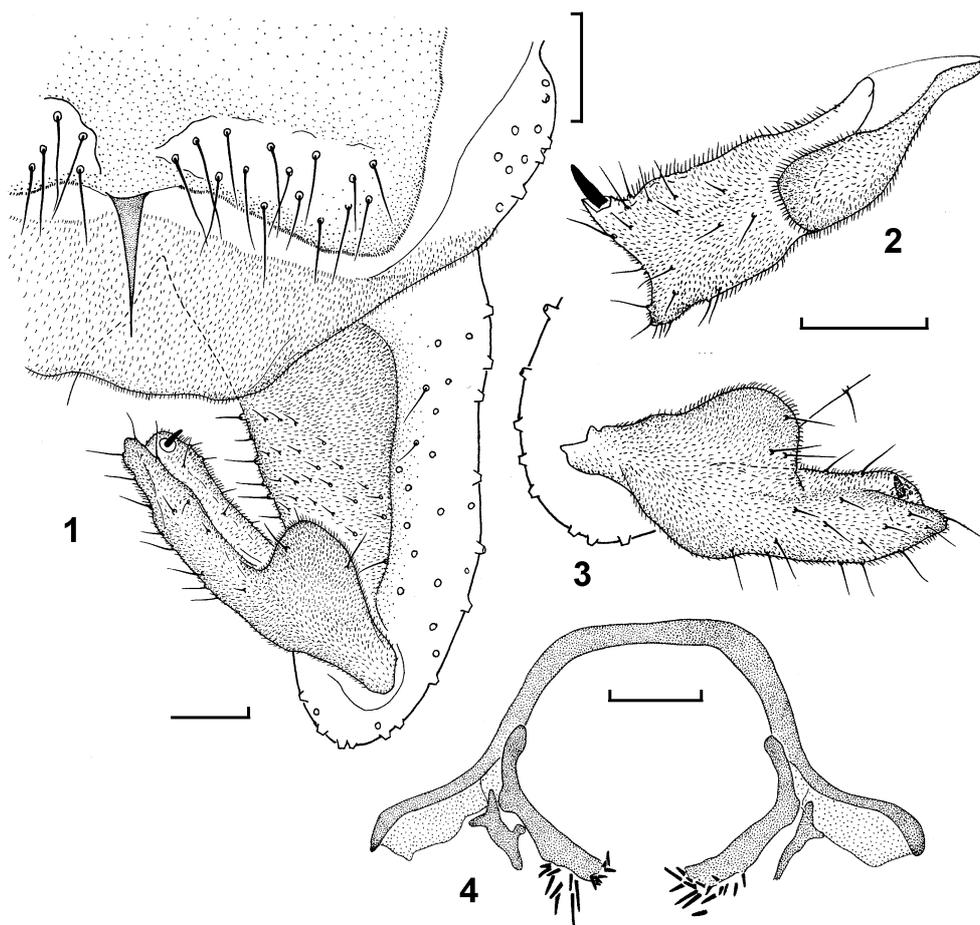
Wing. Anal lobe well developed. Squama with 41–43 setae. R with 12–15 setae, R_1 with 2 campaniform sensillae and 8 or 9 setae, R_{4+5} with 2 or 3 setae subapically. R_{2+3} faint with 2 campaniform sensillae in basal part.

Legs. BR_1 2.7, BR_2 2.0, BR_3 4.3. Spur of front tibia 92 μm . Spurs of middle tibia 48 μm and 40 μm long, of hind tibia 76 μm and 44 μm long. Hind tibial comb with 10 setae. Middle ta_1 with 2 pseudospurs 28 μm long, hind ta_1 with 2 pseudospurs 36 μm long.

Lengths (μm) and proportions of legs ($n = 1$):

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	SV	BV
P_1	816	1216	944	448	272	88	112	0.78	2.15	3.23
P_2	992	1064	608	320	184	80	96	0.57	2.38	3.92
P_3	1088	1248	768	432	256	96	104	0.62	3.04	3.50

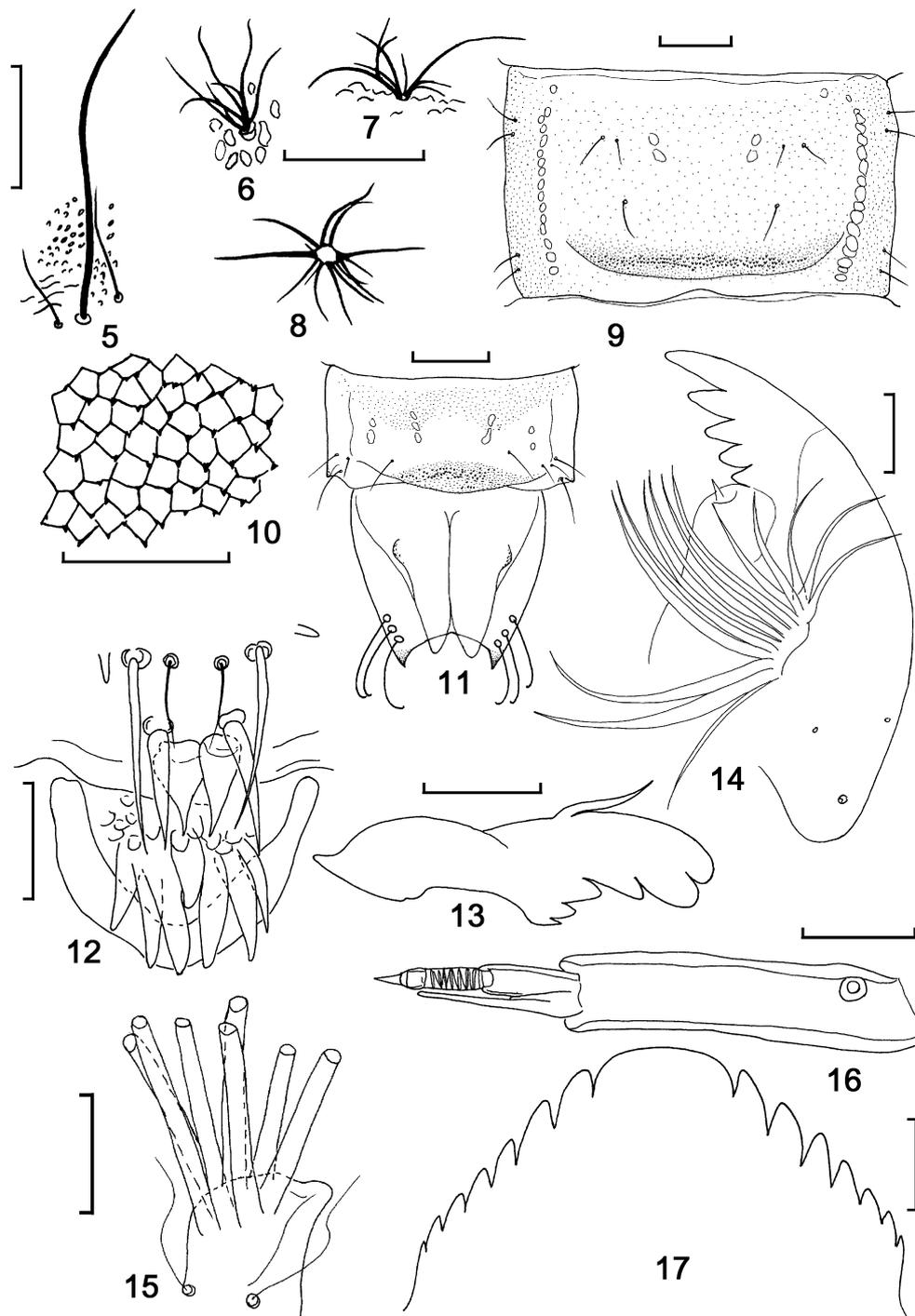
Hypopygium (Figs. 1–4). Tergite IX with 30 setae and narrow, anal point 68 μm long. Laterosternite IX with 12 setae. Transverse sternapodeme 144 μm wide. Medial aedeagal lobe weakly sclerotized, with strong apical spines (Fig. 4). Gonocoxite 284–288 μm long, superior and inferior volsellae reduced. Gonostylus 156 μm long, with rounded, wide (36–40 μm) lobe in basal half and short projection in subapical part; megaseta 20 μm long. HR 1.82–1.85.



FIGURES 1–4. Male of *Arctodiamesa marinae* sp. n. **1**, hypopygium in dorsal view; **2**, gonostylus deflected from gonocoxite; **3**, gonostylus pressed to gonocoxite; **4**, sternapodeme and medial aedeagal lobe. Scale bars = 50 μm .

Pupa ($n = 4$). Total length 4.9–5.5 mm. Coloration brownish. Exuviae grey or brownish grey.

Cephalothorax. Frontal tubercles low, with 252–256 μm long setae. Thorax smooth and granulated. Pc-setae lengths (μm): Pc_1 — 11–2–116, Pc_2 — 305–310, Pc_3 — 124–128 (Fig. 5). Dorsocentrals divided into 5–12 branches 16–36 μm long (Figs. 6–8).



FIGURES 5–17. Pupa (5–11) and larva (12–17) of *Arctodiamesa marinae* sp. n. **5**, precorneals; **6–8**, dorsocentrals of thorax; **9**, tergite IV; **10**, netlike surface of tergites; **11**, tergite VIII and anal segment; **12**, part of labrum; **13**, premandible; **14**, mandible; **15**, procercus; **16**, antenna; **17**, mentum. Scale bars = 50 μm for Figs. 5–8, 10; 200 μm for Figs. 9, 11; 20 μm for Figs. 12–17.

Fourth-instar larva ($n = 5$). Coloration greenish. Total length 6.8–7.4 mm.

Head. Head capsule 0.40–0.46 mm long, 0.30–0.34 mm wide, light yellow. Labrum with simple S_I – S_{IV} setae and large lamellae (Fig. 12). Premandible brown to light brown, distally with 6 or 7 teeth (Fig. 13). Antenna yellow, large ring organ situated in basal quarter of first segment; antennal blade ending near base of fourth segment (Fig. 16); AR 1.56–1.61. Lengths (μm) of antennal segments 1–5: 65.1: 15.0: 13.4: 4.2: 3.3. Mandible dark brown or black in distal part; apical tooth longest; seta interna with 15–18 branches, seta subdentalis short and spinelike (Fig. 14). Mentum with 1 median and 7 lateral pairs of teeth; median tooth 4.7–5.0 times broader than first lateral tooth (Fig. 17).

Abdomen. Procercus dark brown, slightly longer than wide, with 7 anal setae. Two dark brown subapical setae 208–232 μm long.

Remarks. The male of *A. marinae* can be separated from other known species of *Arctodiamesa* by the shape of the gonostyli. The basally wide and rounded lobe, combined with the short, subapical projection, is characteristic. Larvae of *A. marinae* have six or seven teeth on the premandible, whereas the other species have only three. *Arctodiamesa marinae* also differs from the other species by the wide median tooth of the mentum. The pupae are similar to those of the previously described but unnamed *Arctodiamesa* sp. (Makarchenko 1995), but can be distinguished by details of the tergite shagreen and the number of branches on the dorsocentral setae of the thorax. *Arctodiamesa marinae* has 5–12 branches on each dorsocentral, whereas *Arctodiamesa* sp. has only 2–4 branches.

Etymology. The new species is named in honour of my wife Marina Makarchenko, who studies the taxonomy of the Orthoclaadiinae of the Russian Far East. She is a driving force in my chironomid investigations.

Distribution and biology. *Arctodiamesa marinae* is known only from the type locality in Kedrovaya Pad Nature reserve in the southern part of Primorye Territory of the Russian Far East. Pupae and larvae were collected in the middle reaches of the Kedrovaya River on small and medium-sized stones covered with green algae. The water temperature was 14°C at the time of collection.

Keys to known species of *Arctodiamesa* Makarchenko

Males

1. Gonostylus with wide rounded lobe in basal half and short projection subapically; megaseta narrow and simple *A. marinae* sp. n.
- Gonostylus with projection on subapical outer part or distinctly bifurcate; megaseta broad, with serrated apex 2
2. Gonostylus with short projection on subapical outer part.....
- *A. breviramosa* Makarchenko
- Gonostylus with outer branch longer than inner branch
- *A. appendiculata* (Lundström)

Pupae

1. Tergites III or tergites III–VII with posterior band of tubercles; dorsocentral setae of thorax divided into more than 3 branches 2
 - Tergites without posterior band of tubercles; dorsocentral setae of thorax divided into 2 branches *A. appendiculata* (Lundström)
2. Tergite III with posterior band of tubercles; dorsocentrals divided into 3 or 4 branches *Arctodiamesa* sp. Makarchenko (Russian Far East)
 - Tergites III–VII with posterior band of tubercles; dorsocentrals divided into 5–12 branches
A. marinae sp. n.

Fourth-instar larvae

1. Premandible with 3 teeth; labral lamellae absent; mentum with 2 median teeth or with 1 median tooth 2 times broader than first lateral tooth 2
 - Premandible with 6 or 7 teeth; labral lamellae large; mentum with 1 median tooth 4.7–5.0 times broader than first lateral tooth *A. marinae* sp. n.
2. Mentum with 2 median teeth in deep incision... *A. appendiculata* (Lundström)
 - Mentum with 1 median tooth about as long as and 2 times broader than first lateral tooth
Arctodiamesa sp. Makarchenko

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