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REFERENCES CITED


HUDSONIMYIA PARRISHI, A NEW SPECIES OF TANYPODINAE (DIPTERA: CHIRONOMIDAE) FROM GEORGIA

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ABSTRACT

The adult male, adult female, pupa, and larva of Hudsonimyia parrishi n. sp. are described. Characters are given to distinguish H. parrishi from the other member of the genus, H. karelena Roback. The generic diagnosis for Hudsonimyia Roback is emended to include the new species. The habitat and aspects of the ecology of the immature stages are discussed.

RESUMEN

Se describe el macho, la hembra, la pupa, y la larva de Hudsonimyia parrishi sp. n. Se indican los caracteres que distinguen H. parrishi del otro miembro del género, H. karelena Roback. Se modifica la diagnosis del género Hudsonimyia Roback para incluir la nueva especie. Se discute el habitat, y aspectos de la ecología de los estados inmaduros.

The new species described here was present in collections of chironomids from an urban Georgia stream. All specimens were collected in intense sampling efforts of an uncommon stream microhabitat. The immature stages of the new species occupy a wet, mossy, algal, and detrital granite micro-
habitat similar to that of *Hudsonimyia karelena* Roback, but in a 2nd order stream. Locally known as Millrock Branch, the stream has a relatively undisturbed watershed in an urban area.

All specimens were preserved in 70% ethanol prior to mounting in Canada balsam. The mounting technique was similar to that of Forsier as outlined by Saether (1969). Measurements are usually expressed as a range. All measurements are given in μm unless otherwise stated. The number of specimens examined is indicated by (n=). Isolated numerals in parentheses indicate the number of structures, segments, groups of setae, etc. used to derive the range or value given. This system is used for clarity due to inconsistencies in true bilateral symmetry, as well as obscured, missing, or distorted structures on individual specimens. Terminology generally follows Saether (1980).

_Hudsonimyia parrishi* Caldwell & Soponis, New Species

**Male** (n=2).

*Head.* Yellowish brown. Dorsal interocular distance 96-116 (2). Orbitals, outer vertexals, and postorbitals merged into irregular, but uniserial row of about 11-13 (4) setae. Clypeals 17-18 (2). Antennal pedicel with 3 grouped short setae and one longer seta (4); AR 1.17-1.20 (4); flagellomere 15, 58-67 (4) long with preapical seta (Fig. 7) 52 (4) long. Lengths of palpal segments 2-5, 58-87 (4), 133-174 (4), 133-212 (4), 261-267 (2).

*Thorax.* Yellowish brown with darker to slightly darker vittae, postnotum, and anterior anepisternum. Anterior border of scutum with 10-12 (4) small rounded tubercles in a row; ventrolateral antepronotals 2-5 (4); dorsocentrals 19-20 (4), irregularly biserial, merging with humerals; acrostichals biserial, about 20-25 (2); prealars 7 (4), one widely separate from others anteriorly; supraalars 1-2 (4); scutellars 8-10 (2) in posterior row, 8-10 (2) in anterior row.

*Wings.* (Fig. 1). Surface setose, length 1.32-1.46 mm (4), with 4-6 (4) squamals.

*Legs.* Pale yellow. Beard not evident, with tibial spurs as shown in Fig. 2-4. Longest seta on ta₄ about 5X diameter of segment. Lengths and proportions:

<table>
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<th>Segment</th>
<th>fo</th>
<th>ti</th>
<th>ta₁</th>
<th>ta₂</th>
<th>ta₃</th>
<th>ta₄</th>
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<td>P₁</td>
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<td>557-661(3)</td>
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<td>232-273(3)</td>
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<tr>
<td>P₂</td>
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<td>737-899(4)</td>
<td>690-777(3)</td>
<td>273-313(3)</td>
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<tr>
<td>P₃</td>
<td>609-702(4)</td>
<td>847-1056(4)</td>
<td>574-737(4)</td>
<td>354-429(4)</td>
<td>261-319(4)</td>
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*Abdomen.* Pale yellowish brown with darker basal bands on III-V; VI-IX darker; T IX with irregular row of 8-10 (2) setae. Hypopygium as shown in Fig. 5-6, gonocoxite 75-81 (4) long, 59-64 (4) wide, L/W about 1.3, medially basally with a field of short bristles; gonostylus 49-54 (4) long, 17 (4) wide, with a large apical spur; apodemes distinct.

**Female** (n=3).

Similar to male except for the following differences:
Fig. 1-6. *Hudsonimyia parrishi*, male: 1) wing; 2-4) tibial spurs of \( P_1 \), \( P_2 \), \( P_3 \), and \( P_4 \); ventral (5) and dorsal (6) views of hypopygium.

**Head.** Dorsal interocular distance 99 (3). Clypeals 18-23 (3). Scape with 3-6 (6) frontal setae; pedicel with 6-13 (6) setae; flagellomere average lengths (6), 6, 10, 6, 6.5, 6.5, 7, 7, 8, 8, 8, 20; preapical seta 52-55 (6) long. **Lengths** of palpal segments 2-5: 75-81 (6), 157-180 (6), 168-180 (6), 238-237 (6).

**Thorax.** Anterior border of scutum with 7-10 (6) small rounded tubercles in a row; ventrolateral anterpronotals 2-3 (5); dorsocentrals 27-41 (6); prealars 9-12 (6), with 1-3 widely separated from group anteriorly; scutellars 9-12 (3) posteriorly, 6-7 (3) anteriorly.
Fig. 7-10. *Hudsonimyia parrishi*: 7) apex of male antenna; 8) ventral view of female genitalia; 9) thoracic horn of pupa; 10) T VII-IX of pupa.
Wing. Length 1.32-1.38 mm (6); squamals 3-4 (6).

Legs. Lengths and proportions:

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<td>882-1015 (6)</td>
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<td>P₃</td>
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<td>87-99 (4)</td>
<td>0.68-0.72 (4)</td>
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Abdomen. Genitalia as shown in Fig. 8. Seminal capsules clear.

Pupa (n=5).

Cephalothorax. Light brown. Thoracic horn (Fig. 9) with rugose area near base; total length 267-325 (9); width of pleuron plate 116-157 (9); length of pleuron plate 104-180 (8); few scattered spinules present except on pleuron plate. Two dorsoventrals, one precorneal, one supraalar, and one median antepronotal (5); one lateral antepronotal evident in one specimen.

Abdomen. Pale yellow to almost clear. Scar on T I very lightly pigmented. Tergal shagreen covering most of tergite with no obvious pattern; sternal shagreen very faint. Segment I with 3 D, 2 L, segments II-VI with 5 D, 2 L, 2 V, segment VII with 6 D, 1 L, 3 short L's, and segment VIII with 5 short L's setae. L setae on I more anteriorly positioned than on other segments. Dorsal 5 setae present on II-VI, none evident ventrally. Prominent central pair, and single orolateral muscle marks present on T II-VI; central pair usually very indistinct on VII. Centrally paired sensilla campaniformia (cf. Roback 1972, fig. 15) present on T II-VII. Anal lobe arms divergent and bare, or at most with 3 spines near apex; apex of arms with slight creases, tips strongly hooked (Fig. 10). Male genital sacs extended to base of anal lobe arms.

Larva (n=5, final instar).

Head. Yellowish brown with brown occipital margin; length 449-516 (4); width 307-319 (5). Antenna (Fig. 11) with RO about 129-140 (9) from base; AR 3.82-4.11 (a). Details of labral sensilla SI-III and bisensillum not clear. Maxillary palp (Fig. 12) 43-57 (7) long, 8.6 (7) wide, with RO 17-23 (7) from base. Mandible (Fig. 13) light yellow with brown apex; length 86-97 (10); one specimen with unbranched mesal lateroventral seta present. Ligula (Fig. 14) 57-69 (4) long with teeth brown. Paragula unevenly divided appendage and pseudoradula without lateral projections present. Two distinct dorsomential teeth with 1-2 smaller, less distinct teeth present. Pecten hypopharyngis with about 11-13 (10) teeth, mesal tooth each side bulbous.

Abdomen. Ventrally with distinct setal pattern as shown for segment V (Fig. 15); dorsal setae very short, no distinct pattern obvious. Procreci pale yellowish brown 140-149 (7) long, 23-37 (7) wide, with a small seta basally and medially; 7 anal setae. Apical seta of XIII up to 510 long. Seta of posterior parapod up to about 200 long. Four anal tubules, cylindrically shaped with tapered ends present, up to about 1/3 as long as posterior parapods.
Fig. 11-15. *Hudsonimyia parrishi*, 4th larval instar: 11) antenna; 12) maxillary palp; 13) mandible; 14) ligula; 15) ventral view of setal pattern on segment V.

Claws of posterior parapods yellowish brown with serrations present on some claws, especially longer ones.

**ETYMOLOGY.** The species is named in honor of Professor Fred K. Parrish, who allowed and encouraged collections in Millrock Branch at his home.

**REMARKS.** Although coloration can be quite variable within a species, the immature and adult stages of *H. parrishi* should be separable in most cases from the other member of the genus, *H. karelina*, solely by this character. A comparison with larvae of *H. karelina* from Georgia revealed similar serra-
tions on the posterior parapod claws, similar ventral and dorsal abdominal setae, and similar measurements as *H. parrishi*, but the color difference for the head capsule, posterior parapod claws, and procerci was striking.

In the larval stage, *H. parrishi* can be separated from *H. karelena* by the lack of brown pigmentation on the caudal half of the head capsule, by the pale yellowish brown procerci, and by the yellowish brown claws of the posterior parapods.

In the pupal stage, *H. parrishi* can be separated from *H. karelena* by the expanded respiratory atrium at the base of the plastron plate, the slightly creased, generally bare apices of the anal lobes, and the hooked tips of the anal lobes. One pupa of *H. karelena* from Georgia possessed the rugose area at the base of the thoracic horn, a character present in *H. parrishi*, but not previously recorded for *H. karelena*. Not all of the pupal specimens of *H. parrishi* possessed the small aeropyle-like structures at the apex of the respiratory atrium. Also, some thoracic and abdominal setae of *H. parrishi* may prove to be branched as in *H. karelena*, if viewed at considerably higher magnification.

In the adult stage, *H. parrishi* can be separated from *H. karelena* by the shorter wings, generally shorter leg segments, lower AR, and details of the genitalia: female—gonopophysis VIII with smooth margin forming pointed lobe; male—larger tooth of gonostylus and spine field of gonocoxite, extended more than half the length of the gonocoxite.

Roback's (1979) diagnosis for *Hudsonimyia* is amended as follows:

**Adult.** AR about 1.17-1.30; $t_a$ of legs 1 and 3 up to twice as long as $t_a$; gonocoxite with basal row or with a field of short bristles; about 1.28-1.48 times as long as wide; length of gonocoxite/gonostylus 1.47-1.89.

**Pupa.** Thoracic comb absent, rugose area usually present near base of thoracic horn; respiratory atrium slightly narrowed or expanded near base of plastron plate; membrane of thoracic horn with spines or spinules, present or absent on plastron plate; abdominal segments coloration almost clear to brown; D, V, and L setae simple or multibranchial; anal lobes smooth with slight creases apically or with several spines and additional spinules apically; tips of anal lobes strongly hooked or slightly curved.

**Larva.** Head coloration variable; L/W 1.28-1.64; antenna 0.53-0.61 head length; claws of posterior parapods simple or with serrations, yellowish brown to brown in color.

**Ecology.** *Hudsonimyia parrishi* is known only from the type locality, Millrock Branch. This 2nd order Piedmont Province stream originates from 2 small spring fed ponds. The watershed is relatively undeveloped, but eroded materials enter the stream at a road ford about 10 m upstream of the collection site. The immature stages have been collected only in one stream microhabitat: extremely shallow (about 1 cm) water, slowly flowing over granitic bedrock covered with moss, algae, and detritus.

Water quality parameters measured at the collection site on 7-VII-79 included a dissolved oxygen concentration of 7.8 mg/l, a water temperature of 21.5 °C, a pH of 6.8, and a conductivity of 165 $\mu$hos/cm @ 25 °C.

Gut contents of several larvae included pennate diatoms, chitinized arthropod fragments, and detritus.

Other immature chironomids found in the same microhabitat, but not necessarily at the same time, include *Limnophyes* Eat., *Parametriocnemus*

The presence of sensilla campaniformis on pupal tergites of *H. parrishi* probably relates to a sensory function for positioning on rock surfaces in flowing water (cf. Roback 1970, p. 164).

**Type Material.** Holotype: ♀ reared from larva, with exuvia, Millrock Branch at Haralson Mill Road 83° 57' 24" N, 30° 45' 41" W, Rockdale County, Georgia, 5-VII-78, leg. B. A. Caldwell. Allotype: ♀ reared from larva, with exuvia, same data. Paratypes (♀): ♀ reared from larva, with exuvia, same data except 28-VI-78; ♀ reared from larva, with exuvia, same data as for holotype; ♂ reared from larva, with exuvia, same data as for holotype except 28-VI-78.

The holotype and allotype are deposited in the Florida State Collection of Arthropods (Tallahassee). One reared ♀ is in the collection of the U. S. National Museum, Washington, D.C. Other paratypes are in the collection of the senior author.

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