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LIMNOCHIRONOMIDS IN IOWA INCLUDING THEIR LIFE HISTORIES

(Chironomidae-Diptera)

U. A. HAUBER AND THOMAS MORRISSEY

Limnochironomus is a group of the genus *Tendipes* Meig 1800 (*Chironomus* Meig 1803). The genus may be described as follows:

Wings clear; medio-cubital crossvein absent; front tibial spur absent or indistinct; combs of posterior tibiae composed of basally fused spinules, at least one comb with a spur; fore metatarsus longer than the tibia (L.R. greater than 1).

The group *Limnochironomus* may be distinguished from other groups of the genus as follows:

Adults: Wings devoid of macrotrichia; r-m distinct and oblique. Combs of posterior tibiae armed with one short spur; fore tarsi (in ours) not bearded; pulvilli well developed. Pronotum forming a distinct collar reaching up to the front end of the scutum and not completely divided. No frontal tubercles. Appendage 2 of hypopygium reaching beyond end of coxite, narrow and arched ventrally with curved hairs only on the enlarged tip.

Pupae: Respiratory organs composed of a tuft of numerous filaments; latero-posterior angles of segment 8 with a simple spur or rarely with a main spur and one or a few short branches.

Larvae: Pale red or yellowish. No ventral gills on 11th segment. Labial plate (figs. 8, 9) with thirteen teeth, the middle one simple, first and second laterals more or less fused at base, outermost laterals distinct, the whole plate strongly arched so that the lateral teeth are not visible without flattening the plate. Paralabial plates broadly separated along median line. Antennae (figs. 5-7) five-segmented, straight, with blade at distal end of basal segment and ring organ on its proximal third. Maxillary palp about twice as long as broad.

ECOLOGY

Members of this group breed preferably in clear, shallow ponds or in quiet areas along the shores of rivers where floating algae are present. We have not taken any in deep water and none of our specimens are from the Okoboji region.

Keys to the species of *Limnochironomus* taken in Iowa.

ADULTS

- | | |
|---------------------------------------|---|
| 1—Body green with pale vittae | 2 |
| —Body dark with blackish vittae | 3 |

The authors of this paper gratefully acknowledge their indebtedness to Dr. H. K. Townes of the U. S. Department of Agriculture who identified the adults in our collection.

- 2—Appendage 1 of hypopygium broadly swollen at tip.....*L.modestus*
- Appendage 1 not swollen, more or less flaring at tip and truncate *L. lucifer*
- 3—Appendage 1 of hypopygium swollen at tip, thorax strongly pruinose *L. neomodestus*
- Appendage 1 not swollen *L. fumidus*

PUPAE

- 1—Spur on latero-posterior angle of 8th segment slender and sinuate (fig. 13). Sternites 1-3 with four transverse rows of spinules *L. modestus*
- *L. neomodestus*
- Spur not sinuate, sternites without transverse rows of spinules 2
- 2—Casts clear; spur on 8th segment short, simply curved, sometimes multiple or branched (fig. 15)..... *L. lucifer*
- Casts smoky with yellowish tinge; spur longer, abruptly curved or slightly sinuate, rarely with a short branch near base *L.fumidus*

LARVAE

The following key is constructed from specimens in our collection. It is barely possible that some of the determinations of larval specimens are not correct. Moreover, when only one or a few specimens are available there is little clue to the possible variability of structures. Further detailed investigation may, therefore, necessitate a recast of the key.

- 1—First segment of antenna about twice as long as the sum of the remaining segments (Ratio about 2.2). Proximal of the four mandibular teeth not darkened.....*L. fumidus*
- First antennal segment about half again as long or less than the sum of the remaining segments. Proximal tooth of mandible darkened as much as the others.....2
- 2—Fourth segment of antenna longer than the third. Proximal mandibular tooth large, broad and with a lobe proximally *L. lucifer*
- Fourth segment of antenna shorter than the third. Proximal mandibular tooth simple and smaller than the third *L. modestus*

DESCRIPTION OF THE SPECIES

Tendipes (Limnochironomus) modestus Say

Say, Jour. Acad. Nat. Soc. Phil. 3:; 13:3, 1823.
 Johannsen 1905, pp. 227-9, Pl.22, figs. 8-12.
 Malloch 1915, p. 476, Pl. 34, fig. 8.
 Johannsen 1937, p. 43 and Pl. VII, figs. 115, 116.

Adults: Green; vittae, postnotum and sternum pale reddish yellow. Legs pale, the knees and tarsi often darkened, as also the tip of the abdomen. Appendage 1 of hypopygium moccasin-like (fig. 1). Wing length 2.2-3.0 mm; body length 3.5-4.5 mm; leg ratio 1.5-1.8; antennal ratio 2.5-3.0.

Pupae: Casts 5-6 mm. long, clear to more or less smoky. Cephalic

tubercles short, conical and acute, with preapical bristle. Tergites 2-6 each have a rather large area of shagreen which is stronger on tergites 5-6 than on the anterior ones; a small area of shagreen also on the 8th tergite. There are four rows of simple, colorless spines on the sternites as follows: one row near posterior margin of first sternite; one each near the anterior and posterior margins of second sternite; and one row near anterior margin of third sternite. On the lateral margins of each segment 5-8 there are four long filaments. The spur on the latero-posterior angle of the 8th segment is strongly sinuate (fig. 15).

Larvae: As in key and figures 7-10. Length of antenna about 1.6 mm. Proportional length of antennal segments 100-28-18-15-7. Epipharyngeal comb with five blunt teeth.

This species is very common in Davenport from early spring to late fall.

Our *Tendipes modestus* is quite similar to the widely distributed and rather variable European species *Tendipes (Limnochironomus) pulsus* Walker, and the two should perhaps be put in the same specific category. See Kruseman 1933, p. 176, fig. 40; and Edwards 1929, p. 386, fig. 12d.

Tendipes (Limnochironomus) neomodestus Malloch

Malloch 1915, p. 475, adults only.

Adults: All dusky brown with blackish gray vittae and heavy gray pruinescence on the thorax. Hypopygium (fig. 2) with dististyles attenuated distally, the tip of appendage 1 less broad than in *modestus* and bent laterally at right angles. Wing length 2.3-2.4 mm.; body length 3.5-4.0 mm.; Leg ratio 1.6-1.7.

Immature stages: We have not been able to distinguish the pupal casts from those of *modestus*, and no larvae definitely known to belong to this species have been examined.

Davenport, April and May. The color and the hypopygium of this species distinguishes the specimens at hand definitely from those of *modestus*. Whether there are intergrading forms remains to be seen.

Tendipes (Limnochironomus) fumidus Joh

Johannsen 1905, p. 221 for adults. On page 214 the larvae and pupae of this species were described under the name of *Chironomus tenellus* Zett. (See Johannsen 1937, p. 44).

Adults: Thorax pale yellowish, pruinose; vittae, sternum and abdomen dark brown. Legs pale yellowish. Hypopygium (fig. 4) with the dististyles broad and appendage 1 truncated at tip, not at all swollen. Our specimens are larger than Johannsen's. Wing length 3.0-3.3 mm; body length 4.2-4.6 mm; L.R. 1.5-1.6; A.R. about 3.

Pupae: Casts 6-7 mm long, tinged with yellowish brown. Cephalic tubercles as in *modestus*; shagreen coarser than in *modestus* cover-

ing most of the disk on tergites 2-6 and with smaller areas on tergites 7-8. There are no sternal rows of spinules. Spur on latero-posterior angle of segment 8 rather variable, usually with a simple abrupt curve though sometimes slightly sinuate, rarely with a short branch near the base (fig. 14).

Larvae: As in key and figures 5 and 12. Head mostly brown. Antenna .17 mm long; proportional length of antennal segments 120-24-10-15-7. The epipharyngeal comb of one specimen, at least, has a comb with 8 teeth irregularly disposed: there is one large central tooth with three rather broad teeth on one side and four slender teeth on the other.

With one exception all our specimens emerged during the winter months in an aquarium from material brought in from the neighborhood of Davenport. One adult was taken near the river on August 18.

Tendipes (Limnochironomus) lucifer Joh.

Johannsen 1907a, pp. 10-11; 1907b, p. 278; 1937, p. 45. See also 1905, p. 228, under *Chironomus modestus*, var. *A.*
Malloch 1915, p. 477, pupa and adult male of *Chironomus indistinctus* Mall.

Adults: The color varies from bright green to smoky olive green with the vittae reddish yellow to pale yellow (brownish black in Johannsen's specimens). The green specimens tend to have pale legs, the darker ones may have the knees and tarsi brownish. Some specimens have the last three segments of the abdomen much darkened. Hypopygium (fig. 3) with dististyle slender and tending to be constricted near the middle; appendage 1 slightly flaring and truncate at tip. Wing length 2.0-2.2 mm; body length 3.0-3.3 mm; L.R. 1.7-1.9.

Pupae: Casts 5 mm long. Cephalic tubercles somewhat longer and more slender than in *modestus*. Patches of shagreen larger than in *modestus* with some shagreen on tergite 8 and two very small patches on tergite 7. No sternal rows of spinules. Spur on latero-posterior angle of 8th segment variable, generally short and multiple (fig. 15).

Larvae: As in key and figures 6 and 11. Length of antenna about .13 mm. Proportional length of antennal segments 62-28-10-15-5.

Common at Davenport during the summer months.

Our specimens cannot be distinguished from the European *Tendipes (Limnochironomus) nervosus* Staeg. as described by Kruseman (p. 176) and by Edwards (p. 386). This species is widespread and common in Europe and also has a variety with the abdomen blackish apically.

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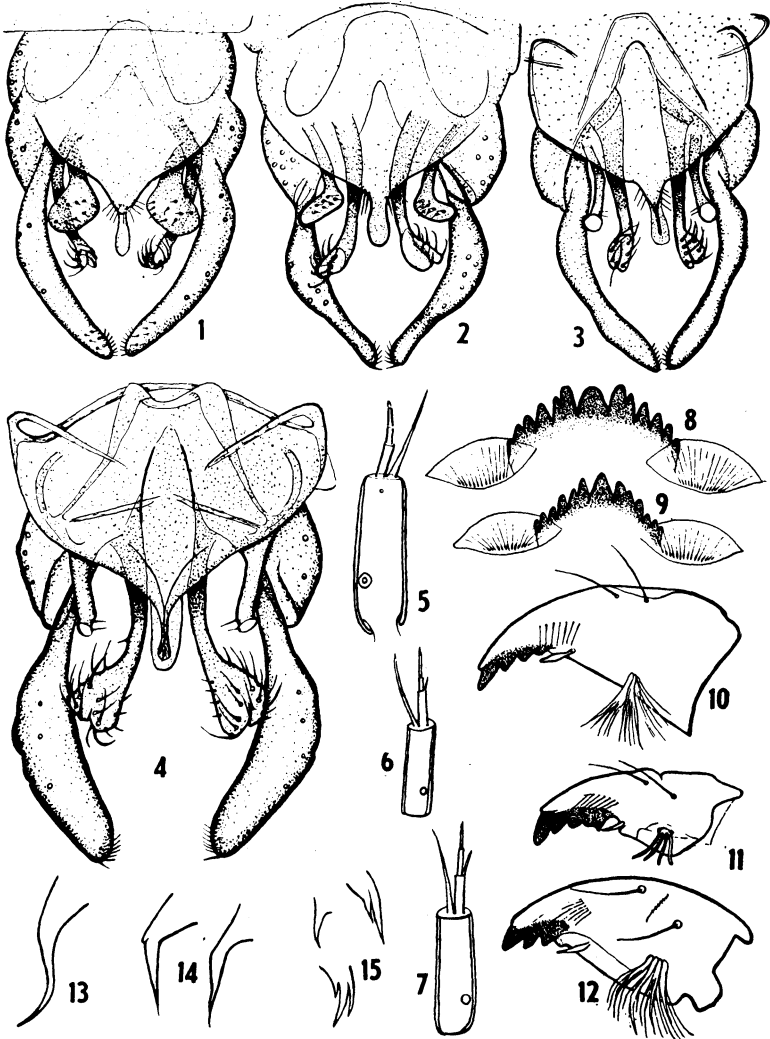


Plate 1

EXPLANATION OF PLATE 1

- Figs. 1-4, Hypopygia x 150. 1. *T. modestus*
2. *T. neomodestus*
3. *T. lucifer*
4. *T. fumidus*
- Figs. 5-7, Larval antennae x 200. 5. *T. fumidus*
6. *T. lucifer*
7. *T. modestus*
- Figs. 8-9, Labial plates of larva of *T. modestus* x 150, showing variability.
- Figs. 10-12, Mandibles of larvae x 150. 10. *T. modestus*
11. *T. lucifer*
12. *T. fumidus*
- Figs. 13-15, Spurs on 8th segment of pupae x 150
13. *T. modestus*
14. *T. fumidus*
15. *T. lucifer*