

A DESCRIPTION OF THE LARVA AND PUPA
OF *GLOSSOSOMA NIGRIOR* BANKS
(TRICHOPTERA:GLOSSOSOMATIDAE)

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ABSTRACT

A general literature review and descriptions of the larva and the pupa of *Glossosoma nigrior* Banks are presented. A key to the species of *Glossosoma* larvae of eastern North America is also included.

Key Words: Trichoptera, Glossosomatidae, *Glossosoma nigrior*.

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GLOSSOSOMA CURTIS

The genus *Glossosoma* consists of ten subgenera, each defined by structures of the male terminalia (Ross 1956). *Glossosoma nigrior* Banks is a member of the subgenus *Eomystra* Martynov which also includes the other remaining eastern North American *Glossosoma* species, *G. lividum* (Hagen) and *G. intermedium* (Klapalek). Only *G. lividum* and *G. nigrior* were reported by Unzicker et al. (1982) from North and South Carolina and a key to the larvae of the species of *Glossosoma* from North and South Carolina was not included in this work because the larva of *G. nigrior* was undescribed.

Betten (1934) redescribed adults of *G. nigrior* and *G. lividum* and redescribed and illustrated adults of *Mystrophora americana* (synonymized with *G. lividum* by Ross 1956). Further description and figures of the male of *G. nigrior* were given by Denning (1942, as *Eomystra unica* Denning, n. sp.). Kimmins (1943, as *Mystrophora intermedia*) and Ross (1944, 1956) redescribed and illustrated adults of *G. intermedium*.

Lloyd (1921) and Sibley (1926) supplied descriptions and figures of larva + case and pupa, respectively, for *G. lividum* (as *G. americanum* and *M. americana*, respectively) and Betten (1934) did so for both life stages of this species (as *M. americana*). Descriptions and illustrations of the larva, pupa and case of *G. intermedium* were provided by Kimmins (1943, as *M. intermedia*), Ross (1944), Mackereth (1956), and Lepneva (1964, as *M. intermedia*).

Although *G. nigrior* is common in the East and although detailed studies of its life-history (Trapp and Hendricks 1984) and feeding biology (Oemke 1984a, 1984b) have been completed, descriptions of its larva and pupa have not been publicized. These are described and illustrated herein and a key to the larvae of *Glossosoma* species known to occur in eastern North America is presented.

GLOSSOSOMA NIGRIOR BANKS

This species inhabits cool or cold rapid flowing streams throughout the eastern United States as far west as Minnesota (Wiggins 1977). The larvae are typical of *Glossosoma* species in building saddle cases and having sclerotization only on the pronotum of the thorax. Mackereth (1956) used the presence of a dark spot on the side of the pronotum dorsal to the site of attachment of the first pair of legs to distinguish *G. intermedium* from *G. boltoni* and *G. vernal*. The spot is smaller in *G. intermedium* than in the other two species. Kimmins (1943) also noted that the lateral notches of the frontoclypeus of *G. intermedium* had smaller denticles than the latter two species. Lloyd (1921) showed that the frontoclypeus of *G. lividum* was without the obvious denticles of *G. intermedium*. However, there does seem to be a slight rounding laterally in the position of the denticles in *G. lividum*. Both mandibles have a triangular apex in *G. lividum* whereas the mandibles of *G. intermedium* are more rounded. *Glossosoma nigrior* may be distinguished from the other two species on the basis of the sclerites present on the ventral intersegmental fold between abdominal segments I and II. No sclerites were mentioned at this location in the other two species. Additionally, the frontoclypeus of *G. nigrior* is smooth laterally and not interrupted by denticles or rounded protrusions.

LARVAL DESCRIPTION

Length of larva 5 - 6 mm. Body round in cross-section, curved caudally. Dome-shaped case of small stones, closed beneath except at either end.

Head

Brown in color with light yellow mottling posterior and lateral to eyes. Yellow ring present around eye forming a tear-drop shaped yellow patch immediately posteroventral to eye. Dark brown strip present across entire posterodorsal margin of head. Frontoclypeus with edges smooth laterally; pit-hair formula 0 + 2 + 3 (Fig. 1D).

Thorax

Pronotum heavily sclerotized, brown with two small, darkened spots on anterolateral margins (Fig. 1F). Dark brown border present across posterior and posterolateral margins of pronotum, fusing anteriorly with anterolateral spot. Prosternal plate with anterior margin dark brown. Mesothorax and metathorax entirely membranous. Meso- and metathoracic coxae brown with darkened margins.

Abdomen

Largely membranous except for a pair of sclerotized plates on anal prolegs, dorsal plate on segment IX, and two sclerites in intersegmental fold between abdominal segments I and II. One pair of setae present on ventral surface of abdominal segments I - V and IX. Abdominal segment IX with eight setae: six long and two short (Fig. 1G). Additional scattered setae present on dorsal and lateral surfaces of all abdominal segments. Four setae present on dorsal surface of each anal proleg (Fig. 1G).

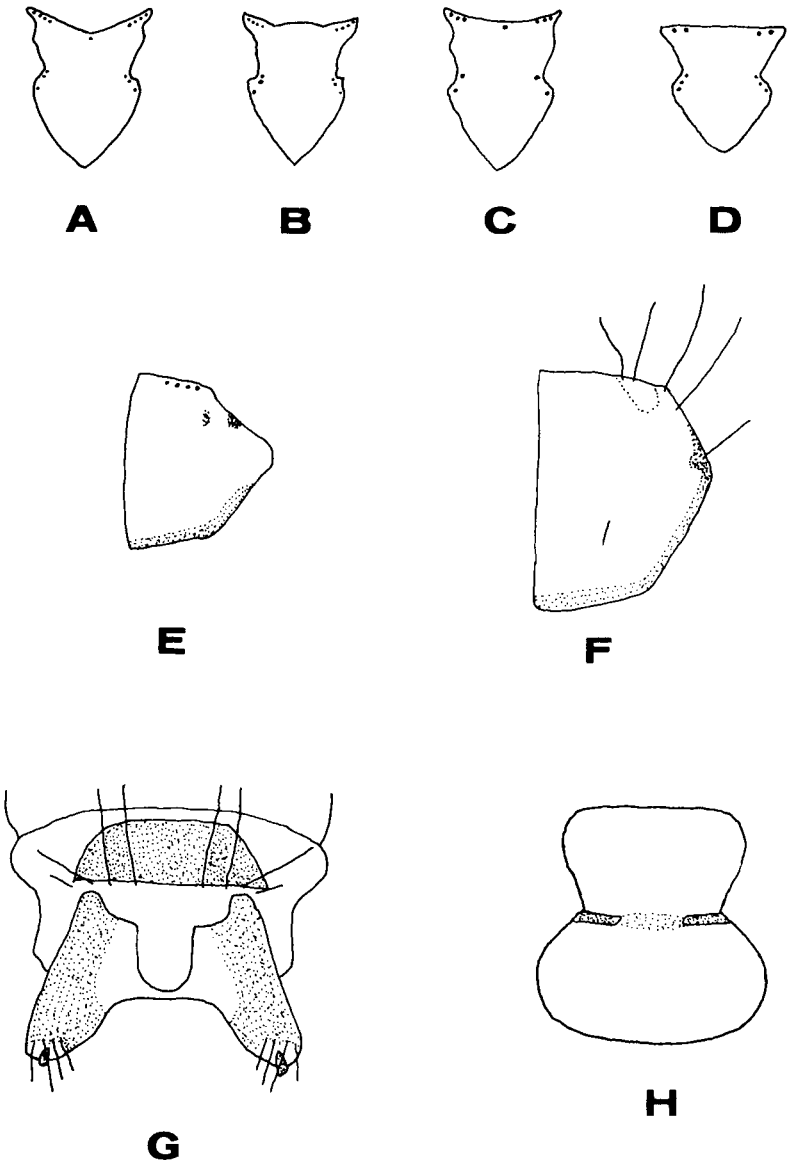


Fig. 1. *Glossosoma* spp. larval characters. (A) frontoclypeus of *G. intermedium*, (redrawn from Mackereth 1956); (B) frontoclypeus of *G. intermedium*, (redrawn from Lepneva 1964); (C) frontoclypeus of *G. lividum*, (redrawn from Lloyd 1921); (D) frontoclypeus of *G. nigrior* indicating hair-pit arrangements; (E) pronotum of *G. intermedium*, (redrawn from Mackereth 1956); (F) pronotum of *G. nigrior* indicating spot locations; (G) dorsal view of caudal end of abdomen of *G. nigrior*; (H) ventral abdominal fold between segments I and II of *G. nigrior*.

PUPAL DESCRIPTION

Length of pupa 5-6 mm. Pupal cocoon consisting of a red-brown silken structure constructed inside stone case of pupa. Pupal case not closed beneath, sealed all around to rock substrate with silk.

Head

Sclerotized, dark brown with antennae as long as entire body and folded ventrally while in cocoon. Top of head with two isolated anterior setae and two paired posterior setae. Mandible dark brown, similar to that of *G. intermedium* (Kimmins 1943).

Thorax

Fore and hind wings folded under abdomen. Proximal margin of mid-tibia with two pairs of spines, each approximately 0.01 mm in length. Proximal margin of hind-tibia with one single and one pair of spines each approximately 0.01 mm in length.

Abdomen

Tan, terminal segment with two tufts of three setae, each tuft 2 mm long. Dorsal hook plates on segments 3-9 (Wiggins 1978, Fig. 14.78).

Key to the species of *Glossosoma* larvae of eastern North America.

1. Pronotum brown with dark spot on each anterolateral edge (Figs. 1E and F); frontoclypeus with either 1 + 4 + 3, 0 + 4 + 3, or 0 + 2 + 3 arrangement of pits and setae (Figs. 1A or B and Fig. 1D, respectively); with or without denticles laterally; apex of mandible not triangular 2
- Pronotum brown with no spot as above; frontoclypeus with 1 + 3 + 2 arrangement of pits and setae (Fig. 1C) and without denticles laterally; apex of mandible triangular *G. lividum* Hagan
2. Small spot on anterolateral margin of the pronotum separate from posterolateral marginal band (Fig. 1E); no sclerites on ventral abdominal intersegmental fold between segments I and II *G. intermedium* Klapalek
- Small spot on anterolateral margin of the pronotum fused with posterolateral band (Fig. 1F); two sclerites may be present on ventral abdominal intersegmental fold between segments I and II (Fig. 1H) *G. nigrior* Banks

MATERIAL EXAMINED

NORTH CAROLINA: Jackson Co. Whitewater Falls. 4 February 1979. 1 pupa. Coll. J. C. Burne and J. S. Weaver. Whitewater Falls. 14 July 1979. 1 larva, 1 male pupa, 4 female pupae. Coll. J. Morse.

SOUTH CAROLINA: Pickens Co. Indian Creek, Issaqueena Forest, 13 April 1979, 1 female larva. Coll. J. S. Weaver. Pickens Co. Carrick Creek. 9 Oct. 1982. 2 larvae and 2 pupae. Coll. J. C. Morse.

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