

NEW NEARCTIC SPECIES OF LEPIDOSTOMA IN THE VERNALIS GROUP FROM THE SOUTHERN APPALACHIANS (TRICHOPTERA: LEPIDOSTOMATIDAE)¹

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INTRODUCTION

During the past several years three new species of the *Lepidostoma vernalis* group have been found in the southern Appalachians. The group appears to have undergone extensive speciation throughout the Appalachians, especially in the southern part of the range. Undoubtedly, one explanation for this is that the immature stages are almost invariably associated with small, isolated spring-fed streams and seeps. The adults do not appear to be strong fliers since they are usually caught adjacent to the preceding type habitat. The group was the subject of an excellent treatment by Flint & Wiggins (1961). As pointed out by them, adults of the *vernalis* group can be readily recognized by the pair of prominent, setae-bearing, dorsal warts on the ninth abdominal tergum.

Unless stated otherwise, all holotypes and paratypes mentioned in this paper are in the University of Georgia collection.

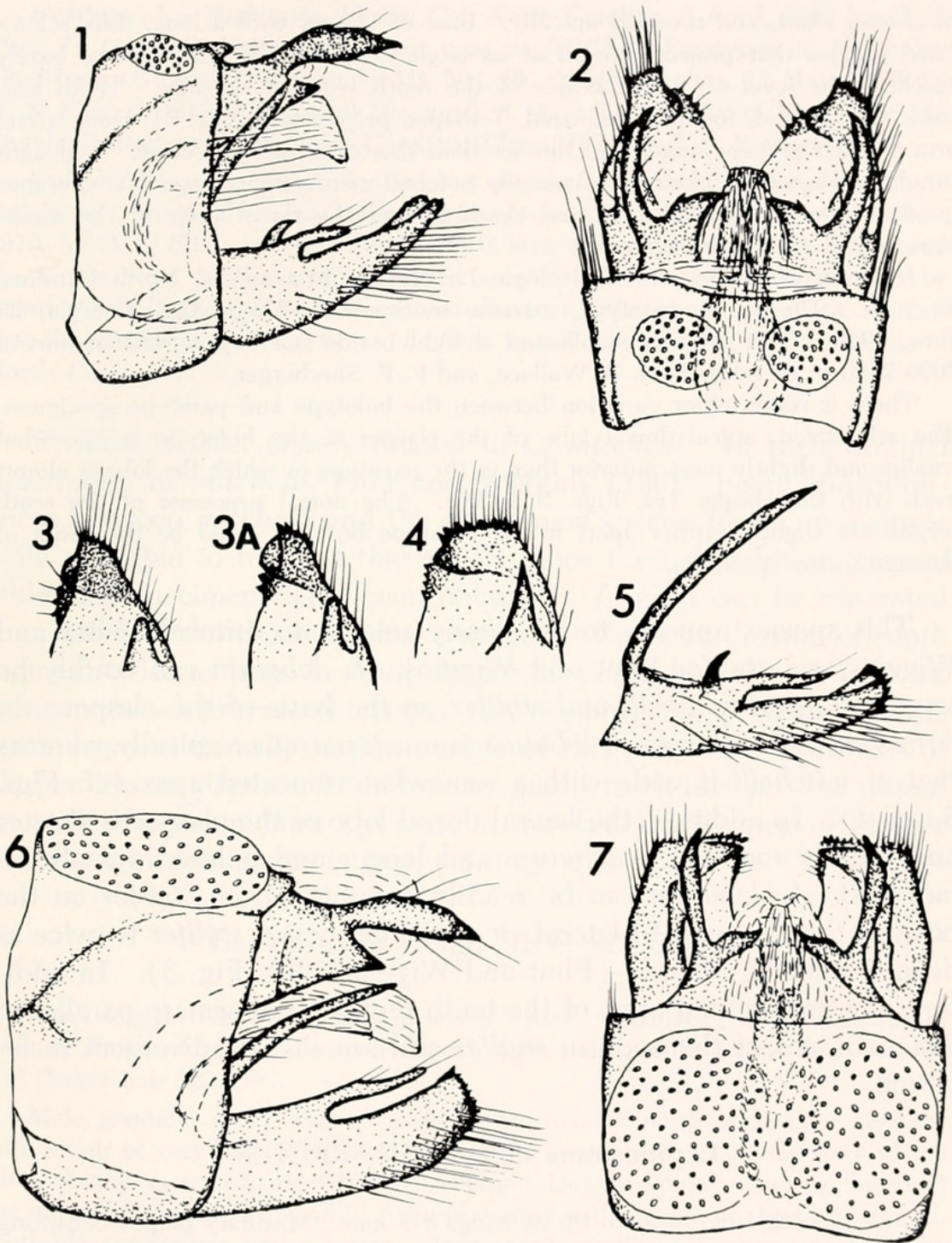
Lepidostoma lobatum NEW SPECIES

Male: length from head to tip of wings 7 mm. Maxillary palpus consisting of a single flattened segment curved dorsad.

Genitalia as in Figs. 1-3. Ninth segment with dorsal warts of moderate size. Clasper long and fairly shallow in lateral view. Apex of clasper narrowed with a rounded dorsomesal lobe that partially overlies a dentate ventral lobe in dorsal

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FIGURES 1-7. 1, male genitalia of *Lepidostoma lobatum*, lateral view; 2, dorsal view of same; 3, apex of male clasper, dorsal view of holotype of same; 3a, same of paratype; 4, same of *L. mitchelli*; 5, clasper of male, lateral view, of same; 6, male genitalia of *L. flinti*, lateral view; 7, dorsal view of same.

view, Fig. 3. Apex of clasper with several small teeth. Each clasper with a small tooth-like projection at mesal edge of clasper near base. Lateral dorsal lobe

of clasper short, and rounded apically. Base of clasper with a long, thin, sclerotized process that projects dorsad at an angle of about 50° , this process barely reaching the level of the processes of the tenth segment dorsally. Tenth segment with paired, forked, sclerotized, Y-shaped projections, (Fig. 2). Dorsolateral arm of each process longer and thinner than shorter mesal projection. Aedeagus tubular with paired sclerites. A mesally notched membranous process at the apex overlies apex of the aedeagus and the apices of the mesal arms of the dorsal processes of the tenth segment.

Holotype ♂ : Coweeta Hydrologic Laboratory, Macon Co., North Carolina, 11 June, 1970. 1 ♂ paratype, extreme southwestern Union Co., Georgia, 23 June, 1969. Both specimens collected at light beside small spring-fed streams at 2000-2500 ft. elevation by J. B. Wallace, and F. F. Sherberger.

There is some minor variation between the holotype and paratype specimens. The sclerotized, apical dorsal lobe of the clasper in the holotype is somewhat smaller and slightly more anterior than in the paratype in which the lobe is almost even with the clasper (cf. Figs. 3 & 3A). The dorsal processes of the tenth tergite are slightly farther apart in the paratype but this could be the result of damage to the specimen.

This species appears to be closely related to *mittelli* Flint and Wiggins and *stylifer* Flint and Wiggins. *L. lobatum* can readily be separated from *mittelli* and *stylifer* on the basis of the clasper. In dorsal view, the clasper of *lobatum* is much narrower apically whereas that of *mittelli* is wide with a somewhat truncated apex (cf. Figs. 3 and 4). In addition, the lateral dorsal lobe of the clasper is shorter and bluntly rounded in *lobatum* and longer and pointed apically in *mittelli*. *L. lobatum* can be readily separated from *stylifer* on the basis of the clasper. In lateral view, the clasper of *stylifer* is twice as deep as that of *lobatum* (Flint and Wiggins 1961, Fig. 3). In addition, the dorsolateral arms of the tenth tergal processes are parallel to the main axis of the body in *stylifer* and are slightly divergent in *lobatum*.

Lepidostoma flinti NEW SPECIES

Male: length from head to tip of wings 8-9 mm. Maxillary palpus consisting of a single flattened segment curved dorsad.

Genitalia as in Figs. 6 and 7. Ninth segment broad dorsally; dorsal warts very large, almost touching on the meson. Claspers long and deep in lateral view, truncated at their apices. Apex of each clasper bearing a series of short teeth; base of clasper with a long, thin, sclerotized process not quite reaching level of processes of the tenth segment dorsally. Tenth segment consisting of a pair of forked Y-shaped processes; the longer dorsolateral arm of each process projecting posteriorly, the shorter ventromesal process projecting mesad.

Holotype ♂ : Highlands, Macon Co., North Carolina, 3 April, 1961 by O. S. Flint, Jr. (in U. S. National Museum, type no. 71978). Paratypes: 1 ♂, Smoke-mont Camp Ground, Great Smoky Mt. Nat. Pk., North Carolina, 11 May, 1970, by O. S. Flint, Jr. (U. S. National Museum); 1 ♂, 4.0 Mi. south of summit of Mt. Pisgah, Transylvania Co., North Carolina, 7 June, 1971, by J. B. Wallace, et. al.

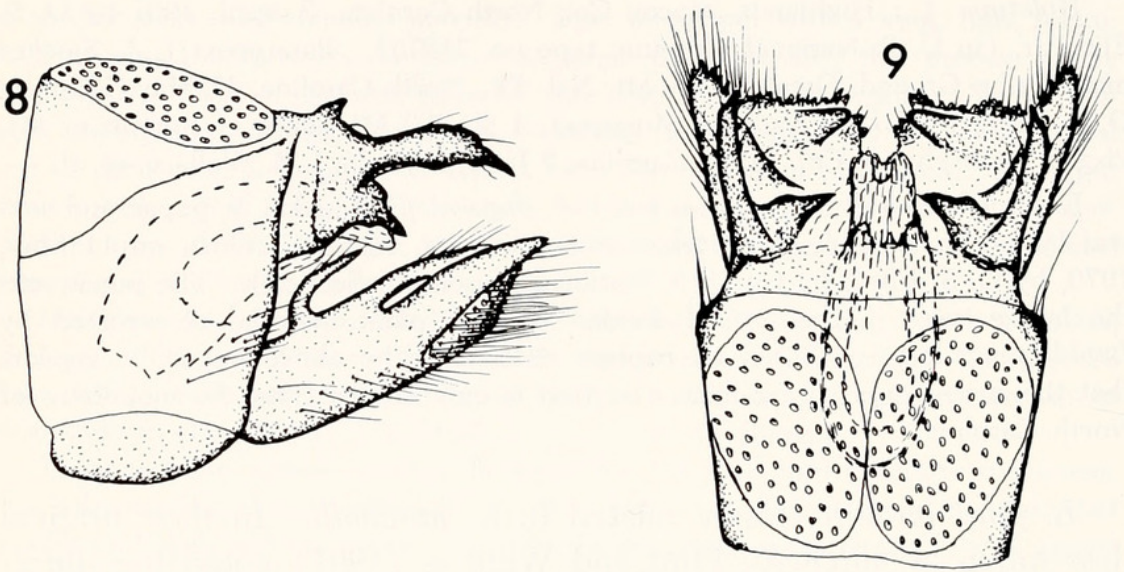
Excluded from the type series are 1 ♂ pupa of *flinti* and 2 ♀ pupae and several larvae, presumably *flinti*, taken at Smokemont, North Carolina, on 11 May, 1970, by O. S. Flint, Jr. (in U. S. National Museum collection). The pupae and the larvae were in the typical 4-sided case of plant material constructed by *Lepidostoma* larvae. Based on capture dates and the above pupae, it appears that the species is a spring flyer. *L. flinti* is only known from the mountains of North Carolina.

L. flinti is most closely related to *L. mitchelli*. In their original description of *mitchelli*, Flint and Wiggins (1961) noted the differences between *mitchelli* and the above new species based on a single male available to them at that time. Since their description, several additional specimens have been obtained. *L. flinti* can be separated from *mitchelli* on the following characters: warts on dorsum of ninth segment twice as large in *flinti*; clasper deeper in lateral view in *flinti*; elongate basal process of clasper not reaching the processes of the tenth segment dorsally in *flinti*; angle of this process to main axis of clasper less in *flinti*, in lateral view; mesal tooth-like process absent on each clasper in *flinti* (present in *mitchelli*) and apex of clasper wider and more truncate in *flinti* (cf. Figs. 6 and 5).

Lepidostoma glenni NEW SPECIES

Male: length from head to tip of wings 8 mm. Maxillary palpus consisting of a single flattened segment curved dorsad; each palpus with lighter hair mesally and darker hair laterally.

Male genitalia as in Figs. 8 and 9. Dorsum of ninth abdominal segment with a pair of very large warts, touching on the meson and occupying most of the ninth tergite as seen in dorsal view. Clasper long in lateral view, produced at the dorsolateral margin apically. Apex of clasper with a series of short, sclerotized, tooth-like projections, and a larger, sclerotized, tooth-like projection dorsomesally. Basal process of clasper rather short, sclerotized, and hook-like. Apically, dorsal process of clasper bent slightly ventrad, the lower portion of this process partially obscured in lateral view by dorsolateral margin of clasper (Fig. 8). Tenth segment with a pair of sclerotized forked processes; dorsolateral arm of each process thinner and longer than mesal arm, and projecting posteriorly, nearly parallel with main axis of body and almost as long as clasper. Mesal arm of process curved posteriomesad, wider and shorter than dorsal process.



FIGURES 8-9. 8, male genitalia of *Lepidostoma glenni*, lateral view; 9, dorsal view of same.

Holotype ♂ : Extreme southwestern Union Co., Georgia, 2 June, 1971, taken by a small spring-fed stream at 2000 ft. elevation by F. F. Sherberger, et al. The species is named for Dr. Glenn B. Wiggins.

L. glenni does not appear to be closely allied with any known species in the *vernalis* group. The clasper somewhat resembles that of *vernalis*. However, *glenni* lacks the forked basal process of the clasper and the processes of the tenth segment in *glenni* lack the long, heavily sclerotized, hook-like mesal processes present in *vernalis*.

KEY TO MALES OF THE VERNALIS GROUP

The following key is adapted from Flint and Wiggins (1961) to incorporate the species described in this paper.

1. Dorsum of the ninth segment enormously enlarged and bulbous, overhanging all other parts of the genitalia (Flint and Wiggins 1961, Fig. 10) . . . **sackeni (Banks)**
Dorsum of the ninth segment not enlarged, the whole segment in the form of a fairly regular ring . . . 2
2. Base of clasper with a long, heavily sclerotized process which terminates in a single sharp point (Figs. 1, 5, 6) . . . 3
Base of the clasper with a shorter sclerotized process which is hooked (Fig. 8), fork-like (Flint and Wiggins 1961, Fig. 4) or quadrate (Flint and Wiggins 1961, Figs. 7, 8) . . . 7
3. Sclerotized process at the base of clasper strongly recurved, the apical portion nearly parallel with the main body axis, tenth tergite with only laterally sclerotized projections. (Flint and Wiggins 1961, Fig. 1) . . . **liba Ross**
Sclerotized process at the base of clasper not strongly recurved, the apical portion

- extending from the main body axis at an angle of 30-50°; tenth tergite with both laterally and mesally paired sclerotized projections (Figs. 1, 2, 6, 7) . . . 4
4. Warts on dorsum of ninth abdominal tergite very large, occupying most of the dorsal area and touching mesally; clasper without a mesal tooth (Fig. 6) *flinti* n. sp.
Warts on dorsum of ninth segment smaller than above, not touching mesally; clasper with a mesal tooth (Figs. 1, 2, 5) 5
5. Clasper deep in lateral view; lateral processes of the tenth segment in dorsal view parallel, mesal processes dentate (Flint and Wiggins 1961, Fig. 3) *stylifer* Flint & Wiggins
Clasper thinner in lateral view (Figs. 1, 5); lateral processes of tenth segment at least slightly divergent (Fig. 2); mesal processes at most minutely dentate (Fig. 2) 6
6. Clasper, in dorsal and ventral view, narrowed apically, a rather large overhanging dorsal lobe present mesally at apex of clasper, dorsal process of clasper short and rounded at its apex in dorsal view (Figs. 1, 2, 3) *lobatum* n. sp.
Clasper, rather truncate apically in dorsal view, dorsal process of clasper long and pointed apically (Figs. 4, 5) *mittchelli* Flint & Wiggins
7. Sclerotized process at base of clasper fork-like (Flint & Wiggins 1961, Fig. 4), or hook-like (Fig. 8) in lateral view 8
Sclerotized process at the base of clasper more or less quadrate in lateral view (Flint & Wiggins 1961, Figs. 7-8) 11
8. Tenth segment consisting of a pair of heavily sclerotized, pointed, hook-like mesal processes, and a pair of shorter less heavily sclerotized lateral processes; sclerotized processes at base of clasper fork-like (Flint & Wiggins 1961, Fig. 4) *vernalis* (Banks)
Tenth segment lacking pointed, hook-like mesal processes, sclerotized process at base of clasper hook-like in lateral view (Figs. 8, 9) 9
9. Lateral sclerotized, paired, processes of tenth tergite nearly as long as clasper, nearly parallel and pointed apically; shorter mesal processes of tenth tergite sclerotized and pointed; warts on dorsum of ninth abdominal segment large, occupying most of the tergite in dorsal view (Figs. 8, 9) *glenni* n. sp.
Tenth segment with paired lateral processes much shorter than clasper and bluntly rounded at their apices; mesal processes of tenth segment represented only by membranous folds; dorsal warts of ninth segment small, occupying less than one-half of the tergite in dorsal view (Flint & Wiggins 1961, Figs. 5, 6) 10
10. Apex of clasper without a deep notch (Flint & Wiggins 1961, Fig. 5) *sommermanae* Ross
Apex of clasper with a deep notch (Flint & Wiggins 1961, Fig. 6) *excavatum* Flint & Wiggins
11. Tenth segment circular in lateral view, with two short, sclerotized, ventral processes, each bearing an apical spine (Flint & Wiggins 1961, Fig. 9) *griseum* (Banks)
Tenth segment not circular in lateral view 12
12. Tenth segment with two stout lateral processes, their dorsolateral edges with deep serrations (Flint & Wiggins 1961, Fig. 7) *serratum* Flint & Wiggins
Tenth segment consisting of an overhanging dorsal plate with margins produced into small points (Flint & Wiggins 1961, Fig. 8) *carrolli* Flint

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LITERATURE CITED

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2.0173 New Nearctic species of *Lepidostoma* in the *vernalis* group from the Southern Appalachians (Trichoptera: Lepidostomatidae).

ABSTRACT—Three new species of the *Lepidostoma vernalis* group are described from the southern Appalachian region. One of the new species is known only from North Carolina, one only from Georgia, and one from both states. A key is provided for the males of the thirteen known species of the *vernalis* group.—J. B. Wallace and F. F. Sherberger, Department of Entomology, University of Georgia, Athens, GA 30601.

Descriptors: Trichoptera; Lepidostomatidae; *Lepidostoma*, new species: *lobatum*, *flinti*, *glenni*; key.



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