INSECTA MUNDI A Journal of World Insect Systematics

0273

# An annotated list of the caddisflies (Trichoptera) of Florida: Part I. The family Hydroptilidae, with descriptions of five new species

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Date of Issue: December 12, 2012

CENTER FOR SYSTEMATIC ENTOMOLOGY, INC., Gainesville, FL

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Insecta Mundi 0273: 1-32

ZooBank Registered: urn:lsid:zoobank.org:pub:16782618-BD4F-4CD3-82B5-53F780B0BF82

**Published in 2012 by**
Center for Systematic Entomology, Inc.
P. O. Box 141874
Gainesville, FL 32614-1874 USA
http://www.centerforsystematicentomology.org/

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# An annotated list of the caddisflies (Trichoptera) of Florida: Part I. The family Hydroptilidae, with descriptions of five new species

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**Abstract.** Five **new species** of *Hydroptila* (Trichoptera: Hydroptilidae), *H. murtlei* sp. n., *H. criokera* sp. n, *H. auriscuspa* sp. n., *H. santarosa* sp. n., and *H. ebroensis* sp. n., from Florida are described and illustrated. We provide an annotated list of the 76 species known to occur in the state, including 10 species that represent new state records, one of which is also a new country record. New illustrations are presented for those species which were difficult to identify or exhibited new range extensions into Florida, namely: *Hydroptila acadia* Ross, *H. ajax* Ross, *H. icona* Mosely, *H. latosa* Ross, *H. lloganae* Blickle, *H. maculata* (Banks), *H. novicola* Blickle and Morse, *H. wakulla* Denning, *Oxyethira arizona* Ross, *O. lumipollex* Kelley and Harris, and *O. simulatrix* Flint.

**Key words.** Caddisflies, microcaddisflies, Hydroptilidae, *Hydroptila*, Trichoptera, new species, Florida

## Introduction

The Hydroptilidae, or microcaddisflies, of Florida were first summarized by Blickle (1962) who listed 31 species from the state. Since that time, numerous new species have been described from the state (Holzenthal and Kelley 1983, Harris and Armitage 1987, Harris 1991, Sykora and Harris 1994, Harris et al. 1998, Harris 2002, Harris and Keth 2002). Harris et al. (1982) presented an annotated checklist of the caddisflies of several streams on Eglin Air Force Base, Florida. Pescador et al. (1995, 2004) presented checklists of the caddisflies of Florida. Rasmussen (2004) summarized the caddisfly fauna of ravine ecosystems in North Florida. Since the time of these publications extensive collecting by Rasmussen, Denson and colleagues has resulted in the discovery of 10 new state records, including 1 new country record, as well as 5 new species. The aim of this paper is to describe the new species, document the new state records, and present an annotated checklist of the microcaddisflies of Florida.

## Materials and Methods

The material presented in this paper were primarily collected by UV light traps, Mercury-vapor light, or in some instances emergence traps over streams. To prepare drawings, specimens were cleared using concentrated KOH, then washed and mounted on slides for examination under a compound microscope. All material was subsequently stored in 80% alcohol. Terminology follows that of Marshall (1979), with lengths measured from the tip of the head to the wing end. Type material is deposited at the National Museum of Natural History, Smithsonian Institution (**NMNH**), Illinois Natural History Survey (**INHS**), and Florida A&M University (**FAMU**).

In the course of identifying all of the microcaddisflies collected during this study, several species new to science were discovered. Species descriptions and figures for these species were prepared. As we worked through the identifications of Hydroptilidae collected throughout Florida, the identification of particular species was difficult because current figures were inadequate or incomplete, for example only showing the species in one view. We have taken the opportunity with this paper to redo illustrations for these species and also to redraw several species with significant range extensions.

**New Species Descriptions**

***Hydroptila murtlei* sp. n.**
(Fig. 1)

**Diagnosis.** In overall appearance this species is very similar to *H. roberta* Hamilton and Holzenthal from Georgia and *H. hamiltoni* Harris from Eglin Air Force Base in northern Florida. As with both these species, *H. murtlei* has a bulbous segment X and narrow inferior appendages which are straight in both lateral and ventral aspects. The new species can be distinguished by the relative lengths of the phallus sections; in *H. roberta* the apical and basal portions of the phallus are about equal in length; in *H. hamiltoni*, the apical portion is much shorter than the basal portion; in *H. murtlei* the basal portion is about twice the length of the apical portion. As well, the apical portion of the phallus in both *H. roberta* and *H. hamiltoni* is curved, particularly so in *H. hamiltoni*, while in *H. murtlei* the apical portion is straight. Additionally, the inferior appendage of *H. murtlei* narrows apically compared to the rounded apices in both *H. roberta* and *H. hamiltoni*.

**Description**, male. Length 2.1 mm. 28 antennal segments. Brown in alcohol. Abdominal segment VII annular with short posteromesal process ventrally. Segment VIII annular, slightly incised on posteroventral margin. Segment IX circular in lateral view, slight protuberance posterodorsally; ventrally with wide excision mesally, bearing row of elongate setae near posterior margin; dorsally lobate with narrow mesal incision. Segment X elongate and bulbous in lateral view; dorsally narrow basally, widening distally with deep and wide triangular incision. Inferior appendage thin in lateral view, gradually tapering to acute apex; in ventral view appendages narrow and elongate, nearly parallel and widely separate, apices curving slightly outward, bearing elongate setae at midlength. Subgenital plate long and slender in lateral view; ventrally broadly rounded, apically bearing pair of setae mesally. Phallus elongate and tubular, basal section about twice length of apical section, apical section sharply narrowing sub-basally, and straight; ejaculatory duct thin, extending to end of phallus apex; short paramere encircling shaft below juncture of sections.

**Material examined. Holotype, male. FLORIDA: Bay Co.**, Little Crooked Creek at SR-79, Pine Log State Forest, 2.4 km S Ebro, N30°24'48" W85°52'04", 28 April 2002, A. Rasmussen and T. Thom (**NMNH**). **Paratype. FLORIDA: Calhoun Co.**, Juniper Creek at SR-73, N30°21'31.65" W85°12'47.60", 19 May 2010, A. Rasmussen and D. Denson, 1 male (**FAMU**)

**Etymology.** Named for Michael McMurray, affectionately nicknamed "murtle" by his son Andrew, in recognition of the McMurray family's support of scholarship at Clarion University.

***Hydroptila criokera* sp. n.**
(Fig. 2)

**Diagnosis.** This new species appears most similar to *H. maculata* (Banks) (Fig. 3), which is widespread in Florida east of the Apalachicola River, and several related species, with the tenth tergum having elongate processes and a posteroventral extension of segment VIII. From *H. maculata*, *H. criokera* is distinguished by strongly diverging inferior appendages, which are not diverging in *H. maculata*, and by the elongate, stout setae from the posterodorsal margin of segment IX, which are lacking in *H. maculata*.

**Description**, male. Length 1.9 -2.1 mm. Antenna broken after 15 segments. Brown in alcohol. Abdominal segment VII annular with short posteromesal process ventrally. Segment VIII narrow dorsally, elongate extension ventrolaterally. Segment IX annular in lateral view with dorsolateral process bearing numerous elongate, stout setae; ventrally with deep mesal excision; dorsally with lateral lobes bearing elongate setae on posterior margin. Segment X in lateral view shelf-like, with elongate process distally; tubular dorsally and ventrally, elongate distal process thin, extending anteriorly and narrowing to acute apex. Inferior appendage thin and tubular in lateral view, gradually tapering to rounded apex bearing a thin process; in ventral view appendages narrow over length, strongly curved basally and diverging

posteriorly. Subgenital plate thin and indistinct, seemingly fused with venter of segment X. Phallus thin and tubular; ejaculatory duct thin and sinuate, extending beyond end of phallus apex; short paramere encircling shaft near midlength.

**Material examined. Holotype, male. FLORIDA: Liberty County**, Gregory Mill Creek at CR-379, Apalachicola National Forest, N30°10'26" W85°00'48", 6 May 2004, M. Pescador, A. Rasmussen and B. Richard (**NMNH**). **Paratype. FLORIDA:** same locality and date, 1 male (**FAMU**).

**Etymology.** From the Greek "krios" ram, and "keras" horn, referring to the ram-like appearance of the tenth tergum.

***Hydroptila auriscuspa* sp. n.**
(Fig. 4)

**Diagnosis.** This new species appears most similar to *H. lloganae* Blickle (Fig. 5) which is fairly common in Florida, with the tenth tergum having posterolateral extensions. From *H. lloganae*, *H. auriscuspa* is distinguished by the short, triangular inferior appendages, the rounded subgenital plate, and the truncate apex of segment X.

**Description**, male. Length 1.8-2.4 mm. 27-29 antennal segments. Brown in alcohol. Abdominal segment VII annular with short posteroventral process. Segment VIII annular, with slight posteroventral protuberance; ventrally with deep mesal incision. Segment IX narrowing anteriorly in lateral view; square in both dorsal and ventral views. Segment X in lateral view square, with apex truncate; dorsally square, posterolateral margins with pointed lobes, mesal area membranous. Inferior appendages tubular in lateral aspect, rounded apically; in ventral view trianguloid, wide basally, narrowing to acute apex, bearing elongate seta at midlength. Subgenital plate thin and trianguloid in lateral view; ventrally rounded posteriorly, bearing pair of setae mesally. Phallus with basal section elongate, narrowing subapically, apical section short, thin and tubular; ejaculatory duct thin, extending slightly beyond end of phallus apex; short paramere encircling shaft below juncture of apical and basal sections of phallus.

**Material examined. Holotype, male. FLORIDA: Okaloosa Co.**, Blackwater River at Florida A&M University Biological Station, 4.5 mi NW Holt, 23 April 1981, W. & J. Peters (NMNH). **Paratypes. FLORIDA:** same locality and date, 21 males (**NMNH**, **FAMU**, **INHS**); **Okaloosa Co.**, Rogue Creek at Base Rd. 233 bridge, Eglin Air Force Base, 14 August 1985, B. Armitage, 1 male (**NMNH**).

**Etymology.** From the Latin "auris" ear, and "cuspis" pointed, referring to the pointed, ear-like extensions of the tenth tergum.

***Hydroptila santarosa* sp. n.**
(Fig. 6)

**Diagnosis.** This new species appears most similar to *H. cottaquilla* Harris and *H. bribriae* Harris, with the tenth tergum in all these species trilobed. However, the phallus in *H. santarosa* is more similar to that of *H. bribriae*. The new species differs from *H. bribriae* in the structure of segment X, particularly in lateral view, and in the shape of the subgenital plate.

**Description**, male. Length 2.1-2.3 mm. 28 antennal segments. Brown in alcohol. Abdominal segment VII annular with short posteroventral process. Segment VIII annular. Segment IX rounded anteriorly in lateral view, widening posteroventrally; in dorsal and ventral views with deep mesal incision; ventrally with posterior margin incised laterally. Segment X in lateral view rectangular, narrowing posteroventrally, thin median process from dorsum; dorsally trilobed, lateral lobes acute apically, mesal lobe rounded. Inferior appendages boat-shaped in lateral aspect, sclerotized point apically; in ventral view, wide basally and bearing elongate lateral seta, narrowing to acute apex with is turned outward. Subgenital plate in lateral view as wide as segment X, rounded apically, sclerotized ventrally; in ventral view triangular,

narrowing mesally and bearing pair of stout setae. Phallus with basal section elongate, narrowing subapically, apical section elongate, basally tubular, distally sharply angled then tubular; ejaculatory duct thin, and enclosed within phallic shaft; short paramere encircling shaft below juncture of apical and basal sections of phallus.

**Material examined. Holotype, male. FLORIDA: Santa Rosa Co.**, McCostill Mill Creek at Ebenezeer Church Road, N30°55'06" W87°14'50", 15 June 2007, A. Rasmussen and D. Denson (**NMNH**). **Paratype. FLORIDA:** same locality and date, 1 male (**NMNH**).

**Etymology.** Named for Santa Rosa County where the species was collected.

***Hydroptila ebroensis* sp. n.**
(Fig. 7)

**Diagnosis.** This new species appears most similar to *H. morsei* Sykora and Harris and other members of the *H. strepha* Group. It differs in the flared lateral aspect of the tenth tergum and the shape of the inferior appendages in ventral aspect.

**Description**, male. Length 2.5-2.8 mm. 30 antennal segments. Brown in alcohol. Abdominal segment VII annular with short posteroventral process. Segment VIII annular. Segment IX rounded anteriorly in lateral view, deeply incised on posterodorsal margin; in dorsal and ventral view with deep lateral incisions posteriorly, deep mesal incision anteriorly. Segment X in lateral view rectangular, narrowing posteroventrally, thin median process from dorsum; dorsally trilobed, lateral lobes acute flaring outward to acute apices, mesal lobe short and tubular. Inferior appendages in lateral aspect widening distally from narrow base; in ventral view, narrow basally and widely separated, bearing elongate lateral seta, gradually widening posteriorly and turned outward at pointed apices. Subgenital plate in lateral view narrow and sinuate, sclerotized on dorsal margin; in ventral view triangular, narrow point mesally and bearing pair of stout setae. Phallus with basal section elongate, narrowing subapically, apical section elongate, wide basally narrowing distally and curving; ejaculatory duct thin, and slightly longer than phallic shaft; short paramere encircling shaft below juncture of apical and basal sections of phallus.

**Material examined. Holotype, male. FLORIDA: Bay Co.**, Little Crooked Creek at SR-79, 1.5 mi S Ebro, Pine Log State Forest, N30°24'48" W85°52'04", 11 May 2007, A. Rasmussen (**NMNH**). **Paratypes. FLORIDA:** same locality and date, 3 males (NMNH); **Liberty Co.**, Gregory Mill Creek at CR-379, Apalachicola National Forest, N30°10'26" W85°04'04", 16 May 2006, R. Flowers, A. Rasmussen, and B. Richard, 1 male (**FAMU**); **Santa Rosa Co.**, Thomas Creek at Molino Bridge Road, N30°43'50" W87°16'21", 13 June 2007, A. Rasmussen and D. Ray, 1 male (**INHS**); **Washington Co.**, Pine Log Creek at SR-79, Pine Log State Forest, N30°25'07" W85°52'21", 11 May 2007, A. Rasmussen, 20 males (**INHS**, **FAMU**).

**Etymology.** Named for the town of Ebro, Florida located near the type locality.

**Annotated List of the Hydroptilidae of Florida**

The following checklist includes 76 species of Hydroptilidae known to occur in Florida and an additional 5 species which are likely to be collected in Florida based on their distribution in Alabama. Collection records are presented for 10 species representing new state/country records and are preceded by a (*). Species which have not been collected in Florida, but would be expected to occur based on their distribution in Alabama, are preceded by a (?). Species reported as occurring in Florida for which the record is dubious and the occurrence in Florida is doubtful is preceded by (¿). For distributions, states are abbreviated by the standard postal codes and county records for Florida are given as numeric codes (Fig. 8). Following the county codes, we list the conservation status for each species (1-5) as assigned by NatureServe (2012), where 1=critically imperiled, 2=imperiled, 3=vulnerable, 4=apparently secure, 5=secure, and the appropriate geographic scale of assessment is indicated by G=global, and S=state. In some instances conservation status is indicated with letters: H=historic, possibly extinct, U=unrankable.

*Hydroptila acadia* Ross, 1941a. 2, 4, 8, 9. GU. This species was described from Nova Scotia and its occurrence in Florida seemed unlikely, but in 2004, Flint et al. recorded the species from VA and we have seen an additional specimen from Mobile Co. in coastal AL. In FL, the species has been collected from several streams of various sizes in the western panhandle. As the species was unexpected in FL, we have redrawn it here (Fig. 9).

**Hydroptila ajax* Ross, 1938. 1, 52, 57. G5. This species is widespread, primarily in the northern United States, with previous southern records from AR, TX and Mexico. Florida populations appear to be widespread but sparse. As its occurrence in FL was unexpected and the original drawings in Ross (1938) lack a dorsal view of the male, we have taken the opportunity to redraw the species (Fig. 10). **NEW STATE RECORD, FLORIDA: Escambia Co.**, Pine Barren Creek below US-29, 28 April 2009, N30°46'33" W87°20'20", 1 male. **DeSoto Co.**, Peace River at SR-70, American Legion Park, N27°13'27" W81°52'52", 4 May 2007, 3 males. **Hardee Co.**, Horse Creek at Goose Pond Road, N27°24'40" W81°58'57", 4 May 2007, 2 males.

**Hydroptila alabama* Harris and Kelley, 1984. 1-3, 6, 8. G4, S2. Widespread in AL, extending southward into the western panhandle of FL. Also recorded from GA, ME, NC, NY, PA, TN, and TX. **NEW STATE RECORD, FLORIDA: Escambia Co.**, Blue Water Creek at Fire Break Road #5, Blue Water Creek Wildlife Management Area, N30°47'45" W87°22'26", 15 June 2007, 5 males; Canoe Creek above Bratt Road, N30°57'27" W87°20'54", 15 June 2007, 8 males; same as above except 24 April 2009, 1 male; Pine Barren Creek below US-29, N30°46'25" W87°20'38", 14 June 2007, 1 male; Brushy Creek at Pineville Road West of Enon, N30°47'48" W87°33'24", 14 June 2007, 2 males; McDavid Creek at CR-99, N30°44'56" W87°27'31", 14 June 2007, 3 males. **Jackson Co.**, Bridge Creek at SR-71, N30°43'50" W85°11'07", 7 May 2011, 1 male. **Okaloosa Co.**, Panther Creek at Sherman Kennedy Road, Blackwater River State Forest, N30°51'22" W85°43'30", 19 May 2007, 1 male. **Santa Rosa Co.**, Reedy Creek at Bracken Road, N30°58'53" W86°49'58", 19 April 2012, 1 male; McCostill Mill Creek at Ebenezeer Church Road, N30°55'06" W87°14'50", 15 June 2007, 1 male; Thomas Creek at Molino Bridge Road, N30°43'50" W87°16'21", 13 June 2007, 1 male. **Washington Co.**, Pine Log Creek at SR-79, Pine Log State Forest, N30°25'07" W85°52'21", 11 May 2007, 1 male.

*Hydroptila apalachicola* Harris, Pescador, and Rasmussen, 1998. 12. G1, S1. Endemic to small streams draining to the Apalachicola River in the Apalachicola Bluffs and Ravines Region located in the western panhandle of FL. Subsequent to the type collection from Little Sweetwater Creek in May of 1994, we have recovered the species from Little Sweetwater Creek (May 2012) and Big Sweetwater Creek (June 2012).

*Hydroptila armata* Ross, 1938. 8, 9, 12, 15, 20, 28, 32, 35, 36, 38, 41. G5. Widespread across the eastern United States. In FL, most common in spring-fed rivers, with records extending from the Chipola River in the panhandle southeastward to the Homosassa River on the peninsula.

*Hydroptila auriscuspa* **sp. n.** 3. Fig. 4. Known only from specimens collected in the 1980s from two localities, the Blackwater River and Rogue Creek in the western FL panhandle.

*Hydroptila berneri* Ross, 1941a. 3, 4, 6, 8-10, 12, 18-20, 22, 28, 32, 33, 35, 36, 40, 43, 45, 47, 51, 52. G4G5, S3. Described from specimens collected from the Santa Fe River, this primarily southeastern species is common in lotic habitats throughout much of FL. The key in Blickle (1979) uses the convergence of the tips of the inferior appendages as a diagnostic character, but in many of the specimens examined from FL these structures are parallel-sided.

*Hydroptila bribriae* Harris, 2002. 2-4. G1, S1. Endemic to spring-fed streams on Eglin Air Force Base in the western panhandle of FL.

*Hydroptila circangula* Harris, 1985. 1-3, 7, 9. G2G3. Endemic to streams of the coastal counties of AL and the western panhandle of FL.

*Hydroptila criokera* **sp. n.** 12. Fig. 2. Known only from the type locality, Gregory Mill Creek, a large and healthy blackwater stream in the Apalachicola National Forest.

*Hydroptila disgalera* Holzenthal and Kelley, 1983. 1-4, 6-9, 12, 15, 28. G4. Recorded from AL, FL, and SC, this species commonly occurs in streams and rivers of Coastal Plain AL and across northern FL.

*Hydroptila ebroensis* **sp. n.** 2, 6, 7, 12. Fig. 7. Restricted in distribution to healthy blackwater streams in the western panhandle of FL.

*Hydroptila eglinensis* Harris, 2002. 2-4. G1, S1. Endemic to spring-fed streams on Eglin Air Force Base in the western panhandle of FL.

**Hydroptila gunda* Milne, 1936. G5. This widespread eastern species was recently collected in FL for the first time from a stream a few miles from the AL/FL border. **NEW STATE RECORD, FLORIDA: Jackson Co.,** Spring Branch at SR-2, N30°56'14" W85°19'26", 10 May 2012, 1 male.

*Hydroptila hamata* Morton, 1905. 3, 4, 8. G5. This species occurs in much of North America, but in FL has been collected only from a few panhandle streams.

*Hydroptila hamiltoni* Harris, 2002. 3, 4. G1, S1. Endemic to spring-fed streams on Eglin Air Force Base, in the western panhandle of FL.

**Hydroptila icona* Mosely, 1937. 14. G5. This species occurs primarily in Central America and the southwestern US as far east as TX. The species also occurs on the Hawaiian Islands where it appears to have been introduced recently and rapidly expanded its range (Flint et al. 2003). Because this species is now known from FL and may occur in other southeastern states, we take the opportunity to provide new illustrations herein (Fig. 11). **NEW STATE RECORD, FLORIDA: Leon Co.**, Fisher Creek at Springhill Road, Apalachicola National Forest, N30°18'54" W84°23'58", 8 May 2008, 1 male.

*Hydroptila latosa* Ross, 1947. 2-4, 7-10, 16, 28. G2G3. A widespread and common species in healthy streams across North FL, also occurring in AL, GA, and SC. The original description and the subsequent key (Blickle 1979) uses the diverging inferior appendages as a diagnostic character, however in most of the specimens we've seen in Florida this is not the case, as illustrated in Fig. 12.

*Hydroptila lloganae* Blickle, 1961. 1-3, 11, 16, 19, 24, 28, 30, 32, 43, 45, 47-49, 52, 53. G3. We had difficulty separating this species from *H. novicola* Blickle and Morse, both of which are widespread in FL and throughout the southeast. With this mind, we have redrawn *H. lloganae* (Fig. 5) and *H. novicola* (Fig. 13). Paratypes of *Hydroptila morsei* Sykora and Harris, a junior synonym of *H. lloganae*, included specimens collected from Archbold Biological Station in Highlands Co., FL (Sykora and Harris 1994).

*Hydroptila maculata* (Banks, 1904a). 14, 15, 28, 31-33, 35, 36, 38, 40, 43, 47-50, 57, 59, 61, 67. G3G4. This species is distributed along the east coast from FL to ME. In FL it is found throughout the peninsula and west to the Ochlockonee River basin. When we were trying to differentiate *H. criokera* n. sp. (Fig. 2) from *H. maculata*, we found the original drawings of *H. maculata* to be incomplete and have taken the opportunity herein to rectify the situation (Fig. 3).

**Hydroptila metteei* Harris, 1991. 8. G1G2. A narrow-range endemic previously known from only two small streams in southeastern AL, near the border with FL. Due south of the these localities, we recovered the species in FL from Dry Creek, a tributary of the Chipola River. **NEW STATE RECORD, FLORIDA: Jackson Co.**, Dry Creek at SR-73, N30°41'22" W85°14'10", 6 May 2010, 5 males; same as above except 2 October 2010, 1 male.

*Hydroptila molsonae* Blickle, 1961. 1-4, 6, 9, 12, 28, 43, 53. G2G3, S2. A lower Gulf Coastal Plain species of AL, FL, LA, and MS. The species was described based on specimens collected in 1958 from Highlands

Hammock State Park in south-central FL. Recent collections near that area yielded no new specimens (Rasmussen et al. 2008), but recent collections have recovered the species from a number of streams in the panhandle of FL and as far South as Seminole Co. on the peninsula. The most abundant collections have come from small, healthy blackwater streams.

*Hydroptila murtlei* **sp. n.** 7, 9. Fig. 1. Known only from 2 blackwater streams in the western panhandle of FL.

*Hydroptila novicola* Blickle and Morse, 1954. 1-3, 9, 11, 12, 15, 24, 28, 43. G4G5. An eastern species with a disjunct populations in the southeast (AL, FL, GA, LA, and east TX). In FL we have collected it from various healthy streams across northern FL and on the peninsula as far south as Seminole Co.

*Hydroptila okaloosa* Harris, 2002. 2, 3. G1, S1. Endemic to spring-fed streams on the western side of Eglin Air Force Base, in the western panhandle of FL.

**Hydroptila paralatosa* Harris, 1985. 1, 8. G2. Previously only known from small streams situated along, or near, the Fall Line in AL (Harris et al. 1991); its occurrence in FL is surprising. **NEW STATE RECORD, FLORIDA: Escambia Co.**, Blue Water Creek at Fire Break Road #5, Blue Water Creek Wildlife Management Area, N30°47'45" W87°22'26", 15 June 2007, 3 males. **Jackson Co.**, Mill Creek upstream of Maddox Road, N30°34'53" W85°12'54", 2 October 2010, 1 male.

*Hydroptila parastrepha* Kelley and Harris, 1983. 1-3. G2G3. This narrow-range endemic is restricted in distribution to streams of coastal AL and the far-western panhandle of FL.

*Hydroptila quinola* Ross, 1947. 1-9, 11, 12, 14-17, 19, 22, 24, 28, 30, 32, 33, 35, 36, 43, 49, 53. G5. A common species found in much of the eastern United States. In FL the species occurs in many streams and rivers across FL as far south as Highlands Co.

*Hydroptila remita* Blickle and Morse, 1954. 1-4, 6-9, 11, 12, 14, 28, 53. G5. A widespread eastern species that is fairly common in streams and rivers in the FL panhandle as far east as Leon Co. The only records for peninsular FL come from Blickle's collections from the late 1950s (Blickle 1962).

*Hydroptila santarosa* **sp. n.** 2. Fig. 7. Known from only the type locality, McCostill Mill Creek, a small spring-fed stream within the Escambia River basin in northern Santa Rosa Co.

*Hydroptila sarahae* Harris, 2002. 2-4. G1, S1. Endemic to spring-fed streams on Eglin Air Force Base, in the western panhandle of FL.

**Hydroptila scheiringi* Harris, 1986. 15. G1G2. A lower Coastal Plain endemic known from only a few streams in AL and now from one FL locality south of Tallahassee. **NEW STATE RECORD, FLORIDA: Wakulla Co.**, Lost Creek at CR-368 near Arran, Apalachicola National Forest, N30°11'19" W84°24'31", 6 May 2007, 4 males.

*Hydroptila sykorai* Harris, 2002. 11. G1, S1. This species is known from only 5 specimens collected from an emergence trap placed over a ravine spring run that drains to Quincy Creek within the Ochlockonee River basin.

*Hydroptila wakulla* Denning, 1947. 15, 32, 33, 36, 40, 47, 53. G2, S2. Endemic to FL, this species occurs most abundantly in larger spring runs, such as the Wakulla and Silver. We were hindered in our identifications by the incomplete original drawings, which we redo here (Fig. 14).

*Hydroptila waubesiana* Betten, 1934. 1-4, 6-12, 14-16, 28, 32, 48. G5. A common species throughout much of the United States; it is widespread and common in streams and rivers of northern FL. The species has

not been collected from central and south FL since Blickle's survey during the 1950s when he recorded the species from Lakeland, Polk Co. (Blickle 1962).

**Hydroptila wetumpka* Harris, 1991. 6. G1. Previously only known from the type locality in the Piedmont region of AL; its occurrence in FL is surprising. **NEW STATE RECORD, FLORIDA: Washington Co.**, unnamed ravine stream that flows into Whitewater Lake, N30°28'46" W85°33'14", 6 June 2009, 1 male.

*Ithytrichia clavata* Morton, 1905. 8. G5. Widespread throughout the United States and southern Canada, but rare in the southeast with records from AR, FL, and TX. The sole FL record for this species is based on 2 males collected from the Florida Caverns State Park on 4 May 1970 (Moulton et al. 1999). Pescador et al. (1995, 2004) overlooked this record in their checklists; the record of which is the only record for this genus in FL.

*Mayatrichia ayama* Mosely, 1934. 1-4, 8, 9, 11, 12, 15-17, 19, 20, 22, 28, 32, 33, 36, 40, 47, 57. G5. A widely distributed species in North America, including Mexico, United States, and Canada. It occurs fairly commonly in streams and rivers in northern FL; our southernmost record is from the Peace River in De Soto Co.

*Neotrichia alabamensis* Kelley and Harris, 1983. 1, 3, 11, 12. G3G4. Known from AL, FL, and MS. In FL, the species is restricted to the western panhandle. New figures of this species, as well as *N. armitagei, N. mobilensis*, and *N. rasmusseni* are available in Harris and Rasmussen (2010).

*Neotrichia armitagei* Harris, 1991. 1-4, 6-10, 12, 15, 24, 28, 32, 33, 49. G2. Endemic to the lower Coastal Plain, with records from AL, FL, GA, MS, and TX. In FL, it occurs in small to large streams across northern FL, extending into central FL.

*Neotrichia minutisimella* (Chambers, 1873). 1-10, 12, 22, 35, 53, 57. G5. Distributed across most of the United States east of the Rockies. It is common in a wide variety of streams and rivers throughout most of FL as far south as the Peace River.

?*Neotrichia mobilensis* Harris, 1985. G1G2. While this species has not yet been found in FL, recent collecting by Dr. Pat O'Neil and his colleagues from the Geological Survey of Alabama, in the large rivers of the Mobile Delta of coastal AL, discovered large numbers of this species. We would expect to find it in some of the larger rivers of northern FL.

¿*Neotrichia okopa* Ross, 1939. G5. Transcontinental in distribution, but uncommon in the southeast. Hamilton and Schuster (1978) and Blickle (1979) listed this species as occurring in FL but provided no additional locality information. Other than this state listing which is dubious (S.H. Hamilton and G.A. Schuster Pers. Comm.), we have no other collection records from FL. Therefore, we remove this species from the state checklist. There are a few scattered records for this species in AL so there is a possibility that it will be found in FL.

*Neotrichia rasmusseni* Harris and Keth, 2002. 15, 20, 28, 36, 40. G1G2. A FL endemic, originally described from the Santa Fe River, the species has since been found to be locally abundant in large spring run systems in the Ocala National Forest. Our western-most record is from the Wakulla River in the panhandle of FL. Harris and Rasmussen (2010) provided a description and illustrations of the female along with new figures for the male.

*Neotrichia vibrans* Ross, 1938. 1-12, 14-17, 19, 22, 28, 30-33, 35-37, 40-43, 45, 47-49, 51, 52, 58, 61, 67. G5. A common eastern species which was frequently collected in large streams and rivers throughout FL.

*Ochrotrichia apalachicola* Harris, Pescador, and Rasmussen, 1998. 3, 11, 12. G1, S1. Endemic to the panhandle of FL, this species was described based on a single male collected from Beaver Dam Creek located on The Nature Conservancy's Apalachicola Bluffs and Ravines Preserve, Liberty Co., FL. Subsequent to the type collection, we recovered the species from a steephead on Eglin Air Force Base (Rasmussen 2004) and more recently, from 3 ravine streams within the Apalachicola Bluffs and Ravines Region (Little and Big Sweetwater creeks, Liberty Co., and Crooked Creek headwater, Gadsden Co.)

*Ochrotrichia confusa* (Morton, 1905). 12. G5. A widely scattered, uncommon species in the eastern United States. Our sole record from FL is from a short, unnamed ravine stream that empties into the Apalachicola River just north of Alum Bluff (Rasmussen 2004).

*Ochrotrichia okaloosa* Harris, 1987. 3. G1, S1. Known only from the holotype male collected from Turkey Creek on Eglin Air Force Base in the panhandle of FL. Subsequent light trap collections at and near the type locality have not recovered any additional specimens.

*Ochrotrichia provosti* Blickle, 1961. 47. GH, SH. Known only from the holotype collected from Temple Terrace, FL. Numerous collections from the nearby Hillsborough River yielded no additional specimens (Rasmussen et al. 2008).

*Ochrotrichia tarsalis* (Hagen, 1861). 1, 15, 36, 40, 45, 47. G5. A common eastern species which extends into the southwestern U.S. and Mexico. Except for 2 collections in the panhandle of FL, all of our collections have come from the northern part of peninsular FL where we have found the species to be locally abundant in the Hillsborough River and large spring-run systems in and around the Ocala National Forest.

*Orthotrichia aegerfasciella* (Chambers, 1873). 1-9, 11, 12, 14-17, 19, 24, 28, 32, 33, 35-38, 40-43, 45, 47-53, 55, 57, 59, 61, 63, 67. G5. Common throughout the eastern half of the United States, it is abundant in FL, particularly in slow-moving waters and lakes. The species is also known from Cuba, Haiti, and Mexico.

*Orthotrichia baldufi* Kingsolver and Ross, 1961. 2, 3, 5, 8, 9, 11, 12, 14, 15, 24, 30, 32, 33, 36, 37, 40, 53. G5. An eastern species that is uncommon in the southeast with records from eastern TX, northern AL, and FL. It occurs in many different types of lotic and lentic habitats in FL but is uncommon in our collections.

*Orthotrichia cristata* Morton, 1905. 1-4, 8, 9, 11, 12, 15, 24, 36, 50, 61, 66, 67. G5. A widely distributed species in the United States east of the Rockies. The species has been collected throughout FL from the western panhandle to Key West in the FL Keys but is less frequently collected in FL than *O. aegerfasciella*. The species also occurs in Cuba and Jamaica.

*Orthotrichia curta* Kingsolver and Ross, 1961. 1, 3, 8, 9, 11, 12, 14, 16, 24, 28, 36, 40, 43, 47, 48, 53, 59. G4, S2S3. Another primarily southeastern species, which occurs in both lotic and lentic habitats. This species was found to be locally abundant in some prairie ponds of peninsular FL.

*Orthotrichia dentata* Kingsolver and Ross, 1961. 1, 3, 6, 8, 9, 15, 28, 31, 36, 47. G2G3, S1S2. Recorded from FL, MS, SC, and VA but rarely collected. The species is described from specimens collected from Temple Terrace (Hillsborough Co.) by R.L. Blickle in the 1950s. Recent collections from the Hillsborough River and other localities within the basin did not recover any additional specimens, but we have collected the species from scattered localities across the northern half of FL, most abundantly from the Rainbow and Silver rivers (Marion Co.).

*Orthotrichia instabilis* Denning, 1948. 8, 9, 12, 36, 40, 42. G3, S1. A primarily southeastern species with disjunct records from NH. Somewhat more widely distributed in the eastern United States than *O. dentata*, it is rare in our collections.

*Oxyethira abacatia* Denning, 1947. 2, 3, 6, 8, 9, 11, 12, 14, 15, 28, 36, 40, 43. G4G5. Another southeastern species which is fairly common in northern FL, particularly in ponds and lakes.

?*Oxyethira anabola* Blickle, 1966. G4G5. Although this species is primarily northern in distribution, 2 males have been reported from two streams in coastal AL (Baldwin and Mobile Cos.) (Moulton and Harris 1999); therefore this species is likely to also occur in FL.

**Oxyethira arizona* Ross, 1948. 47, 51, 52, 59. G2G4. Known from the southwestern United States (AZ, CA), Costa Rica, Mexico, and the Antilles (Dominica, Jamaica, Martinique, and Puerto Rico) (Flint et al. 1999), we collected this species at several localities in the southern half of FL. Since we had difficulty placing this species owing to the known range, we have redrawn the species herein (Fig. 15). **NEW STATE RECORD, FLORIDA: Hardee Co.**, Horse Creek at Goose Pond Road, N27°24'40" W81°58'57", 4 May 2007, 7 males. **Hillsborough Co.**, Little Manatee River at CR-579, S of Wimauma, N27°39'46" W82°18'02", 4 April 2007, 3 males. **Manatee Co.**, Manatee River at SR-64, N27°28'24" W82°12'40", 4 May 2007, 1 male. **Martin Co.**, unnamed lake adjacent to bike trail, Jonathan Dickinson State Park, N27°00'06" W80°06'14", 14 April 2007, 1 male; same as above except wetland prairie pond near Pine Grove Camping Area, N26°59'57" W80°06'12", 3 males.

*Oxyethira chrysocara* Harris, 2002. 6, 28. G1, S1. This species was described based on a single male specimen collected from Gold Head Branch (Clay Co., FL), a spring-fed stream that flows from a steephead ravine and empties into Little Lake Johnson. Subsequent to the type collection, we recovered another male from Gold Head Branch further downstream where the stream flows into Little Lake Johnson. Interestingly, we also collected this species in the western FL panhandle in Washington Co. from an unnamed ravine stream that flows into Whitewater Lake. Here we collected 1 male from the middle reaches of the stream and 4 males downstream where the stream enters the lake basin. The species is known from only these localities.

*Oxyethira elerobi* (Blickle, 1961). 1-4, 6, 7, 9, 12, 28. G3G4, S2S3. Endemic to the southeastern states, this species is widespread in northern FL and is found primarily in healthy blackwater creeks and rivers (Rasmussen et al. 2008).

*Oxyethira florida* Denning, 1947. 3, 28, 47, 67. G1G2, S1S2. Known from FL, TX, and Cuba. The type series of specimens was collected from Miami and subsequently the species was reported in FL from Temple Terrace (Hillsborough Co.) by Blickle (1962) and much more recently, from several sites spread across the state, including 12 specimens collected from a constructed wetland pond within Oleta River State Park (Miami-Dade Co.) (Rasmussen et al. 2008).

*Oxyethira glasa* (Ross, 1947). 1-4, 6-9, 11, 12, 14-16, 19, 28, 32, 33, 36, 38, 40, 43, 47-50, 53, 59, 61, 66, 67. G5. Primarily southeastern in occurrence, but also reported from Cuba and Costa Rica. It is quite common on the Gulf Coastal Plain; in FL we collected it from lotic and lentic habitats throughout the state, frequently in large numbers from ponds and lakes.

*Oxyethira grisea* Betten, 1934. 12. G5. A widespread eastern species infrequently collected on the Gulf Coastal Plain. In FL it is known from a single male collected from Beaver Dam Creek, a spring-fed tributary of the Apalachicola River in Liberty Co. (Rasmussen 2004).

*Oxyethira janella* Denning, 1948. 1-4, 6-12, 14-19, 22, 24, 28, 30-33, 35-38, 41-43, 45, 47-49, 51-53, 57-59, 61. G5, S4S5. The holotype of the species was collected in Winter Park, FL (Orange Co.) The species occurs in Central America, the Antilles, and across much the southeastern United States, extending into OK and VA.

*Oxyethira kelleyi* Harris, 1987. 2-4. G1G2, S1S2. Endemic to Eglin Air Force Base where it is widespread and common in Eglin's spring-fed streams.

*Oxyethira kingi* Holzenthal and Kelley, 1983. 67. GH, SH. Only known from a single specimen collected at the Plant Inspection Center in Miami. The species is a member of the *O. santiagensis* Group whose members are primarily South American in distribution. That the lone specimen was collected at an inspection center and that we have not seen the species anywhere else in FL, suggests that it accidentally entered the United States in cargo from the tropics.

?*Oxyethira lumipollex* Kelley and Harris, 1983. G2. This AL species has not yet been collected in FL, but in looking at material from the Escatawpa River near the FL border, we had difficulty placing material based on existing drawings. With the distinct possibility that this species will eventually be collected in northern FL, we provide new illustrations here (Fig. 16).

*Oxyethira lumosa* Ross, 1948. 2-4, 6-9, 11, 12, 14-16, 24, 28, 30, 32, 33, 36-38, 40, 43, 45, 47-49, 53. G4. Endemic to the southeast (AL, FL, GA, SC, TX), the species is widespread and fairly common in streams and rivers of northern and central FL, south to Highlands Co. The species is easily confused with *O. pescadori*, with which the species often co-occurs. The two species can be separated using the figures and descriptions in Harris and Keth (2002).

*Oxyethira maya* Denning, 1947. 2-4, 6, 8, 9, 11, 12, 14, 15, 17, 19, 22, 24, 28, 30, 32, 33, 35-38, 40-43, 45, 47, 49-53, 57-59, 61, 67. G5. Distributed across Mexico, TX, AL, FL, and GA, as well as the Hawaiian Islands and Cuba. In FL, it is widespread and common in lentic and lotic habitats throughout the state, including the southern FL Keys.

*Oxyethira novasota* Ross, 1944. 1-4, 7-9, 11, 12. G4G5, S2. A widespread and common species that is primarily southeastern in its distribution. In FL, the species is not typically collected in large numbers and is restricted to healthy, small to medium-sized streams in the western panhandle region of the state.

*Oxyethira pallida* (Banks, 1904b). 1-4, 6-9, 11, 12, 14-17, 24, 28, 32, 33, 36, 38, 40, 42, 45, 47, 51, 52. G5. Widespread east of the Rockies; in FL, it occurs in lotic and lentic habitats across northern and central FL south to Hardee and Manatee Cos.

*Oxyethira pescadori* Harris and Keth, 2002. 1-4, 6-9, 11, 12, 14, 16, 24, 28, 32, 33, 35, 36, 40, 42, 43, 45, 49. G3G4, S3. Originally described from coastal AL and northern FL, the species is also known from AR, KY, NC, TN, and VA. The species is widespread and common in streams and rivers across northern and central FL.

*Oxyethira roberti* Roy and Harper, 1980. 1, 2, 6, 8, 9, 11, 14, 24. G3G4. Widely distributed in the eastern U.S. (AL, FL, SC, TX) and Quebec. The species was reported in FL as *O. leonensis* Kelley based on type material collected from Tall Timbers Research Station in Leon Co. (Kelley 1981). *Oxyethira leonensis* was later determined by Kelley (1984) to be a subjective junior synonym of *O. roberti* which was described from Quebec. We have recovered this infrequently collected species from localities scattered across northern FL.

*Oxyethira savanniensis* Kelley and Harris, 1983. 1-4, 6, 8, 9, 28. G3. Known from AL, FL, and SC; in FL, it occurs sporadically in lotic and lentic habitats across the northern part of the state.

*Oxyethira setosa* Denning, 1947. 2, 4, 6, 8, 9, 12. G2G3, S1S2. Another southeastern endemic (AL, FL, GA), the species is uncommon in FL and appears to be restricted to the western panhandle.

**Oxyethira simulatrix* Flint, 1968. 32, 35-38, 42, 43, 45, 47, 48, 51-53, 61, 63, 66. The previously known distribution of this Neotropical species is from Central America into Mexico and the Greater Antilles. We were surprised to find the species in FL where it was widespread in peninsular FL. Owing to the range extension, we have taken the opportunity to redraw the species (Fig. 17). **NEW COUNTRY AND STATE RECORD, USA, FLORIDA: Alachua Co.**, Santa Fe River at US-27 boat ramp, N29°50'35" W82°37'51", 10 May 2006, 1 male. **Citrus Co.**, Homosassa River at W. Fishbowl Drive, N28°47'53" W82°35'21", 10

December 2008, 11 males. **Hardee Co.**, Horse Creek at Goose Pond Road, N27°24'40" W81°58'57", 4 May 2007, 1 male. **Highlands Co.**, Charley Bowlegs Creek at Cottage Road bridge, Highlands Hammock State Park, N27°28'15" W81°33'09", 30 March 2007, 1 male; Lake Annie at outlet on North end of lake near SR-70, N27°12'37" W81°20'56", 11 April 2007, 7 males. **Hillsborough Co.**, Little Manatee River at CR-579 S of Wimauma, N27°39'46" W82°18'02", 4 April 2007, 5 males. **Lee Co.**, Caloosahatchee River at Alva public boat landing, N26°42'50" W81°36'22", 11 April 2007, 1 male. **Levy Co.**, Waccasassa River at SR-19, N29°16'33" W82°44'13", 8 June 2007, 5 males; Wekiva River at SR-19, N29°14'55" W82°43'15", 8 June 2007, 12 males. **Manatee Co.**, Manatee River at SR-64, N27°28'24" W82°12'40", 4 May 2007, 6 males; Myakka River at Wauchula Road bridge, N27°21'57" W82°08'57", 4 May 2007, 9 males. **Marion Co.**, Juniper Creek at Hwy 19, Ocala National Forest, N29°13'18" W81°39'09", 20 October 2007, 2 males; Rainbow River at SR-484, Dunnelon, N29°02'57" W82°26'50", 8 June 2007, 1 male. **Monroe Co.**, Blue Hole at Key Deer Blvd, National Key Deer Refuge, N24°42'22" W81°22'52", 2 June 2009, 2 males. **Orange Co.**, Davenport Creek at Old Lake Wilson Road, N28°16'20" W81°35'24", 23 July 2009, 3 males; Settlement Creek downstream of SR-520, N28°27'35" W80°59'17", 24 June 2009, 2 males; Swale behind Reedy Creek Improvement District Lab, N28°22'48" W81°35'19, 8 August 2009, 1 male; Whittenhorse Creek at DS Hartzog Road, N28°23'10" W81°36'52", 16 September 2009, 3 males. **Palm Beach Co.**, NW Fork Loxahatchee River at Riverbend County Park, N26°55'53" W80°10'30", 14 April 2007, 2 males. **Pasco Co.**, Hillsborough River at SR-39, N28°11'36" W82°09'56", 13 May 2005, 2 males; Withlacoochee River at River Road bridge E of Dade City, N28°21'09" W82°07'34", 3 April 2007, 1 male. **Polk Co.**, Livingston Creek at Rucks Dairy Road, Arbuckle State Forest, N27°42'32" W81°26'49", 31 March 2007, 2 males; Tiger Creek at Walk-In-Water Road, N27°48'44" W81°26'39", 31 March 2007, 27 males. **Seminole Co.**, Wekiva River at Wilson Landing Park off SR-46, N28°48'31" W81°25'01", 9 May 2007, 121 males; same as above except Wekiva Park Lane at canoe launch, N28°49'46" W81°24'45", 35 males. **Volusia Co.**, Sand Creek at SR-415, N29°04'24" W81°04'06", 22 June 2007, 3 males; Tomoka River downstream of LPGA Blvd, Ormond Beach, N29°13'03" W81°06'32", 22 June 2007, 18 males.

*Oxyethira sininsigne* Kelley, 1981. 3, 6, 8, 12, 14, 15, 28, 36, 40, 53. G3G4. Endemic to the southeast (AL, FL, LA, SC), this species is widespread in FL, but infrequently collected, most often from oligotrophic ponds where it is sometimes locally abundant.

*Oxyethira verna* Ross, 1938. 2, 4, 8, 11, 12, 15-17, 19, 24, 28, 30, 32, 35-38, 40, 42, 43, 45, 47-50, 53, 55, 59, 61, 67. G5. Eastern in distribution, in FL we have records from lotic and lentic habitats across most of the state, but our collection records also indicate that the species is much less common in FL now than it was in the 1940s and 1950s. Denning (1947) reported the species in abundance from Miami, and Blickle (1962) stated this was "a widespread, numerous species."

*Oxyethira zeronia* Ross, 1941b. 1-4, 6-12, 14-16, 22, 24, 28, 32, 33, 35-37, 40-43, 45, 47-53, 59, 61, 66, 67. G5. Unlike the preceding species, *O. zeronia* is common throughout the eastern United States and is common in lotic and lentic habitats throughout FL from the western panhandle to the southern FL Keys.

?*Stactiobiella martynovi* Blickle and Denning, 1977. G4. Locally abundant in the eastern United States with records from AL, SC, NC, and TN in the southeast, we would expect to find this species in northern FL based on its occurrence in Baldwin Co., AL which abuts the western panhandle of FL (Harris et al. 1991).

?*Stactiobiella palmata* (Ross, 1938). G5. More widespread in occurrence than the preceding species with southeastern records from AL, AR, NC, and TN, we would expect to find this species in northern FL based on its occurrence on the Coastal Plain of AL, including Mobile Co.

**Acknowledgments**

We gratefully acknowledge the many colleagues that assisted in the collecting of material, including R. Abad, B. Armitage, R. Flowers, A. Heupel, M. Pescador, W. and J. Peters, D. Ray, B. Richard, and T.

Thom. Samantha Sullivan at Clarion University scanned the original illustrations and assisted in the construction of the figure plates. This research was supported in part by research grants (FLAX 20084 and FLAX 02431) from USDA-NIFA to Florida A&M University and by a State Wildlife Grant from the Florida Fish and Wildlife Conservation Commission (Agreement No. 06009). We appreciate the reviews of this manuscript by Drs. Brian Armitage and Tatiana Arefina-Armitage (Trichoptera, Inc., Columbus, Ohio).

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**Received November 23, 2012; Accepted December 3, 2012.**

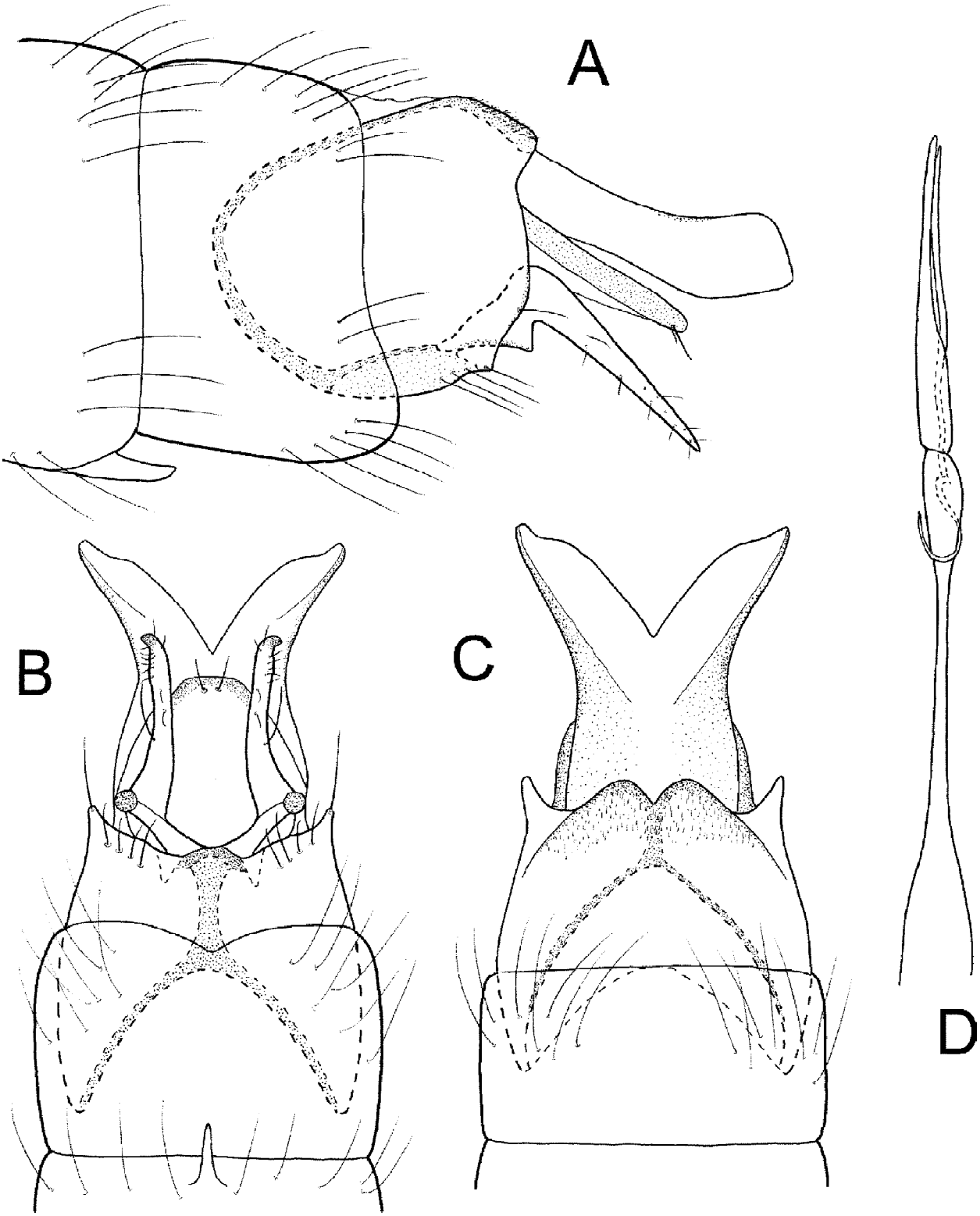


**Figure 1**. *Hydroptila murtlei*, new species. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, ventral.

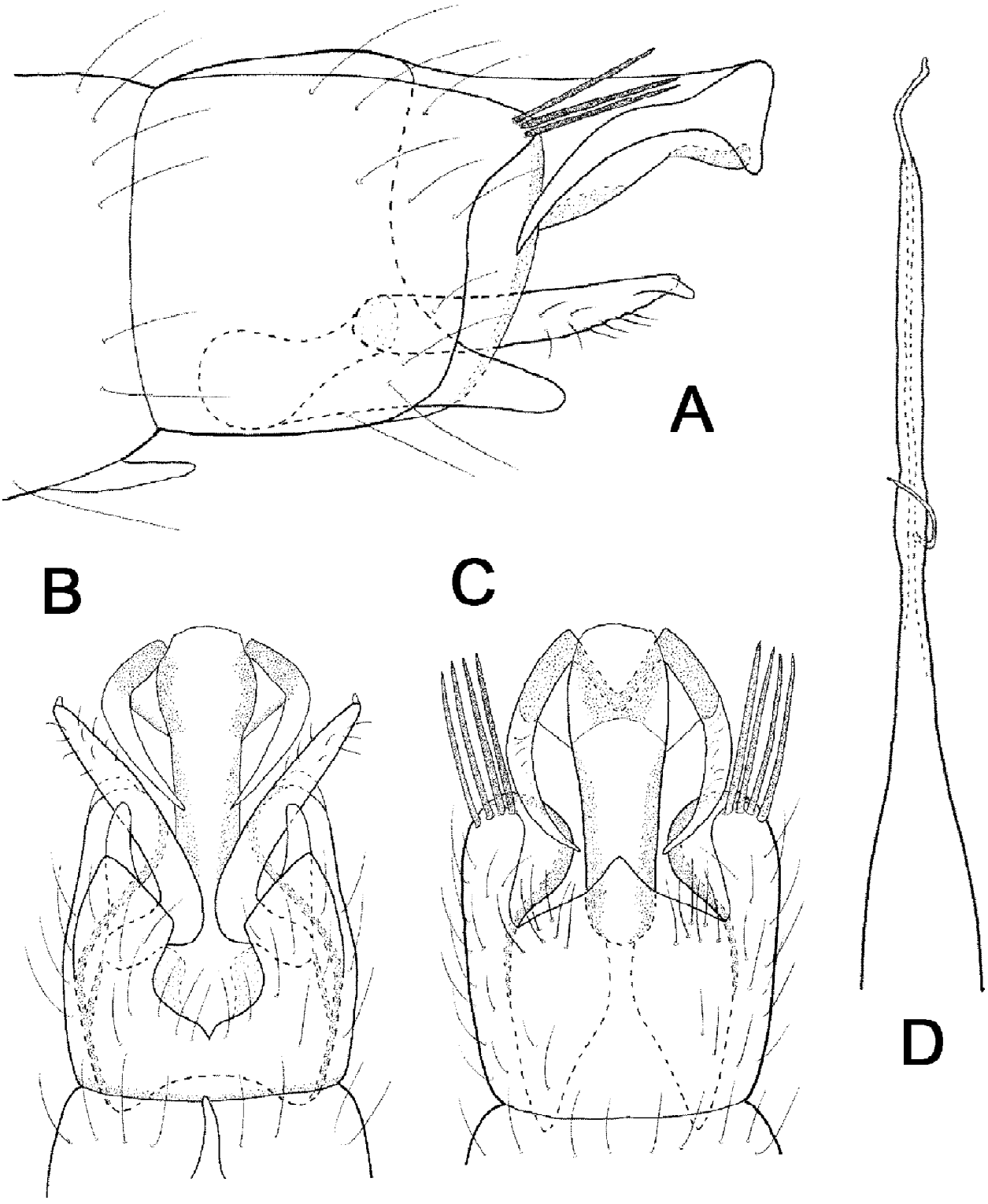


**Figure 2**. *Hydroptila criokera*, new species. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, lateral.

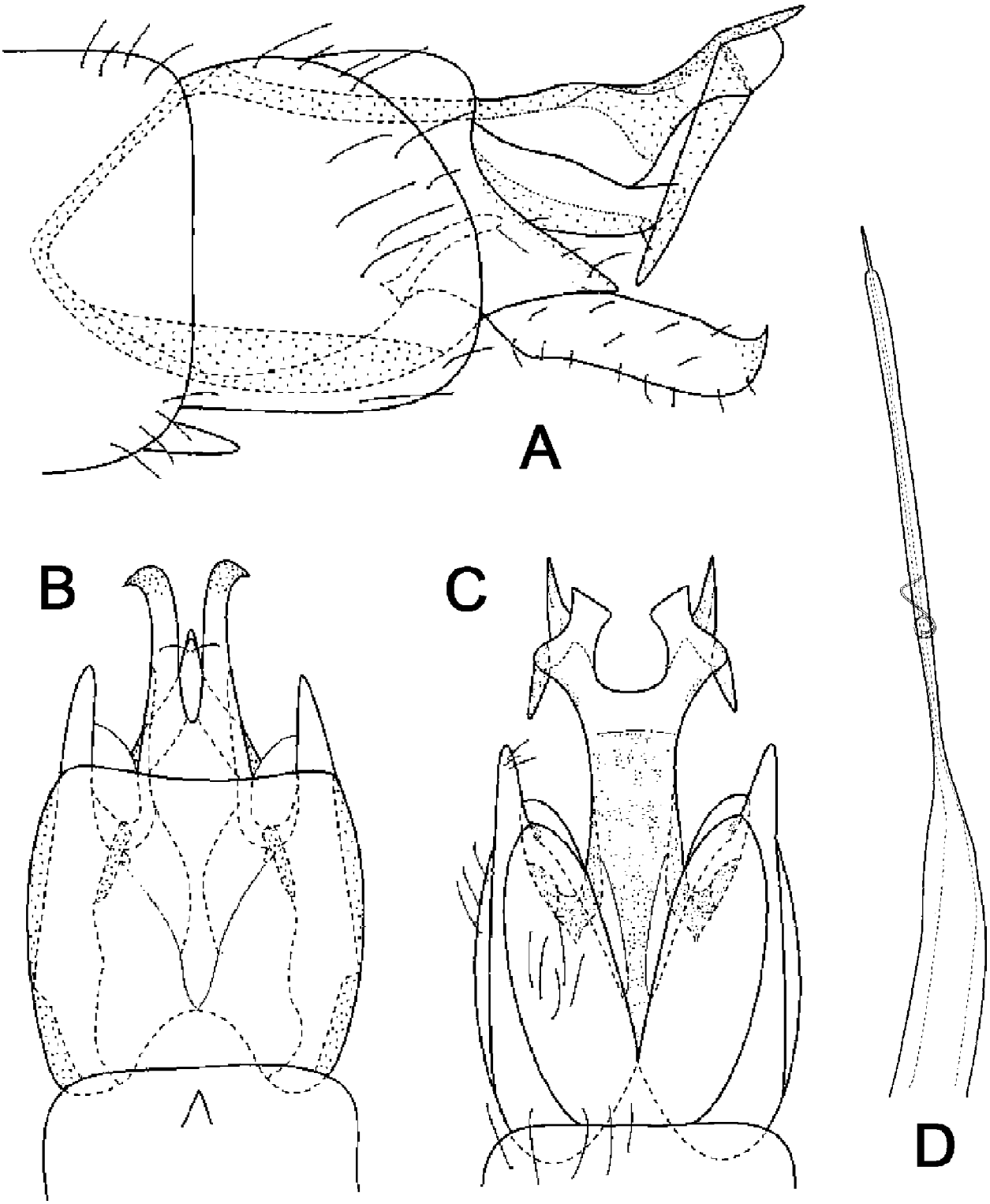


**Figure 3**. *Hydroptila maculata* (Banks). Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, ventral.

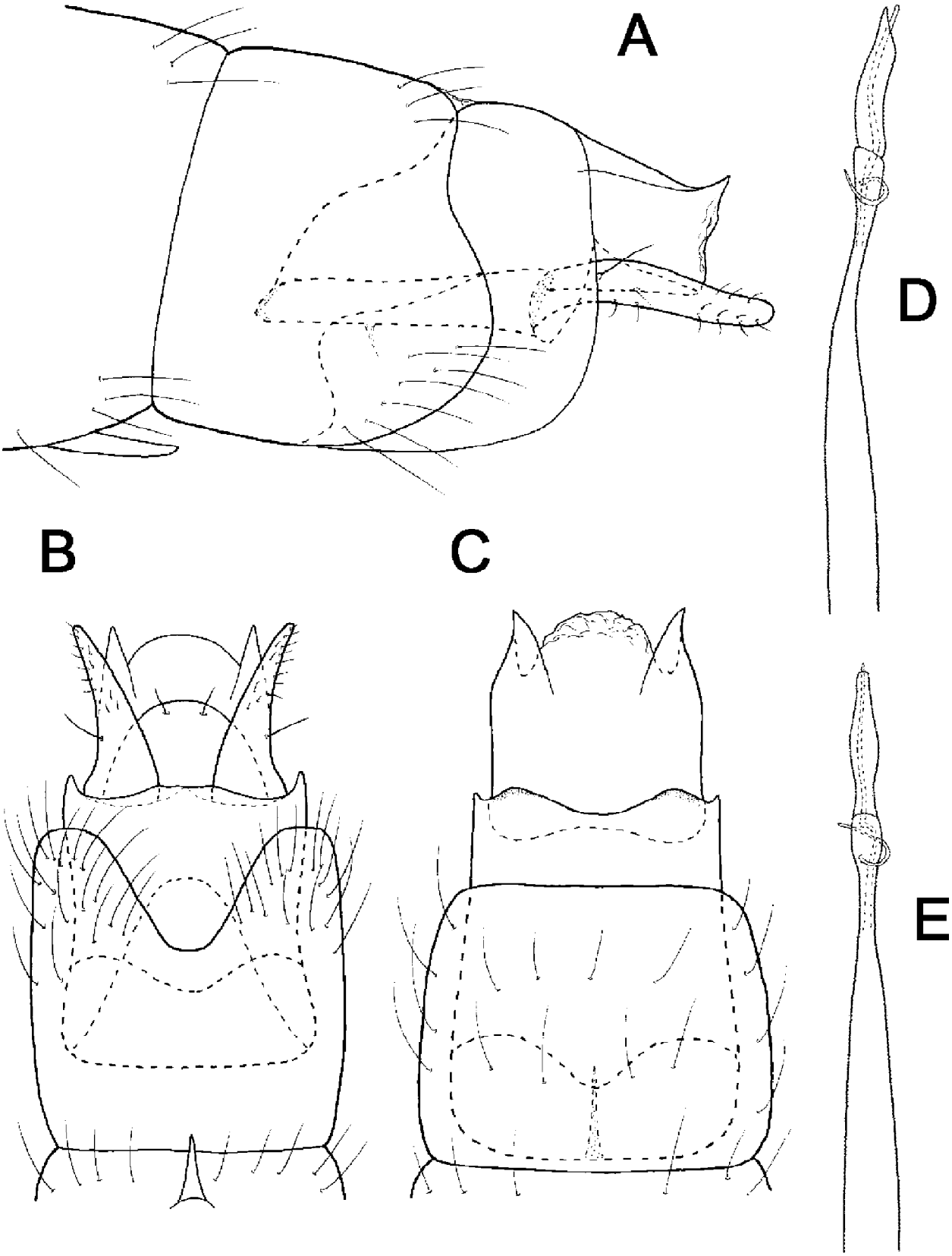


**Figure 4**. *Hydroptila auriscuspa*, new species. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, lateral, E) Phallus, ventral.

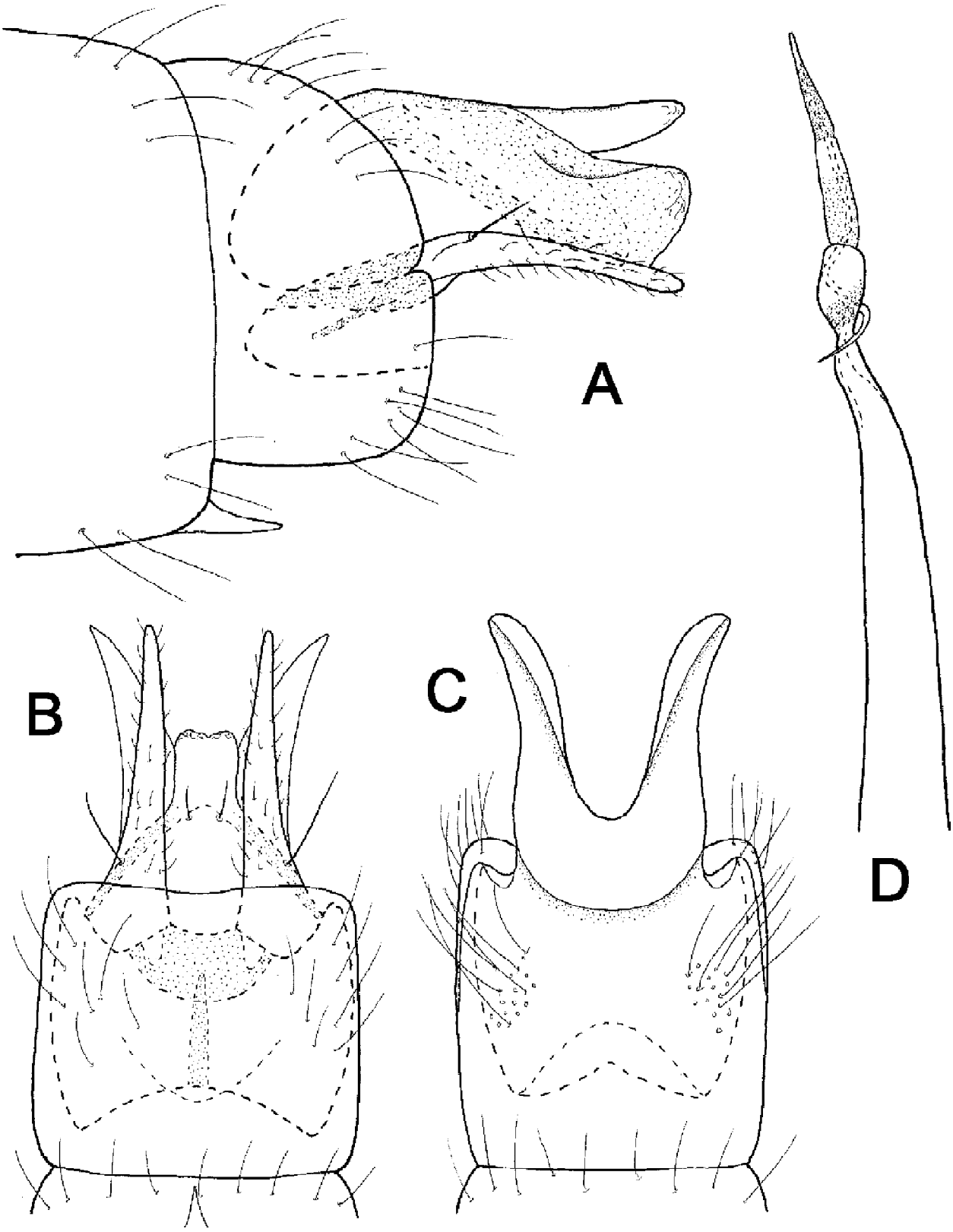


**Figure 5**. *Hydroptila lloganae* Blickle. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, ventral.

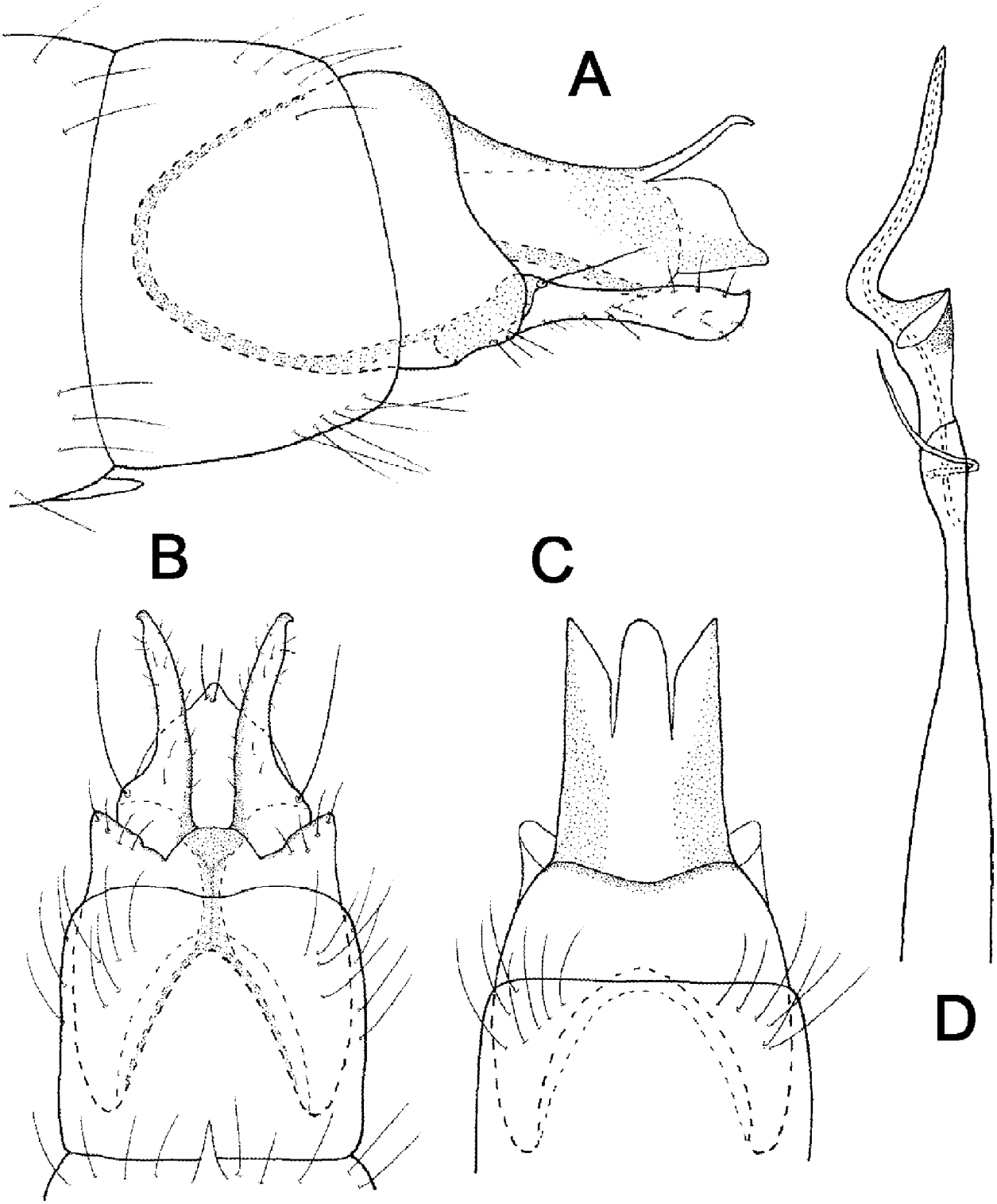


**Figure 6**. *Hydroptila santarosa*, new species. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, ventral.

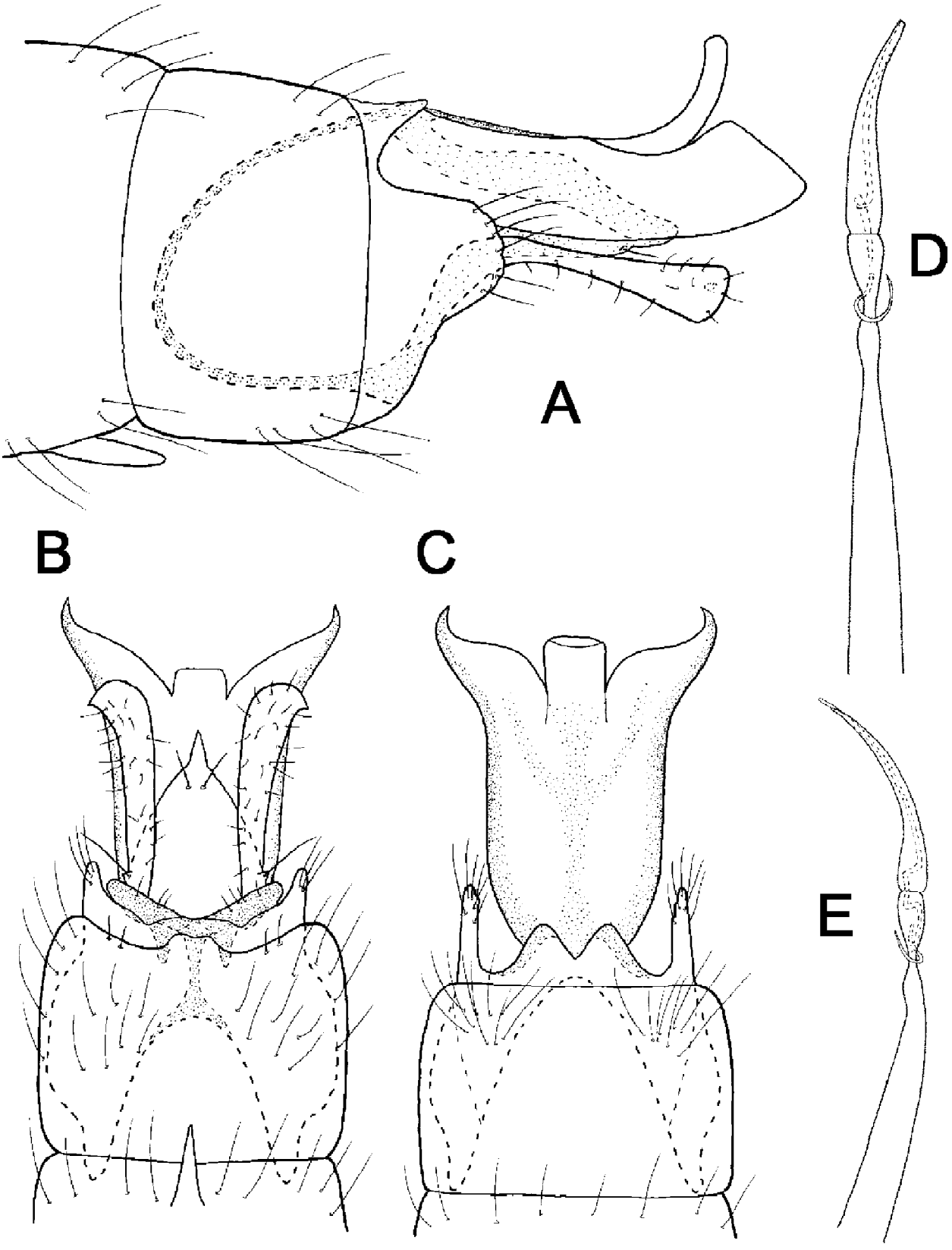


**Figure 7**. *Hydroptila ebroensis*, new species. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, lateral, E) Phallus, ventral.


1. Escambia County
2. Santa Rosa County
3. Okaloosa County
4. Walton County
5. Holmes County
6. Washington County
7. Bay County
8. Jackson County
9. Calhoun County
10. Gulf County
11. Gadsden County
12. Liberty County
13. Franklin County
14. Leon County
15. Wakulla County
16. Jefferson County
17. Madison County
18. Taylor County
19. Hamilton County
20. Suwannee County
21. Lafayette County
22. Dixie County
23. Columbia County
24. Baker County
25. Nassau County
26. Duval County
27. Union County
28. Clay County
29. St. Johns County
30. Bradford County
31. Gilchrist County
32. Alachua County
33. Putnam County
34. Flagler County
35. Levy County
36. Marion County
37. Volusia County
38. Citrus County
39. Sumter County
40. Lake County
41. Hernando County
42. Orange County
43. Seminole County
44. Brevard County
45. Pasco County
46. Pinellas County
47. Hillsborough County
48. Polk County
49. Osceola County
50. Indian River County
51. Manatee County
52. Hardee County
53. Highlands County
54. Okeechobee County
55. St. Lucie County
56. Sarasota County
57. De Soto County
58. Glades County
59. Martin County
60. Charlotte County
61. Lee County
62. Hendry County
63. Palm Beach County
64. Collier County
65. Broward County
66. Monroe County
67. Miami-Dade County

**Figure 8**. Counties of Florida.

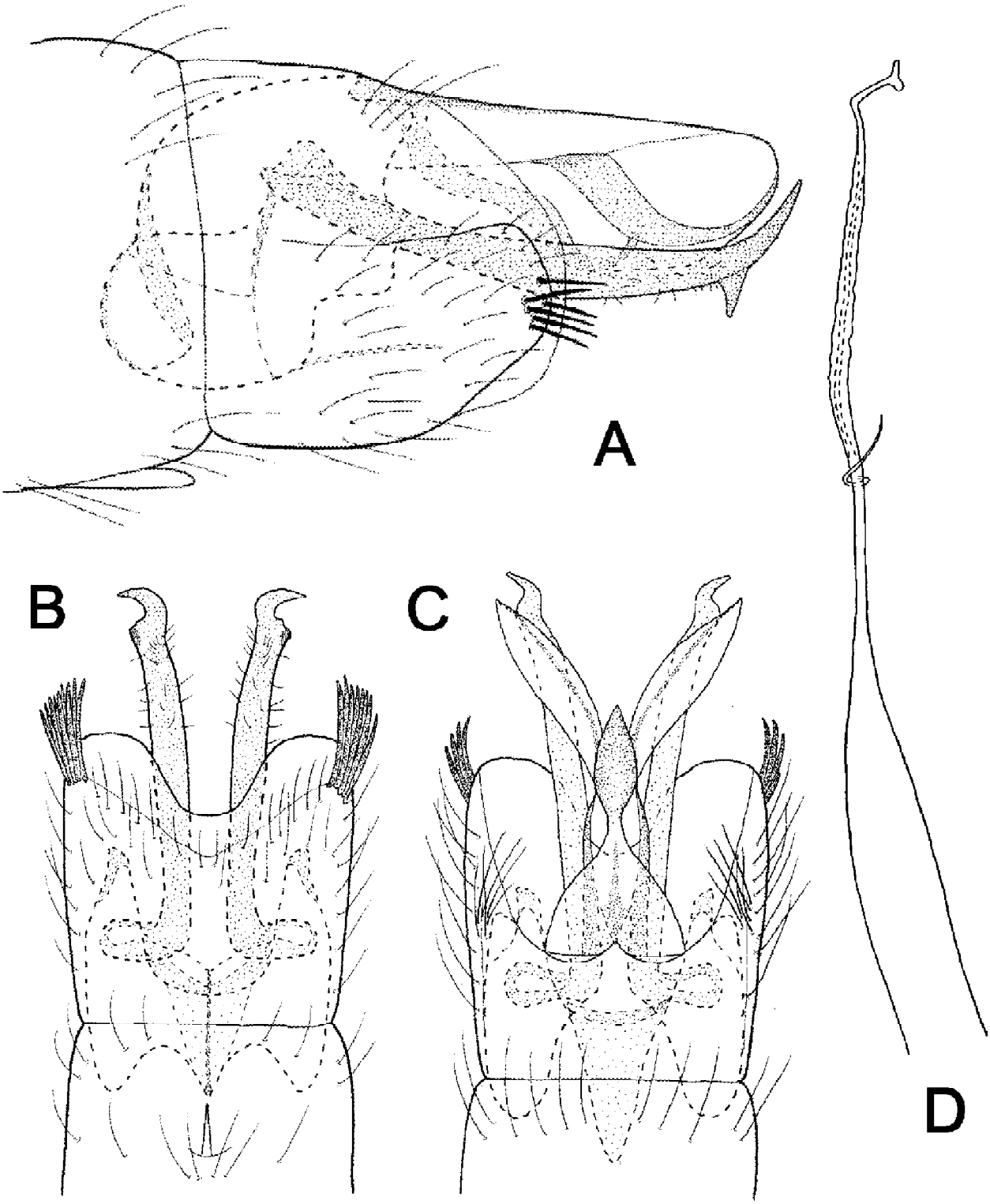


**Figure 9**. *Hydroptila acadia* Ross. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, lateral.

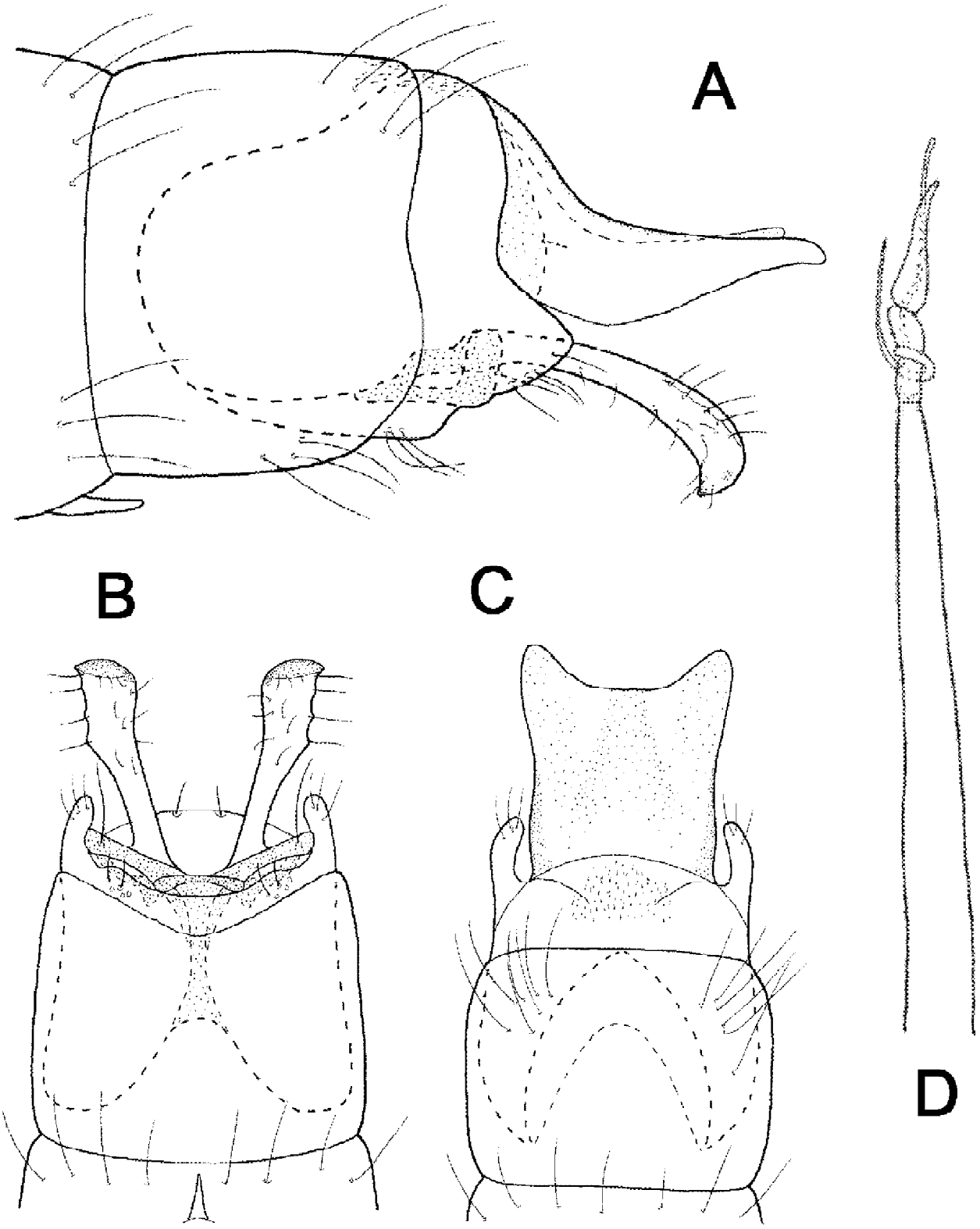


**Figure 10**. *Hydroptila ajax* Ross. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, dorsal.

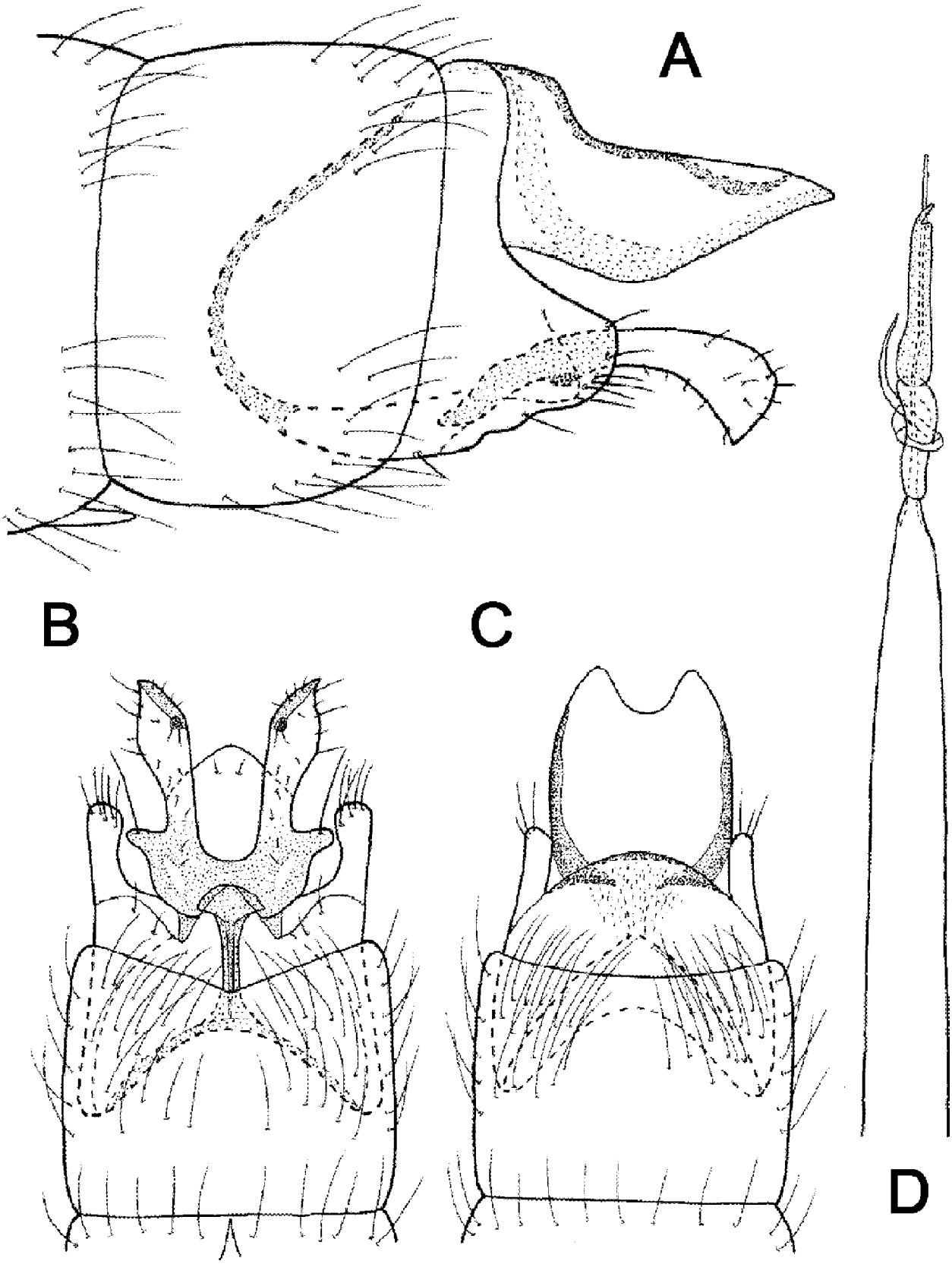


**Figure 11**. *Hydroptila icona* Mosely. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, dorsal.

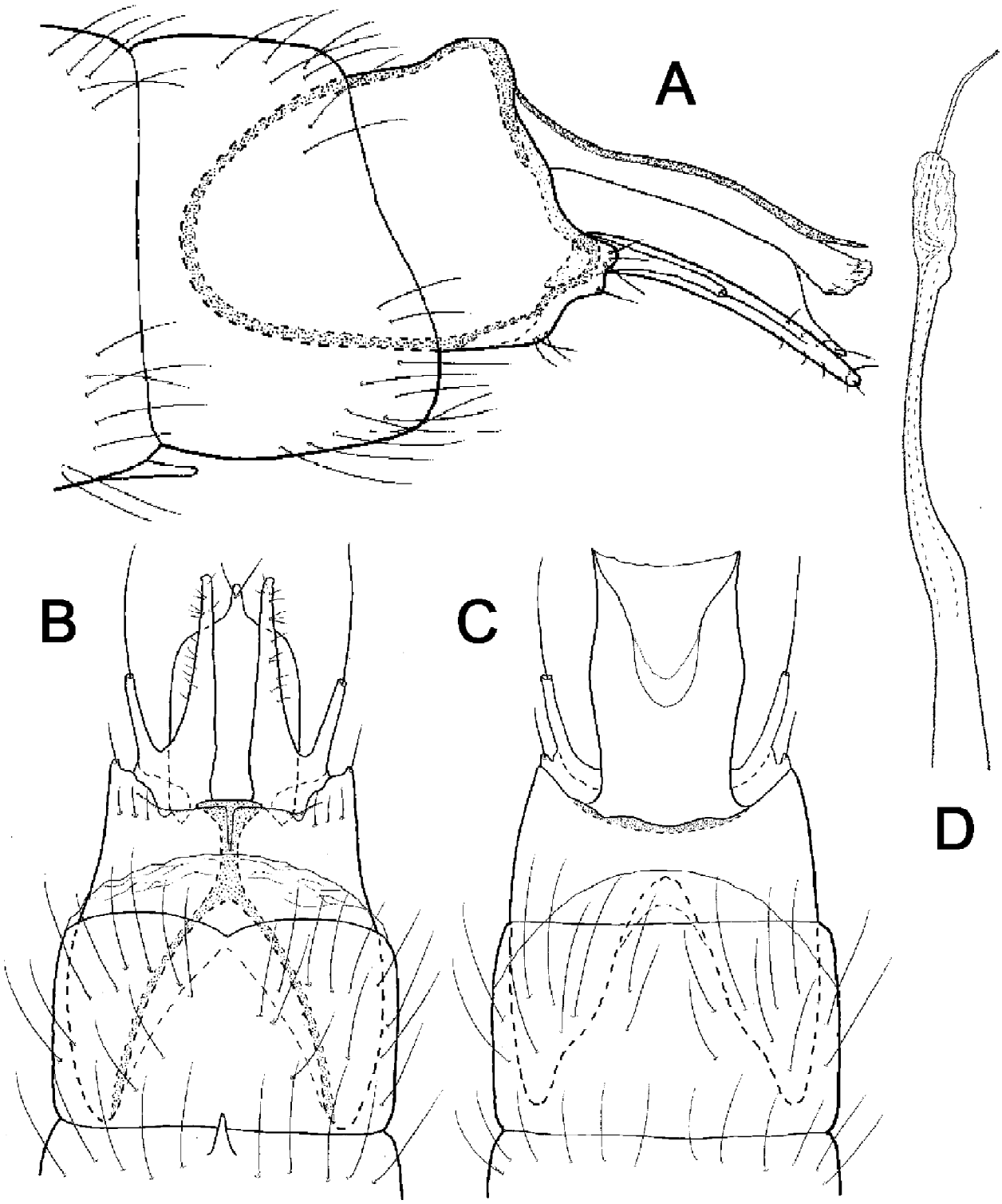


**Figure 12**. *Hydroptila latosa* Ross. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, dorsal.

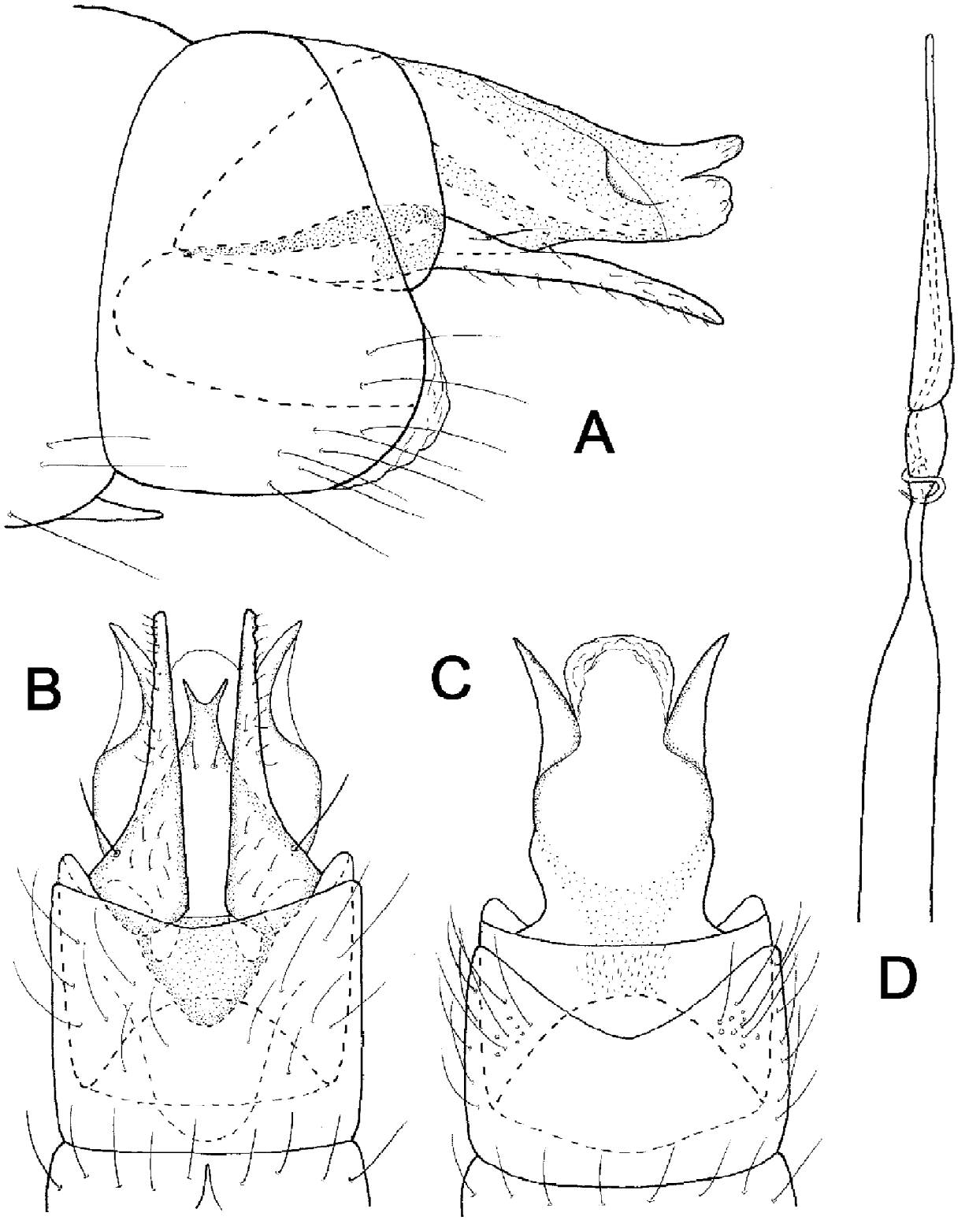


**Figure 13**. *Hydroptila novicola* Blickle and Morse. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, ventral.

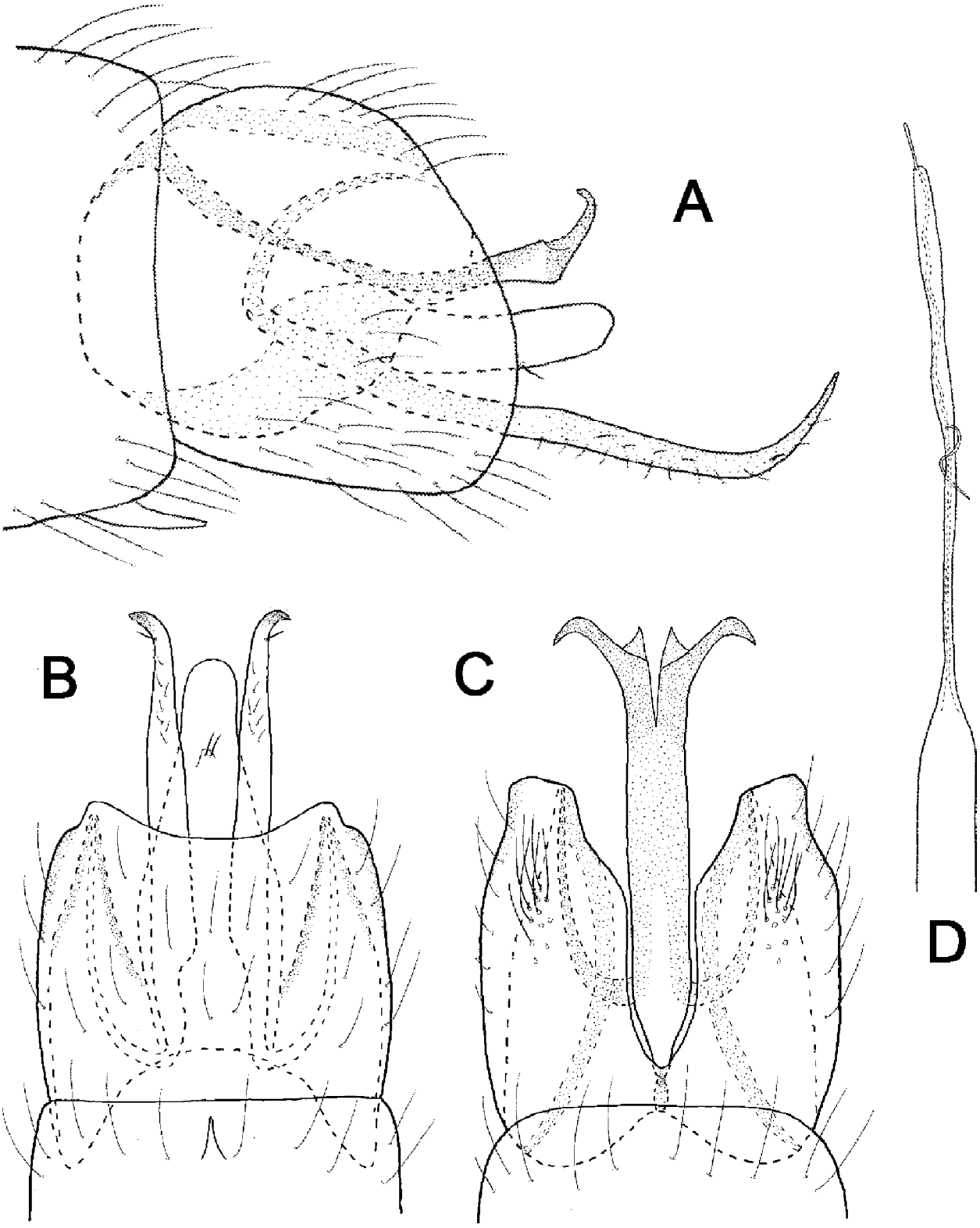


**Figure 14**. *Hydroptila wakulla* Denning. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, ventral.

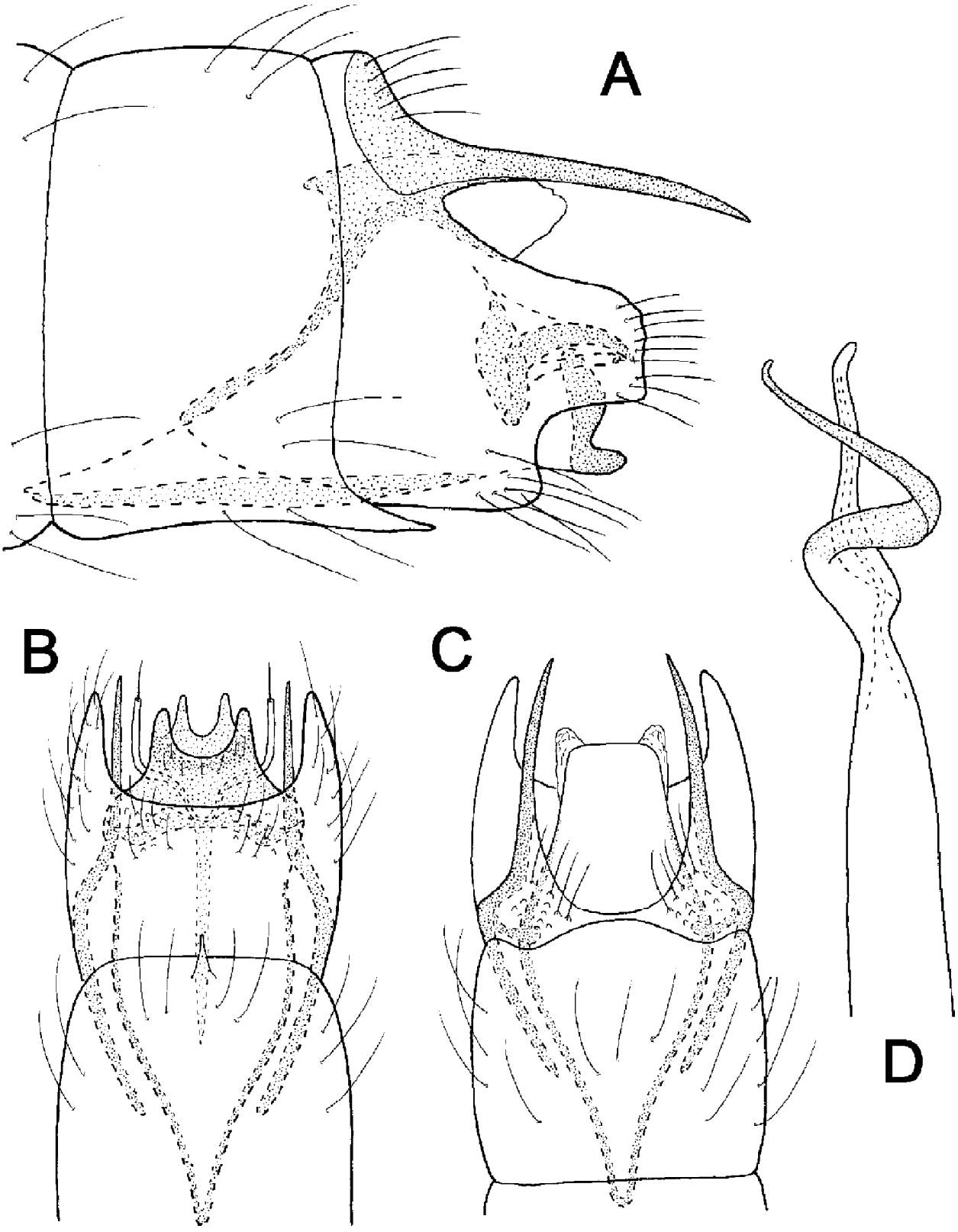


**Figure 15**. *Oxyethira arizona* Ross. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, lateral.

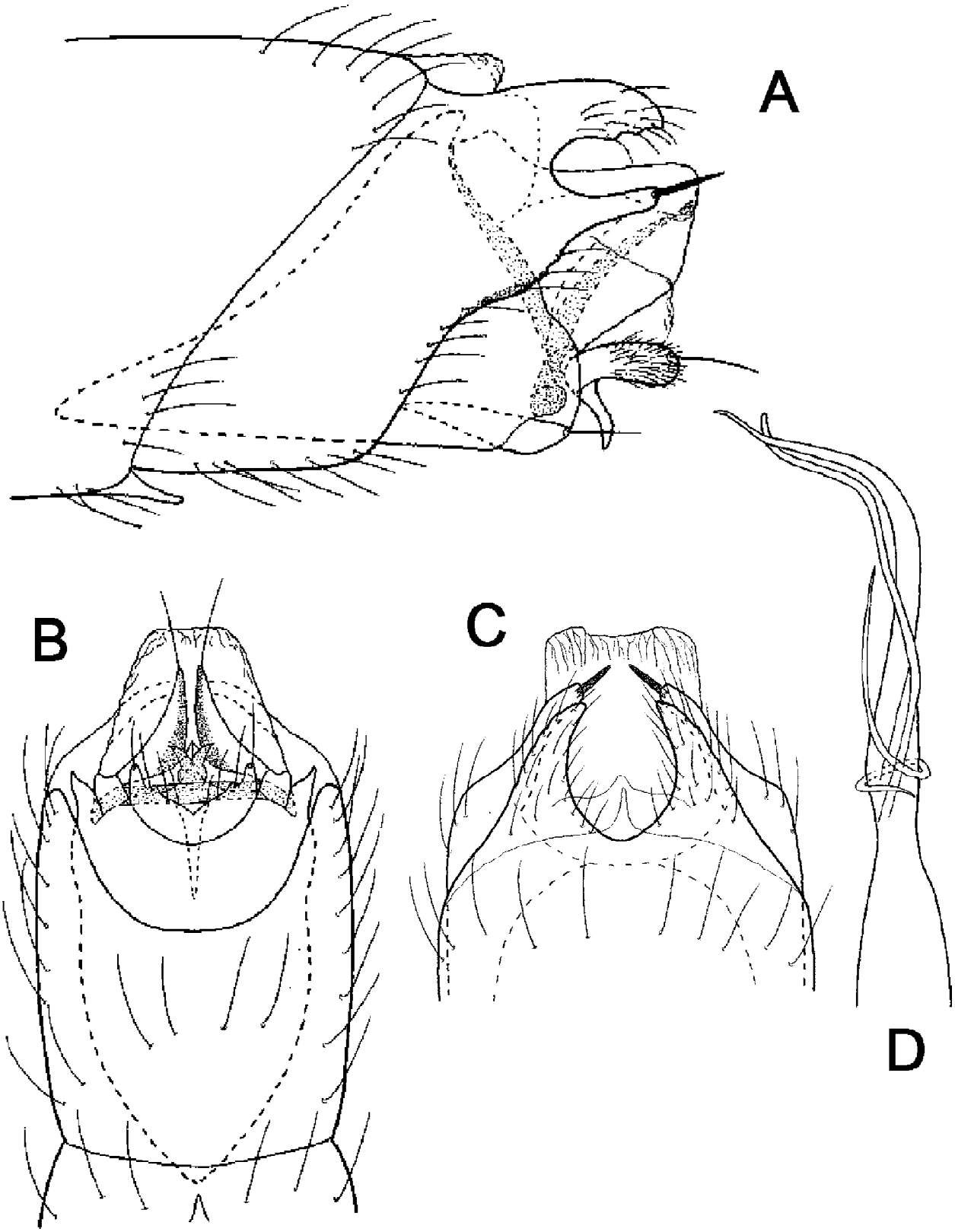


**Figure 16**. *Oxyethira lumipollex* Kelley and Harris. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, lateral.

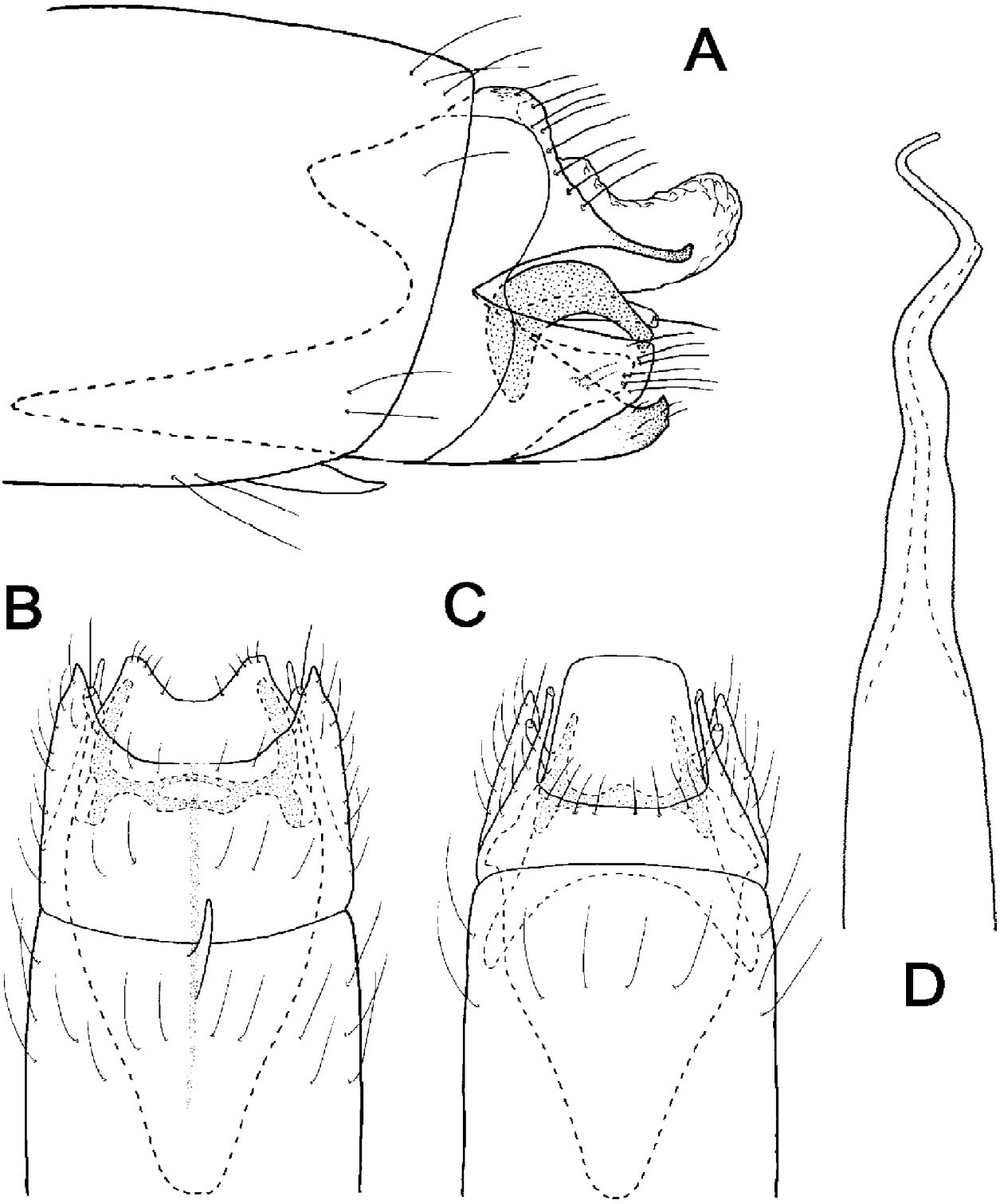


**Figure 17**. *Oxyethira simulatrix* Flint. Male genitalia. A) Lateral, B) Ventral, C) Dorsal, D) Phallus, ventral.