

SEVEN NEW SPECIES OF POLYCENTROPODIDAE (TRICHOPTERA) FROM NICARAGUA AND COSTA RICA

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Abstract.—Seven new species of Polycentropodidae (Trichoptera) are described and illustrated from collections made in Nicaragua and Costa Rica: *Cernotina riosanjuanensis*, *Cynellus zapateriensis*, *Polycentropus garfio*, *Polycentropus hamiltoni*, *Polycentropus phraterus*, *Polyplectropus maesi*, and *Polyplectropus nicaraguensis*. *Polycentropus holzenthali* Bueno-Soria and Hamilton also is illustrated and redescribed.

Key Words: Trichoptera, Polycentropodidae, Nicaragua, Costa Rica, new species, Central America

The family Polycentropodidae is comprised of 372 species in 26 genera worldwide (Morse 2001). Six genera occur in the Neotropics: *Antillopsyche* Banks 1941, with 4 extant and 1 extinct species from the Greater Antilles; *Cernotina* Ross 1938 with 50 species and *Cynellus* Banks 1913 with 9 species are distributed only in the New World; and *Nyctiophylax* Brauer 1965, *Polycentropus* Curtis 1835, and *Polyplectropus* Ulmer 1905 with 4, 64, and 42 species, respectively, in the Neotropics (Flint et al. 1999). Costa Rica and Nicaragua have representatives of all these genera, except *Antillopsyche* and *Nyctiophylax*. Thirty-five species of Polycentropodidae have been recorded for Costa Rica and 19 for Nicaragua: *Cernotina*, 2 species in Costa Rica, 4 in Nicaragua; *Cynellus fraternus*, (Banks) found in both countries; *Polycentropus*, 12 species in Costa Rica, 6 in Nicaragua; and *Polyplectropus*, 8 species in Costa Rica, 7 in Nicaragua (Flint et al. 1999). In this paper, I describe two new species of *Polycentropus* from Costa Rica and five new species in the genera *Cernotina*, *Cynellus*, *Polycentropus*, and *Polyplectropus* from Nic-

aragua. In addition, *Polycentropus holzenthali* Bueno-Soria and Hamilton 1986 is illustrated and redescribed, and a new distribution record is provided.

Dr. Ralph W. Holzenthal, University of Minnesota, and colleagues collected the new species from Costa Rica during an inventory of the caddisflies of that country conducted from 1986 through 1995. Dr. Jean-Michel Maes, Museo Entomológico, León, Nicaragua, provided the Nicaraguan caddisflies, which he collected during an ongoing inventory of Coleoptera and nocturnal Lepidoptera of Nicaragua. I collected the remaining Nicaraguan caddisflies during two trips from June through August 2000 and from July through August 2001.

Types are deposited in the University of Minnesota Insect Collection, Saint Paul, Minnesota (UMSP), the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (NMNH), and the Instituto Nacional de Biodiversidad, Heredia, Costa Rica (INBIO). The terminology used in this paper follows that of Hamilton (1986) for *Polycentropus* and *Polyplectropus*, and Flint (1971) for *Cernotina* and *Cynellus*, with minor modifications.

Cernotina riosanjuanensis
Chamorro-Lacayo, new species

(Fig. 1)

This new species appears to be closest to *Cernotina zanciana* Ross 1951, but differs in the more slender shape of the dorsal branches of the intermediate appendages, in the evenly rounded apex of the inferior appendages, and in the medial origin of the basodorsal lobes of the inferior appendages.

Male.—Length of forewing 4.5 mm. Color in alcohol, yellowish brown. Genitalia as in Fig. 1. Sternum IX short, produced anterolaterally; anterior margin, in ventral view, deeply excavated. Tergum X semi-membranous, long, narrow, setose; in lateral view, curved posterad; in dorsal view, curved posteromesally. Intermediate appendages bipartite; dorsal branches with bases broad, curved mesally and tapering into pigmented acute apices; ventral branches setose, in lateral view, digitate with broad bases and rounded thumblike apices, in dorsal view, square, mesal margins deeply convex, posterior margins truncate, excavated, expanded posterolaterally. Preanal appendages apparently absent. Inferior appendages elongate, oval, in lateral view, posterolateral margins rounded, apicoventral and apicomesal lobes concealed; basodorsal lobes clublike each with long, thick apical setae and a small posteriorly directed submedial process; apicoventral lobes pigmented, in dorsal and ventral views triangular; apicomesal lobes, in dorsal view, square, transparent with posterior margins lightly pigmented. Phallus long, slender, tubular, membranous internally.

Female.—Unknown.

Type material.—Holotype, ♂. NICARAGUA: Río San Juan, Refugio Bartola, small creek, 300 m NW of station, 10°58'N, 84°21'W, el. 35 m, 7.viii.2000, Chamorro, Dobbins (UMSP) (UMSP000066732).

Etymology.—This species is named for the magnificent national treasure that is the

San Juan River (Río San Juan), Nicaragua, by which this species was collected.

Cyrnellus zapateriensis
Chamorro-Lacayo, new species

(Fig. 2)

This new species is closely related to *Cyrnellus fraternus* (Banks 1905). *Cyrnellus zapateriensis*, can be distinguished from *C. fraternus* by the smaller size and truncate apices of the inferior appendages, and by the membranous ventrolateral margins of the intermediate appendages.

Male.—Length of forewing 4.5 mm. Color in alcohol, body and legs yellowish brown; wings brown. Male genitalia as in Fig. 2. Sternum IX, in lateral view, reversed L-shaped, apparently fused with intermediate appendages dorsally. Tergum IX and X membranous, fused with setose intermediate appendages; fused structure, in lateral view, nearly square with ventrolateral margins membranous and expanded posterad (in some specimens not as expanded, but reduced to a narrow apex), in dorsal view, trapezoidal. Body of bipartite preanal appendages digitate, setose, not exceeding intermediate appendages, produced mesally into digitate, posteroventrally curved mesobasal processes, with pigmented apex, bordering phallus. Inferior appendages, in lateral view, broad basally, curved posterodorsally and narrowing to rounded apices; in ventral view, posterior margins truncate, apicomesal lobes a narrow, acute mesally directed spine with pigmented apex; mesal margin concave basad of apicomesal lobes, expanding into medial setose circular lobes. Phallus short; phallic sclerite in lateral view somewhat indistinct, basally broad, slightly curved; in dorsal view distinct, Y-shaped. Subgenital plate digitate, fused basally, uniform width throughout, apex lightly pigmented, slightly curved ventrally, almost same size as mesobasal processes of preanal appendages.

Female.—Unknown.

Type material.—Holotype: ♂. NICARAGUA: Granada: Isla Zapatera, El

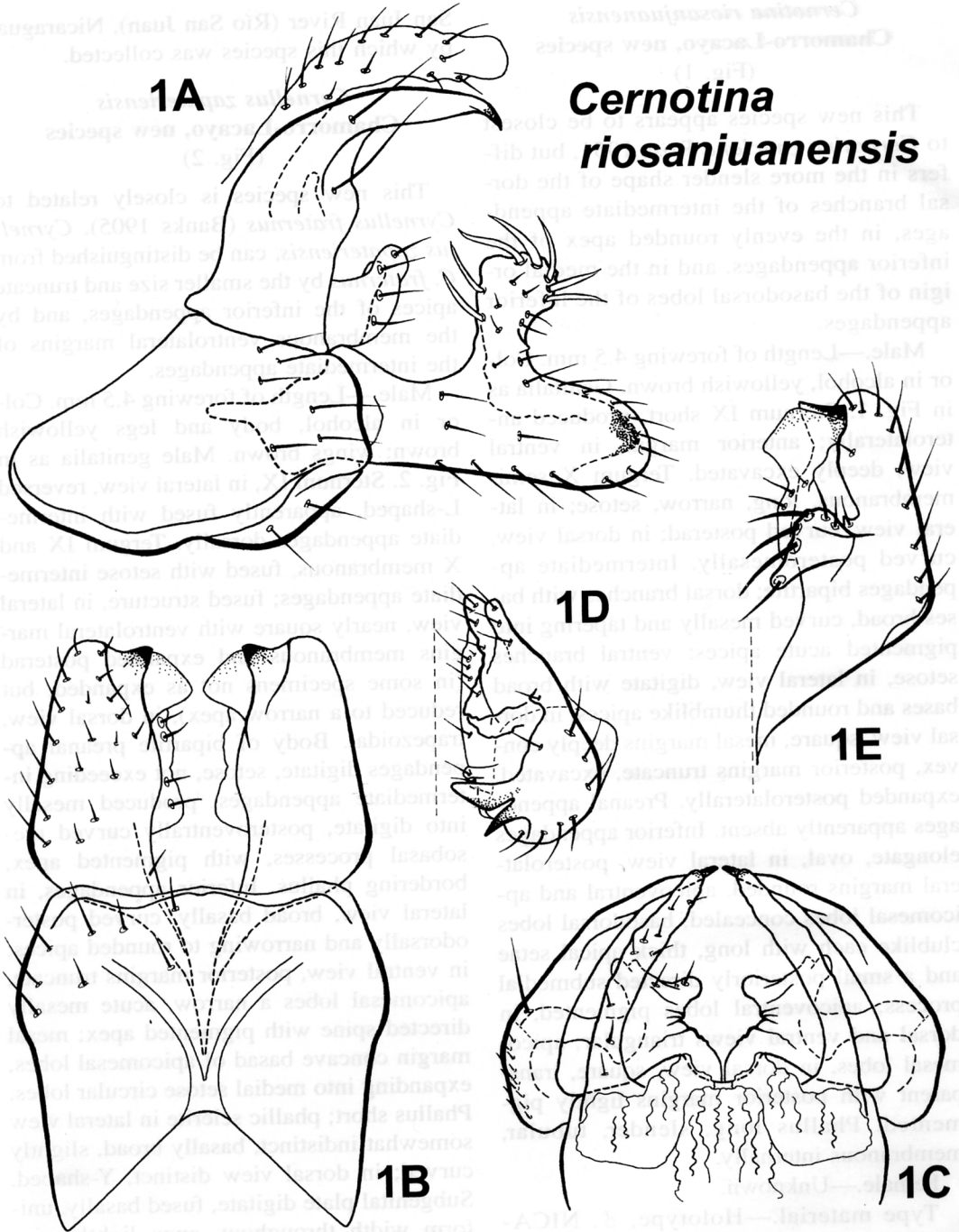
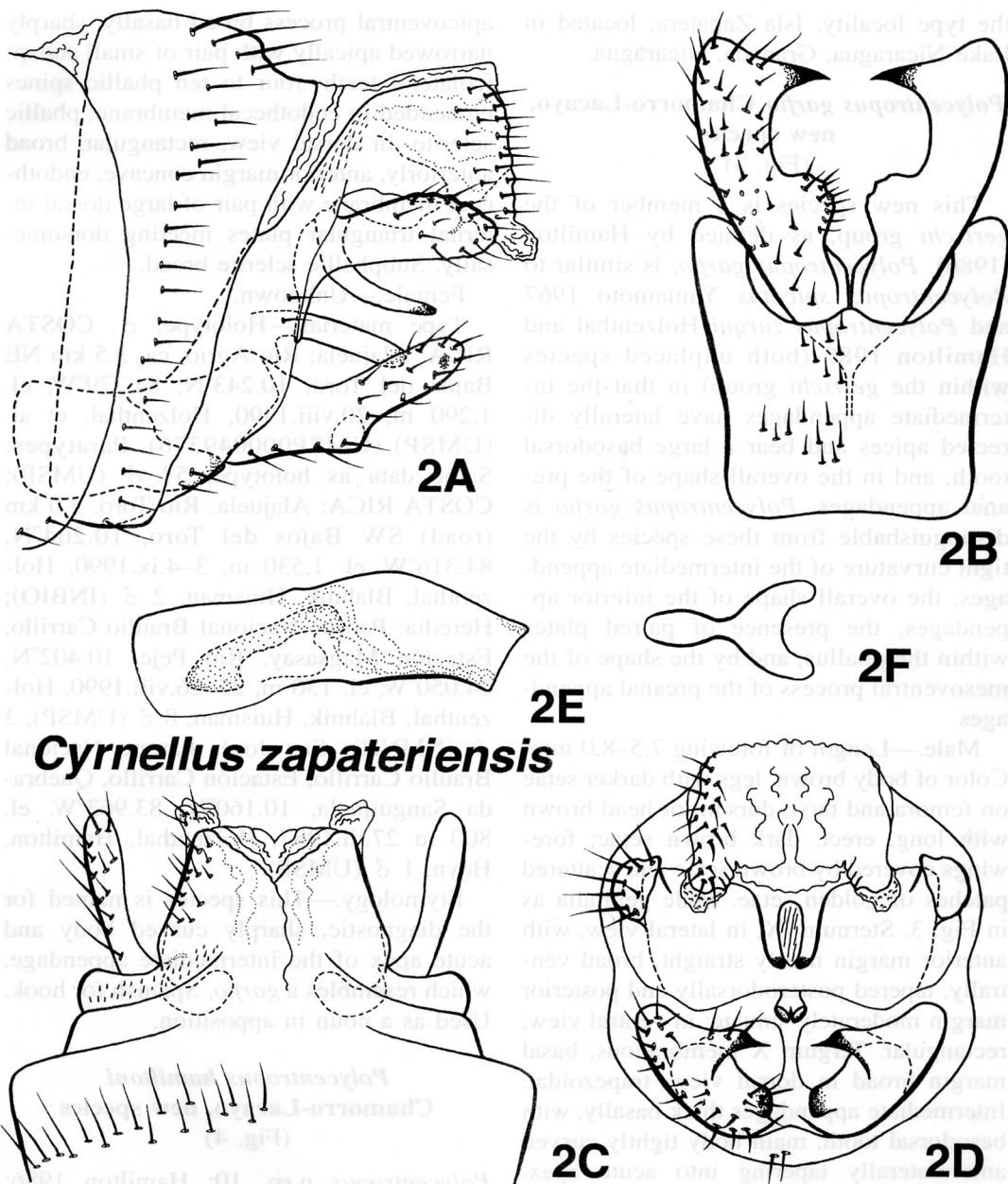


Fig. 1. *Cernotina riosanjuanensis*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Inferior appendage, caudal view. E, Inferior appendage, dorsal view.



Cynnellus zapateriensis

Fig. 2. *Cynnellus zapateriensis*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Caudal view. E, Phallus. F, Phallic sclerite, dorsal view.

Bambú, Frente a Lago de Nicaragua, 11°45.829'N, 85°51.991'W, el. 42 m, 19.vii.2001, Chamorro, Martinez, Ruiz (UMSP) (UMSP000066725). Paratypes:

Same as holotype, 1 ♂ (NMNH); Granada: Isla Zapatera, 20.v.1988, S. Valle, 1 ♂ (UMSP).

Etymology.—This species is named for

the type locality, Isla Zapatera, located in Lake Nicaragua, Granada, Nicaragua.

***Polycentropus garfio* Chamorro-Lacayo,
new species**
(Fig. 3)

This new species is a member of the *gertschi* group, as defined by Hamilton (1986). *Polycentropus garfio*, is similar to *Polycentropus spicatus* Yamamoto 1967 and *Polycentropus zurqui* Holzenthal and Hamilton 1988 (both unplaced species within the *gertschi* group) in that the intermediate appendages have laterally directed apices and bear a large basodorsal tooth, and in the overall shape of the preanal appendages. *Polycentropus garfio* is distinguishable from these species by the tight curvature of the intermediate appendages, the overall shape of the inferior appendages, the presence of paired plates within the phallus, and by the shape of the mesoventral process of the preanal appendages.

Male.—Length of forewing 7.5–8.0 mm. Color of body brown, legs with darker setae on femora and tarsi; dorsum of head brown with long, erect, dark brown setae; forewings covered by brown setae and scattered patches of golden setae. Male genitalia as in Fig. 3. Sternum IX, in lateral view, with anterior margin nearly straight, broad ventrally, tapered posterodorsally and posterior margin moderately sinuate; in ventral view, rectangular. Tergum X membranous, basal margin broad in dorsal view, trapezoidal. Intermediate appendages thick basally, with basodorsal tooth, main body tightly curved anterolaterally tapering into acute apex. Preanal appendages dorsally positioned and apically truncate, tapering into narrow mesoventral processes; processes curved posteroventrally, apices thin and pointed. Inferior appendages, in lateral view, triangular, bearing dorsally directed mesoventral tooth, mesal ridge with numerous thick spine-like setae, in ventral view, oval shaped, expanded laterally, mesoventral tooth directed medially. Phallobase long;

apicoventral process broad basally, sharply narrowed apically with pair of small subapicolateral teeth; four to ten phallic spines embedded in endothecal membrane; phallic sclerite, in dorsal view, rectangular, broad anteriorly, anterior margin concave; endothecal membrane with pair of large dorsal internal triangular plates meeting dorsomesally. Subphallic sclerite broad.

Female.—Unknown.

Type material.—Holotype: ♂. COSTA RICA: Alajuela: Río Agrio, ca. 3.5 km NE Bajos del Toro, 10.243°N, 84.279°W, el. 1,290 m, 20.viii.1990, Holzenthal, et al. (UMSP) (UMSP000049376). Paratypes: Same data as holotype, 57 ♂ (UMSP); COSTA RICA: Alajuela: Río Toro, 3.0 km (road) SW Bajos del Toro, 10.204°N, 84.316°W, el. 1,530 m, 3–4.ix.1990, Holzenthal, Blahnik, Huisman, 2 ♂ (INBIO); Heredia: Parque Nacional Braulio Carrillo, Estación Magsasay, Río Peje, 10.402°N, 84.050°W, el. 130 m, 25–26.viii.1990, Holzenthal, Blahnik, Huisman, 8 ♂ (UMSP), 3 ♂ (NMNH); San José: Parque Nacional Braulio Carrillo, Estación Carrillo, Quebrada Sanguijuela, 10.160°N, 83.963°W, el. 800 m 27.iii.1987, Holzenthal, Hamilton, Heyn, 1 ♂ (UMSP).

Etymology.—This species is named for the diagnostic, sharply curved body and acute apex of the intermediate appendage, which resembles a *garfio*, Spanish for hook. Used as a noun in apposition.

***Polycentropus hamiltoni*
Chamorro-Lacayo, new species**
(Fig. 4)

Polycentropus n.sp. 10: Hamilton 1986: 110; Holzenthal and Hamilton 1988: 335.

This new species is a member of the *bonus* complex of the *gertschi* group and is closely related to *Polycentropus fortispinus* Holzenthal and Hamilton 1988. *Polycentropus hamiltoni* differs from *P. fortispinus* in that the bodies of the preanal appendages are approximately equal in size to the inferior appendages. It also differs in the

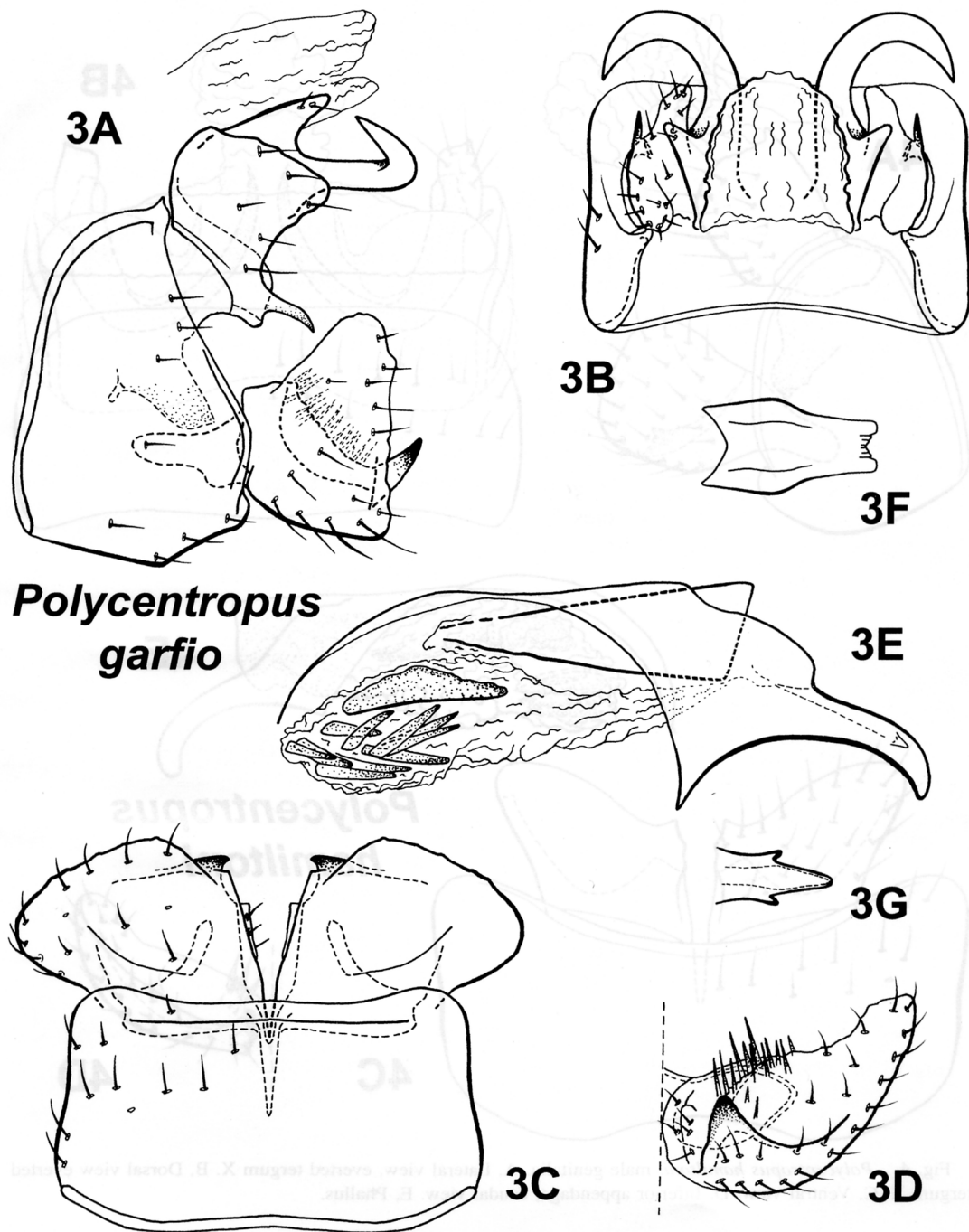


Fig. 3. *Polycentropus garfio*, male genitalia. A, Lateral view. B, Dorsal view. C, Ventral view. D, Inferior appendage, caudal view. E, Phallus. F, Phallic sclerite, dorsal view. G, Apex of apicoventral process of phallus, dorsal view.

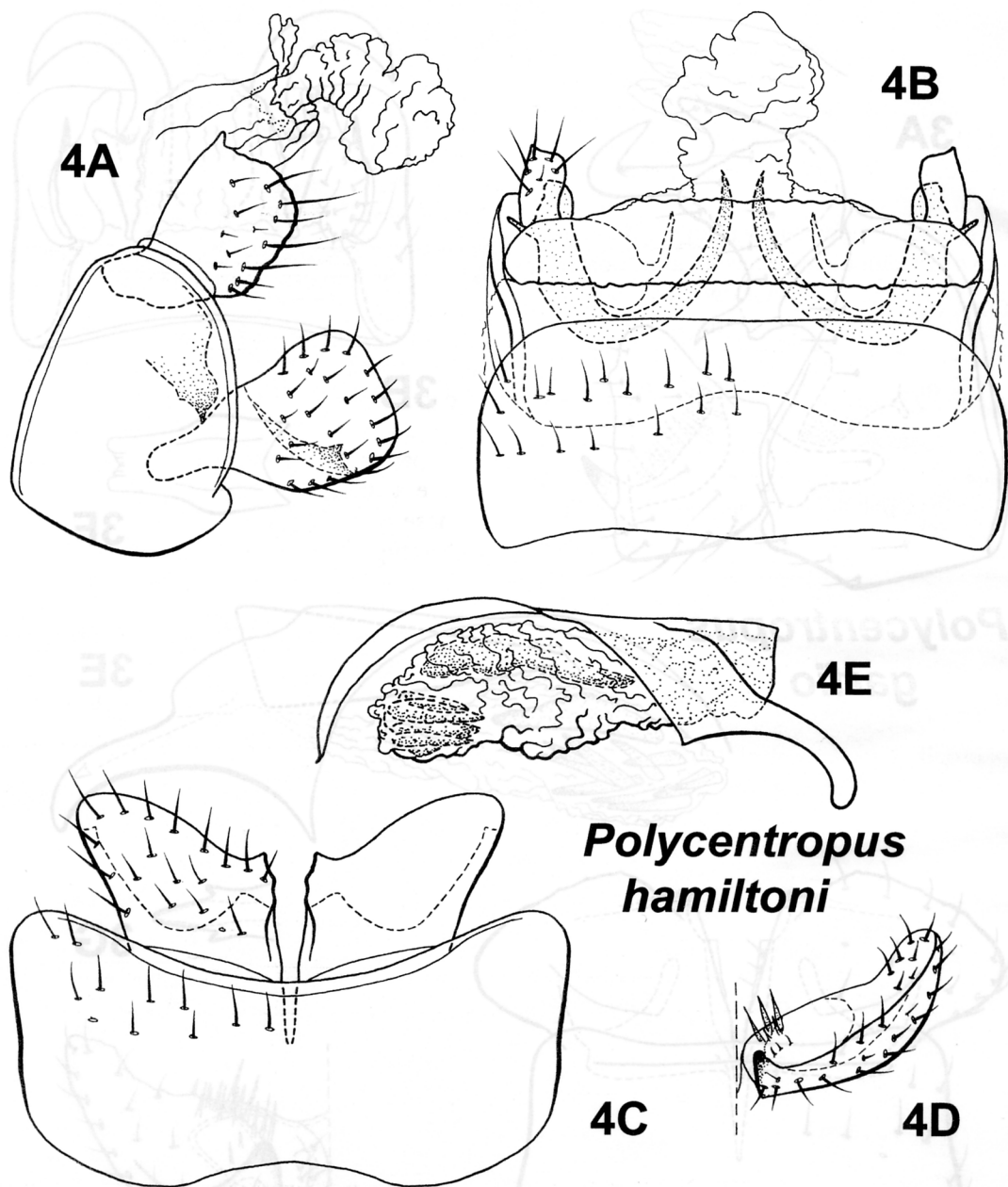


Fig. 4. *Polycentropus hamiltoni*, male genitalia. A, Lateral view, everted tergum X. B, Dorsal view everted tergum X. C, Ventral view. D, Inferior appendage, caudal view. E, Phallus.

smaller and more medially positioned mesoventral processes of the preanal appendages, the slightly smaller intermediate appendages, and the strongly ovoid and less angularly shaped inferior appendages. Fi-

nally, the numerous phallic spines of *P. hamiltoni* are longer and thinner than in *P. fortispinus*.

Male.—Length of forewing 5.0–6.6 mm. Body generally pale brown to yellow be-

low, dorsum of head and thorax dark brown with long, dark setae and some paler setae between antennal bases; forewing bases with long erect setae, with general vestiture of fine, dark brown setae, and numerous patches of fine golden setae scattered over wing. Male genitalia as in Fig. 4. Sternum IX in lateral view nearly rounded; in ventral view, rectangular, anterior and posterior margin broadly and shallowly concave. Tergum X membranous; short, in dorsal view rectangular. Intermediate appendages broad, fused basally to membrane below tergum X, tapering posteromesally to very thin apices, each with single apical seta; length not exceeding preanal appendages. Body of preanal appendages, in lateral view, nearly square, mesoventral process rod-like, originating laterally, then directed anteriorly and then curving posteromesally. Inferior appendages short, in lateral view, nearly square appearing subquadrate; in ventral view appearing nearly elliptical, expanded posterolaterally; mesal surfaces irregular with broad mesoventral tooth. Phallobase short with projecting ventral apex; apicoventral process tapering to rounded ventrally directed apex; group of phallic spines embedded in endothecal membrane; phallic sclerite, in lateral view, broad anteriorly, curved posteroventrad to narrow apex, in ventral view narrow posteriorly and broad anteriorly. Subphallic sclerite extending laterally to contact preanal appendages basoventrally.

Female.—Unknown.

Type material.—Holotype: ♂. NICARAGUA: Jinotega: Cerro Mazú, 14°33'N, 85°07'W, el. 220 m, 7–10.ix.1997, J. M. Maes and B. Hernández (UMSP) (UMSP000066734). Paratypes: MÉXICO: Chiapas: Río Contento, 7 km N. of Ocosingo, 20.v.1981, C. M. and O. S. Flint, Jr., 2 ♂ (NMNH).

Etymology.—Named in honor of Dr. Steven W. Hamilton for his contribution to the study of Neotropical caddisflies, especially in the family Polycentropodidae.

Polycentropus phraterus
Chamorro-Lacayo, new species
(Fig. 5)

This new species is a member of the *bartolus* complex of the *gertschi* species group and is closely related to *Polycentropus nebulosus* Holzenthal and Hamilton 1988. *Polycentropus phraterus*, differs from *P. nebulosus* in the triangular shape and the acute posteromesal point of the inferior appendages and the gradual curvature of the intermediate appendages. After close examination of the 5 paratypes of *P. nebulosus* in UMSP, it became apparent that 3 of these paratypes differ from the holotype and are actually *P. phraterus*. Consequently, these 3 paratypes are here assigned as the paratypes series for *P. phraterus*.

Male.—Length of forewings 6.0–6.5 mm. Body sclerites and setae generally pale brown to yellow; legs, especially femora and tarsi, with fine, dark brown setae; dorsum of head and thorax dark brown with long, erect, golden-brown setae; forewings covered with fine, brown setae and with scattered patches and mottled areas of golden and brown setae; forewing bases with long erect, golden-brown setae. Genitalia as in Fig. 5. Sternum IX, in lateral view, with anterior margin nearly straight, ventral margin broad, tapering posterodorsally, posterior margin moderately sinuate, posteroventral corner rounded, in ventral view, rectangular. Tergum X membranous, trapezoidal. Intermediate appendages broad basally, tapering into acute apices, gently curved mesoventrally. Preanal appendages in lateral view, nearly semicircular, mesoventral processes absent. Inferior appendages, in lateral view, triangular, ventral margins nearly straight, posteroventral corners angulate and bearing acute posteromesal pigmented point; in ventral view, nearly triangular, posteromesal margins irregular, posterolateral margins straight, mesal margins nearly straight, expanded laterally, with mesobasal spines. Phallobase short, apicoventral process broad basally, nar-

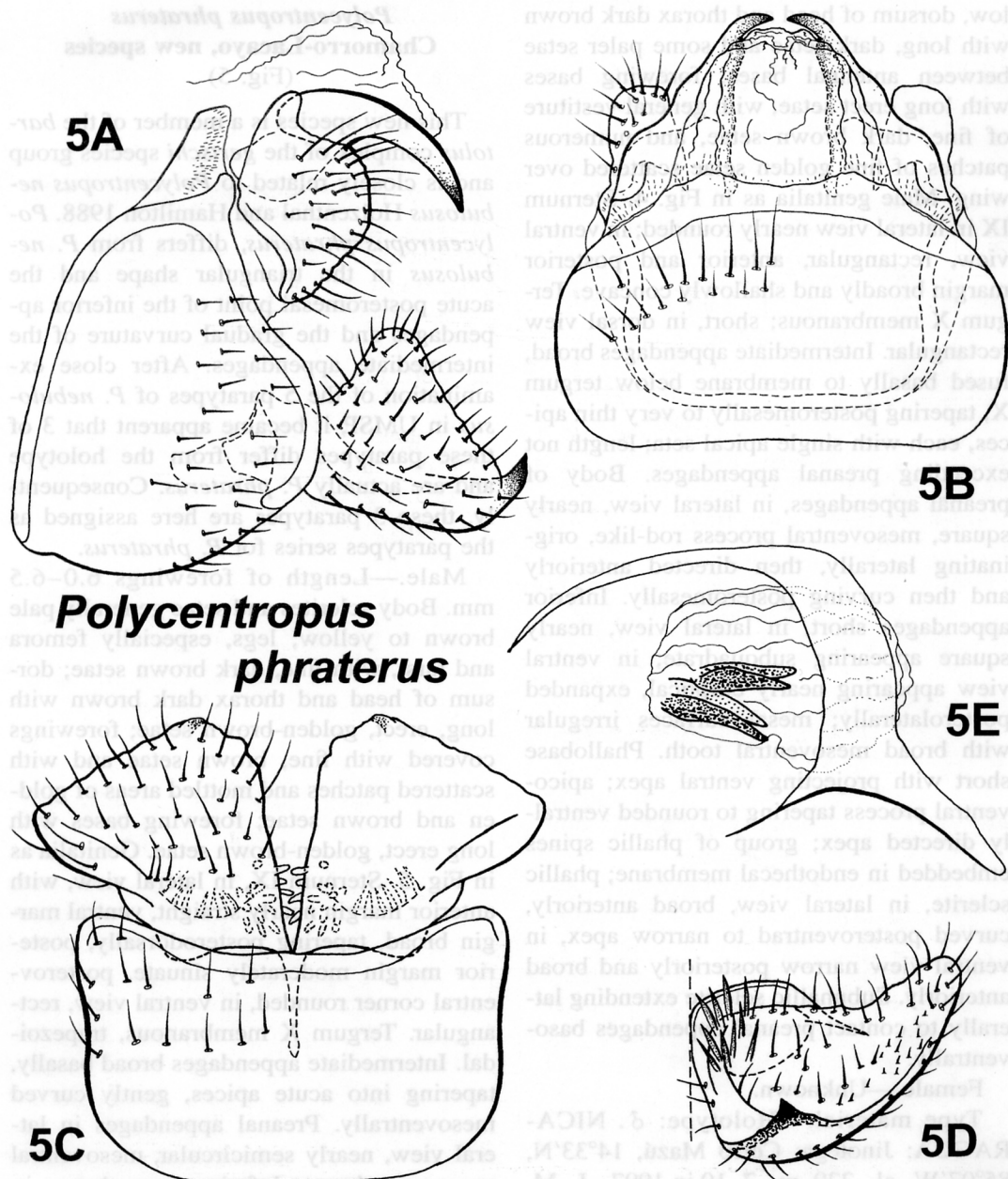


Fig. 5. *Polycentropus phraterus*, male genitalia. A, Lateral view. B, Dorsal view. C, Ventral view. D, Inferior appendage, caudal view. E, Phallus.

rowed apically; four phallic spines embedded in the endothecal membrane. Subphallic sclerite weakly developed.

Female.—Unknown.

Type material.—Holotype: ♂. COSTA RICA: Alajuela: Reserva Forestal San Ra-

món, Río San Lorencito and tributaries, 10.216°N, 84.606°W, el 980 m, 6–10.iii.1991, Holzenthal, Muñoz, Huisman (UMSP) (UMSP000049471). Paratypes: Guanacaste: Parque Nacional Guanacaste, Río San Josecito, Estación Mengo,

10.922°N, 85.470°W, 28–29.vii.1987, el. 960 m, Holzenthal, Morse, Clausen, 1 ♂ (NMNH), 1 ♂ (UMSP), 1 ♂ (INBIO).

Etymology.—This species is named *phraterus* from the Greek *phratero*, brothers, in honor of Dr. Ralph W. Holzenthal and Dr. Steven W. Hamilton for their contributions to the study of Neotropical cadisflies.

***Polyplectropus maesi* Chamorro-Lacayo,
new species
(Fig. 6)**

This new species is a member of the *thilus* group of Yamamoto (1967), which includes *Polyplectropus deltoides* (Yamamoto 1967), *P. carolae* Bueno-Soria 1990, *P. denticulus* Bueno-Soria 1990, and *P. thilus* (Denning 1962), as defined by Bueno-Soria (1990). *Polyplectropus maesi* differs from the other members of this group in the following ways: the ventrolateral processes of the preanal appendages are expanded posterad, each bearing two ventrally directed short subapical lobes; in the posterior margins of the dorsolateral lobes of the inferior appendages are bilobed; and the inferior appendages have broadly triangular spine bearing ventromesal lobes.

Male.—Length of forewing 5.0 mm. Color in alcohol, yellowish brown. Genitalia as in Fig. 6. Sternum IX, in lateral view, short, deltoid, posterior margin sinuate, anterior margin produced ventrally; in ventral view, rectangular, anterior margin concave. Tergum X membranous, broad and elongate. Intermediate appendages digitate, setose, not exceeding inferior appendages. Preanal appendages tripartite; dorsolateral processes heavily sclerotized, long, directed anteromesally, from base recurved posterolaterally, then mesoventrally, finally postero-mesally tapering into acute point; mesolateral processes rectangular, broad, setose, lightly sclerotized, produced into ventrolateral processes meeting mesally to form narrow bridge below phallus; ventrolateral processes directed posteriorly, subapically each bearing two fused ventrally-directed highly

sclerotized lobes. Inferior appendages divided into two lobes; dorsolateral lobes, in lateral view, club-shaped with posterior margins bilobed, setose; ventromesal lobes short, in lateral view, triangular with rounded ventral margins, setose, in ventral view, broadly triangular tapering mesally; mesal margins scalloped bearing robust sclerotized spines, seven visible, in caudal view. Phallobase short, apically membranous; dorsal phallic sclerite cylindrical, narrowing apically; endophallus cylindrical, ventrally located, embedded in endothecal membrane.

Female.—Unknown.

Type material.—Holotype, ♂. NICARAGUA: Zelaya: Río Las Latas, 14°04'N, 88°33'W, el. 220 m, 2.vi.1998, J. M. Maes and B. Hernández (UMSP) (UMSP000066724).

Etymology.—It gives me great pleasure to name this species in honor of Dr. Jean-Michel Maes, Belgian entomologist, in recognition of the many years he has dedicated to the study of Nicaraguan insects, for his unrelenting efforts, and for his wholehearted support, collaboration, and friendship.

***Polyplectropus nicaraguensis*
Chamorro-Lacayo, new species
(Fig. 7)**

This new species is a member of the *charlesi* group, as defined by Bueno-Soria (1990) and is closely related to *Polyplectropus mignoniae* Bueno-Soria 1990. *Polyplectropus nicaraguensis* resembles *P. mignoniae* in the overall shape of the inferior appendages, in the reduction of the dorsolateral processes of the preanal appendages, and in the shape of the intermediate appendages and phallus. *Polyplectropus nicaraguensis* can be distinguished from *P. mignoniae* by the shape and position of the ventrolateral processes of the preanal appendages and by the lack of spines on the posterior margins of the ventromesal lobes of the inferior appendages.

Male.—Length of forewing 4.5–5.0 mm. Color in alcohol yellowish brown. Genitalia

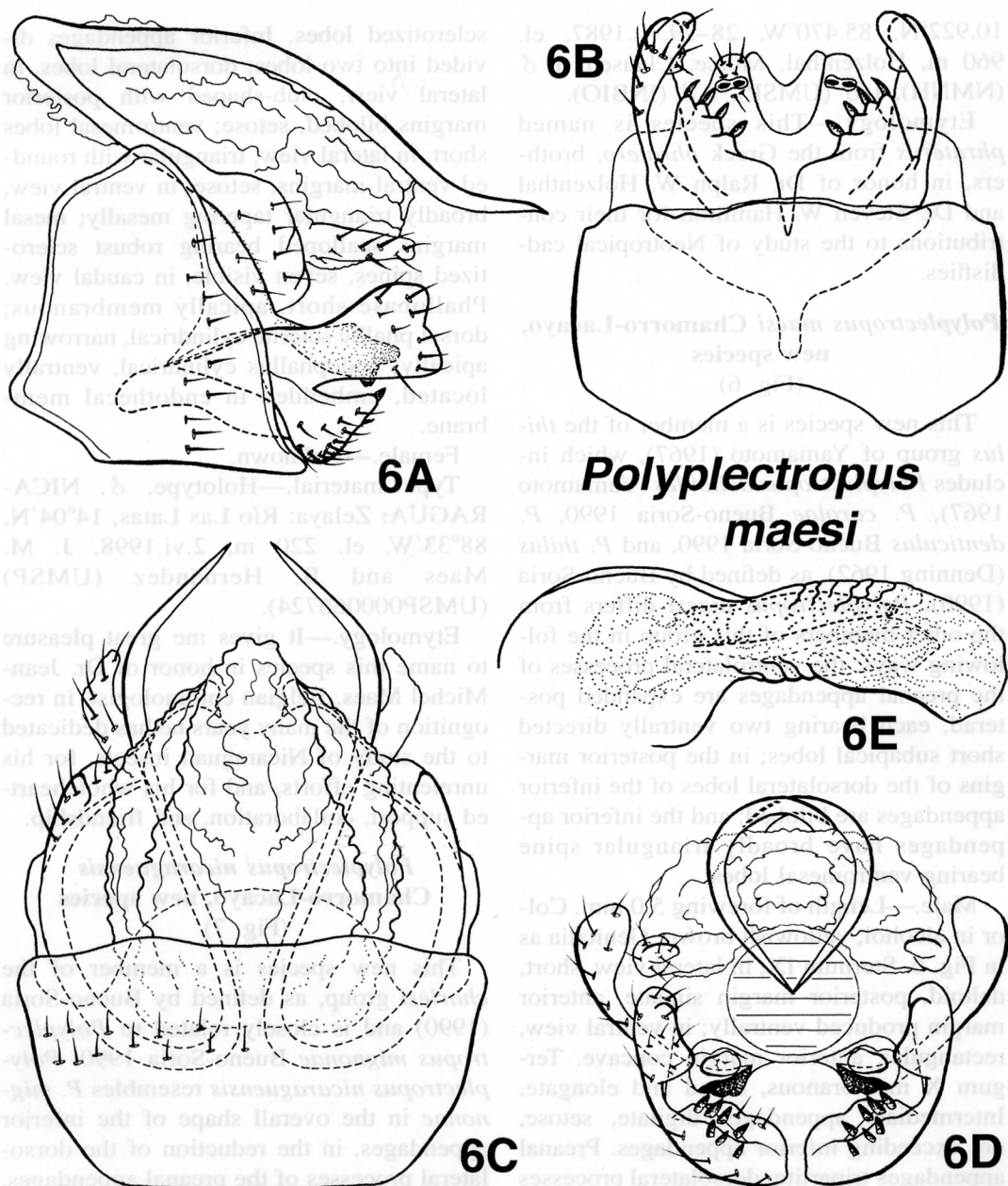
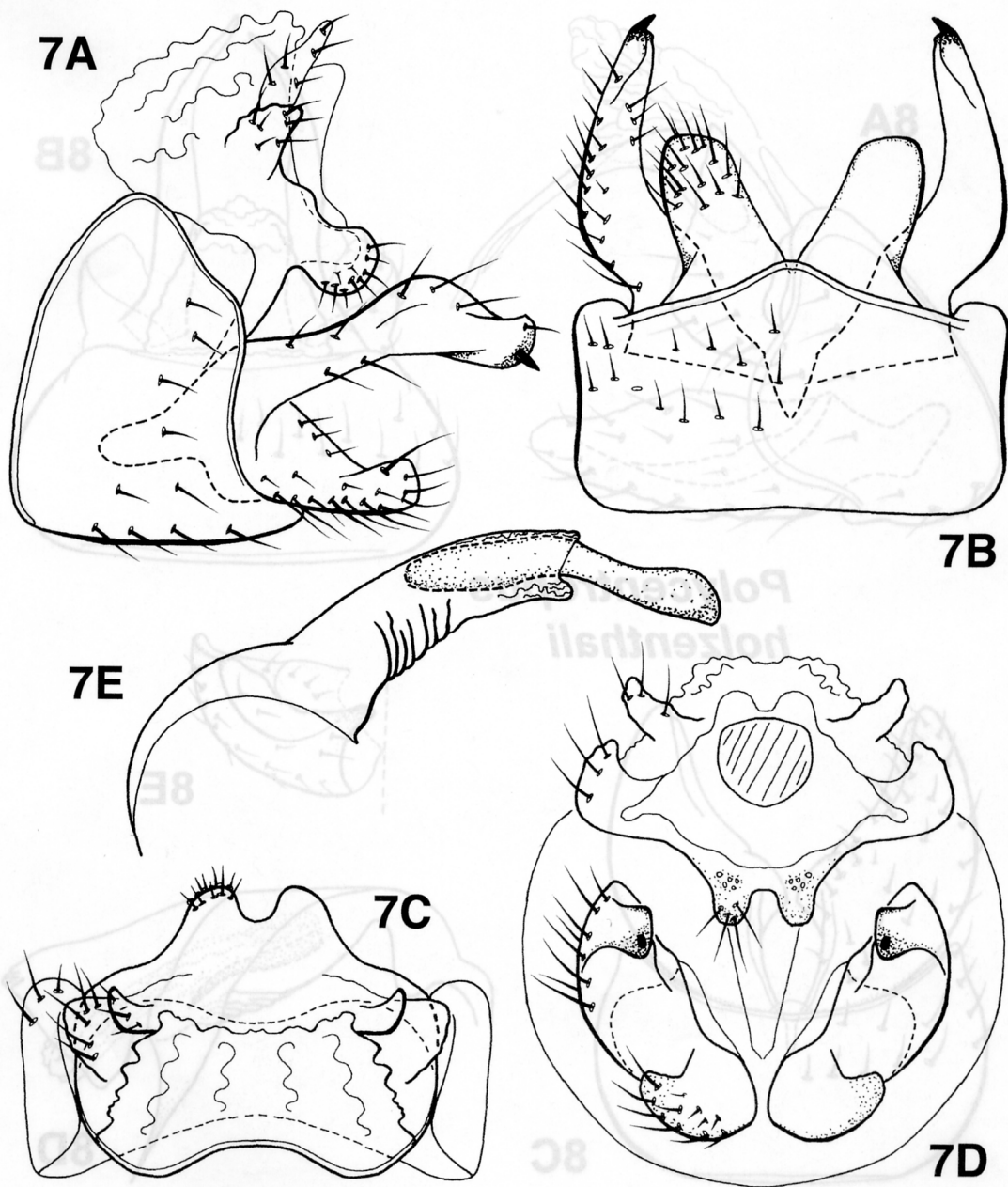


Fig. 6. *Polyplectropus maesi*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Caudal view. E, Phallus.

as in Fig. 7. Sternum IX, in lateral view, short, deltoid, posterior margin sinuate, anterior margin nearly straight. Tergum X membranous, short, in dorsal view, rectangular, in lateral view deltoid. Intermediate appendages digitate, setose, directed dor-

solaterally. Preanal appendages bipartite and migrated dorsally; mesolateral processes short, setose, oval, broadly tapering posterodorsally, produced into ventromesal processes which meet mesally below phallus, forming narrow bridge; ventromesal



Polyplectropus nicaraguensis

Fig. 7. *Polyplectropus nicaraguensis*, male genitalia. A, Lateral view. B, Ventral view. C, Dorsal view. D, Caudal view. E, Phallus.

processes round, setose, pigmented. Inferior appendages divided into two lobes; dorso-lateral lobes, in lateral view, long, slender with median hump, posterior margin trun-

cate, bearing ventrolateral spine; ventromesal lobes short, in lateral view, broad basally tapering to truncate apex, in ventral view, nearly rectangular, basally broad, di-

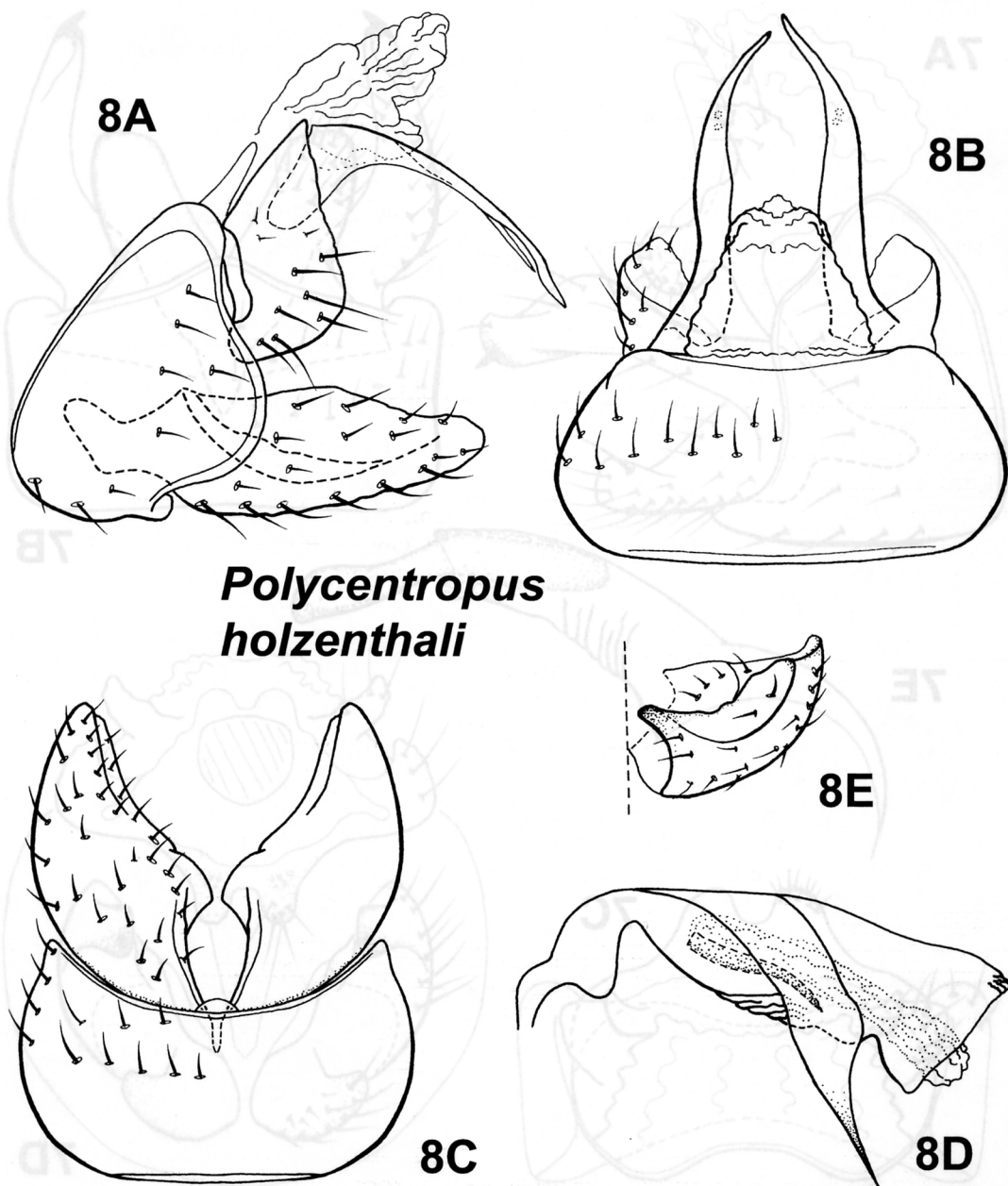


Fig. 8. *Polycentropus holzenthali*, Bueno and Hamilton 1986, male genitalia. A, Lateral view. B, Dorsal view. C, Ventral view. D, Phallus. E, Inferior appendage, caudal view.

rected laterally. Phallus narrow; phallic sclerite cylindrical; phallus surrounded by membrane, situated well dorsally in genital capsule.

Female.—Unknown.

Type material.—Holotype, ♂. NICA-

RAGUA: Zelaya: Río Las Latas, el. 220 m, 14°04'N, 88°33'W, 2.vi.1998, J. M. Maes and B. Hernández (UMSP) (UMSP000066727). Paratype: Same data as holotype, 1 ♂ (NMNH).

Etymology.—This species is named for

the country where the types were collected.

Polycentropus holzenthali

Bueno-Soria and Hamilton 1986

(Fig. 8)

Polycentropus holzenthali Bueno-Soria and Hamilton 1986: 300. [Type locality: MÉXICO: Chiapas: Tributario del Río Teapa situado en la carretera 195 a 3 km al N de Ixhuatán; NMNH, ♂.]

This species belongs to the *gertschi* group and is similar to *Polycentropus veracruzensis* Flint 1981, in the elongate shape of the inferior appendages, in the dorsal processes of the preanal appendages, and in the overall shape of the phallus. *Polycentropus holzenthali* can be distinguished from *P. veracruzensis* by the nearly rectangular shape of the body of the preanal appendages, by the shape of the inferior appendages, and by differences in the phallus, including the presence of a single spine embedded in the endothecal membrane. *Polycentropus holzenthali* is here redescribed and reillustrated in order to provide additional views that will aid in the identification of these closely related species, *P. veracruzensis* and *P. holzenthali*. This specimen represents a new country record for this species in Nicaragua, and the first found outside of México.

Male.—Length of forewing 6.0 mm. Color in alcohol, brown. Genitalia as in Fig. 8. Sternum IX, in lateral view, with anterior margin almost straight, posterior margin sinuate. Tergum X membranous, in dorsal view, trapezoidal. Intermediate appendages not apparent. Preanal appendages bipartite; dorsal processes long, highly sclerotized, in lateral view curved posteroventrally, bearing subapical transparent ventral spine not exceeding margins of dorsal processes, in dorsal view, sinuate, tapering apically; body of preanal appendages setose, in lateral view, nearly rectangular, expanded posteroventrally. Inferior appendages, in lateral view, elongate, broad basally, narrowing

gradually into rounded apex; in ventral view, semicircular, apex narrow, mesal margin expanded medially into triangular lobes. Phallus short, in lateral view apicoventral process broad basally, sharply narrowed apically and highly sclerotized; endothecal membrane with embedded spine.

Female.—Unknown.

Material examined.—NICARAGUA: Jinotega: Cerro Kilambé, 13°34'N, 85°43'W, el. 1,520 m, viii.1997, J. M. Maes and B. Hernández, 1 ♂ (UMSP) (UMSP000066735).

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