

NEW SPECIES AND RECORDS OF  
COSTA RICAN *POLYCENTROPUS*  
(TRICHOPTERA: POLYCENTROPODIDAE)

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*Abstract.*—Five new species of *Polycentropus* (Trichoptera: Polycentropodidae) from Costa Rica are described and illustrated: *P. fasthi*, *P. fortispinus*, *P. nebulosus*, *P. volcanus*, and *P. zurqui*. In addition, *P. digitus* Yamamoto, *P. fortunus* Flint, and *P. mayanus* Flint are recorded from Costa Rica for the first time. Also, *P. acanthogaster* Flint, *P. altmani* Yamamoto, *P. costaricensis* Flint, *P. dentoides* Yamamoto, *P. lingulatus* Flint, and *P. spicatus* Yamamoto occur or are likely to occur in the country.

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In Costa Rica, caddisflies of the genus *Polycentropus* are restricted in distribution to small-medium sized streams in wet, forested areas, generally above 600 meters elevation. These streams are for the most part clear, cool, and fast flowing and are relatively free from pollution (Figs. 1, 2). Hamilton (1986) presented a review of the systematics and biogeography of New World *Polycentropus*, including the descriptions of 11 new Neotropical species. Collections made in Costa Rica in 1986 and 1987 revealed five additional new species not covered by Hamilton (1986) as well as several new distribution records of previously described species. These specimens support our contention that the Neotropics harbor an unexpectedly rich *Polycentropus* fauna. In this paper, we provide descriptions of these five new species along with distribution records and notes for other *Polycentropus* known (7 species) or likely (2 species) to occur in Costa Rica. Additional collecting, especially in the more remote, mountainous areas of Costa Rica will undoubtedly yield additional new species.

Morphological terminology follows Hamilton (1986). Types are deposited in the collections of the Museo Nacional de Costa Rica, San José (MNCR); the U.S. National Museum of Natural History, Smithsonian Institution, Washington, D.C. (NMNH); and the University of Minnesota Insect Collection, St. Paul (UMSP); as indicated below. All specimens of previously described species upon which new records are based are deposited in UMSP.

***Polycentropus fasthi*, new species**

Fig. 3

*Diagnosis.* This species is closest to *P. mayanus* Flint differing most noticeably from that species in the shape of the preanal appendages. In the new species, the mesoventral processes of the preanal appendages are elongate and form sharp points (in this feature *P. fasthi* resembles *P. gertschi* Denning and *P. alatus* Flint). The inferior appendages of *P. fasthi* and *P. mayanus* are similar except that the apicomeral processes of these appendages are much less pronounced in the former species.



Figs. 1, 2. Habitats: 1. headwaters of Río Zurquí at 1,650 meters elevation, lower montane rainforest, Parque Nacional Braulio Carrillo, San José Province. 2. Río Bellavista at 1,400 meters elevation, premontane wet forest, Cordillera de Talamanca, Puntarenas Province.

Additionally, the apicoventral process of the phallus is longer and thinner and the phallic sclerite is shorter in *P. fasthi* than in *P. mayanus*. It is a member of the *bartolus* complex of the *gertschi* group.

*Description.* Male: Forewing length 5.5–6.5 mm. Body sclerites and setae generally pale brown dorsally, yellow ventrally; legs, especially femora and tarsi, with fine, dark brown setae; dorsum of head and thorax dark brown with long, erect, brown setae; forewings covered with fine, dark brown setae and with numerous small, scattered patches of golden setae; forewing bases with long, erect, dark setae. Genitalia as in Figure 3. Abdominal sternite IX large, about  $\frac{2}{3}$  height of abdominal segment VIII; in lateral view approximately circular, in ventral view approximately rectangular, slightly wider than long. Intermediate appendages of moderate length and thickness, curved mesally, apices pointed, apicomasal regions membranous. Preanal appendages approximately circular, small; mesoventral processes broad, apices attenuated, directed caudomesally. Inferior appendages relatively short; in lateral view, oval shaped, with no sharp angles or points; in ventral view, generally oval with small, apicomasal points, mesal surfaces only slightly convex. Phallus with short phallobase, apicodorsal portion mostly membranous; phallobase with narrow apicoventral process directed posteriorly then posteroventrally; single, large phallic spine present; in dorsal view, phallic sclerite broad basally, slightly expanded posteriorly and forked apically; subphallic sclerite small, forming shallow “U.”

*Type material.* Holotype: Male, Costa Rica: Guanacaste: Parque Nacional Rincón

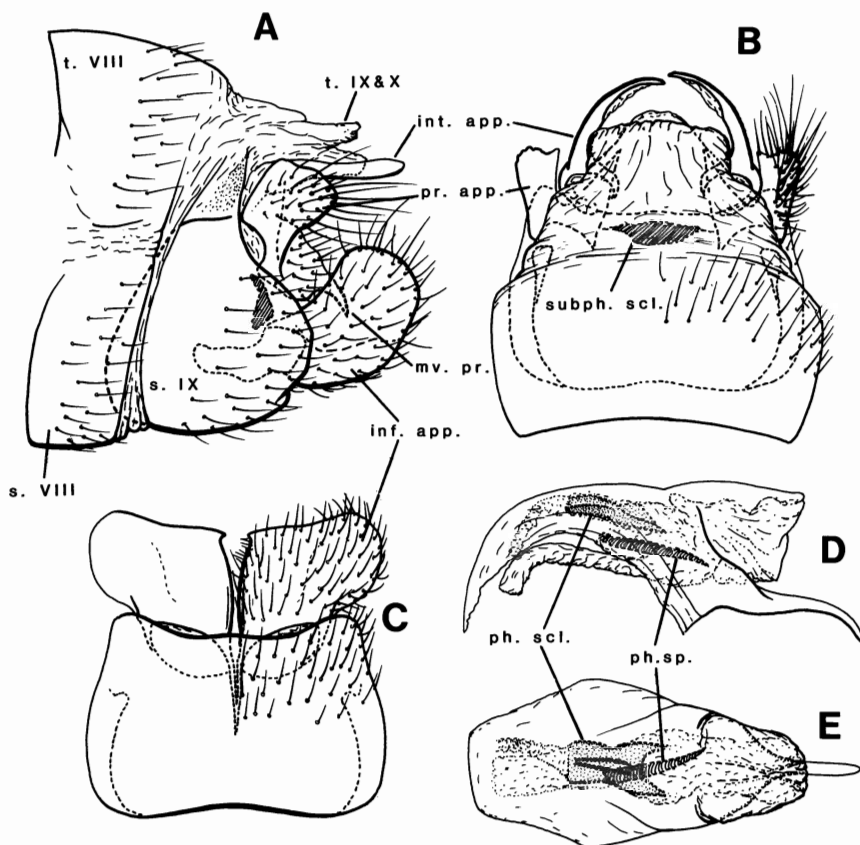


Fig. 3. *Polycentropus fasthi*. Male genitalia: A, left lateral; B, dorsal; C, ventral; D, phallus, left lateral; E, phallus, dorsal. (inf. app. = inferior appendage, int. app. = intermediate appendage, mv. pr. = mesoventral process, ph. scl. = phallic sclerite, ph. sp. = phallic spine, pr. app. = preanal appendage, s. VIII = sternite VIII, s. IX = sternite IX, subph. scl. = subphallic sclerite, t. VIII = tergite VIII, t. IX & X = tergites IX & X).

de la Vieja, Río Negro, 10.765°N, 85.313°W, 810 m, 3.iii.1986, Holzenthal and Fasth (NMNH). Paratypes: same data as holotype, 3 males (MNCR, UMSP); Costa Rica: Alajuela: Parque Nacional Rincón de la Vieja, Quebrada Provisión, 10.769°N, 85.281°W, el. 810 m, 4.iii.1986, Holzenthal and Fasth, 1 male (UMSP); Reserva Forestal San Ramón, Río San Lorencito and tribs., 10.216°N, 84.607°W, 980 m, Holzenthal, Hamilton, Heyn, 2 males (UMSP); Cerro Campana, Río Bochinche trib., 6 km (air) NW Dos Ríos, 10.945°N, 85.413°W, 600 m, Holzenthal, Morse, Clausen, 4 males (MNCR, UMSP); Cartago: Río Platanillo, 2.2 km E Tayutic, 9.82°N, 83.55°W, 730 m, 30.i.1986, Holzenthal, Morse, Fasth, 1 male, 8 females (UMSP); San José: Parque Nacional Braulio Carrillo, Estación Carrillo, Quebrada Sanguijuela, 10.160°N, 83.963°W, 800 m, Holzenthal, Hamilton, Heyn, 4 males (UMSP).

*Etymology.* Named in honor of Mr. William P. Fasth, in recognition of his invaluable assistance in collecting this species and many other interesting Costa Rican Trichoptera.

***Polycentropus fortispinus*, new species**

Fig. 4

*Diagnosis.* This species, a member of the *bonus* complex of the *gertschi* group, is very closely related to *Polycentropus* n. sp. 10 from near Ocosingo, Chiapas, Mexico (Hamilton, 1986, fig. 6.24). *Polycentropus fortispinus* can be separated from *P. n. sp. 10* by rather subtle differences in the male genitalia. The bodies of the preanal appendages of the new species are larger relative to the inferior appendages; in *P. n. sp. 10* these appendages are approximately equal in size. The larger size and more dorsal position of the mesoventral processes of the preanal appendages and the slightly larger intermediate appendages of the new species can be used to separate the two species. Also, the inferior appendages of *P. fortispinus* are less ovoid and more angular than in *P. n. sp. 10*. Finally, the numerous phallic spines are much shorter and stouter in this species than in *P. n. sp. 10*.

*Description.* Male: Forewing length 5.5–6.4 mm. Body sclerites and setae generally pale brown dorsally, yellow ventrally; legs with darker setae on femora and tarsi; dorsum of head brown with long, erect, dark brown setae; forewings covered with fine, dark brown setae and with numerous small, scattered patches of golden setae; forewing bases with long, erect, dark setae. Genitalia as in Figure 4. Abdominal sternite IX large, about  $\frac{3}{8}$  height of abdominal segment VIII; in lateral view approximately circular; in ventral view very broad, lateral margins and corners rounded, anterior and posterior margins shallowly concave. Intermediate appendages thin, short, not reaching length of preanal appendages; broadened at bases to form weakly sclerotized plates below tergum X; each with single seta at apex. Preanal appendages large, irregularly oval in lateral view, about  $\frac{1}{3}$  height of abdominal segment VIII, caudoventral edges concave; mesoventral processes rodlike, thicker than intermediate appendages, originating at anteroventral corners of preanal appendages, slightly longer than body of each preanal appendage. Inferior appendages short, small; in lateral view, approximately ovoid, posterior margins nearly straight; mesal teeth broad, heavy; in ventral view, posterior margins nearly straight to slightly concave, mesal margins straight, lateral margins convex. Phallus with posterior portion of phallobase short, anterior portion slightly elongate, apicoventral process broad at base, evenly decurved and narrowed to small, weakly sclerotized point; 13 short, stout phallic spines; phallic sclerite large, apical forks separated mesally; subphallic sclerite broad, extending between preanal appendages, two dorsal arms extended to encircle phallobase.

*Type material.* Holotype: Male, Costa Rica: Guanacaste: Parque Nacional Rincón de la Vieja, Río Negro, 10.765°N, 85.313°W, 3.iii.1986, 810 m, Holzenthal and Fasth (NMNH). Paratypes: Costa Rica: Alajuela: Reserva Forestal San Ramón, Río San Lorencito and tribs., 10.216°N, 84.607°W, 980 m, 2–4.vii.1986, Holzenthal, Heyn, Armitage, 1 male (MNCR); same, except 30.iii–1.iv.1987, Holzenthal, Hamilton, Heyn, 1 male (UMSP); Guanacaste: Parque Nacional Guanacaste, Río San Josecito [Estación Biológica Mengo], 10.992°N, 85.470°W, 960 m, 3–4.iv.1987, Holzenthal, Hamilton, Heyn, 1 male (UMSP).

*Etymology.* Named for the short, stout phallic spines characteristic of this species.

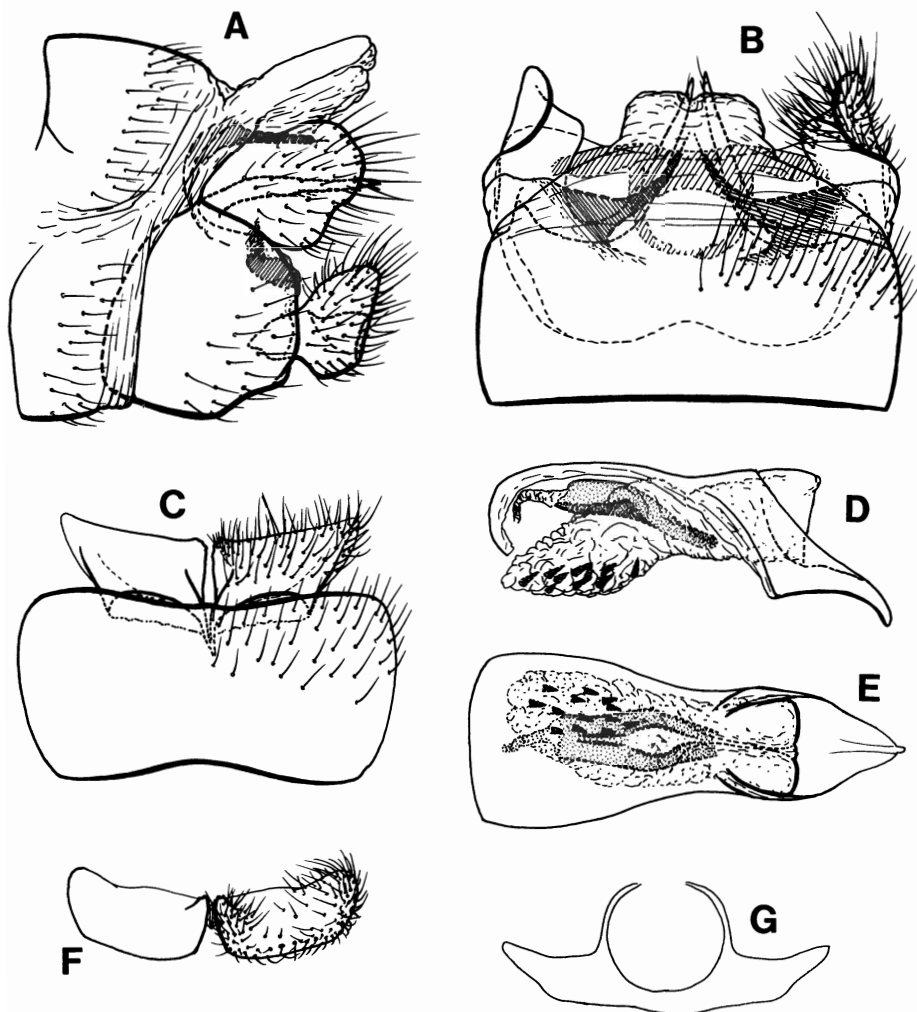


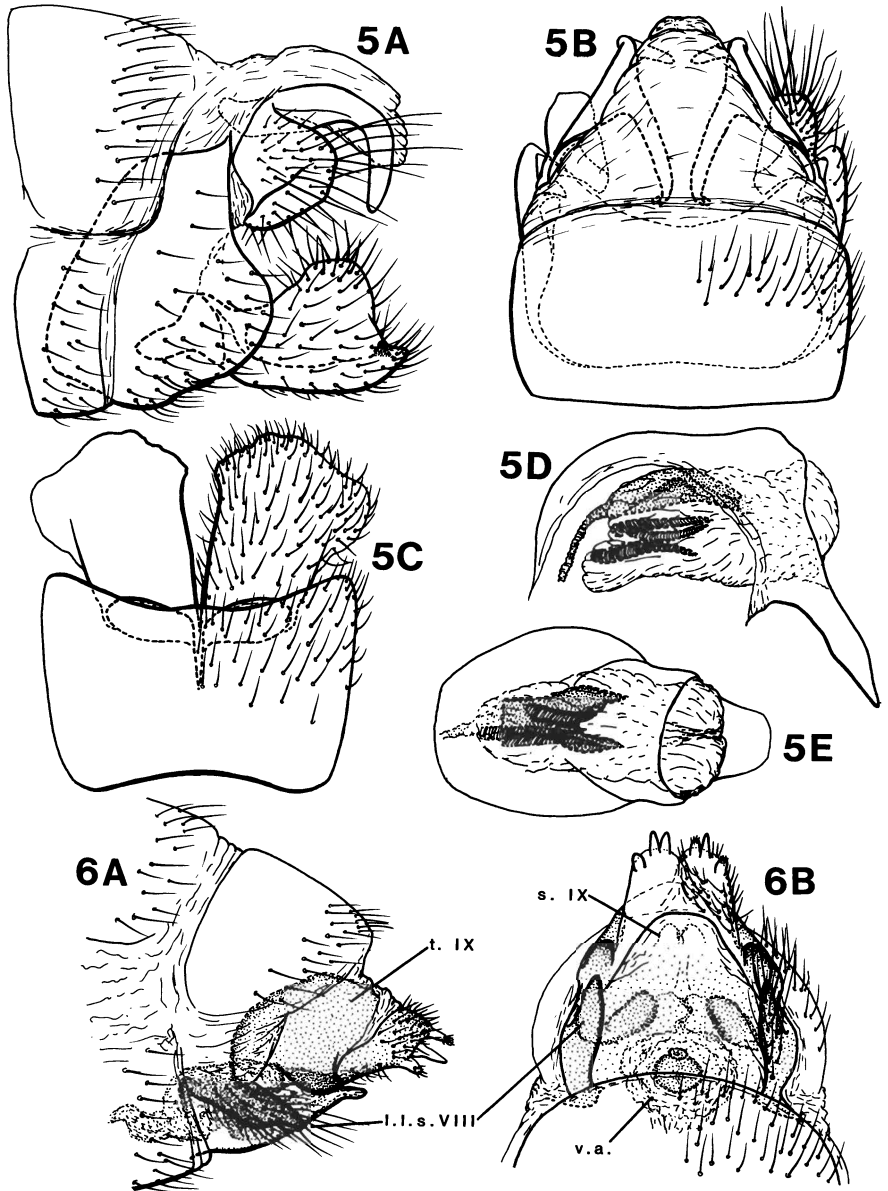
Fig. 4. *Polycentropus fortispinus*. Male genitalia: A, left lateral; B, dorsal, C, ventral; D, phallus, left lateral; E, phallus, dorsal; F, inferior appendages, caudal; G, subphallic sclerite, caudal.

#### ***Polycentropus nebulosus*, new species**

Figs. 5, 6

*Diagnosis.* This species is closest to *P. fortuneus* Flint and is another member of the *bartolus* complex of the *gertschi* species group. In addition to the overall difference in shape of the inferior appendages, the presence of three phallic spines, the shorter, thicker intermediate appendages, and the absence of mesobasal spines on the inferior appendages render this species distinct from *P. fortuneus*.

*Description.* Male: Forewing length 6.9–7.0 mm. Body sclerites and setae generally



Figs. 5, 6. *Polycentropus nebulosus*. Fig. 5, male genitalia: A, left lateral; B, dorsal; C, ventral; D, phallus, left lateral; E, phallus, dorsal. Fig. 6, female genitalia: A, left lateral; B, ventral. (l. l. s. VIII = lateral lobe of sternite VIII, s. IX = sternite IX, t. IX = tergite IX; v. a. = vaginal apparatus).

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 (Monteverde paratypes with forewings more mottled than holotype); forewing bases with long, erect, golden-brown setae. Genitalia as in Figure 5. Abdominal sternite IX large, about  $\frac{3}{4}$  height of abdominal segment VIII; in lateral view, posteromesal corner rounded, produced, posterodorsal margin straight; in ventral view anterior and posterior margins broadly emarginate. Intermediate appendages relatively thick, curved ventrad at mid-length, apices curved mesad; in length, not exceeding inferior appendages (Monteverde paratypes with intermediate appendages somewhat shorter and less curved than holotype). Preanal appendages semicircular, mesoventral processes absent. Inferior appendages moderately short; in lateral view, approximately triangular, ventral margins nearly straight, with posteroventral corners angulate, bearing mesal point; dorsolateral flange evenly rounded; in ventral view moderately broad, mesal margin nearly straight, posterior margin irregular, dorsolateral flange slightly produced, rounded. Phallus with moderately short phallobase, apicoventral process broad basally, apex strongly narrowed; three large phallic spines (one Monteverde paratype with five phallic spines); phallic sclerite broad; subphallic sclerite weakly developed.

Female: Forewing length 8.6–10.9 mm. Color and setation as in male. Genitalia as in Figure 6. Lateral lobes of sternite VIII narrow, acute. Sternite IX trapezoidal in ventral view, posterior margin truncate, lightly sclerotized basally; densely covered with minute, fine setae. Tergite IX weakly sclerotized dorsally; with ventrolateral, round lobe. Vaginal apparatus with vase-like anterior sclerite bearing lipped central pore; pair of sclerotized pockets posteriorly.

*Type material.* Holotype: Male, Costa Rica: Puntarenas: Río Bellavista, ca. 1.5 km NW Las Alturas, 8.951°N, 82.846°W, 15–17.vi.1986, 1,400 m, Holzenthal, Heyn, Armitage (NMNH). Paratypes: same data as holotype except 8–9.iv.1987, Holzenthal, Hamilton, Heyn, 2 males (UMSP); Costa Rica: Guanacaste: Parque Nacional Guanacaste, Río San Josecito, Estación Mengo, 10.922°N, 85.470°W, 28–29.vii.1987, 960 m, Holzenthal, Morse, Clausen, 3 males (UMSP); Puntarenas: Reserva Bosque Nubosa Monteverde, Quebrada Cueba, 10.31°N, 84.79°W, 28.ii.1986, 1,500 m, Holzenthal and Fasth, 2 males, 2 females (MNCR, UMSP).

*Etymology.* From the Latin *nebulosus*, misty, foggy, cloudy; in reference to the often fog shrouded lower montane habitat of the species.

### ***Polycentropus volcanus*, new species**

Fig. 7

*Diagnosis.* This species is clearly a member of the *halidus* complex of the *gertschi* group. It resembles *P. guatemalensis* Flint, *P. halidus* Milne, and *P. palmitus* Flint in the thick, moderately long intermediate appendages, the short, broad preanal appendages, the elongate inferior appendages, and the short phallus with its two phallic spines and broad phallic sclerite. It can be distinguished from those species by the ventrally directed point on the mesoventral process of the preanal appendage and by the narrow upturned apical region of the inferior appendage.

*Description.* Male: Forewing length 6.8 mm. Body sclerites and setae generally

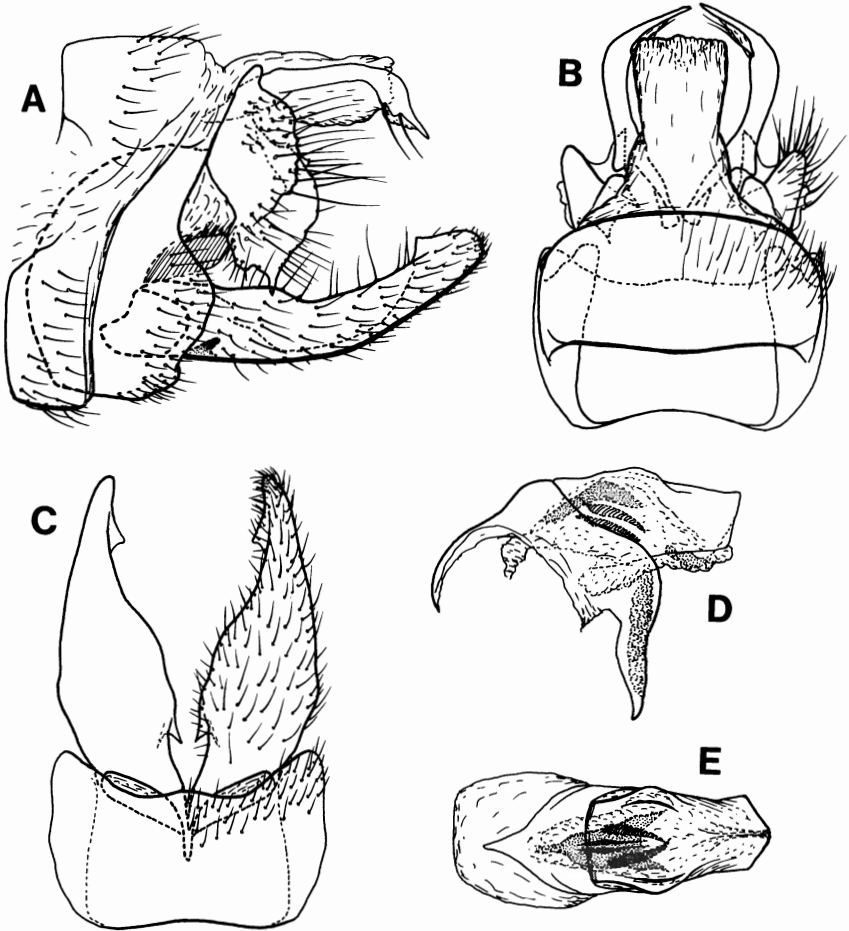


Fig. 7. *Polycentropus volcanus*. Male genitalia: A, left lateral; B, dorsal; C, ventral; D, phallus, left lateral; E, phallus, dorsal.

brownish-yellow; dorsum of head and thorax dark brown, with long, erect, dark brown setae; leg segments with dark apical setae; forewings covered with fine, brown setae and with numerous small, scattered patches of golden setae; forewing bases bearing long, erect, dark setae. Genitalia as in Figure 7. Abdominal sternite IX large, about  $\frac{2}{3}$  height of abdominal segment VIII; in lateral view, approximately hemispherical, anterior margin evenly curved, posterior margin sinuate. Intermediate appendages moderately long, but not extending posteriorly beyond inferior appendages, apical  $\frac{1}{3}$  thickened and curved ventromesally, apicomasal surfaces membranous, each with two apicoventral setae. Preanal appendages short, broad; mesoventral processes with prominent, ventrally directed, acute projections. Inferior appendages elongate, slightly upcurved, apical halves acute in ventral view; each with prominent

apicodorsal and basomesal spine-like processes. Phallus with short phallobase divided into basal and apical portions; basal portion with thick, ventrally directed apicoventral process, bearing prominent rugosity on posterior surface; apical portion simple, truncate, somewhat laterally compressed; two phallic spines; in dorsal view, phallic sclerite large, apical forks directed laterally.

*Type material.* Holotype: Male, Costa Rica: San José: Parque Nacional Braulio Carrillo, 6.2 km NE administration building [Estación Zurquí], 1,100 m, 10.09°N, 83.97°W, 6.ii.1986, Holzenthal and Morse (NMNH). Paratypes: San José: Río Parrita Chiquito, rt. 12, 6.5 km SW jct. rt. 2, 9,703°N, 83.970°W, 1,990 m, Holzenthal, Hamilton, Heyn, 2 males (MNCR, UMSP).

*Etymology.* Named for Volcán Barva near the type locality, in Costa Rica's large, highly dissected, volcanic Cordillera Central.

### ***Polycentropus zurqui*, new species**

Fig. 8

*Diagnosis.* This species appears to be related to *Polycentropus spicatus* Yamamoto, an unplaced species within the *gertschi* group, in that the inferior appendages bear narrow, erect dorsolateral flanges and the intermediate appendages have secondary spines and laterally directed apices. The unique overall shape of these appendages on the new species distinguishes it from *P. spicatus* and all other Neotropical *Polycentropus* species.

*Description.* Male: forewing length 8.2–8.8 mm. Body sclerites and setae generally yellow, dark brown setae on femora and tarsi of all legs; dorsum of head and thorax brown with long, erect, dark brown setae; forewings covered with fine, brown setae and numerous, small, scattered patches of golden setae; forewing bases with long, erect, dark setae. Genitalia as in Figure 8. Abdominal sternite IX large, about  $\frac{3}{4}$  height of abdominal segment VIII; in lateral view, anterior margin nearly straight, posterior margin moderately sinuate; in ventral view rectangular, nearly as long as wide, anterior and posterior margins concave. Intermediate appendages thick basally, with acute ventromesal processes, each with main body twisted, first mesally, then ventrally, then laterally; apex very acute. Preanal appendages small, slightly narrowed and rounded posteriorly; mesoventral processes thick, curved slightly posteriorly, apices rounded, blunt. Inferior appendages short, each with prominent, acute, apical tooth and erect, narrow dorsolateral flange, mesal ridges with numerous spine-like setae. Phallus with moderately short phallobase and narrow, posteroventrally directed apex; in dorsal view, phallic sclerite narrow basally, broad and U-shaped apically; three phallic spines; subphallic sclerite rectangular in dorsal view.

*Type material.* Holotype: Male, Costa Rica: San José: Parque Nacional Braulio Carrillo, park headquarters [Estación Zurquí], 10,059°N, 84,017°W, 1,650 m, Holzenthal (NMNH). Paratype: Same data as holotype, 1 male (UMSP).

*Etymology.* Named for the Río Zurquí, whose headwaters originate in pristine montane rainforest near Estación Zurquí in Costa Rica's Braulio Carrillo National Park (Fig. 1).

The following list presents new distribution records for previously described Costa Rican *Polycentropus*. Previously published distributional data for these species were presented by Hamilton (1986). *Polycentropus fortuneus*, *P. digitus*, and *P. mayanus* are here recorded from Costa Rica for the first time. Those species preceded by an

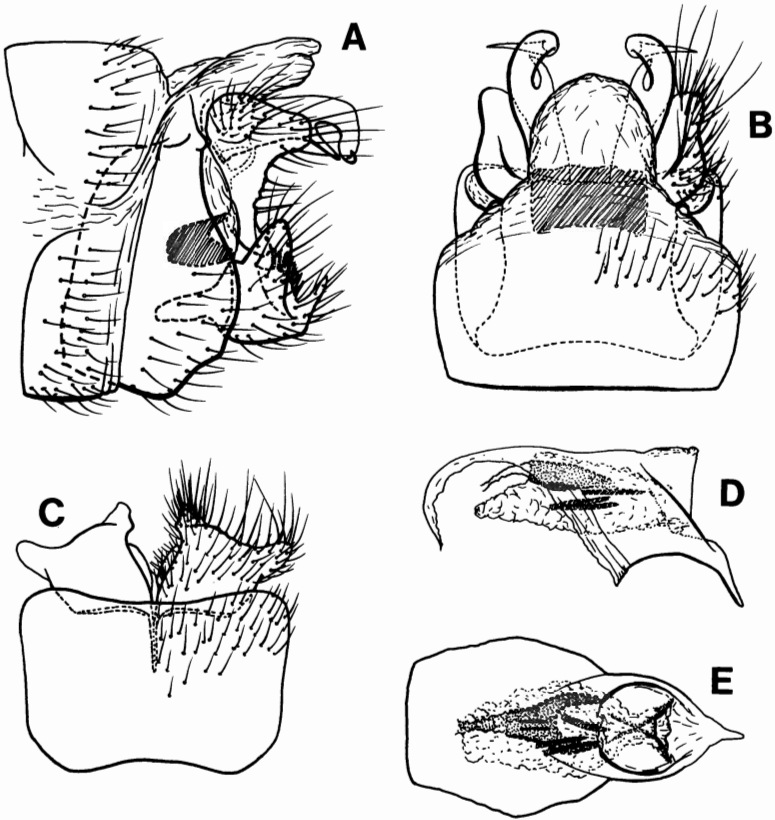


Fig. 8. *Polycentropus zurqui*. Male genitalia: A, left lateral; B, dorsal; C, ventral; D, phallus, left lateral; E, phallus, dorsal.

asterisk (\*) have been reported from the Cordillera de Talamanca of Panama and are expected to occur in the Costa Rican portion of that mountain range.

\**Polycentropus acanthogaster* Flint, 1981:157, figs. 46–49, male (NMNH); Hamilton, 1986:112, fig. 6.25, male.

*Distribution.* PANAMA (Chiriquí).

*Polycentropus altmani* Yamamoto, 1967:130, fig. 2, male (INHS); Flint, 1967:8, figs. 27–28 (as *P. macrostylus*); Hamilton, 1986:123, fig. 6.32, male.

*New record.* Costa Rica: Guanacaste: Parque Nacional Santa Rosa, Río Cuajiniquíl, 10.881°N, 85.613°W, 25.vii.1987, 250 m, Holzenthal, Morse, Clausen, 1 male.

*Distribution.* COSTA RICA (Guanacaste, Puntarenas); ECUADOR (Pastaza); HONDURAS; NICARAGUA; PANAMA (Canal Zone, Cocle); VENEZUELA (Aragua, Lara).

*Notes.* The type of *P. macrostylus* Flint is from Golfito, Puntarenas Prov. This widespread species occurs at much lower elevations than other Costa Rican *Polycentropus*.

*Polycentropus costaricensis* Flint, 1967:8, figs. 29–32, male (NMNH); Hamilton 1986: 143.

*New records.* San José: Parque Nacional Braulio Carrillo, Río Zurquí, 10.059°N, 84.019°W, 1,650 m, Holzenthal, Heyn, Armitage, 1 male.

*Distribution:* COSTA RICA (Alajuela, Cartago, San José).

*Notes.* This rare species is known only from the type series (male holotype, Volcán Poás; 2 male, 6 female paratypes, Volcán Irazú) and the specimen listed above from the Río Zurquí, near Volcán Barva. Flint (pers. comm.) considers this species to be synonymous with *P. spicatus* and this opinion was accepted by Hamilton (1986). However, there are distinct morphological differences between the two species, especially in the shapes of the preanal and inferior appendages. Furthermore, *P. costaricensis* is known only from the higher elevations of the volcanic peaks of the Cordillera Central, while *P. spicatus* appears to be restricted to the upper elevations of the northern Talamanca; the two populations being separated by the low elevations of the Río Reventazón valley. Unfortunately, both species are known from only a very few individuals thus limiting knowledge of intraspecific variation. We conclude that it is better to retain the separate identities of these species to call attention to the problem and hope that additional collecting will yield more specimens.

*Polycentropus dentoides* Yamamoto, 1967:132, fig. 6, male (INHS); Hamilton, 1986: 106, fig. 6.20, male (recorded from Costa Rica, but no specific locality information given).

*Distribution.* PANAMA (Canal Zone, Chiriquí); COSTA RICA.

*Polycentropus digitus* Yamamoto, 1967:131–132, fig. 5, male (INHS); Hamilton, 1986:115, fig. 6.28, male.

*New records.* Cartago: Reserva Tapantí, Río Grande de Orosi, 9.686°N, 83.756°W, 1,650 m, 8–9.vii.1986, Holzenthal, Heyn, Armitage, 1 male; same, except 18–21.iii.1987, Holzenthal, Hamilton, Heyn, 8 males; Puntarenas: Río Bellavista, ca. 1.5 km NW Las Alturas, 8.951°N, 82.846°W, 1,400 m, 18.ii.1986, Holzenthal, Morse, Fasth, 2 males, 2 females; San José: Parque Nacional Braulio Carrillo, Río Zurquí, 10.059°N, 84.019°W, 1,650 m, 5.ii.1986, Morse and Fasth, 1 male; same, except park headquarters [Estación Zurquí], 10.059°N, 84.017°W, Holzenthal, 1 male; same, except 7.vii.1987, Holzenthal, Heyn, Armitage, 2 males; same, except 6.2 km NE adm. build. [Estación Zurquí], 10.09°N, 83.97°W, 1,100 m, 6.ii.1986, Holzenthal and Morse, 1 male; Río Chirripó Pacífico, 9.5 km NE Rivas, 9.470°N, 83.591°W, 23.ii.1986, Holzenthal, Morse, Fasth, 16 males, 8 females.

*Distribution.* COSTA RICA (Cartago, Puntarenas, San José); PANAMA (Chiriquí).

*Polycentropus fortuneus* Flint, 1981:155, 157, figs. 42–45, male (NMNH); Hamilton, 1986:108, fig. 6.22, male.

*New records.* Alajuela: Río La Paz Pequeña, 7.8 km N Vara Blanca, 10.211°N, 84.116°W, 1,230 m, 13.ii.1986, Holzenthal, Morse, Fasth, 1 male; San José: Parque Nacional Braulio Carrillo, 6.2 km NE adm. build. [Estación Zurquí], 10.09°N, 83.97°W,

1,100 m, 6.ii.1986, Holzenthal, Morse, Fasth, 2 males, 1 female; same, except park headquarters [Estación Zurquí], 10.059°N, 84.017°W, 1,650 m, 5.ii.1986, Holzenthal, 7 males, 4 females.

*Distribution.* COSTA RICA (Alajuela, San José); PANAMA (Chiriquí).

\**Polycentropus lingulatus* Flint, 1981:151, figs. 13–16, male (NMNH); Hamilton, 1986:135, fig. 6.41, male.

*Distribution.* PANAMA (Chiriquí, Cocle).

*Polycentropus mayanus* Flint, 1981:151, figs. 9–12, male (NMNH); Hamilton, 1986: 109, fig. 6.23, male.

*New record.* Guanacaste: Parque Nacional Guanacaste [Estación] Maritza, Río Tempisquito, 10.958°N, 85.497°W, 550 m, 19–20.vii.1987, Holzenthal, Morse, Clausen, 4 males, 1 female.

*Distribution.* COSTA RICA (Guanacaste); MEXICO (Chiapas).

*Notes.* The specimens from Guanacaste have much more pronounced apicomeres teeth on the inferior appendages compared to the holotype from Chiapas, Mexico.

*Polycentropus spicatus* Yamamoto, 1967:131, fig. 4, male (INHS); Hamilton, 1986: 143, fig. 6.47, male.

*New records.* Cartago: Reserva Tapantí, Río Grande de Orosi, 9.686°N, 83.756°W, 1,650 m, 9–8.vii.1986, Holzenthal, Heyn, Armitage, 1 male; same, except 18–21.iii.1987, Holzenthal, Hamilton, Heyn, 1 male; same, except 15–16.vii.1987, Holzenthal, Morse, Clausen, 3 males; San José: Río Parrita Chiquito, rt. 12, 6.5 km SW jct. rt. 2, 9.703°N, 83.970°W, 1,990 m, 18.vi.1986, Holzenthal, Heyn, Armitage, 2 males; same, except 10.iv.1987, Holzenthal, Hamilton, Heyn, 3 males, 2 females.

*Distribution.* COSTA RICA (Cartago, San José); PANAMA (Chiriquí).

#### ACKNOWLEDGMENTS

The following Costa Rican individuals and their institutions are extended sincere appreciation for their generous assistance in making this research possible: I. Chacón and A. Solíz, Museo Nacional de Costa Rica; F. Cortés, Servicio de Parques Nacionales; R. Valverde and F. Montalto, Instituto Costaricense de Electricidad; R. Ortiz and V. Mora, Universidad de Costa Rica—San Ramón; M. Ramírez, Centro Ciencia Tropical; R. Garcia, Fundación Neotropical; F. Umaña, Compañía Las Alturas; and L. D. Gómez and J. A. León, Organización para Estudios Tropicales. A special note of appreciation is extended to I. Chacón, W. Hallwachs, D. Janzen, and A. Solíz for their interest and enthusiastic support of the caddisflies of Costa Rica project. For field assistance thanks are extended to B. Armitage, A. Chacón, M. M. Chavarría, P. Clausen, W. Fasth, M. Heyn, and J. Morse. This material is based upon work supported by the National Science Foundation Grant BSR-8512368. Paper No. 15,835, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul, Minnesota.

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Received February 19, 1988; accepted April 20, 1988.