

## ***Humongochela*, a New Genus of Waterfall-Loving Flies From the Marquesas Islands (Diptera: Dolichopodidae)**

NEAL L. EVENHUIS

*J. Linsley Gressitt Center for Entomological Research, Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii'i, 96817-2704, USA; email: neale@bishopmuseum.org*

### **Abstract**

A new genus of Dolichopodidae allied to *Campsicnemus*, *Humongochela*, **n. gen.**, is described to include three new species: *H. englundii* **n. sp.**, *H. hardyi* **n. sp.**, and *H. polhemusi* **n. sp.** A key to species in the genus is given and all species are described and illustrated. These flies are found only in association with vertical rock surfaces near waterfalls in the Marquesas Islands.

### **Introduction**

Little is known of the dolichopodid fauna of the Marquesas and few collecting ventures have taken place in which to ascertain the fauna of these flies that abound in those remote French Polynesian islands. However, two recent scientific expeditions led by the Smithsonian Institution and the Bishop Museum have resulted in several new discoveries of aquatic insects and have helped significantly increase our knowledge of the biodiversity of these islands. Some of these results included recent discoveries of 3 species of water-skating *Campsicnemus* Haliday, which were published in Evenhuis (2000). However, many more new *Campsicnemus* from the Marquesas await description and publication. In the meantime, this paper describes a remarkable new genus of sympycnine Dolichopodidae occurring on Nuku Hiva, Fatu Hiva, and Hiva Oa that resembles an extremely large *Campsicnemus*.

With the publication of the three new species in this genus, the Marquesan dolichopodid fauna is now known from 10 species in 6 genera (*Condyllostylus*, *Chrysosoma*, *Medetera*, *Campsicnemus*, *Chrysotus*, *Humongochela*, **n. gen.**). Based on specimens at hand, it is estimated that an additional 10–15 species of dolichopodids await description from these islands, primarily in the genus *Campsicnemus*.

### **Materials and Methods**

Specimens for study derived from the Bishop Museum, Honolulu (BPBM) and the National Museum of Natural History (USNM). When series number allowed, specimens were distributed to the following institutions: Museum National d'Histoire Naturelle, Paris (MNHN), Laboratoire d'Entomologie Médicale, Institut Louis Malardé, Paea, Tahiti (ILMP). Morphological terminology follows Evenhuis (1997).

### **Systematics**

#### ***Humongochela* Evenhuis, new genus**

Type species: *Humongochela hardyi* Evenhuis, new species, by present designation.

**Diagnosis.** Relatively large sympycnine dolichopodids (ca. 5 mm in length) very similar in appearance to large species of *Campsicnemus* with pronounced modifications of the midleg. The genus is easily distinguished from *Campsicnemus* by crossvein m-cu subequal in length to last section of vein CuA<sub>1</sub> from crossvein m-cu to wing margin (the crossvein m-cu less than 1/2 the length of the last segment of CuA<sub>1</sub> in *Campsicnemus*) and the large claws (1/2 length of last tarsomere) (slightly less



**Figure 1.** *Humongochela polhemusi*, male habitus

than 1/3 the length of the last tarsomere in *Campsicnemus*, but 1/8 the overall size of those in *Humongochela* — compare Figs. 10 and 11).

**Description. Male** (Fig. 1). *Head*. Fairly large, in lateral view slightly smaller in size than thorax. In frontal view with eyes slightly converging below level of antennal sockets, then diverging again to level of clypeus; width of front at narrowest portion about equal to width of two ommatidia. Ocellars strong, diverging, subequal to or slightly shorter than length of antennal segments (without arista). Antenna (Fig. 6) with scape cylindrical, length ca.  $2 \times$  width; pedicel short cup-like, with short stiff setae dorsally; first antennal flagellomere relatively long, subequal in length to scape and pedicel together, subtriangular in shape; arista pubescent, subequal in length to head height. Mouthparts large, extending below eyes in lateral view.

*Thorax*. Black to dark brown dorsally, with blue-green reflections in some specimens. With following compliment of setae: 4-5 *dc* (with posteriormost *dc* diverging from line of others); 1 *np*; 1+2 *ph*; 1+1 *sa*; 1 *pa*; 1+1 *sc*; *ac* absent. Scutellum with 1+1 *sc*, where smaller hair-like setae is lateral; posterior margin with 4 tiny hairs medially. Pleura with upper sclerites brown to black, lower sclerites varying in coloration.

*Legs*. CI with apical comb of 6 stiff black bristles, 2 subapical bristles, numerous smaller setae on anteroapical half. CIII with 3-4 very tiny hairs on lateral surface. FI and FII subequal in length;

FIII  $1.3 \times$  length of FII. TI and TII subequal in length to FI and FII; TIII long,  $1.5 \times$  length of FIII. FII, TII, and IIt1 with MSSC (Figs. 7–9). Fore and hind tarsi normal; mid basitarsus (IIt1) modified with apical thorn-like spur apically; IIt2 inserted either apically or subapically on IIt1. Claws extremely long, thin, length about  $1/2$  length of last tarsomere (Fig. 10). Empodium feather-like, subequal in length to claws; pulvilli reduced, ca.  $1/4$  length of claws.

*Wing* (Fig. 1). Long, slightly shorter than body length. Veins  $R_{4+5}$  and  $M_1$  straight, converging slightly at wing margin. Cell cup incomplete. Crossvein m-cu subequal to or longer than last section of  $CuA_1$ . Vein  $CuA_1$  not quite reaching wing margin. Halter length subequal to length of CIII, with a few tiny hairs at base of knob.

*Abdomen*. Long, thin, width subequal to that of thorax. Tergite II with patch of stiff black setae posterolaterally, tergite II with fewer such hairs; otherwise dorsum of abdomen covered with sparse short hairs.

*Genitalia*. Hypopygium much like in *Campsicnemus*: small without differentiating features. Surstyli small, blunt, dark brown. Aedeagus sinuous, extending beyond hypopygial capsule for length subequal to hypopygium.

**Female**. Similar to male except for lack of MSSC and with a short, stubbier subconically shaped first antennal flagellomere. Oviscapt with 3 pairs of short stubby acanthophorites.

**Remarks**. This genus is found on 3 islands of the Marquesas (Fatu Hiva, Nuku Hiva, and Hiva Oa) (Fig. 2) with one species on each. All are found on vertical surfaces (i.e., seeps or rocks) near waterfalls. It is presumed that the long claws and extremely reduced pulvilli are evolutionary adaptations to allow a better grip on the otherwise slippery substrata near these swift moving waters.

Only three species are known thus far and it is possible that additional species may be found on other Marquesan islands with waterfalls in between Nuku Hiva and Hiva Oa (namely, Ua Pou, Ua Huka, and Tahuata).

**Etymology**. The generic name derives from the American slang “humongous”, meaning large, monstrous + “*chela*” Latin = claw; referring to the extraordinary development of the tarsal claws.

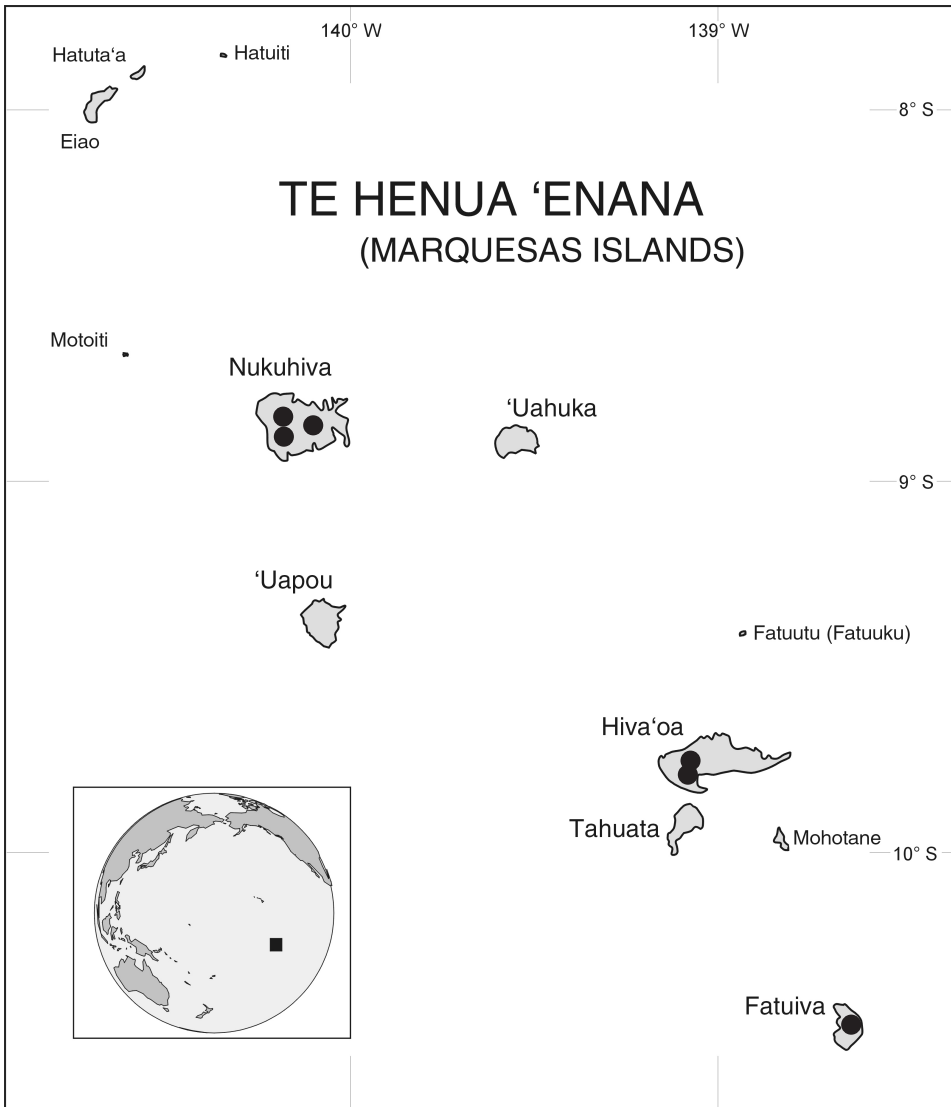
**Classification**. The genus is placed in the Sympycninae, where it fits with characters it has in common with *Campsicnemus* including antennal shape, male genitalia, and MSSC of the male mid-leg. More study will need to be done on the subfamilial limits of Sympycninae and related subfamilies in order to properly ascertain the true subfamilial placement of this and other related genera.

#### KEY TO SPECIES OF *HUMONGOCHELA* EVENHUIS BASED ON MALES

1. Crossvein m-cu subequal in length to last section of  $CuA_1$  from crossvein m-cu to wing margin; claws  $1/2$  length of last tarsomere ..... ***Humongochela* Evenhuis, n. gen.**
- . Crossvein m-cu less than  $1/2$  length of distance of last segment of  $CuA_1$ ; claws small,  $1/8$  to  $1/10$  length of last tarsomere ..... ***Campsicnemus* Haliday**
2. Mid tibia with prominent bulge on apical third, narrowed distally; bulge with dense tuft of fine wavy setae (Fig. 7) ... (Nuku Hiva) ..... ***hardyi* Evenhuis, n. sp.**
- . Mid tibia inflated apically (Figs. 8,9), without prominent bulge but gradually expanding to apex ..... **3**
3. Lower pleura yellow, concolorous with fore coxae; TII with apical bristles subequal in length to basitarsus (Fig. 8) ... (Fatu Hiva) ..... ***englundi* Evenhuis, n. sp.**
- . Lower pleura brown, concolorous with upper pleura; TII with apical bristles  $1/4$  length of basitarsus (Fig. 9) ... (Hiva Oa) ..... ***polhemusi* Evenhuis, n. sp.**

#### *Humongochela hardyi* Evenhuis, new species (Figs. 7, 10)

**Diagnosis**. Differs from the other species in this genus by the pronounced bulge on the mid tibia in the male and the longer basitarsus (the other two species in the genus have the mid tibia without such a bulge and the basitarsus shorter in length).



**Figure 2.** Map of the Marquesas showing distribution of species of *Humongochela* (black dots).

**Male.** Body length: 5.6–5.8 mm. Wing length: 5.0 mm. *Head.* Gray-black; inner eye margins parallel-sided from level of antenna to level of upper margin of clypeus; palp and proboscis brown; antenna dark brown with arista length slightly less than head height.

*Thorax.* Mesoscutum, scutellum, and upper pleura dark brown; lower pleura (katapisternum, meron, katapisternum) yellow; dorsocentrals with last pair diverging posteriorly; thoracic setae black to dark chocolate brown: 5 *dc*; 1 *np*; 1+2 *ph*; 1+1 *sa*; 1 *pa*; 1+1 *sc*; *ac* absent.

*Legs.* CI and CIII yellow, CII yellow anteriorly, brown posterolaterally; Femora yellow, brown at extreme apex, apical brown color most evident on mid and hind femora. It4 with large apical spurs ca. 1/2 length of tarsomere; claws large, ca. 1/2 length of It5; otherwise fore leg unmodified and without MSSC. FII (Fig. 7) with 6–7 long stiff black setae ventrolaterally on basal 1/3, numerous



shorter, almost peg-like black setae extending further along ventral surface to subapex; ventroapex without setae. TII (Fig. 7) sinuous, flared from base to apex, with swollen bulge just beyond middle; 5 strong black setae on lateral surface just before bulge; numerous admixed long and midsized setae along ventral mesal surface; bulge with dense tuft of long fine wavy setae mixed with long stiff black setae. IIt1 1/2 length of IIt2, with thorn like apical spur, IIt2 inserted subapically; IIt4 with large apical spurs 1/2 length of tarsomere; claws (Fig. 10) large, 1/2 length of IIt5, pulvilli small, 1/4 length of claws; otherwise IIt2-5 unmodified. FIII with numerous short spine-like setae along entire ventral surface, longest basally, becoming shorter apically; claw shorter than on fore and midlegs, ca. 1/3 length of IIt5.

**Wing.** Subhyaline throughout; vein  $M_1$  slightly converging with  $R_{4+5}$  at wing margin; crossvein m-cu slightly longer than last section of  $CuA_1$ ;  $CuAx$  0.80;  $CuA_1$  almost reaching wing margin; halter dark brown at extreme base, otherwise bright white.

**Abdomen.** Dark brown dorsally with yellow brown anterolaterally; stiff black setae posterolaterally on tergite I. Hypopygium light brown; apex of surstyli dark brown; cerci brown.

**Female.** As in male except as follows: body all black with blue-green reflections. First antennal flagellomere short, subconical. Wing smoky brown, especially along longitudinal veins. Pleura brown. Legs brown, trochanters paler. Claws on all legs subequal in length; otherwise legs without modifications or MSSC.

**Types.** Holotype male (BPBM 16,507) and paratypes (4 male, 3 female) from **MARQUESAS**: Nuku Hiva: Taiipi Valley, Tehua Falls, 500 ft., 22.viii.2001, below second falls, cascade/pool, 8°52'14" S, 140°06'16" W, R.A. Englund. *Other paratypes*: Nuku Hiva: 1 male, Vaikaheke Stream, 2100 ft., 20.x.1999, tributary to Upper Vaiohei Valley, riffle, splash zone, 8°53'27" S, 140°08'39" W, R.A. Englund (BPBM); 1 male, same locality, 18.x.1999, caught on vertical wet rock face, D.A. Polhemus (USNM); 2 females, same locality, 18.x.1999, 620 ft., R.A. Englund (BPBM); 1 male, 1 female, Toovi Plateau, stream, 2800 ft., 23.viii.2001, headwall falls, along seep, 8°50'58.1" S, 140°09'14.5" W, R.A. Englund (BPBM). Holotype in BPBM. Paratypes collected with holotype in BPBM, USNM, and MNHN.

**Habitat.** Occurring on vertical surfaces of rocks and seeps in association with falls (Fig. 4).

**Etymology:** This species is named for D. Elmo Hardy, who provided this author with encouragement and wise advice as well as numerous inspirational stories associated with working with Dolichopodidae in Hawai'i.

### *Humongochela englund* Evenhuis, new species

(Fig. 8)

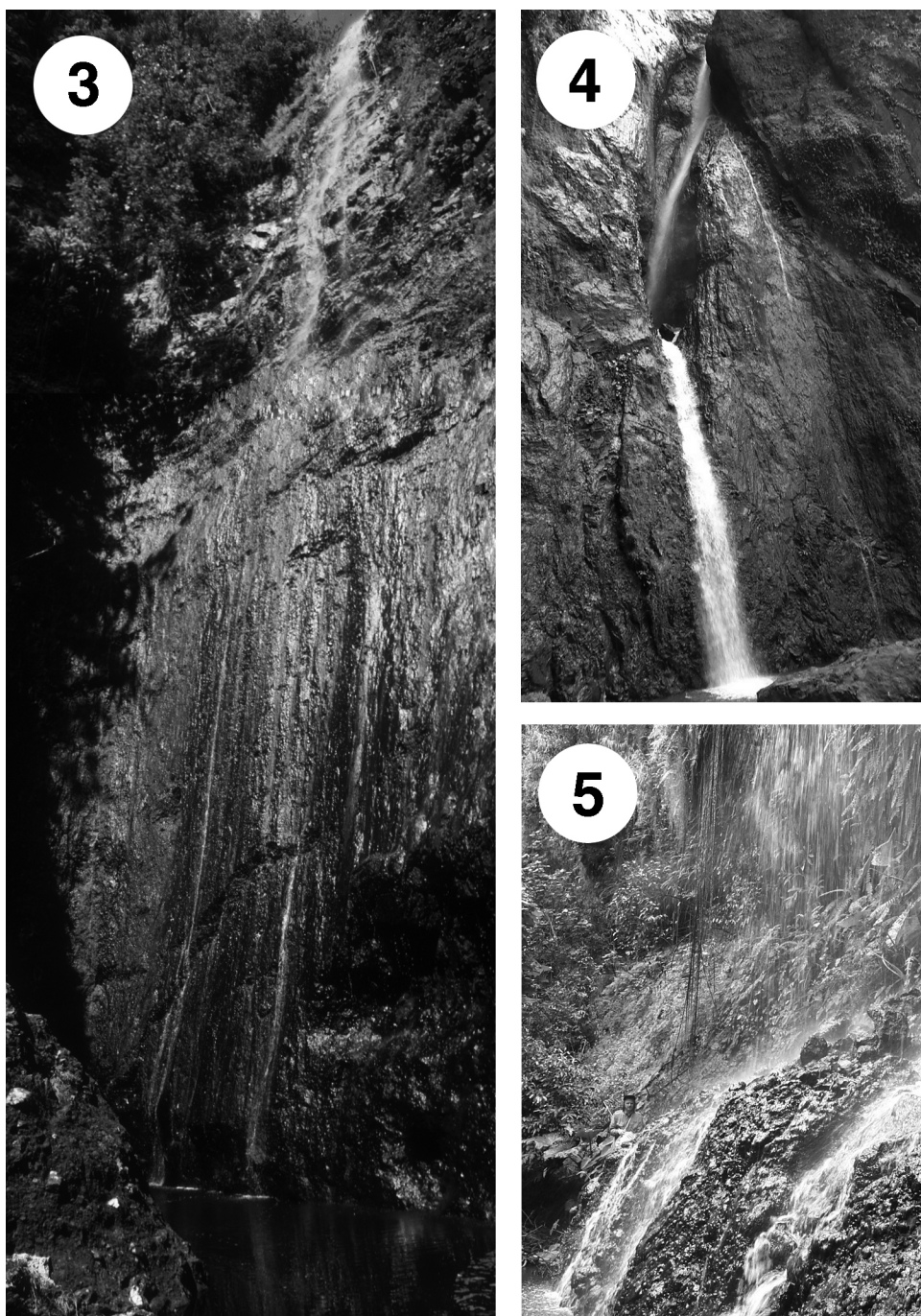
**Diagnosis.** Most similar to *H. polhemusi*, from which it can be separated by the short apical tibial spurs ca. 1/4 length of basitarsus (these spurs ca. 2/3 length of basitarsus in *H. polhemusi*) and the predominantly yellow lower pleura (katapisternum, meron and katepimeron) (these sclerites brown in *H. polhemusi*).

**Male.** Body length: 5.6–5.8 mm. Wing length: 5.0 mm. **Head.** Gray-black; inner eye margins parallel-sided from level of antenna to level of upper margin of clypeus; palp and proboscis brown; antenna dark brown with arista length slightly less than head height.

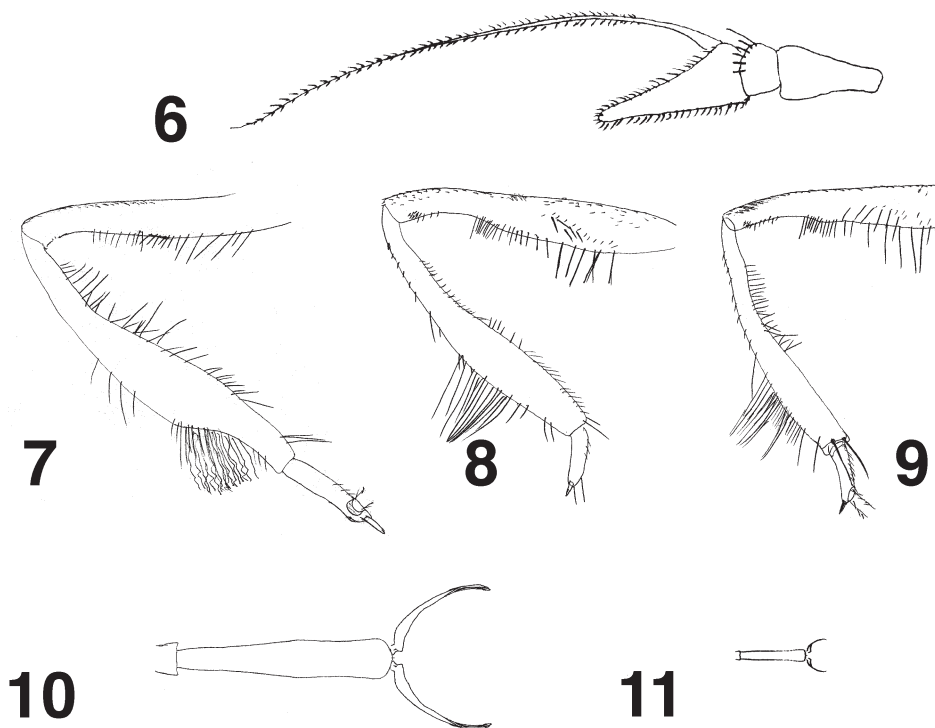
**Thorax.** Mesoscutum, scutellum, and upper pleura dark brown; lower pleura (katapisternum, meron, katapisternum) yellow; dorsocentrals with last pair diverging posteriorly; thoracic setae black to dark chocolate brown: 5 *dc*; 1 *np*; 1+2 *ph*; 1+1 *sa*; 1 *pa*; 1 + 1 *sc*; *ac* absent.

**Legs.** Coxae yellow. Femora yellow, brown at extreme apex, apical brown color most evident on mid and hind femora. It4 with large apical spurs ca. 1/2 length of tarsomere; claws large, ca. 1/2 length of It5; otherwise fore leg unmodified and without MSSC. FII (Fig. 7) with two rows of 6–7 long stiff black setae ventrally on basal 1/2, numerous shorter, peg-like black setae extending further along ventral surface to apical 2/3; ventroapex with 4 small peg-like setae. TII (Fig. 7) as in *H. polhemusi* except more numerous setae at apical 1/3 of lateral surface; apical tibial spurs 1/4 length of IIt1.

**Wing.** As in *H. polhemusi*.



**Figures 3–5.** Type localities of *Humongochela*. **3.** Fatu Hiva, Upper Hanavave Stream, 400–500 ft. elev., cascade (type locality of *Humongochela englundii*). **4.** Nuku Hiva, Taipei Valley, Tehua Falls, 500 ft. elev., cascade/pool (type locality of *Humongochela hardyi*). **5.** Hiva Oa, Atuona Valley, Vaioa River, 1050 ft. elev., cascade (type locality of *Humongochela polhemusi*).



**Figure 6.** *Humongochela polhemusi*, antenna. **Figures 7–9.** *Humongochela* male mid femora, tibiae, and basitarsi. **7.** *H. hardyi*. **8.** *H. englundii*. **9.** *H. polhemusi*. **Figure 10.** *Humongochela hardyi*, last tarsomere and claw of male midleg. **Figure 11.** *Campsicnemus scurra*, last tarsomere and claw of male midleg (Figs. 10 and 11 drawn to same scale).

**Abdomen.** Black with paler areas laterally on tergites; stiff black setae posterolaterally on tergite I. Hypopygium yellow; apex of surstyli dark brown; cerci yellow.

**Female.** As in male except as follows: Pleura and coxae yellowish brown. First antennal flagellomere short, conical, but longer than in *H. hardyi* or *H. polhemusi*. Wing infumate brown, especially so along longitudinal veins. Halter stem gray-brown, knob white.

**Types.** Holotype male (BPBM 16,508) from **MARQUESAS**: Fatu Hiva: Hanavave, Upper Hanavave Stream, 400–500 ft. cascade face, 10°30'31.3"S, 138°39'45.7"W, 27.viii.2001, R.A. Englund. Paratype female from same locality except D.A. Polhemus collector (USNM). Holotype in BPBM. Paratype in USNM.

**Habitat.** Only a single male and female of this species were collected from the cascade face of Upper Hanavave Stream on Fatu Hiva (Fig. 3).

**Discussion.** This is the only species in the genus that has females that are similar in general appearance to the males. The other 2 species have almost black females, while the males are brown and yellow colored.

**Etymology:** This species is named for Ronald Englund, avid participant in these expeditions, superb collector of aquatic insects, and the one who collected the only male of this species.

***Humongochela polhemusi* Evenhuis, new species**

(Figs. 1, 5, 6, 9)

**Diagnosis.** Can be distinguished from the congeners by the dark lower pleura in combination with long apical tibial spurs, ca. 3/4 length of basitarsus (these tibial spurs much shorter in the other two

species). It is most similar to *H. englundii* with regard to leg MSSC, but the length of the tibial spurs and the denser hairs laterally on the mid tibia should serve to separate the two.

**Male** (Fig. 1). Body length: 4.8–5.0 mm. Wing length: 4.2 mm. Head. Black; inner eye margins converging just below level of antenna (width ca. width of ocellar tubercle), then diverging slightly to level of upper margin of clypeus; palp and proboscis brown; antenna (Fig. 6) dark brown with arista length subequal to head height.

**Thorax** (Fig. 1). Mesoscutum, scutellum, and all pleura dark brown; katapisternum and meron with some yellow; dorsocentrals with last pair diverging posteriorly; thoracic setae black: 5 *dc*; 1 *np*; 1+2 *ph*; 1+1 *sa*; 1 *pa*; 1 + 1 *sc*; *ac* absent. Some specimens with 2–4 very tiny hairs anterior to and in line with *dc*.

**Legs**. C yellow, CII with small spot of dark brown dorsoposteriorly. Femora yellow, brown at extreme apex, apical brown color most evident on mid and hind femora. It4 with large apical spurs ca. 1/3 length of tarsomere; claws large, ca. 1/2 length of It5; otherwise fore leg unmodified and without MSSC. FII (Fig. 8) with 9–10 long stiff black setae ventrolaterally on basal 1/2, a dozen or so shorter, almost peg-like black setae extending further along ventral surface to subapex; ventroapex with 8 small peg-like setae. TII (Fig. 8) almost straight, slightly flared from base to apex; 2 strong black setae on lateral surface near middle; numerous mid-sized straight setae along ventral mesal surface; apical 1/3 with patch of 9–10 long hairs and a few long fine wavy setae; apical tibial spurs 2/3 length of IIIt1. IIIt1 2/3 length of IIIt2, with thorn like apical spur, IIIt2 inserted apically; IIIt4 with large apical spurs 1/2 length of tarsomere; claws large, 1/2 length of IIIt5, pulvilli small, 1/4 length of claws; otherwise IIIt2–5 unmodified. FIII with sparse short spine-like hairs on basal 1/2 of ventral surface; claws large, ca. 1/2 length of IIIIt5.

**Wing** (Fig. 1). Subhyaline throughout; vein  $M_1$  slightly converging with  $R_{4+5}$  at wing margin; crossvein m-cu slightly longer than last section of  $CuA_1$ ;  $CuAx$  0.80;  $CuA_1$  almost reaching wing margin; halter dark brown at extreme base, otherwise bright white.

**Abdomen** (Fig. 1). Black; stiff black setae posterolaterally on tergite I. Hypopygium light brown; apex of surstyli dark brown; cerci brown.

**Female**. As in male except as follows: Body all black with blue-green reflections. Pleura with brassy reflections. Wing as in females of *H. hardyi* except  $CuAx$  1.10.

**Types**. Holotype male (BPBM 16,509) and 3 paratype females from **MARQUESAS**: Hiva Oa: Atuona Valley, Viaoa River, 1040 ft., 30.viii.2001, riffle/pool, 9°47'07.3" S, 139°03'57.0" W, R. Englund. *Other Paratypes*: Hiva Oa: 5 males, 13 females, same locality and date except 1050 ft., swept from wet vertical face next to falls, D.A. Polhemus (USNM); 1 female, same locality and date except collected from pool/cascade, R.A. Englund (BPBM); 1 male, Taaoa Valley, 300–500 ft., 9°29'46" S, 139°04'15" W, rocky stream and waterfall, 24.x.1999, D.A. Polhemus (USNM). Holotype in BPBM. Paratypes in BPBM, USNM, IMLP, and MNHN.

**Habitat**. Collected from vertical rock surfaces in association with waterfalls (Fig. 5).

**Etymology**: This species is named for Dan Polhemus, who was one of the expedition participants and who has collected much valuable material of Dolichopodidae from the Marquesas.

### Acknowledgments

Ronald Englund and Dan Polhemus collected the material described in this paper. Their fervent interest in and avid pursuit of aquatic Diptera throughout the years with a keen eye to collecting dolichopodids, has kept this author pleasantly occupied. Brad Evans illustrated the map.

### Literature Cited

- Evenhuis, N.L.** 1997. Review of flightless Dolichopodidae (Diptera) in the Hawaiian Islands. *Bishop Museum Occasional Paper* **53**, 29 p.
- . 2000. Water skating *Campsicnemus* of the Marquesas Islands, including two new species (Diptera: Dolichopodidae). *Journal of the New York Entomological Society* **107**(4): 289–296.