

## Everyone loves a cercus: the endemic Hawaiian genus *Uropachys* Parent (Diptera: Dolichopodidae), with descriptions of new species<sup>1</sup>

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**Abstract.** The endemic Hawaiian dolichopodid genus *Uropachys* Parent, endemic to the island of Kaua'i, is reviewed. Three new species, *Uropachys fleacercus* n. sp., *U. mediacercus*, n. sp., and *U. politicocercus*, n. sp., are described and illustrated. A key to species in the genus is given and previously described species are redescribed and the cercus of the male genitalia redrawn to correct errors and inconsistencies in previously published illustrations. Based on examination of the type series of *Uropachys pulvereus* (Hardy & Kohn) it is returned to *Eurynogaster* Van Duzee as *Eurynogaster pulvereus* Hardy & Kohn, **stat. rev.**

**Keywords:** Diptera, Dolichopodidae, *Campsicnemus*, taxonomy, Hawaiian Islands, Kauai.

### INTRODUCTION

Parent (1934) proposed the new genus *Pachyurus* based on a single species from Kaua'i, *P. hawaiiensis* Parent, 1934. Realizing his genus was preoccupied by *Pachyurus* Agassiz, 1831, Parent (1935) proposed the new replacement name *Uropachys*. Hardy & Kohn (1964) synonymized *Uropachys* under a broad definition of *Eurynogaster* Van Duzee. This synonymy was maintained until Evenhuis (2005) re-examined the species in *Eurynogaster* and assigned various species to previously described genera and new genera. In that work, *Uropachys* was resurrected from synonymy. *Uropachys* is a monophyletic genus found only on the island of Kaua'i and is sister to another endemic Kaua'i genus *Arciellia* Evenhuis (cf. fig. 1 in Goodman *et al.* 2016). Previously, seven species were listed in *Uropachys*. This review describes and illustrates three new species, *Uropachys fleacircus* Evenhuis, n. sp., *U. mediacercus* Evenhuis, n. sp., and *U. politicocercus* Evenhuis n. sp., the suffix of the names deriving from the species-specific male cercus, which has diagnostic shape and setation. A key is given to the species of *Uropachys* and, based on study of the type series, *U. pulvereus* Hardy & Kohn is transferred back to *Eurynogaster*, **stat. rev.**

### MATERIAL AND METHODS

Material examined in this study derives from the following collections: BMNH = the Natural History Museum, London, UK; BPBM = Bernice Pauahi Bishop Museum, Honolulu, Hawai'i, USA; CNC = Canadian National Collection, Ottawa, Ontario, Canada; UHIM = University of Hawai'i Insect Museum, Honolulu, Hawai'i, USA.

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Confocal images of various morphological structures were accomplished by using a Leica M165C stereo dissecting scope via the Leica Microsystems LAS Multifocus software (v. 4.12.0) and using Zerene Stacker® software (v. 1.04) (Zerene Systems, LLC, Richmond, Washington, USA) to align and stack-focus each final image.

Morphological terminology follows Cumming & Wood (2017). Abbreviations used in text: I, II, and III = fore, mid, and hind legs, respectively (used in combination with abbreviations for coxa, femur, tibia, and tarsi); ac = acrostichal setae; C = coxa; dc = dorso-central setae; F = femur; np = notopleural setae; oc = ocellar setae; pa = postalar setae; ph = posthumeral setae; sa = supraalar setae; sc = scutellar setae; Ti = tibia; t = tarsi; vt = vertical setae; WIP = Wing Interference Pattern.

## TAXONOMY

### Genus *Uropachys* Parent

*Pachyurus* Parent, 1934: 305. Type species: *Pachyurus hawaiiensis* Parent, 1934, by monotypy. [Preoccupied by *Pachyurus* Agassiz, 1831.]

*Uropachys* Parent, 1935: 80 (new replacement name for *Pachyurus* Parent, 1934). Type species: *Pachyurus hawaiiensis* Parent, 1934, automatic. Evenhuis, 2005: 56, 2009: 50; Zhang & Yang, 2011: 60. Bennett, 2012: 277; Grichanov, 2014: 20; Chursina *et al.*, 2016: 507; Goodman *et al.* 2016: 4.

*Uropacys*: Tenorio, 1969: 40 (incorrect subsequent spelling of *Uropachys*).

Van Duzee (1933) described the genus *Eurynogaster* to include three new species, all from the Hawaiian Islands. In the same paper, Van Duzee also proposed the genus *Sweziella*, for the single new Hawaiian species, *Sweziella albifacies* Van Duzee. He placed *Eurynogaster* in the Sympycninae and *Sweziella* in the Thinophilinae. The next year, Parent (1934) proposed the genus-group name *Pachyurus* Parent for the single species *Pachyurus hawaiiensis*. He later (Parent, 1935) noted the generic name was preoccupied and proposed the replacement name *Uropachys* Parent. Subsequently, little study was undertaken on species in the genera *Eurynogaster*, *Sweziella*, and *Uropachys* until Hardy & Kohn (1964) and Tenorio (1969), in their respective works on the dolichopodids of Hawai'i, treated *Sweziella* and *Uropachys* as junior synonyms under *Eurynogaster*. Hardy & Kohn described 32 new species of *Eurynogaster*, five of which were transferred to *Uropachys* in the study by Evenhuis (2005) who broke up the large genus *Eurynogaster* into seven genera (*Adachia* Evenhuis, *Arciellia* Evenhuis, *Elmoia* Evenhuis, *Eurynogaster*, *Major* Evenhuis, *Sweziella*, and *Uropachys*). A molecular study (Goodman *et al.* 2016) verified the monophyly of the genera proposed by Evenhuis (2005).

*Uropachys* is separated from related Hawaiian dolichopodid genera based on the characteristic prominent male cercus and large male hypopygium. The cercus is useful as a primary diagnostic character in separating species in the genus and the names for new species in this paper are proposed by adding prefixes to the suffix *-cercus* in keeping with other species in the genus so named [e.g., *U. crassicercus* (Hardy & Kohn), *U. fusticercus* (Hardy & Kohn)].

**Included species:** *Uropachys clavastyla* Hardy & Kohn, *U. crassicercus* Hardy & Kohn, *U. flavicrura* Hardy & Kohn, *U. fleacercus* Evenhuis, **n. sp.**, *U. fusticercus* Hardy & Kohn, *U. hawaiiensis* (Parent), *U. mediacercus* Evenhuis, **n. sp.**, *U. palustricola* Hardy & Kohn, *U. politicocercus* Evenhuis, **n. sp.**

**Diagnosis.** *Uropachys* is easily separated from other genera of native Hawaiian Dolichopodidae by the absence of anterior preapical setae on all femora; the presence of 4 dc and absence of ac on the mesonotum; the hypopygium extremely large (larger than 1/2 length of abdomen); and cerci variably shaped, long (usually over three times width), sclerotized, possessing strong, modified bristles, especially at apex; aedeagal tip recurved, S-shaped in lateral view. As in *Sigmatineurum* Parent, what appears to be a long thin upper surstylar lobe is actually the apicoventral epandrial lobe.

KEY TO SPECIES OF *UROPACHYS* PARENT BASED ON MALES

1. Mid and hind femora predominantly all yellow except apices brown ..... 2
  - . At least mid (and often hind) femora brown to black on lateral surface, with metallic green highlights (seen best in dried specimens) ..... 3
2. Fore coxa brown to black, gray pollinose (Fig. 3) ..... *flavicrurus* Hardy & Kohn
  - . Fore coxa yellow (Fig. 4) ..... *mediacercus* Evenhuis, **n. sp.**
3. Femora and tibiae all brown to dark brown ..... 4
  - . Femora dark brown to black, tibiae contrastingly yellow ..... 5
4. Halter knob yellow; cercus not extending to third abdominal segment ..... 8
  - . Halter knob dark brown; cercus elongate, extending at least to middle of third abdominal segment ..... *fusticercus* Hardy & Kohn
5. Wing uniformly smoky brown ..... *politicocercus* Evenhuis, **n. sp.**
  - . Wing subhyaline ..... 6
6. Fore femur with basalmost two strong ventral bristles distinctly longer than remainder of stiff spines ..... *hawaiensis* Parent
  - . Fore femora with strong ventral bristles short, all equal in length ..... *clavastyla* Hardy & Kohn
7. Fore femur with strong ventral spines ..... *crassicercus* Hardy & Kohn
  - . Fore femur without strong ventral spines or setae ..... 8
8. Cercus extremely thin in lateral view, without pointed process basomedially (Fig. 8); mesonotum dark metallic green ..... *fleacercus* Evenhuis, **n. sp.**
  - . Cercus much broader in lateral view, with small pointed process basomedially (Fig. 12); mesonotum pale brassy green ..... *palustricola* Hardy & Kohn

*Uropachys clavastyla* (Hardy & Kohn)

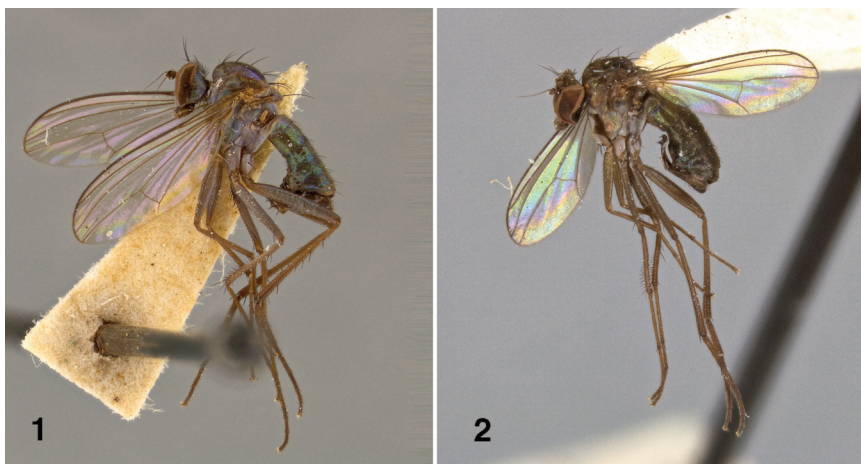
(Fig. 5)

*Eurynogaster clavastyla* Hardy & Kohn, 1964: 186. Tenorio, 1969: 41; Bickel & Dyte, 1989: 413; Nishida, 1992: 97, 1994: 91, 1997: 76, 2002: 94; Evenhuis & Thompson, 2004: 208; Anonymous, 2009: 87.

*Uropachys clavastylus* (Hardy & Kohn): Evenhuis, 2005: 57; Yang *et al.*, 2006: 519; Grichanov, 2014: 523, 2017: 538.

*Uropachys clavastyla* (Hardy & Kohn). Goodman *et al.* 2016: 3.

**Diagnosis.** Most similar to *U. hawaiensis*, but can be separated from it by the lack of two long strong basal ventral setae on the fore femur (present in *U. hawaiensis*).



**Figures 1–2.** *Uropachys* male habitus. 1, *U. palustricola* (Hardy & Kohn); 2, *U. fusticercus* (Hardy & Kohn).

**Description. Male:** Body length: 3.3 mm. Wing length: 3.5 mm.

**Head.** Frons gray pollinose with metallic green highlights; face and clypeus shining black; oc black, about two-thirds width of head; vertex black with green highlights; occiput gray pollinose; postgena with sparse short black hairs and green highlights; face slightly constricted below antennae, separated by width of five ommatidia; palpus small, brown; proboscis brown, extending below eye in lateral view; antenna with scape and pedicel dark brown; scape subcylindrical, length  $1.5 \times$  width; pedicel obconical, with ring of short spiky black setae subapically; postpedicel broken off and missing in holotype [noted in Hardy & Kohn, 1964: 186].

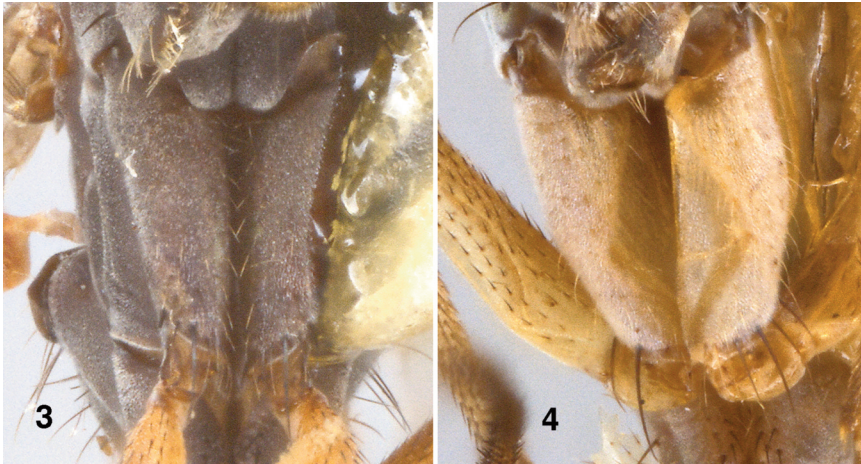
**Thorax.** Mesonotum brassy green and magenta on anterior half, dark metallic green on posterior half and scutellum; pleura gray pollinose except magenta anepisternum, and green katepisternum; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem and knob yellow.

**Legs.** Coxae brown, gray pollinose; femora metallic green, yellow ventrally; tibiae and tarsal segments 1–3 yellow, tarsal segments 4–5 brown; FI with row of 14–16 short, stiff spines ventrally; FII with two strong setae basoventrally, shorter, thinner stiff setae along entire venter; FIII with two rows of long fine hairs ventrally; fore and hind tibiae without MSSC; TiII with row of long stiff setae mesally; remaining leg segments without MSSC.

**Wing** (left wing broken off in holotype). Subhyaline, veins pale brownish; posterior crossvein length  $1/4$  apical segment of  $CuA_1$ .

**Abdomen.** Brassy green and dark metallic green; tergal vestiture sparse, black.

**Genitalia.** Hypopygium brown; cercus (Fig. 5) subrectangular, length ca.  $3 \times$  basal width, with broad flat apical peg (in lateral view) recurved apically (in dorsal view), with three extremely long, thick slightly wavy setae subapicoventrally, length ca.  $2/3$  length of cercus, with row of six long setae medioventrally, dense long fine hairs ventrobasally.



**Figures 3–4.** *Uropachys*, male fore coxa. 3, *U. flavicrura* (Hardy & Kohn); 4, *U. fleacercus* Evenhuis, n. sp.

**Female:** Unknown.

**Material Examined.** *Type.* HOLOTYPE ♂ (BPBM 4,160) from HAWAIIAN ISLANDS: **Kauaʻi:** Mohihi Ridge, 15 Jul 1937, E.C. Zimmerman.

**Remarks.** The female listed under *clavastyla* in Hardy & Kohn (1964) could not be reliably associated with the male (the WIP is not the same pattern). It is placed here as *incertae sedis* in *Uropachys*. Also, the hypopygial drawing in Hardy & Kohn (1964: fig. 43b,c) is inaccurately drawn and wrongly depicts the apical peg and the lengths of the strong ventral setae.

***Uropachys crassicercus*** (Hardy & Kohn)  
(Fig. 6)

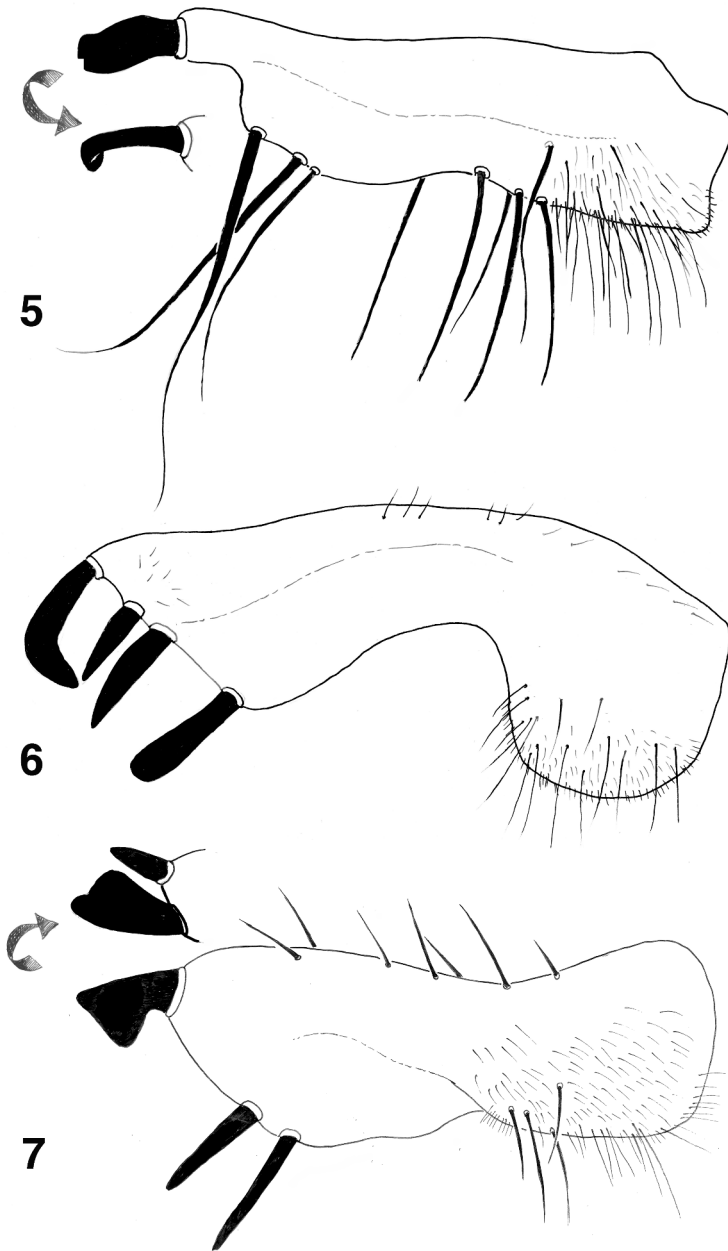
*Eurynogaster crassicercus* Hardy & Kohn, 1964: 190. Tenorio, 1969: 41; Bickel & Dyte, 1989: 415; Nishida, 1992: 97, 1994: 91, 1997: 77, 2002: 94; Evenhuis & Thompson, 2004: 208; Anonymous, 2009: 88.

*Uropachys crassicercus* (Hardy & Kohn): Evenhuis, 2005: 57; Yang *et al.*, 2006: 519; Grichanov, 2014: 523, 2017: 538.

**Diagnosis.** Easily separated from the congeners by the combination of brown tibiae, yellow halter knob and strong spines on the venter of the fore femora.

**Description. Male:** Body length: 3.6 mm. Wing length: 3.8 mm.

*Head.* Face, frons and clypeus black; vt black, slightly longer than antennal arista; occiput, and vertex black; postgena with sparse short black hairs and some green high-lights; face constricted at middle, separated by width of four ommatidia; palpus small, black; proboscis brown, extending below eye in lateral view; antenna black; scape sub-cylindrical, length  $1.5 \times$  width; pedicel obconical, with ring of short spiky black setae sub-apically; postpedicel, subconical, length  $1.5 \times$  width, bluntly rounded apically; arista slightly longer than head height.



Figures 5–7. *Uropachys*, male cercus. 5, *U. clavastyla* (Hardy & Kohn); 6, *U. crassicercus* Hardy & Kohn; 7, *U. flavicrura* (Hardy & Kohn).

*Thorax.* Mesonotum and scutellum black with dark green highlights; pleura dark gray pollinose except brassy anepisternum and katepisternum; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem and knob yellow.

*Legs.* CI and FI metallic green, CII and CIII brown, remainder of legs dark brown; FI with row of 8–10 short stiff spines ventrally; FII with dense cluster of 4–5 long, thick, stiff setae basoventrally; row of 12 very short spines on apicoventral half; FIII (broken off in holotype) without ventral setation; fore and mid legs without MSSC; TIII with two rows of stiff setae on apical 2/3; remaining leg segments unmodified and without MSSC.

*Wing.* Subhyaline, veins pale brownish; posterior crossvein length 1/4 apical segment of CuA<sub>1</sub>.

*Abdomen.* Black with dark green highlights; tergal vestiture sparse, black.

*Genitalia.* Hypopygium brown; cercus (Fig. 6) fairly broad in lateral view with bulbous basal portion and broad apex, constricted medially and appearing curved, with thick strong apical peg slightly recurved apically, three subapical pegs roughly the same length, all straight to apex, two distalmost pointed apically, proximalmost rounded apically and flattened, dorsal edge with row of short hairs on basal half, sparse microsetae near apex, basal bulge without strong setae, but numerous long fine hairs and shorter microsetae.

**Female:** Unknown.

**Material Examined.** *Type.* HOLOTYPE ♂ (BPBM 4,162) from HAWAIIAN ISLANDS: **Kaua'i:** Nualolo Valley, 3400 ft [ca. 1036 m], Jul 1952, D.E. Hardy. *Non-Types:* **Kaua'i:** 1♂, Alaka'i Swamp, Halepa'akai Stream region, Pauiohi Field camp, 22.07999°N, 159.546896°W, 25 May 2005, R. Peck, Malaise #2.

***Uropachys flavicrura*** (Hardy & Kohn)  
(Figs. 3, 7)

*Euryogaster flavicrura* Hardy & Kohn, 1964: 194. Tenorio, 1969: 41; Bickel & Dyte, 1989: 413; Nishida, 1992: 97, 1994: 91, 1997: 77, 2002: 94; Evenhuis & Thompson, 2004: 208; Anonymous, 2009: 88.

*Uropachys flavicrura* (Hardy & Kohn): Evenhuis, 2005: 57.

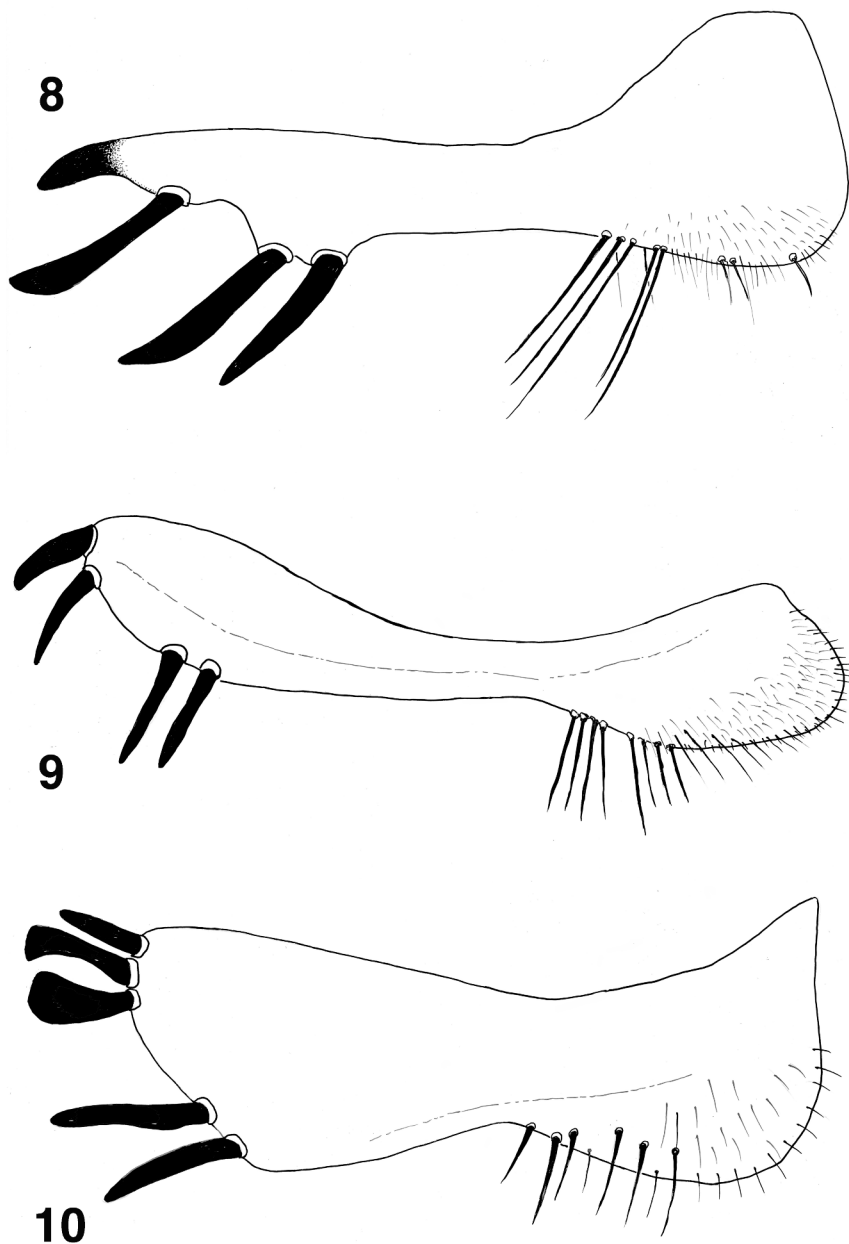
*Uropachys flavicrurus* (Hardy & Kohn): Yang *et al.*, 2006: 519; Grichanov, 2014: 523, 2017: 538; Chursina, 2016: 56.

**Diagnosis.** Similar to *U. mediacerus*, n. sp. by the predominantly yellow legs, but can be separated from it by the fore coxa with green highlights and all abdominal segments with green highlights (fore coxa and abdominal segments II and III yellow in *U. mediacerus*).

**Description. Male:** Body length: 4.0–4.2 mm. Wing length: 4.3–4.5 mm.

*Head.* Face, frons and clypeus black; vt black, slightly longer than antennal arista; occiput, and vertex black; postgena with sparse short black hairs and some green highlights; face constricted at middle, separated by width of four ommatidia; palpus small, black; proboscis brown, extending below eye in lateral view; antenna black; scape subcylindrical, length 1.5 × width; pedicel obconical, with ring of short spiky black setae subapically; postpedicel, subconical, length 1.5 × width, bluntly rounded apically; arista slightly longer than head height.

*Thorax.* Mesonotum and scutellum black with dark green highlights; pleura dark gray pollinose except brassy anepisternum and katepisternum; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem and knob yellow.



Figures 8–10. *Uropachys*, male cercus. 8, *U. fleacercus* Evenhuis, n. sp.; 9, *U. fusticercus* (Hardy & Kohn); 10, *U. hawaiiensis* (Parent).



*Legs.* CI (Fig. 3) brown with greenish highlights in some specimens, CII and CIII brown, remainder of legs yellowish with brown on dorsal surface of FI; FI with two rows of short stiff spines along entire venter; FII with dense cluster of 4–5 long, thick, black setae basoventrally, row of medium length stiff hairs from apical two-thirds to apex; FIII with row of six strong short setae on subapical one-third; TiII with stiff hairs along mesal surface, longest on apical two-thirds. Remaining leg segments unmodified and without MSSC.

*Wing.* Subhyaline, veins pale brownish; posterior crossvein length 1/4 apical segment of CuA<sub>1</sub>.

*Abdomen.* Dark brown with green highlights; tergal vestiture sparse, black.

*Genitalia.* Hypopygium brown; cercus (Fig. 7) broadly subrectangular, length ca. 2.5 x basal width, two strong ventral spines subapically, apex with large spatulate peg in lateral view, obscuring smaller peg seen in dorsal view, dorsal edge with eight stiff setae, basoventral bulge with 4 strong setae and numerous fine hairs.

**Female:** Specimens identified as *U. flavicrura* by Hardy & Kohn cannot be reliably associated with this species as no characters have yet been found to separate females of *U. flavicrura* from other species in the genus except *U. mediacercus*, n. sp. See remarks below.

**Material Examined.** *Type.* HOLOTYPE ♂ (BPBM 4,165) from **Kaua'i**: south Mohihi ridge, 15 Jul 1937, E.C. Zimmerman. *Paratypes:* **Kaua'i**: 1♂, Koke'e, 3,600 ft [ca. 1057 m], Jul 1952, D.E. Hardy (UH); 1♂, Alakai Swamp, 3,800 ft [ca. 1,158 m], Aug 1952, D.E. Hardy (UH).

**Remarks.** Hardy & Kohn (1964) listed ten paratypes (two males and eight females) of *U. flavicrura*. These specimens have been re-examined and those with a yellow fore coxa are transferred here as paratypes of *U. mediacercus*, n. sp. (*vide infra*). The remaining females may or may not belong to *U. flavicrura* and are left here as *incertae sedis* in *Uropachys*.

### *Uropachys fleacercus* Evenhuis, n. sp.

(Fig. 8)

**Diagnosis.** Similar to *U. palustricola* in having brown tibiae, yellow halteres, and a lack of strong setae or spines ventrally on the fore femur. It can be separated from it by the male cercus having (1) a lack of a pointed process basodorsally (pointed process present in *U. palustricola*) and (2) the apical peg short and not curved (apical peg long and curved in *U. palustricola*).

**Description. Male:** Body length: 3.5 mm. Wing length: 3.8 mm.

*Head.* Face, frons and clypeus dark brown; vt black, about two-thirds length of antennal arista; occiput, and vertex black with dark green highlights; postgena with sparse short black hairs, dark green highlights; face constricted at middle, separated by width of three ommatidia; palpus small, black; proboscis brown, extending below eye in lateral view; antenna black; scape subcylindrical, length 1.5 × width; pedicel obconical, with ring of short spiky black setae subapically; postpedicel subconical, length 1.5 × width, rounded apically; arista slightly longer than head height.

*Thorax.* Mesonotum and scutellum black with dark green highlights; pleura dark brown except brassy anepisternum, brassy and purplish katepisternum; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem and knob yellow.

*Legs.* CI brown with green highlights, CII and CIII brown, FII dark brown remainder of legs brown; FII with dense cluster of 3 long, thick black setae basoventrally, medium length hairs ventrally with longest 5–6 at subapical third; TiII with stiff setae mesally, with longest 6–7 at apical fourth; remaining leg segments unmodified and without MSSC.

*Wing.* Subhyaline, veins pale brownish; posterior crossvein length 1/4 apical segment of CuA<sub>1</sub>.

*Abdomen.* Brown with dark green and blue highlights; tergal vestiture sparse, black.

*Genitalia.* Hypopygium dark brown; cercus (Fig. 8) swollen basally, long, thin on apical 2/3, length ca. 3 × basal width, with short thick apical peg and three long thick pegs apicoventrally, five long stiff setae ventrally at basal one-third, shorter setae proximal to long setae, numerous fine hairs along edge and basoventrally.

**Female:** Unknown.

**Material Examined.** *Type.* HOLOTYPE ♂ (BPBM 17,998) and paratype ♂ from HAWAIIAN ISLANDS: **Kaua'i:** Alaka'i Swamp, Halepa'akai Stream region, Pauiohi Field camp, 22.07999°N, 159.546896°W, 25 May 2005, R. Peck, Malaise #2.

***Uropachys fusticercus* (Hardy & Kohn)**

(Figs. 2, 9)

*Eurynogaster fusticercus* Hardy & Kohn, 1964: 197. Tenorio, 1969: 41; Nishida, 1992: 97, 1994: 91, 1997: 77, 2002: 94; Anonymous, 2009: 88.

*Eurynogaster fusticercus:* Bickel & Dyte, 1989: 415; Evenhuis & Thompson, 2004: 208.

*Uropachys fusticercus* (Hardy & Kohn): Evenhuis, 2005: 57; Yang *et al.*, 2006: 519; Evenhuis & O'Grady 2010: 37; Bennett *et al.* 2012: 276; Grichanov 2014: 523, 2017: 538; Goodman *et al.* 2016: 4.

**Diagnosis.** Easily separated from the congeners by the large cercus of the male genitalia, extending forward at least to the middle of the third abdominal segment (not extending as far forward in the congeners) and the dark brown halter knob (yellow to white in the congeners).

**Description. Male** (Fig. 2): Body length: 2.7–3.0 mm. Wing length: 2.5–2.8 mm.

*Head.* Face, front and clypeus dark brown; oc and vt black, about two-thirds length of antennal arista; occiput, and vertex black, the latter with bronze highlights; postgena with sparse short black hairs; face constricted at middle, separated by width of one ommatidium; palpus small, brown; proboscis brown, extending below eye in lateral view; antenna dark brown; scape subcylindrical, length 1.5 × width; pedicel obconical, with ring of short spiky black setae subapically; postpedicel subtriangular, length 2 x width, acute apically; arista slightly longer than head height.

*Thorax.* Mesonotum and scutellum subshining dark brown, with magenta, green, and bronze highlights; anepisternum and katepisternum as in mesonotum, remainder of pleura dull brown pollinose; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem pale brown, knob dark brown.

*Legs.* Coxae I as in anepisternum, CII–CIII dull brown, remainder of legs subshining brown; FI with greenish highlights; rest of fore legs and all of hind legs unmodified, without MSSC; FII with row of stiff black setae along entire ventral surface (MSSC); TiII slightly sinuous, medial surface with 10–12 stiff setae admixed with row or 8 shorter stiff setae (MSSC); Iit<sub>1</sub> subequal in length to TiII; remaining leg segments unmodified and without MSSC.

*Wing.* Subhyaline, veins pale brownish; posterior crossvein length 1/4 apical segment of  $CuA_1$ .

*Abdomen.* Subshining dark brown; tergites I–III with greenish highlights; tergites IV–VII with some magenta and greenish highlights; tergal vestiture sparse, black.

*Genitalia.* Hypopygium dark brown, large, extending forward almost to level of abdominal segment II; cercus (Fig. 9) very long, thin, length ca.  $5.5 \times$  basal width, constricted to thin strip medially, apex with two large thick pegs, distalmost the thickest, subapicoventrally with two strong thick peg-like setae, basal bulge with row of eight strong stiff setae ventrally, numerous fine hairs and microsetae basally.

**Female:** Specimens identified as *U. fusticercus* by Hardy & Kohn cannot be reliably associated with this species as no characters have yet been found to separate females of *U. flavicrura* from other species in the genus except *U. mediacercus*, n. sp. There are treated here as *incertae sedis* in *Uropachys* until reliable characters can be found to associate males and females.

**Material Examined.** HOLOTYPE ♂ (BPBM 4,168) from **Kaua'i:** Mt. Wai'ale'ale trail, 4,500 ft [ca. 1,370 m], Aug 1953, D.E. Hardy. *Non-Types:* **Kaua'i:** 2♂, Koke'e, Alaka'i Swamp Trail, 1228 m, 22°8.765'N, 159°39.016'W, 21 May 2007, G. Bennett (BPBM); 1♂, Alaka'i Swamp, Halepa'akai Stream region, Pauiohi Field camp, 22.07999°N, 159.546896°W, 25 May 2005, R. Peck, Malaise #1 (BPBM); 6m, Alaka'i Swamp, 29 Jul 1963, D.E. Hardy (UH); 8m, Mohihi Stream, 29 Jul 1963, D.E. Hardy (UH); 4m, Alaka'i Swamp, Aug 1953, D.E. Hardy (UH); 2m, Mt. Wai'aleale Trail, 4,500 ft [ca. 1,370 m], Aug 1953, D.E. Hardy (UH).

### *Uropachys hawaiiensis* (Parent)

(Fig. 10)

Gen. nov. et sp.: Grimshaw, 1901: 13. [The specimen referred to here was ultimately used as the type for *Pachyurus hawaiiensis*.]

*Pachyurus hawaiiensis* Parent, 1934: 305.

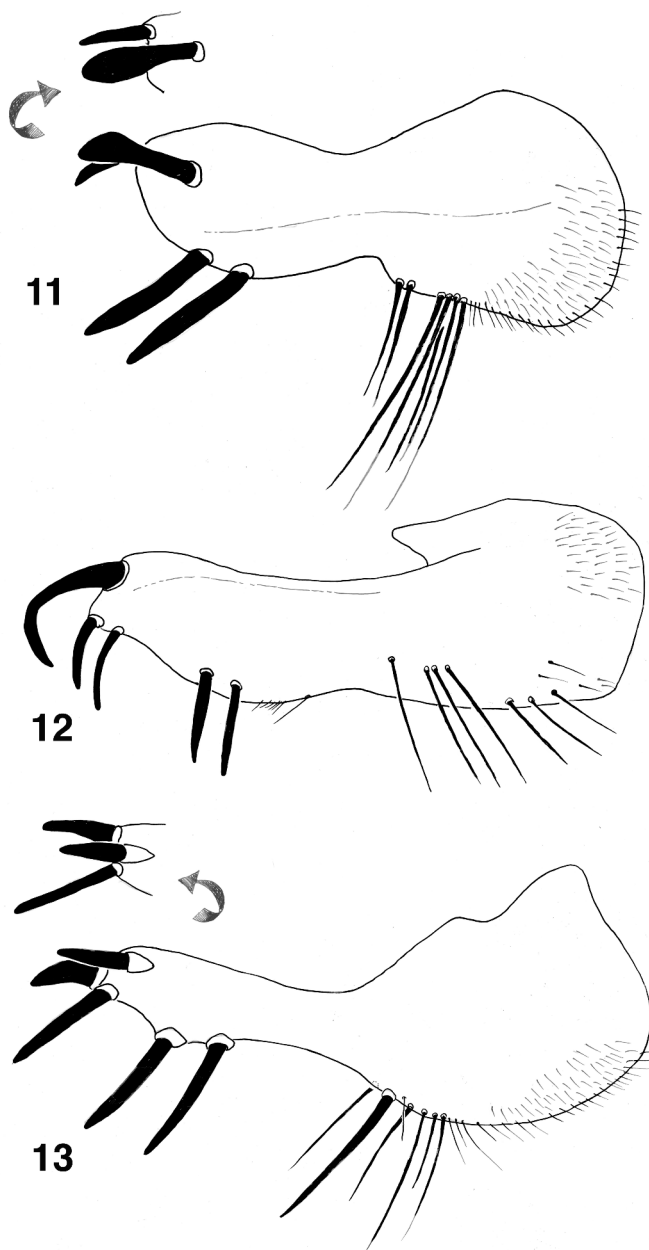
*Uropachys hawaiiensis* (Parent). Parent, 1935: 80. Evenhuis, 2005: 57; Grichanov, 2014: 523, 2017: 538; Chursina *et al.*, 2016: 507.

*Eurynogaster parenti* Hardy & Kohn, 1964: 215 (new replacement name for *Pachyurus hawaiiensis* Parent [at the time preoccupied by *Eurynogaster hawaiiensis* (Grimshaw, 1901)]. Tenorio, 1969: 41; Bickel & Dyte, 1989: 414; Nishida, 1992: 97, 1994: 91, 1997: 77; 2002: 94; Anonymous, 2009: 88.

**Diagnosis.** Most similar to *U. clavastyla* Hardy & Kohn by the possession of a brown hind basitarsus, but can be easily separated from it by the presence of the two basalmost bristles on the venter of the fore femur twice as long as the remainder (all ventral bristles the same length in *U. clavastyla*).

**Description** (from homotype male in UHIM). **Male:** Body length: 3.5 mm. Wing length: 4.0 mm.

*Head.* Face, front and clypeus black, with greenish highlights; oc and vt black, about two-thirds length of antennal arista; occiput, and vertex black, occiput gray pollinose along lateral eye margin; postgena with sparse short black hairs; face constricted at middle, separated by width of three ommatidia; palpus small, brown; proboscis brown, extending below eye in lateral view; antenna brown; scape subcylindrical, length  $1.5 \times$  width; pedicel obconical, with ring of short spiky black setae subapically; postpedicel



Figures 11–13. *Uropachys*, male cercus. 11, *U. mediacercus* Evenhuis, n. sp.; 12, *U. palustricola* (Hardy & Kohn); 13, *U. politticocercus* Evenhuis, n. sp.

short, subtriangular, length ca.  $0.5 \times$  width, rounded apically; arista slightly longer than head height.

*Thorax.* Mesonotum subshining dark brown, with greenish highlights anteriorly; scutellum dark brown; anepisternum and katepisternum as in mesonotum, remainder of pleura dull brown pollinose; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem and knob yellow.

*Legs.* Predominantly brown, with hind femur and tibia yellowish on medial surface; FI with strong spines basally, basalmost 2 twice as long as remainder, otherwise fore and hind legs unmodified and without MSSC; FII with 2 long stiff black setae basally on ventral surface (MSSC); TiII with row of 9 stiff setae on medial surface (MSSC); IIt<sub>1</sub> 2/3 length of tibia. Remaining leg segments unmodified and without MSSC.

*Wing.* Subhyaline, veins pale brownish; posterior crossvein length 1/4 apical segment of Cu<sub>A1</sub>.

*Abdomen.* Brown with greenish and bronze highlights dorsally; tergal vestiture sparse, black.

*Genitalia.* Hypopygium brown; cercus (Fig. 10) broad basally and apically, constricted medially, length ca. 3 x basal width, apex with cluster of three long pegs: dorsalmost acutely rounded apically, subdorsal peg flattened and slightly flared apically, lowermost flattened and broadly flared apically, apicoventral corner of cercus with two strong pegs, slightly longer than apical pegs, basal bulge with row of six strong spine-like hairs ventrally, numerous shorter, finer hairs basoventrally.

**Female:** Unknown.

**Material Examined.** *Non-Types:* **Kaua'i:** Kaunuohua Ridge, 21 Jul 1937, E.C. Zimmerman (UH).

***Uropachys mediacercus* Evenhuis, n. sp.**

(Figs. 4, 11)

**Diagnosis.** Easily separated from the congeners by the yellow fore coxa (fore coxa brown with green highlights in the congeners).

**Description. Male:** Body length: 2.8–3.1 mm. Wing length: 2.8–3.2 mm.

*Head.* Face, front and clypeus black; oc and vt black, about two-thirds length of antennal arista; occiput, and vertex black with purple highlights; postgena with sparse short black hairs; face constricted at middle, separated by width of three ommatidia; palpus small, brown; proboscis brown, extending below eye in lateral view; antenna with scape and pedicel yellowish brown; scape subcylindrical, length  $1.5 \times$  width; pedicel obconical, with ring of short spiky black setae subapically; postpedicel short, yellow with brown border, subspherical, length ca.  $0.5 \times$  width, blunt apically; arista slightly longer than head height.

*Thorax.* Uniformly brown; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem and knob white.

*Legs.* Coxae with CI yellow to yellowish white (Fig. 4), CII–CIII brown, remainder of legs yellowish white; fore and hind legs unmodified and without MSSC; FII with 3–4 long stiff black setae basoventrally, shorter setae elsewhere along medial portion of ventral surface (MSSC); IIt<sub>1</sub> 2/3 length of tibia. Remaining leg segments unmodified and without MSSC.

*Wing.* Subhyaline, veins pale brownish; posterior crossvein length 1/4 apical segment of CuA<sub>1</sub>.

*Abdomen.* Brown except yellow laterally on segments II–III, yellow color extending to sternites IIIII; tergal vestiture sparse, black.

*Genitalia.* Hypopygium brown; cercus (Fig. 11) broad basally, rounded apically, constricted medially, with two pegs apically, one normally shaped, the other spatulate apically, apicoventral corner of cercus with two long pegs, longer than apical pegs, basal bulge with row of six long stiff hairs ventrally, numerous microsetae basally.

**Female:** As in male except as follows: face wider, gray pollinose, not appreciably constricted medially; scutellum with brassy highlights; legs without MSSC; abdomen all brassy green.

**Material Examined.** *Type.* HOLOTYPE ♂ (BPBM 17,999) from HAWAIIAN ISLANDS: **Kaua'i:** Koke'e, Awe'awe'puhi trail, 21 May 2007, on *Charpentaria*, G. Bennett (BPBM); 1♂, Koke'e, Alaka'i Swamp Trail, 1228 m, 22°8.765'N, 159°39.016'W, 21 May 2007, G. Bennett (BPBM). *Paratypes:* **Kaua'i:** 1♀, s. Mohihi ridge, 8 Jul 1937, E.C. Zimmerman (BPBM), 2♂, s. Mohihi ridge, 15 Jul 1937, E.C. Zimmerman (UH); 2♀, Koke'e, 3,600 ft [ca. 1,057 m], Jul 1952, D.E. Hardy (UH); 2♀, Alaka'i Swamp, 10 Jul 1928, E.H. Bryan (UH).

**Remarks.** The type series of *U. mediacercus*, n. sp. includes some female paratypes of specimens originally identified as *U. flavicrura* Hardy & Kohn and *U. palustricola* Hardy & Kohn that have yellow fore coxae.

### *Uropachys palustricola* (Hardy & Kohn)

(Figs. 1, 12)

*Eurynogaster palustricola* Hardy & Kohn, 1964: 214. Tenorio, 1969: 41; Bickel & Dyte, 1989: 414; Nishida, 1992: 97, 1994: 91, 1997: 77, 2002: 94; Evenhuis & Thompson, 2004: 209; Anonymous, 2009: 88.

*Uropachys palustricola* (Hardy & Kohn): Evenhuis, 2005: 57; Yang *et al.*, 2006: 519; Grichanov, 2014: 523, 2017: 538; Goodman *et al.* 2016: 3.

**Diagnosis.** Easily separated from the congeners by the cercus bearing a pointed process dorsobasally.

**Description. Male** (Fig. 1): Body length: 3.2–3.5 mm. Wing length: 3.3–3.9 mm.

*Head.* Face and clypeus silvery pollinose, front black; oc and vt black, about two-thirds length of antennal arista; occiput and vertex black; postgena with sparse short black hairs; face constricted, separated by width of two ommatidia; palpus small, dark brown; proboscis dark brown, extending below eye in lateral view; antenna dark brown; scape subcylindrical, length 1.5 × width; pedicel obconical, with ring of short spiky black setae subapically; postpedicel, conical, length subequal to width, blunt apically; arista slightly longer than head height.

*Thorax.* Mesonotum and scutellum dark brown with greenish highlights dorsally, magenta highlights and humeral corners; pleura dull black except subshining anepisternum and katepisternum with greenish highlights; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem and knob white.

*Legs.* Legs brown, CI with bluish and greenish highlights; FI and FII with greenish

highlights, otherwise fore and hind legs unmodified and without MSSC; FII with patch of 4 long stiff black setae basoventrally, short, stiff setae elsewhere along medial portion of ventral surface (MSSC); TiII (Fig. 1) with medial surface with row of 9 long thin setae and row of 8 shorter spiny setae (MSSC); IIt<sub>1</sub> subequal to length of tibia. Remaining leg segments unmodified and without MSSC.

*Wing.* Subhyaline, veins dark brown; posterior crossvein length 1/4 apical segment of CuA<sub>1</sub>.

*Abdomen.* Brown, tergite I with brassy highlights, II–VII with greenish highlights; tergal vestiture sparse, black.

*Genitalia.* Hypopygium dark brown; cercus (Fig. 12) broad basally with thinner apical two-thirds to rounded apex, basal bulge with distinctive pointed dorsal process, apex with set of three strong downward curved pegs, uppermost curved more than other two, apicoventral corner with two strong pegs subequal in length to lowermost apical pegs and with small patch of short fine hairs proximally, basal bulge with row of six long stiff hairs, numerous microsetae basally.

**Female:** Unknown. The single female paratype tentatively identified as *U. palustricola* by Hardy & Kohn (1964) has all yellow legs and thus belongs to *U. mediacercus*, n. sp. to which it has been transferred.

**Material Examined.** *Types.* Holotype ♂ (BPBM 4178) from **Kaua'i:** Alaka'i Swamp, 10 Jul 1928, E.H. Bryan, Jr. Paratype ♂, same data (UH). *Non-Types:* **Kaua'i:** 5♂, Koke'e, Kalalau to Alaka'i, 9 Apr 1963, J.L. Gressitt (BPBM); 3♂, Alaka'i Swamp @ Pihea, 4,000 ft [ca. 1,220 m], 30 Jun 1985, R. Hurley (BPBM); 5♂, Koke'e, Pihea, Kaunuohua Ridge, 4,260 ft [ca. 1,298 m], 23 May 1979, D.E. Hardy (UH); 1♂, Alaka'i Swamp, 3,800 ft [ca. 1,000 m], 28 Jul 1963, D.E. Hardy (UH); 1♂, Alaka'i Swamp, 4,000 ft [ca. 1,220 m], 22 May 1966, K.Y. Kaneshiro (UH); 1♂, Pihea, 2,260 ft [ca. 689 m], 30 Jul 1964, D.E. Hardy (UH).

### *Uropachys politicocercus* Evenhuis, n. sp.

(Fig. 13)

**Diagnosis.** Easily separated from the congeners by the smoky brown wings (subhyaline in the congeners); the cercus is similar in shape to *U. fleacercus*, n. sp. but can be separated from it by the three apical pegs set closely together (two apical pegs in *U. fleacercus*).

**Description. Male:** Body length: 4.8 mm. Wing length: 4.5 mm.

*Head.* Face and clypeus silvery pollinose, front black; oc and vt black, about two-thirds length of antennal arista; occiput, and vertex black; postgena with sparse short black hairs; face slightly constricted at middle, separated by width of 4 ommatidia; palpus small, dark brown; proboscis dark brown, extending below eye in lateral view; antenna dark brown; scape subcylindrical, length 1.5 × width; pedicel obconical, with ring of short spiky black setae subapically; postpedicel subconical, length ca. 0.75 × width, acute apically; arista slightly longer than head height.

*Thorax.* Mesonotum and scutellum brown; pleura dull dark brown except anepisternum and katapisternum subshining dark brown with magenta highlights; thoracic setae black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; ac absent; halter stem and knob white.

*Legs.* Coxae and femora brown, remainder of legs yellowish; fore legs unmodified and without MSSC; FII with 2–3 long stiff black setae basoventrally, shorter setae in row along medial portion of ventral surface (MSSC); TIII bent slightly beyond middle, entire medial surface with row of short black setae, patch of longer spiny setae on apical one-third (MSSC); IIt<sub>1</sub> slightly short than tibia; remaining leg segments unmodified and without MSSC.

*Wing.* Uniformly smoky brown, veins brown; posterior crossvein length 1/4 apical segment of CuA<sub>1</sub>.

*Abdomen.* Brown, subshining brassy dorsally, fading to pale brassy laterally on tergites II–III; tergal vestiture sparse, black.

*Genitalia.* Hypopygium brown; cercus (Fig. 13) similar in shape to *U. fleacercus* with large basal bulge and tapering to long thin apical portion, apex with cluster of three thick pegs, lowermost ca. 1.5 × length of upper two, apicoventral corner of cercus with two long thick pegs, subequal in length to lowermost apical peg, basal bulge with row of five stiff hairs and one thick stiff hair ventrally, numerous shorter fine hairs ventrally and microsetae basally.

**Female:** Unknown.

**Material Examined.** *Type* (in fluid; taken out to dry to observe pollinosity for description and then immediately placed back in fluid). HOLOTYPE ♂ (BPBM 18,000) from HAWAIIAN ISLANDS: **Kaua'i:** Alaka'i Swamp, Halepa'akai Stream region, Pauiohi Field camp, 22.07999°N, 159.546896°W, 25 May 2005, R. Peck, Malaise #2.

### Species removed from *Uropachys* Parent

#### *Eurynogaster pulverea* Hardy & Kohn, **stat. rev.**

*Eurynogaster pulverea* Hardy & Kohn, 1964: 216. Tenorio, 1969: 41; Bickel & Dyte, 1989: 414; Nishida, 1992: 97, 1994: 91, 1997: 77, 2002: 94; Evenhuis & Thompson, 2004: 209; Anonymous, 2009: 88.

*Uropachys pulverea* (Hardy & Kohn): Evenhuis, 2005: 57.

*Uropachys pulvereus* (Hardy & Kohn): Yang *et al.*, 2006: 520; Grichanov, 2014: 523, 2017: 538.

Re-examination of the type series of *Eurynogaster pulverea* Hardy & Kohn shows it to not belong to *Uropachys* but is a typical *Eurynogaster*. The male genitalia are concealed and previous examination mis-interpreted the shape and size of the cercus. It is actually short, squarish (not elongate) and possesses a patch of apical hairs. The species is only known from the holotype male, hence, the genitalia have not been dissected and further information of the genitalic structures could not be ascertained.

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