

## A New Species of *Yaldwynopsis* from O‘ahu, Hawai‘i (Crustacea: Decapoda: Brachyura: Homolidae)<sup>1</sup>

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The homolid genus *Yaldwynopsis* Guinot & Richer de Forges, 1995, was established for *Paromola spinimana* Griffin, 1965, described from New Zealand. Guinot & Richer de Forges (1995: 439) subsequently reported this species from Japan, Hawai‘i, and French Polynesia. Richer de Forges & Ng (2007) revised the genus and recognized two new species, *Y. saguili* (from Japan and Taiwan) and *Y. guinotae* (from French Polynesia), distinguishing them from *Y. spinimana* s. str. by the proportions and structures of their third maxillipeds, chelipeds, and ambulatory legs. They commented that they were unable to examine the Hawaiian specimen at the time of their study and left its identity as incerta sedis.

The female specimen in question, deposited in the Bishop Museum (BPBM), Honolulu, was recently examined. While it has the ambulatory leg proportions of *Y. spinimana*, the armature is closer to that of *Y. guinotae*; but the number and arrangement of spines was nevertheless different enough to indicate that the Hawaiian specimen should be referred to a new species, here named *Y. hawaiiiana*.

The present paper describes the species and compares it with congeners. Measurements provided are of the carapace length (cl) and width (cw), respectively. The terminology used essentially follows that proposed by Guinot & Richer de Forges (1995: Fig. 52) for the genus. The abbreviations P1–5 refer to pereopods 1–5, respectively. Comparative material from the following institutions were also examined as part of this study: Muséum National d’Histoire Naturelle, Paris, France (MNHN); Crustacean Collection of the National Museum of the Philippines, Manila, Philippines (NMCR); National Museum of New Zealand, Te Papa Tongarewa, Wellington, New Zealand (NMNZ); and Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore (ZRC).

### *Yaldwynopsis* Guinot & Richer de Forges, 1995

**Remarks.** Four species of *Yaldwynopsis* are now known, all from the West Pacific (Ng *et al.*, 2008). Through the courtesy of Colin McLay (University of Canterbury, Christchurch) and Rick Webber (National Museum of New Zealand, Wellington), the authors were able to examine an excellent series of photographs of the type male and another male specimen of *Y. spinimanus* in NMNZ. They complement the otherwise detailed description and figures of the species by Griffin (1965). As such, several characters cited by Richer de Forges & Ng (2007) as separating *Y. spinimanus* from *Y. guinotae* and *Y. saguili* need to be amended. One

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key character is the presence of two spines on the base of the dactylus of the chela, which was neither described nor figured by Griffin (1965). As such, Richer de Forges & Ng (2007) had regarded the dactylus as unarmed; which is incorrect. The chelipeds and ambulatory legs of the type male of *Y. spinimanus* are figured here to allow for more accurate comparisons.

***Yaldwynopsis hawaiiiana* Ng & Eldredge, new species**

(Figs. 1A, 2, 3, 5A, B, 6A–F)

*Homala japonica* - Clarke, 1972: 16 (not *Homola japonica* Parisi, 1915).

*Paromola spinimana* - Titgen, 1988: 144.

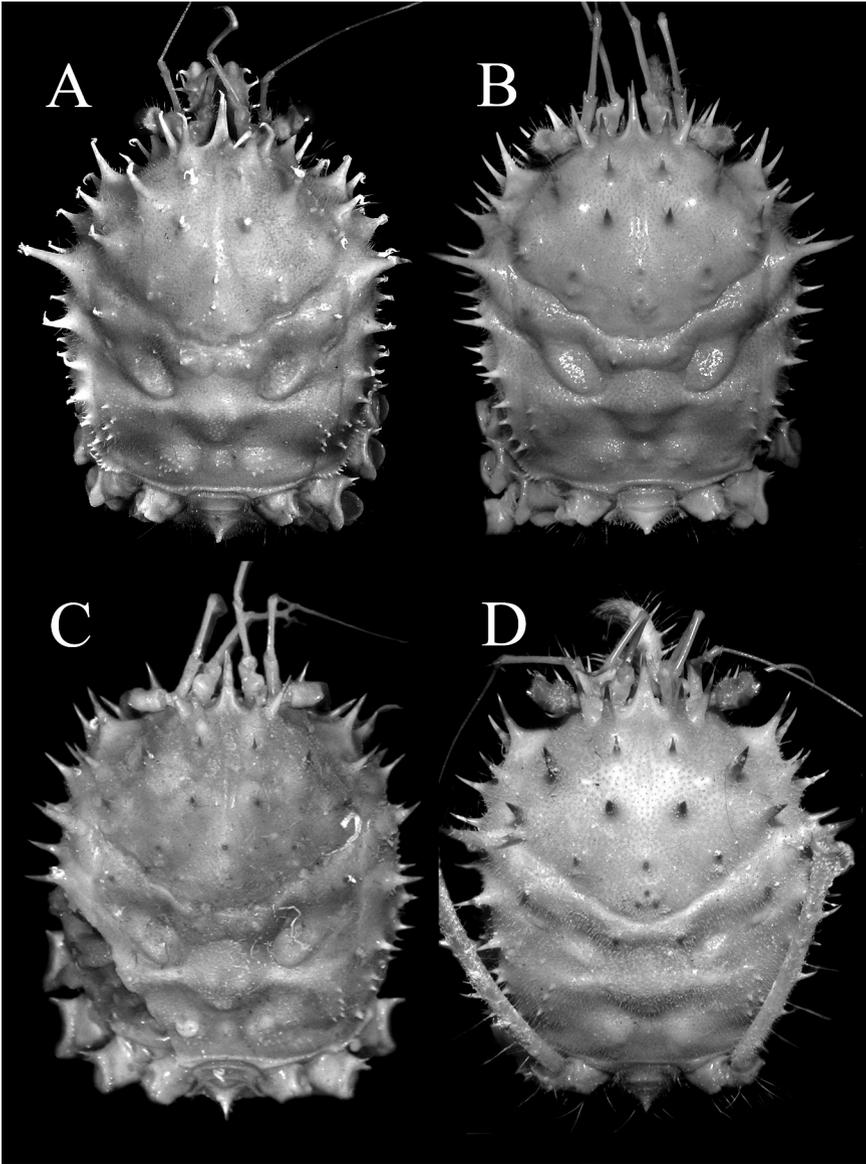
*Yaldwynopsis spinimanus* - Guinot & Richer de Forges, 1995: 439; Castro, 2011: 36; Garassino, 2009: 4, 39 (not *Paromola spinimana* Griffin, 1965)

**Type.** *Holotype* female (cl 44.7 mm [measured between bases of spines], cl 45.27 mm [including spines]; cw 35.4 mm [base of spines], cw 40.82 mm [including spines]) (BPBM S7866), Barbers Point, off Kane'ohe, O'ahu, Hawai'i, in shrimp trap, 293 m (160 fathoms) depth, collection number 69-10-12, coll. T. Clarke, 9–10 Nov 1970.

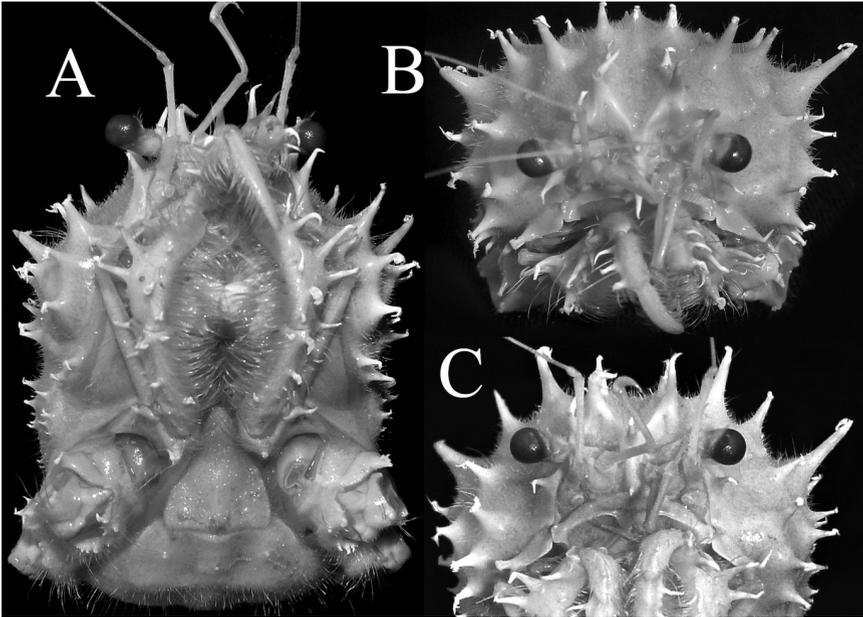
**Comparative material.** *Yaldwynopsis spinimanus* (Griffin, 1965): holotype male (cl 53.0 mm, cw 41.0 mm) (NMNZ Cr 1550) [photographs examined], off North East Island, Three Kings Islands, New Zealand, 50 fathoms, coll. A. Baker, Auckland University Three Kings Expedition, Jan 1963; 1 male (cl 51.5 mm, cw 36.0 mm) (NMNZ Cr 1860) [photographs examined], off Pinnacle Rocks, near Poor Knights Islands, New Zealand, in crayfish pot, ca. 100 m, coll. F. Cotterill, 10 Jan 1969. *Yaldwynopsis saguili*, Richer de Forges & Ng, 2007: holotype male (cl 36.9 mm, cw 30.5 mm) (NMCR), 3 female paratypes (ZRC), 1 ovigerous female paratype (cl 25.4 mm, cw 20.7 mm) (ZRC), Balicasag Island, Bohol and Sulu Seas, 80-100m, Philippines, coll. Panglao 2004 and 2005 Expeditions; 1 paratype male (cl 32.3 mm, cw 26.0 mm) (ZRC 2001.0549), Balicasag Island, Panglao Island, Bohol, Philippines coll. fishermen with tangle nets on the reef slope, 100-500 m, 28 Nov 2001; 1 male (cl 20.8 mm, cw 17.4 mm) (ZRC), Tashi fishing port, northeastern Taiwan, T. Y. Chan, coll. 1999. *Yaldwynopsis guinotae*, Richer de Forges & Ng, 2007: holotype male (cl 34.0 mm, cw 25.0 mm) (MNHN-B 24312), station 231, 22°12.0'S–138°45.9'W, 270 m, Tuamotu, Fangataufa Atoll, French Polynesia, by traps, coll. J. Poupin, 21 May 1990.

**Diagnosis.** Carapace with 1 supraocular spine; 1 pseudorbital spine; 4 short protogastric spines; main anterolateral spine strong, pointing obliquely anteriorly; subhepatic region with 5 strong spines, first largest; sub-orbital area with 1 spine, slightly shorter than supraorbital spine; cheliped merus with 3 rows of long, sharp, curved spines; upper row with 7 spines; lower outer border with 18 spines; carpus with row of 6-8 spines along inner margin; palm with 2 rows of long spines: upper border with 6 or 7 spines; lower border with 11 spines; dactylar finger with 2 strong spines on upper border near base; ambulatory legs long, slender; P2 with upper margin of merus bearing 11 spines and sharp distal tooth, inner surface with about 10 spinules on proximal quarter; upper margin of merus of P4 with total of 11 spines; outer surface with 3 tubercles on proximal part; lower margin with total of 16 small spines; P5 slender, merus with 2 spines on dorsal margin, 4 spines and 2 spinules on ventral margin, outer surface of basal fifth with 2 distinct tubercles.

**Description.** Large species, very spiny on carapace, appendages, chelipeds and ambulatory legs (Figs. 1A, 2). Surface of the carapace with deep grooves and well marked regions (Fig. 1A). Rostrum simple, not longer than other spines of anterior part of carapace (Fig. 1A).



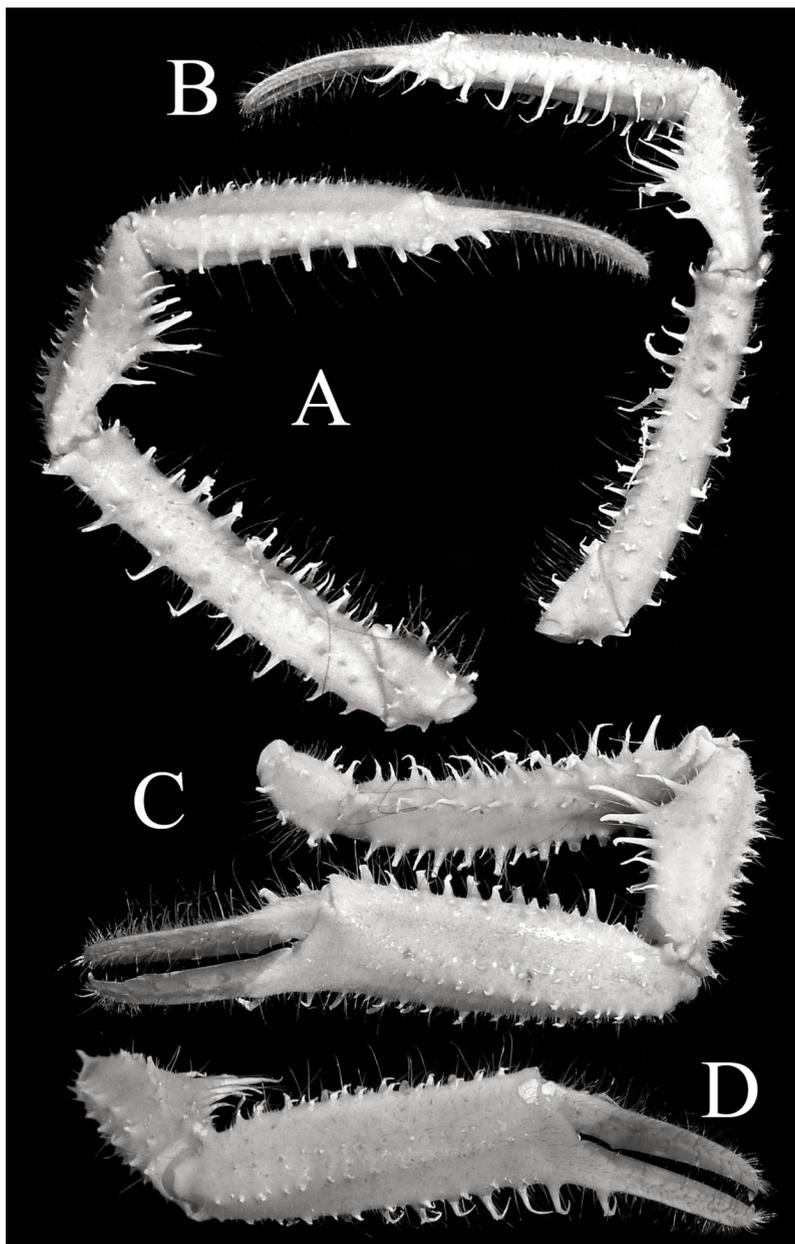
**Figure 1.** Dorsal views of carapaces. **A**, *Yaldwynopsis hawaiiiana* sp. nov., holotype female (carapace length 44.7 mm, carapace width 35.4 mm) (BPBM S7866), Hawai'i; **B**, *Y. guinotae*, Richer de Forges & Ng, 2007, holotype male (carapace length 34.0 mm, carapace width 25.0 mm) (MNHN-B 24312), French Polynesia; **C**, *Y. spinimanus* (Griffin, 1965), male (carapace length 51.5 mm, carapace width 36.0 mm) (NMNZ Cr 1860), New Zealand; **D**, *Y. saguili*, Richer de Forges & Ng, 2007, holotype male (carapace length 36.9 mm, carapace width 30.5 mm) (NMCR), Philippines.



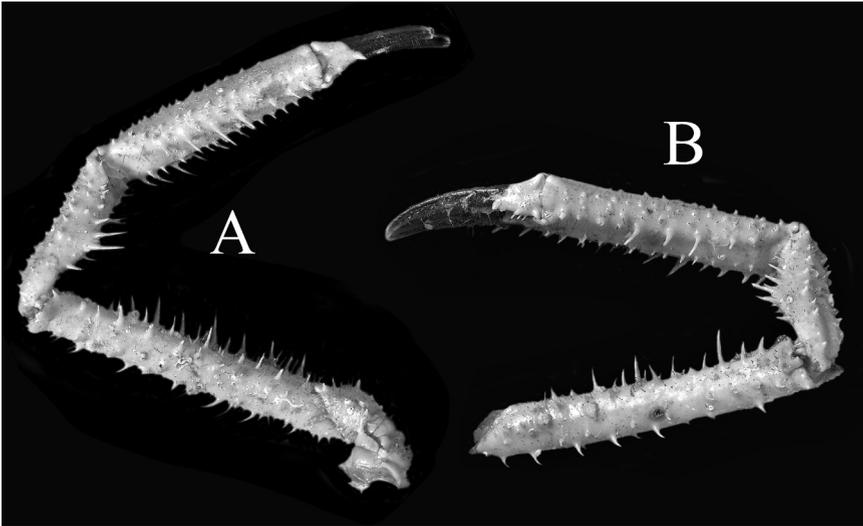
**Figure 2.** *Yaldwynopsis hawaiiiana* sp. nov., holotype female (carapace length 44.7 mm, carapace width 35.4 mm) (BPBM S7866), Hawai'i. A, ventral view of thoracic sternum and abdomen; B, C, frontal view of carapace.

Carapace with 1 supraocular spine; 1 pseudorbital spine, with a spinule behind it; 4 short protogastric spines; anterolateral spine strong, pointing obliquely anteriorly, followed behind along posterolateral margin by a series of spines of decreasing sizes (Figs. 1A, 2A, B). Cervical groove prominently marked (Fig. 1A). Posterior carapace margin distinctly concave; lateral margins of branchiostegite serrulated (Fig. 1A). Lateral border of carapace on branchial region covered with scattered spinules (Fig. 1A). Subhepatic region with 5 strong spines, first largest, directed almost anteriorly (Figs. 1A, 2B, 2C). Sub-orbital area with 1 spine, slightly shorter than supraorbital spine (Figs. 1A, 2B, C). Buccal spine strong (Fig. 2A). Ocular peduncle relatively short, slender, eyes subspherical (Fig. 2). Antennules with a bulbous basal article, other articles long, slender, with short flagellum (Fig. 2C). Antennae short, first article with large urinary article; second article cylindrical with 1 sub-terminal spine, third article long, slender (Fig. 1A). Third maxilliped subpediform, very spinous; inner margins lined with dense long spinules; basis with 2 strong lateral spines; ischium with 8 spines; merus with 11 spines of varying sizes; carpus short, unarmed; propodus with 3 long spines along outer border; dactylus long, unarmed (Fig. 2).

Cheliped relatively long, slender, spiny (Fig. 3); coxa with small anterior spine, ventral surface with several small granules; ischium subtriangular in cross-section, with rows of spines on each margin; merus with 3 rows of long, sharp, curved spines; upper row with 7 spines; lower outer border with 18 spines (Fig. 1A, B); carpus relatively short, triangular in dorsal view, with row of 6-8 spines along inner margin, median ones longest; outer surface with 2 rows of short spines (Fig. 3A, 3B). Palm with 2 rows of long spines: upper border



**Figure 3.** *Yaldwynopsis hawaiiiana* sp. nov., holotype female (carapace length 44.7 mm, carapace width 35.4 mm) (BPBM S7866), Hawai'i. **A, B**, dorsolateral views of chelipeds; **C, D**, outer views of chelae. **A, C**, left cheliped; **B, D**, right cheliped.



**Figure 4.** *Yaldwynopsis spinimanus* (Griffin, 1965), holotype male (carapace length 53.0 mm, carapace width 41.0 mm) (NMNZ Cr 1550), New Zealand. Dorsolateral views of chelipeds. **A**, left cheliped; **B**, right cheliped.

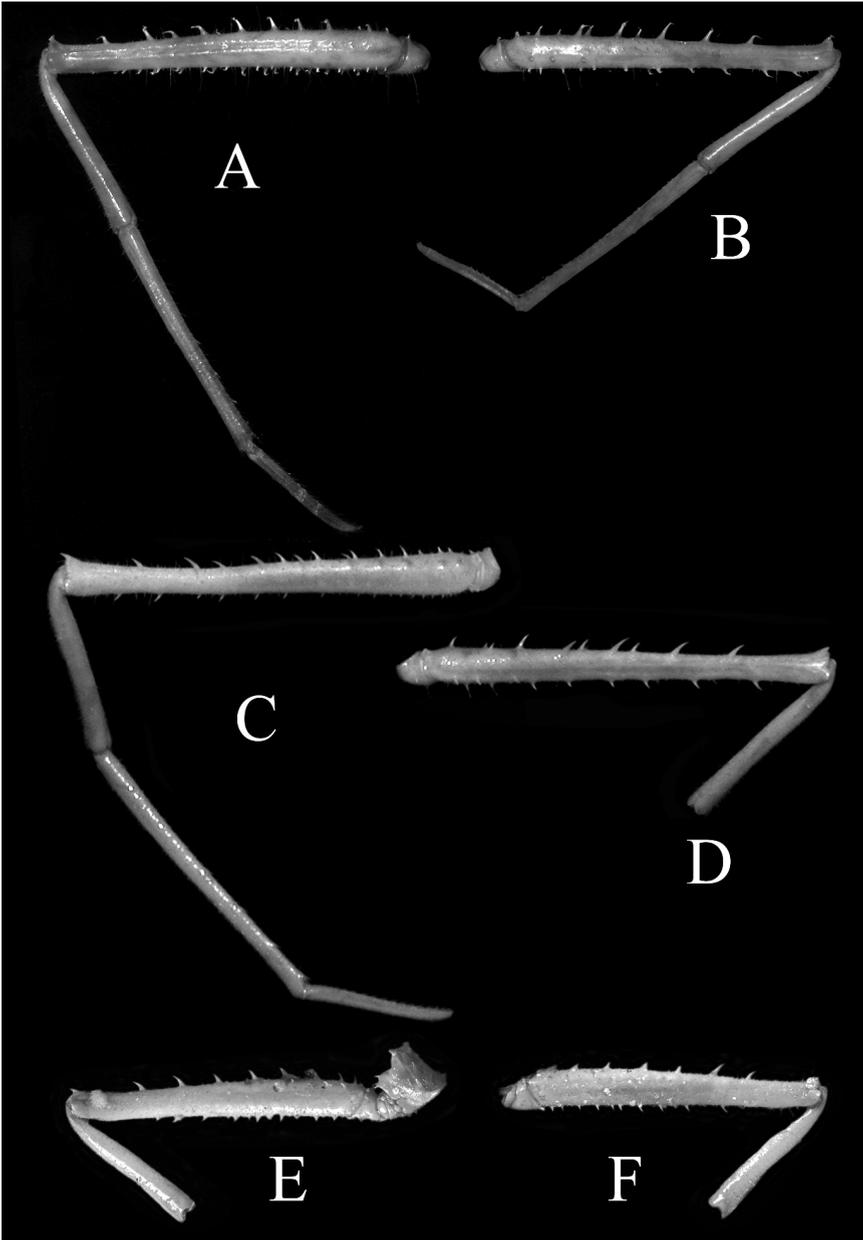
with 6 or 7 spines; lower border with 11 spines; fingers shorter than palm, with hooked tips, pigmented throughout most of length except near base, cutting edges blade-like; dactylus with 2 strong spines on upper border near base (Fig. 3C, D).

Ambulatory legs long, slender; coxa of P2–4 with 2 short spines on anterior margin. P2 with upper margin of merus bearing 11 spines and sharp distal tooth, inner surface with about 10 spinules on proximal quarter, basis-ischium with 3 ventral, 1 dorsal and 2 inner spines (Figs. 5A, 6B). Upper margin of merus of P4 with total of 11 spines, arranged as 2 rows of spines proximally (with 4 spines each), merging into single row distally (with 3 spines) (Figs. 5B, 6A); outer surface with 3 tubercles on proximal part; lower margin with total of 16 small spines, arranged in 2 rows proximally (with 7 and 5 spines), merging into single row distally (with 4 spines); basis-ischium with 1 dorsal spine. P5 slender; basis-ischium with 1 strong ventral spine; merus with 2 spines on dorsal margin, 4 spines and 2 spinules on ventral margin, outer surface of basal fifth with 2 distinct tubercles (Fig. 6C, D); dactylus and propodus forming prominent subchelate structure, inner margin of propodus armed with sharp spines (Fig. 6E, F).

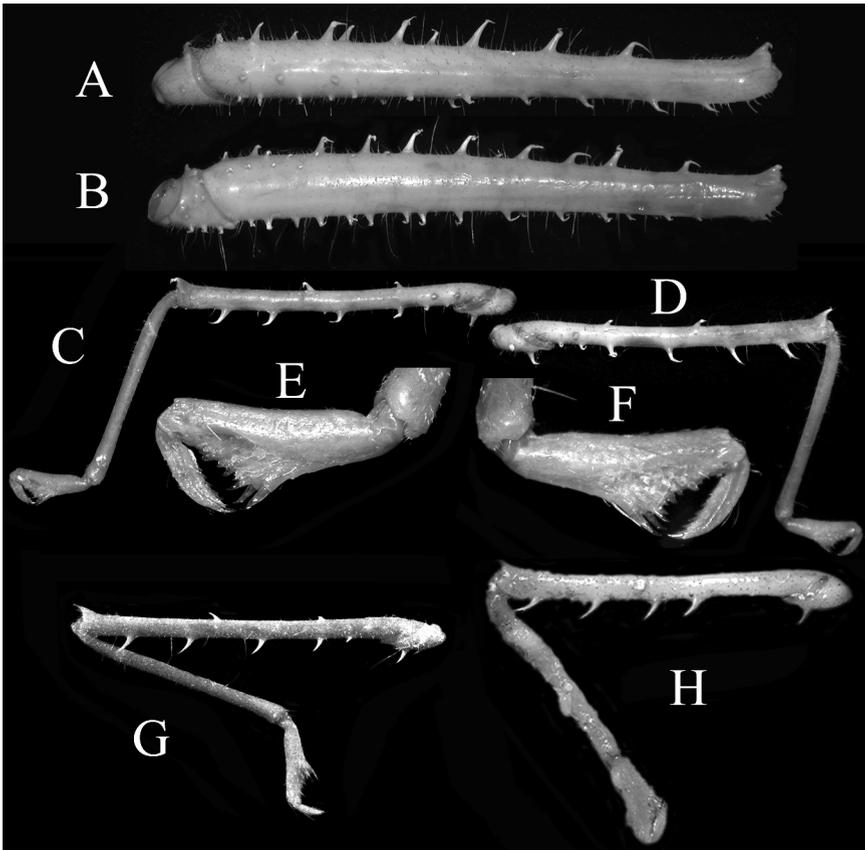
Female abdomen ovate, completely covering thoracic sternal surface; telson triangular with rounded tip, distinctly sinuous lateral margins (Fig. 2A); somite 2 with small median spine; somite 6 with transverse row of 3 low granules; all other somites unarmed. Vulva on sternite 5 large, obliquely elliptical, without visible operculum.

**Etymology.** The species is named after the Hawaiian Archipelago.

**Remarks.** The labels associated with the specimens indicate the specimen was collected “by T. Clarke in a gill net from 100 fathoms depth on 28–29 October 1969, with a col-



**Figure 5.** Ambulatory legs. **A, B**, *Yaldwynopsis hawaiiiana* sp. nov., holotype female (carapace length 44.7 mm, carapace width 35.4 mm) (BPBM S7866), Hawai'i; **C, D**, *Y. guinotae*, Richer de Forges & Ng, 2007, holotype male (carapace length 34.0 mm, carapace width 25.0 mm) (MNHN-B 24312), French Polynesia; **E, F**, *Y. spinimanus* (Griffin, 1965), holotype male (carapace length 53.0 mm, carapace width 41.0 mm) (NMNZ Cr 1550), New Zealand. **A, C, E**, left P2; **B, D, F**, right P4.



**Figure 6.** A–F, *Yaldwynopsis hawaiiiana* sp. nov., holotype female (carapace length 44.7 mm, carapace width 35.4 mm) (BPBM S7866), Hawai‘i; G, *Y. guinotae*, Richer de Forges & Ng, 2007, holotype male (carapace length 34.0 mm, carapace width 25.0 mm) (MNHN-B 24312), French Polynesia; H, *Y. spinimanus* (Griffin, 1965), holotype male (carapace length 53.0 mm, carapace width 41.0 mm) (NMNZ Cr 1550), New Zealand. A, right P4 (outer view); B, left P2, inner-marginal view; C, left P5; D, right P5; E, left subchelate structure of P5; F, right subchelate structure of P5; G, H.

lection number 69-10-12”. However, Clarke’s (1972) detailed report makes it clear that the specimen (which he incorrectly identified as “*Homala japonica*”) was actually collected in 1970 from a trap in deeper water.

The type specimen of *Y. hawaiiiana* on hand is not in good condition. It had clearly been preserved in formalin in the past and the carapace and appendages are slightly soft. Only the two chelipeds, two ambulatory legs and the last two pereopods are present, but all are disarticulated. While it is no problem to determine whether the pereopods are left or right, it was less easy to ascertain which pereopod the two loose ambulatory legs belong to. In homolids, the last pair of legs (P5) is modified for carrying (see Guinot *et*

*al.*, 1995) and the dactylus and propodus form a subchelate structure. The three unspecialised ambulatory legs (P2–4), however, are similar in structure and length. Examination of intact specimens of *Y. saguili* revealed some important features that enabled the identity of the two ambulatory legs in the present specimen of *Y. hawaiiiana* to be determined. The outer surface of the merus (facing the posterior) of P4 has one to three median tubercles or granules on the proximal part; a feature absent on all the other meri. On this basis, the right ambulatory leg of *Y. hawaiiiana* is here ascertained to be P4 (Fig. 6A). The spination on the basis-ischium of the legs is also different. In the basis-ischia of P3 and P4, the ventral margin is granular but never strongly spiniform. Prominent spines are present, however, on the basis-ischium of the P2. On this basis, the left leg of *Y. hawaiiiana* is here identified to be the P2 (Fig. 6B).

The present specimen of *Yaldwynopsis* superficially resembles *Y. spinimanus* in possessing relatively shorter ambulatory legs (Figs. 4, 5). However the armature is completely different. In *Y. hawaiiiana*, the inner ventral margin of the palm has 18 spines (Fig. 3) (versus 12 in *Y. spinimanus*, Fig. 4); there are a total of 11 spines and spinules on the dorsal margin of the merus of P4 (versus 7 in *Y. spinimanus*, Fig. 5F), the merus of P5 is relatively more slender (Fig. 6A, B) (versus proportionately stouter in *Y. spinimanus*, Fig. 6H); and the dorsal margin of the merus of P5 has two spines (Fig. 6A, B) (versus unarmed in *Y. spinimanus*, Fig. 6H).

*Yaldwynopsis hawaiiiana* is perhaps closest to *Y. guinotae* in the armature of the ambulatory legs. It is the only species in which the merus of P5 also has two spines on the dorsal margin and their proportions are similar (Fig. 6G). In the case of *Y. hawaiiiana*, there are also two additional tubercles on the outer surface near the base (Fig. 6C, D). In addition, the P2 and P4 are proportionately shorter in *Y. hawaiiiana* (Figs. 5A, B, 6A, B) compared to *Y. guinotae* (Fig. 5C, D); there are two spines at the base of the dorsal margin of the dactylus of the chela (Fig. 3) (versus four in *Y. guinotae*, see Guinot & Richer de Forges, 1997: Fig. 53E; Richer de Forges & Ng, 2007: Fig. 7E); the inner dorsal margin of the palm has six spines (Fig. 3) (versus 10 in *Y. guinotae*, see Guinot & Richer de Forges, 1997: Fig. 53E; Richer de Forges & Ng, 2007: Fig. 7E); and the merus of P4 has a total of 11 and 16 spines on the dorsal and ventral margins, respectively (Figs. 5B, 6A) (versus 8 and 7, respectively, in *Y. guinotae*, Fig. 5D).

**Ecology.** Not much is known about the ecology of this species other than it was collected from gill nets set in deep water at about 183 m. As has been discussed by Ng *et al.* (2009) and Mendoza *et al.* (2010), there is a component of deep-sea fauna which is generally regarded as rare because their preferred habitats (steep rocky areas) are extremely difficult to sample.

#### Acknowledgments

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