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A new species of *Mesanthura* Barnard (Isopoda, Cymothoida, Anthuridae) from the Hawaiian Islands[1]

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Abstract. A new species of anthurid isopod *Mesanthura kalaeloa* **sp. nov.** is described from Hawai'i. It was collected from an autonomous reef monitoring structure deployed in Barbers Point Harbor, O'ahu. Dorsal pigment patterns immediately distinguish it from all described congeners.

Key words: Crustacea, Isopoda, Anthuridae, taxonomy, new species, Hawai'i

INTRODUCTION

Previously known Hawaiian Anthuridae comprise four species (Poore 2001), including one from the genus *Mesanthura* Barnard, 1914. All were described by Miller & Menzies (1952).

During a study in 2018 of aquatic invasive species, by the State of Hawai'i's Division of Aquatic Resources, a previously undescribed species of *Mesanthura* was discovered at Barbers Point Harbor on O'ahu. The genus is widespread in shallow marine water, with almost 50 known species (Boyko *et al*. 2008). Poore & Lew Ton (1986) provide a current diagnosis of *Mesanthura*. Known species are quickly spotted because of and distinguishable by their pigmentation patterns, which are supported by morphological differences (Poore & Lew Ton 1986, Poore 2001).

MATERIALS AND METHODS

Autonomous reef monitoring structures (ARMS) were used to monitor waters near state harbors for aquatic invasive species. ARMS are standardized structures designed to sample marine cryptofauna passively (Global ARMS Program 2017). A modified ARMS, consisting of four plates rather than the standard nine, was deployed on 11 July 2018 at a depth of 2.44 meters in Barbers Point Harbor on the island of O'ahu, Hawai'i and retrieved approximately 24 months later. All crustaceans retained on a 2-mm sieve were fixed in formalin and preserved in alcohol. These were received on 10 September 2021. Several specimens of an unrecognized anthurid were dissected, body parts were permanently mounted on glass slides with Permount mounting medium, and observed on a Richter Optica UX1D compound microscope outfitted with a 5 megapixel camera. Terminology follows Kensley & Schotte (1989). Material is deposited at Bernice P. Bishop Museum (BPBM).

Abbreviations: A1 = antennule; A2 = antenna; H = head; Md = mandible; Mx = maxilla; Mp = maxilliped; Pe1–7 = pereopods 1–7, Pl1, 2 = pleopods 1, 2; U = uropod; T = telson.

1. Contribution No. 2022-003 to the Hawaii Biological Survey.

SYSTEMATICS

Order ISOPODA Latreille, 1816
Suborder CYMOTHOIDA Wägele, 1989
Superfamily ANTHUROIDEA Leach, 1814
Family ANTHURIDAE Leach, 1814

Mesanthura kalaeloa sp. nov.

(Figs. 1, 2)

Type material. Holotype ♀, 7.5 mm, whole (BPBM S19610). Paratypes: ♀, 6.2 mm, partially dissected (BPBM S19611); ♀, 6.4 mm, partially dissected (BPBM S19612); ♀, 6.8 mm, partially dissected (BPBM S19613); ♀, 5.5 mm and manca, 2.7 mm, whole (BPBM S19614). All from Barbers Point Harbor, O'ahu (21.32475°N, 158.12227°W), 2.44 m, 13 Jul 2020.

Etymology. From the Hawaiian place name of the area in which the species was collected (treated as a noun in apposition).

Description (based on 4 females, 6.2–7.5 mm)

Pigment - Head, pereonites, and pleon have distinct dorsal patches of dark brown pigment with dense well delimited outlines enclosing scattered pigment spots. Head anterior border nearly straight at level of mid-eye, posterior border convex and extending to lateral limits of eyes; pereonite 1 anterior border convex, posterior border concave or nearly linear; pereonite 2 anterior border straight, posterior border convex; pereonites 3–6 anterior and posterior borders convex; pereonite 7 shortest, anterior border concave, posterior border convex; pleon fill evenly scattered; telson with evenly scattered pigment spots within a non-pigmented band around border; uropod with distinct patches of pigment spots on peduncle, endopod, and exopod. Other appendages not pigmented.

Body length about 13× greatest width. Head shorter than pereonite 1, length 1.3× width, rostrum prominent and rounded, length of rostrum and anterolateral projections equal, 0.1× head; eyes anterolateral, black, subtriangular, ommatidia indistinct. Relative length of pereonites: 1<2>3<4=5=6>>7. Telson linguiform, posterior edge with two groups of six setae separated by a small gap on midline, a small seta anterolateral of each group, a pair of statocysts anterior to pigment patch.

Antennule peduncle with 3 articles, proximal to distal proportions 5:2:3; flagellum with 3 articles, slightly shorter than peduncular article 3, distal article with setae and about 5 aesthetascs. Antenna peduncle with 5 articles, article 2 laterally grooved and partially covering article 3, proximal to distal proportions 15:34:12:17:22; flagellum with 3 articles, length 0.7× of peduncular article 5.

Mandible with palp of 3 articles, first and third of subequal length, second longest, third article subfalcate; incisor and lacinia mobilis each with 3 teeth. Maxilla bent apically, with a strong distal tooth and 5 smaller teeth. Maxilliped with palp of 3 articles, the second longest and widest, article 3 with 1 proximomedial robust seta and more distally a closely spaced group of 4 longer robust setae.

Pereopod 1 subchelate, carpus triangular, lower margin with blunt distal angle, propodus enlarged, palm centrally produced with proximal margin entire and distal margin denticulate, dactylus with a group of setae on lower margin. Pereopods 2 and 3 similar, merus noticeably broader than distal articles, carpus triangular with setae at distal angle,

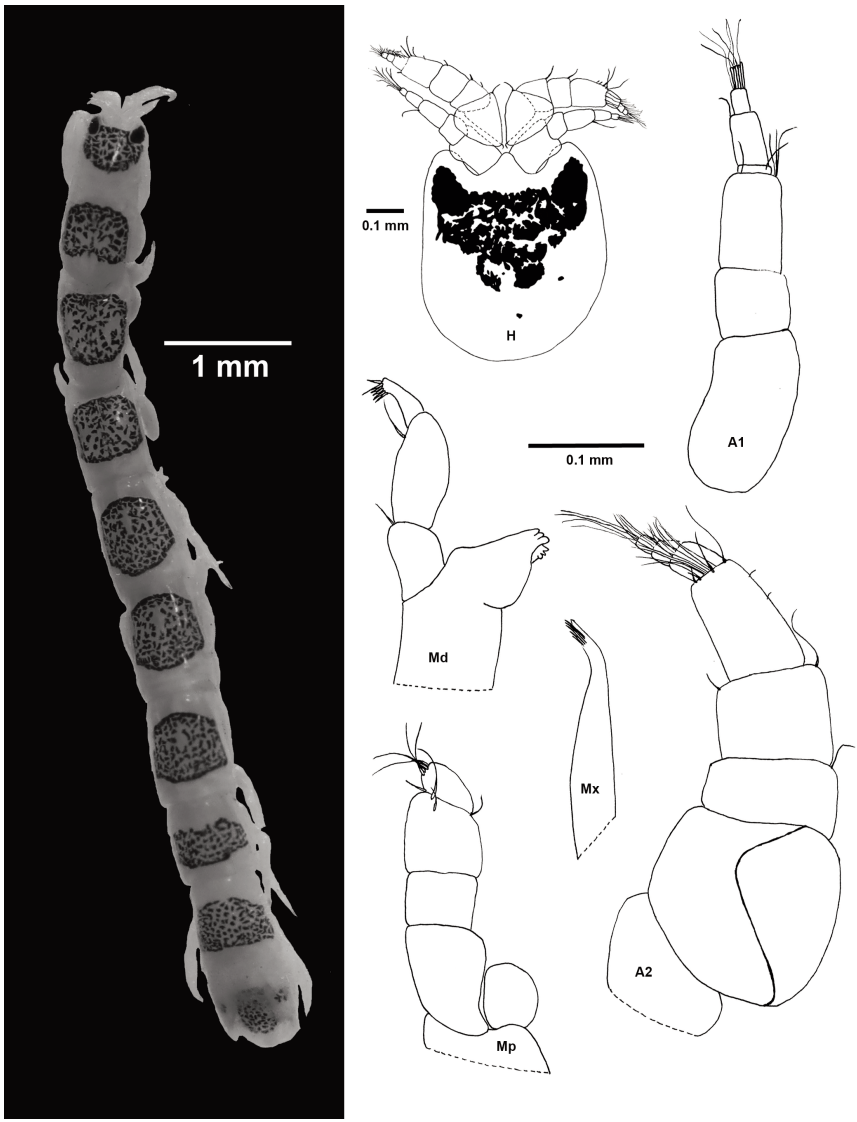

Fig. 1. *Mesanthura kalaeloa* sp. nov.: Left - photograph of holotype, 7.5 mm female (BPBM S19610). Right - 6.4 mm female (BPBM S19612): head, maxilla, mandible; 6.8 mm female (BPBM S19613): antennule, antenna, maxilliped. Scale bar at top left of right pane is for head only.

propodus elongate with setae and a stout serrate spine-like seta at lower distal angle, dactylus with setae and a robust spine-like seta on lower margin. Pereopods 4–6 similar, breadth of merus subequal to distal articles, carpus trapezoidal with setae and a stout

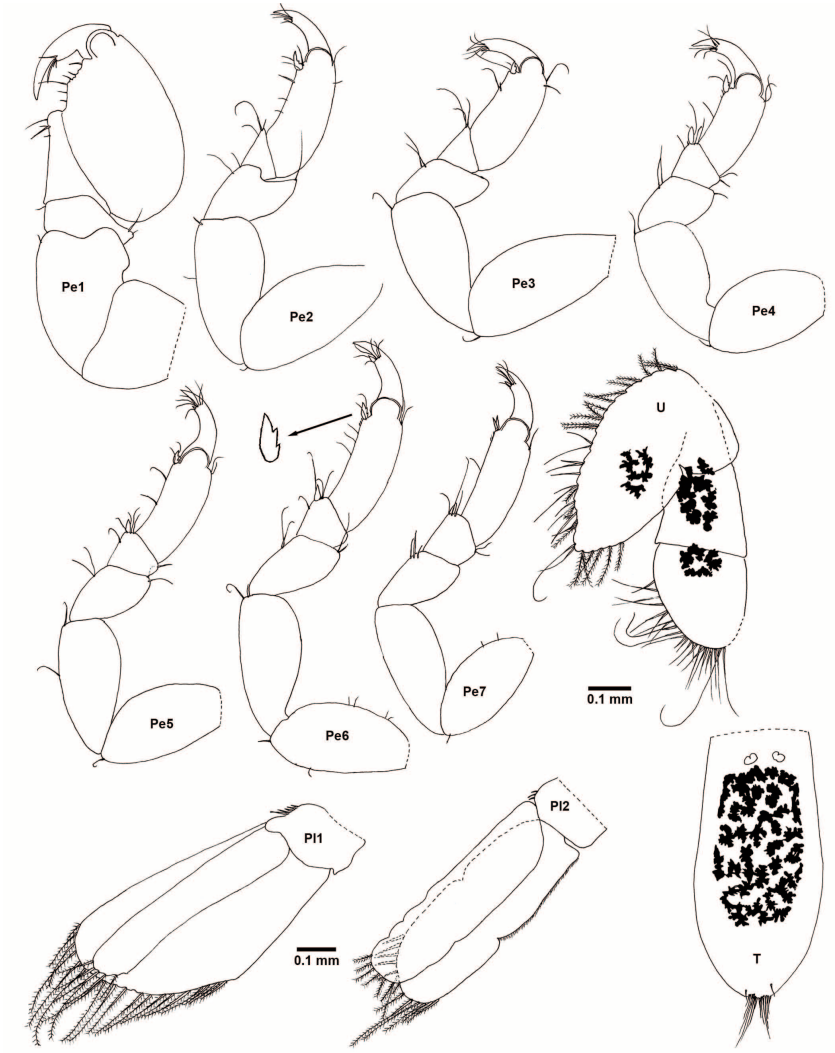

Fig. 2. *Mesanthura kalaeloa* sp. nov.: 6.2 mm female (BPBM S19611): pereopods 1–7, uropod, telson; 6.4 mm female (BPBM S19612): pleopod 1; 6.8 mm female (BPBM S19613): pleopod 2. Scale bar at lower left is for pleopods only.

spine-like seta at distal angle, propodus elongate with setae and a stout serrate spine-like seta at lower distal angle, dactylus with setae and a stout spine-like seta on lower margin. Pereopod 7 merus breadth subequal to distal articles, carpus trapezoidal with setae and a stout spine-like seta at distal angle, propodus elongate with 2 long robust spine-like setae at lower distal angle, dactylus with setae and a robust spine-like seta on lower margin.

Pleopod 1 peduncle with 5 retinaculae; exopod operculiform, length 1.75× width, 19 plumose setae along distolateral margin; endopod slightly shorter than exopod, 0.25× width of exopod, with 5 plumose setae along distal margin. Pleopod 2 peduncle with 3 retinaculae; exopod length 2.75× width, short densely spaced setae along lateral margin proximal to an indentation at mid-length, 13 long plumose setae along distal margin; endopod 0.70× width of exopod, 6 plumose setae along distal margin.

Uropod endopod nearly as wide as long, with long setae along distal margin, length about 0.6× that of peduncle; exopod longer than peduncle, slightly sinuous along distolateral margin, crenulate along lateral and distomedial margins, plumose setae along proximolateral and distomedial margins, simple and plumose setae along distolateral margin.

Habitat. Natural habitat unknown

Distribution. Hawaiian endemic

Remarks. Pigmentation on pereonites 4–7 immediately distinguishes *Mesanthura kalaeloa* from its Hawaiian congener *M. hieroglyphica* Miller & Menzies, 1952. *Mesanthura kalaeloa* has relatively large, well delimited pigment patches, whereas *M. hieroglyphica* has loops (Miller & Menzies, 1952) reminiscent of an upside-down capital omega (Ω). Morphological differences include the relative lengths of pereonites 5 and 6 (equal in *M. kalaeloa*, 5>6 in *M. hieroglyphica*), the upper margin of the merus in Pe2 & 3 (produced to meet the propodus and concealing upper margin of carpus in *M. hieroglyphica*, not so in *M. kalaeloa*), and setation of the lower distal angle of Pe7 propodus (a serrate spine-like seta is present in *M. hieroglyphica*, but absent in *M. kalaeloa*).

Mesanthura kalaeloa most resembles *M. paucidens* Menzies & Glynn, 1968, described from the Caribbean, but lacks the diagnostic five transverse pigment rows on the pleon [although not all illustrations in the redescription by Müller (1991) show these rows]. Additionally, the pigment patches of *M. kalaeloa* are more distinctly outlined and densely filled than *M. paucidens*. Less clear is the significance of pigmentation on the uropods of *M. kalaeloa*, with distinct patches on the peduncle, endopod, and exopod. Menzies & Glynn (1968) mention only that the uropods are scarcely pigmented and show scattered chromatophores rather than distinct pigment patches on the endopod and exopod. Müller (1991) does not discuss pigmentation of the uropod, but shows inconsistent pigmentation on the peduncle and endopod, and no pigment on the exopod.

There are also morphological similarities to *M. paucidens*, especially the blunt distoventral angle of the carpus and shape of the palm of Pe1, and the shape of the carpus and serrate distoventral spine-like seta on the propodus of Pe2–6 in the redescription (Müller 1991). *Mesanthura kalaeloa* differs from *M. paucidens* in the more-strongly projecting rostrum and anterolateral angles of the head; the larger, subtriangular eyes; the subfalcate, rather than semicircular article 3 of the mandibular palp; lack of serration (Menzies & Glynn 1968) or scalation (Müller 1991) on the ventral margin of Pe7; a greater number of retinaculae on the peduncle and longer endopod, relative to exopod, of Pl1; a shorter, relative to width, uropodal endopod; and the two groups of six, rather than two pairs, of setae on the distal margin of the telson.

Mesanthura kalaeloa also resembles *M. miyakoensis* Nunomura, 1979, described from Japan, but can be distinguished by the pigment patch on pereonite 7; a relatively narrow band of evenly scattered pigment with well delimited concave anterior and convex posterior borders in *M. kalaeloa* rather than a well delimited hexagon circumscribing dark irregular markings in *M. miyakoensis*. Additionally, the pigment filling the patches on the

head, pereonites, and pleon is evenly scattered in *M. kalaeloa* rather than irregular markings in *M. miyakoensis*; and the uropodal exopod of *M. kalaeloa* features a distinct pigment patch whereas that of *M. miyakoensis* is unpigmented. Morphologically, *M. kalaeloa* differs from *M. miyakoensis* by having fewer articles in female A1; more articles in female A2; a rostrum equal to, rather than exceeding, the anterolateral projections of the head; larger, subtriangular eyes; a lack of processes on the lower margin of Pe1 dactylus; and the shorter merus on Pe3 and 7.

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