

## ***Hylaeus (Nesoprosopis) mamo* (Hymenoptera: Colletidae), a New Endemic Bee from Oahu, Hawaii**

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**Abstract.** *Hylaeus mamo* new species, a minute bee with extensive yellow markings, is the most recent in a series of Oahu endemic bees discovered in the past 15 years. In addition, the male of *Hylaeus makaha* Magnacca, 2011 is described.

**Key words:** Hawaii, bees, pollinator conservation, endangered species

### **Introduction**

The island of Oahu has been radically transformed compared to its pre-human state, particularly in the last 200 years. In spite of these changes, and a position as the population center of the Hawaiian Islands with many accessible trails that has made it the most intensively collected island, new species continue to be discovered there. Among the native *Hylaeus (Nesoprosopis)* bees, six Oahu endemic species have been described since 2003, compared to only one previously (Daly and Magnacca 2003, Magnacca 2011). The new species described below is the eighth Oahu endemic *Hylaeus*, and brings the total number of species in the Hawaiian radiation to 63. The male of another recently discovered species, *H. makaha* Magnacca 2011, is also described here for the first time.

Specimens are deposited at the Bernice Pauahi Bishop Museum (BPBM) and University of Hawaii Insect Museum (UHIM), Honolulu, as noted. DNA sequencing was performed at the Core Genetics Facility at the University of Hawaii at Hilo, and sequences for the COI gene have been deposited at the Barcode of Life Database ([www.boldsystems.org](http://www.boldsystems.org)) and GenBank, with accession numbers noted

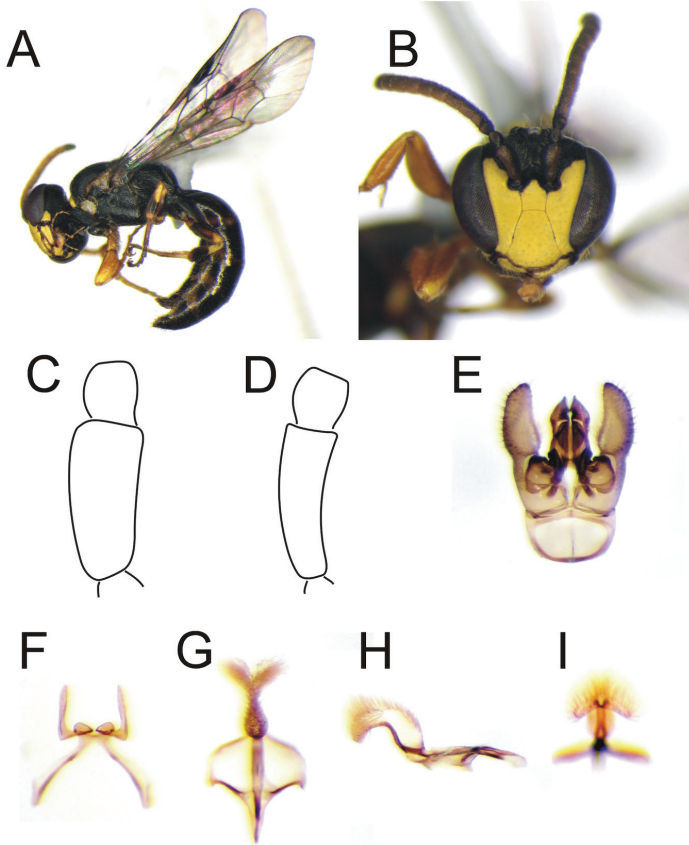
below. Description conventions follow Daly and Magnacca (2003). Setae length is expressed in units of hundredths of a millimeter (usually equivalent to eyepiece micrometer tic marks at 10× magnification on a dissecting microscope, but calibration with a stage micrometer is necessary for accuracy).

### **Species Descriptions**

*Hylaeus mamo* n. sp. (Fig. 1)

**Diagnosis.** This species is sympatric with *H. mana*, but the coloration is much more extensive. Due to the mark on the median plate, it would key to *H. kona* in Daly and Magnacca (2003). It is readily separated from those species and all others by the entirely yellow mandible, paracocular marks broad above the antennal sockets, orange front and middle legs, and yellow mark on the lower gena. Like *H. mana*, the antennal scape is also unusually narrow for a member of the *dumetorum* species group, and is more similar to that of the *difficilis* group. It does, however, possess a groove on the underside like the former.

**Description.** ♂. **Head.** Malar space very short, length about 0.2–0.3 times the diameter of the median ocellus. Upper paracocular area with crowded,



**Figure 1.** *Hylaues mamo*, holotype ♂. A) Lateral habitus. B) Head, frontal view. C) Left antennal scape, frontal view. D) Scape, lateral view. E) Genital capsule, ventral view. F) Seventh sternum, ventral view. G–I) Eighth sternum, ventral, lateral, and caudal views.

distinct pits, nearly touching, denser and distorted in the median frons; ground dull; a large dark patch between acme and median ocellus formed by dense punctation and dull sculpture, covered with pale, appressed hairs. Lower paraocular depression absent. Frontoclypeal sulcus nearly straight; supraclypeal area about as wide as long. Scape in frontal view hardly dilated, ratio about 0.5; lateral edge in frontal view nearly straight, slightly convex at certain angles; weakly arched in lateral view; underside of median edge with a shallow groove; with long, pale,

simple hair along median edge. Vertex hair 8–12, pale brown, weakly plumose.

**Mesosoma.** Scutum with shallow, indistinct pits 2–3 pit widths apart, ground minutely granular, dull; hair even, very short (3–4), mostly simple. Scutellum smoother, more lustrous. Mesepisternum with shallow, indistinct pits about 1–3 pit widths apart, ground weakly lustrous, with short, white, weakly plumose hair. Hypoepimeron shallowly punctate, weakly lustrous, slightly swollen. Metanotum dull. Basal area of propodeum with a few very short rugae at base, the remainder including the

brow smoothly coriaceous, lustrous; dorsal surface longer than scutellum.

**Metasoma.** Disk of T2 impunctate, smoothly coriaceous, lustrous, with fine, pale, prostrate hairs spaced more than a hair length apart. Apical area of tergites translucent, appearing brown. Hair of T7 dark brown, medium to long, erect.

**Terminalia.** Lateral process of S7 enlarged and rounded apically, length greater than width of hemisternite; hemisternite L-shaped. Median process of S8 swollen at base, moderately dilated and arched, apex with moderately long and broad tips. Apices of gonoforceps exceeding penis valves, inwardly pointed.

**Color.** Labrum and mandible entirely yellow; lower portion of gena yellow. Face entirely yellow below the antennae; paraocular marks extended broadly above antennal sockets, tapering only near the upper edge. Pronotum with an interrupted transverse stripe on collar and marks on lobes and tegulae; median plate yellow. Front legs entirely orange except the dark brown coxa; mid and hind femora brown, streaked with orange, yellow apically; mid and hind tibiae yellow on basal third and narrow apical ring, orange-brown medially; mid and hind tarsi brown except hind basitarsus yellow. Wings slightly smoky. ♀. Unknown.

**Holotype.** Oahu: ♂ (BPBM 17646), Tripler Ridge, 460 m, 21.3813°N 157.8481°W, resting on *Scaevola gaudichaudiana*, 20.i.2013, K. Magnacca, GenBank accession no. KF583515.

**Etymology.** From the Hawaiian *mamo*, referring to the extensive bright yellow coloration which is evocative of the now-extinct mamo bird. It is a noun in apposition.

**Discussion.** This species is remarkably similar to the sympatric *H. mana* in overall size and in the shape of the antennal scape, but the coloration and genitalia are strikingly different. Neither morphology

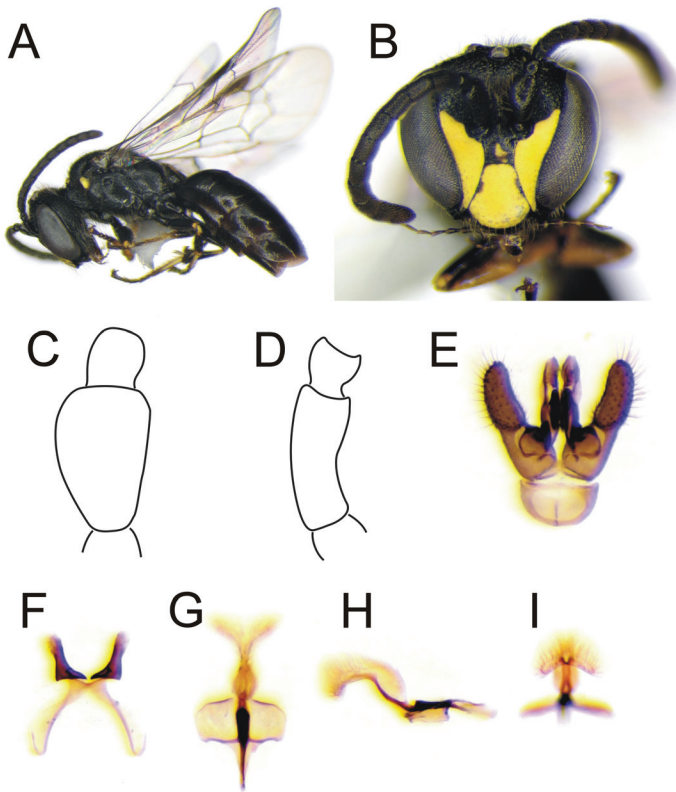
nor COI sequence data indicate a clear sister taxon for *H. mamo*.

*Hylaeus makaha* Magnacca, 2011 (Fig. 2)

**Diagnosis.** Keys to *H. kona* in Daly & Magnacca (2003) based on the yellow median plate and shape of the antennal scape, but is distinguished from that species by the short setae of the scutum and vertex, less extensive yellow markings, shape of S7, and narrow malar space. On Oahu the only similar species are *H. mana* and *H. mamo*; the former has the median plate unmarked and very different genitalia, while the latter has much more extensive yellow marks on the head. The males and females are highly dimorphic; males lack the striking orange-red metasoma of the female. For full description of the female, see Magnacca (2011).

**Description.** ♂. **Head.** Malar space very short, length about 0.2–0.3 times the diameter of the median ocellus. Upper paraocular area with shallow pits up to 1 pit width apart near eye; frons medially with smaller, more distinct, contiguous pits and a small patch of pale hair at the middle; large, lustrous impunctate areas above the antennal sockets. Lower paraocular depression absent. Frontoclypeal sulcus nearly straight; supraclypeal area wider than long, W/L ratio 1.2–1.4. Scape in frontal view moderately dilated, width more than half length, ratio about 0.7–0.8; lateral edge in frontal view nearly straight, median edge convex, reaching maximum width just past middle and narrowing slightly at apex; weakly to moderately arched in lateral view with maximum arch near middle of scape; underside of median edge with a deep, relatively large pore; with long, yellowish white, mostly simple hair along the median edge. Vertex hair 8–12, golden brown, weakly plumose.

**Mesosoma.** Scutum with shallow, indistinct pits 1–2 pit widths apart, ground somewhat dull; hair moderately short (6-



**Figure 2.** *Hylaesus makaha*, ♂. A) Lateral habitus. B) Head, frontal view. C) Left antennal scape, frontal view. D) Scape, lateral view. E) Genital capsule, ventral view. F) Seventh sternum, ventral view. G–I) Eighth sternum, ventral, lateral, and caudal views.

10), yellowish white to pale brown, simple. Scutellum dull. Mesepisternum with indistinct pits, about 1 pit width apart, and long, yellowish white, plumose hair; ground minutely coriaceous, slightly lustrous. Hypoepimeron weakly punctate, slightly swollen. Metanotum dull. Basal area of propodeum, including brow, smoothly coriaceous and lustrous, sometimes with a few short rugae at base.

**Metasoma.** Disk of T2 impunctate, smoothly coriaceous and lustrous; pale, fine, appressed hairs spaced about one hair length apart. T7 hair medium to long, dark brown, erect.

**Terminalia.** Lateral process of S7 en-

larged and rounded apically, length greater than width of hemisternite; hemisternite L-shaped. Median process of S8 swollen at base, moderately dilated and arched, apex bifurcate with moderately long, narrow, rounded tips. Apices of gonoforceps slightly shorter than penis valves.

**Color.** Labrum and mandible dark brown to black. Head and mesosoma black; metasoma dark brown. Face with one large mark extended at sides to above antennal sockets: clypeus entirely yellow or lateral margins very narrowly black; paraocular area yellow to above antennal socket in narrowed vitta; supraclypeal area usually with an irregular yellow

mark, sometimes entirely black. Pronotum with marks on lobes and interrupted transverse collar stripe; median plate at base of wing yellow. Legs dark brown except: fore tibia mostly yellow, black posteriorly; mid and hind tibiae with basal yellow marks extending about 1/4 their length, mid tibia also with a narrow apical yellow mark; all femora with apex narrowly yellow; all basitarsi usually yellow, terminal tarsal segments becoming brownish toward apex. Wings hyaline.

**Specimens examined.** Oahu: 2♂, Waianae-Kaala Trail, 750 m, 21.5014°N 158.1566°W, at *Euphorbia multiformis*, 26.vii.2012, K. Magnacca, BPBM. 1♂ 1♀, same data, UHIM. GenBank accession no. KF583514.

**Discussion.** This species has now been recorded from two more locations but still appears to be restricted to the Kaala massif, and in association with *Euphorbia* (= *Chamaesyce*) spp.

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