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A New Species of *Pseudambasia* (Crustacea: Amphipoda: Lysianassidae) from Hawai'i, with a Key to Species in the Genus[1]

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Abstract. *Pseudambasia kalaupapa*, **n. sp.** from Moloka'i and O'ahu is described and illustrated and marks the first record of the genus from Hawaiian waters. A key to species of *Pseudambasia* is presented.

Introduction

Barnard (1971) noted that lysianassids have been inadequately collected in Hawai'i and predicted more than the one known benthic, shallow-water species, *Arugella ewa* (Barnard, 1970), should occur in the area. Here we describe a new lysianassid species from the marine intertidal zone of Kalaupapa Peninsula, Moloka'i found in a rubble wash gathered to establish a natural history collection of invertebrates for Kalaupapa National Historic Park. The species was subsequently identified from material collected by suction sampling at 13 m on the forereef of Kāne'ohe Bay, O'ahu. The species keys to *Parambasia* in Barnard & Karaman (1991). However, because the type material was lost, and no new material has been reported, Lowry & Stoddart (1995) consider *Parambasia* a dubious genus. All but the type species, *Parambasia forbesi* Walker & Scott, 1903, are now placed in *Pseudambasia*. This is the first record of *Pseudambasia* from Hawaiian waters.

Materials and Methods

Specimens examined derive from material in the Bishop Museum collected by S. Godwin, H. Bolick, and M. Carnivale for research funded by the National Park Service and by K. Longenecker for doctoral research. The holotype and paratypes are deposited in the Bishop Museum. Morphological terminology follows Barnard & Karaman (1991).

Systematics

Pseudambasia kalaupapa Longenecker & Bolick, **n. sp.**
(Figs. 1–3)

Diagnosis. No constriction on the inner ramus of uropod 2.

Description. *Color:* shiny white with strong black pigment (that does not fade in alcohol) on head, pereon 1, coxa 1, pereon 4–6, and coxa 5; pigment may be present on antenna 1 article 1, pereons 2–3, and pleon 2; a spot is common in the center of coxa 7.

1. Contribution No. 2007-010 to the Hawaii Biological Survey

Head: normal gammaridean; subequal to first 2 pereonites; rostrum absent; lateral lobe broadly rounded, extending 1/2 length of antenna 1 article 1; eyes large, ovoid, dark brown. *Antenna 1:* geniculate; subequal to antenna 2; 0.18 x body length; peduncular article 1 barrel-shaped; peduncular article 2 short, 0.5 x article 1; peduncular article 3 short, 0.3 x article 1; flagellum 7-articulate, 0.8 x peduncular length, densely setose ventrally in males; accessory flagellum 3-articulate. *Antenna 2:* strongly geniculate between peduncular articles 3 and 4; subequal to antenna 1; flagellum 4-articulate.

Mouthpart bundle: subquadrate; epistome and upper lip fused, straight. *Mandible:* incisors symmetrical, with convex margins; 3 accessory spines present; molar absent, represented by a single seta on left appendage; palp falcate, attached proximally, 3-articulate; article 2 longest, with a distal seta; article 3 with about 18 strong setae medially and 2 much more stout setae anteromedially. *Maxilla 1:* inner plate with a single apical seta; outer plate with 11 bifurcate spine-teeth in a 6/5 arrangement; palp 2-articulate, pointed apically, with setae along distal and lateral margin. *Maxilla 2:* inner plate with 7 terminal spines, 0.8 x outer plate; outer plate with 5 terminal spines. *Maxilliped:* inner plate large, subrectangular, minutely serrate terminally, with an apicolateral spine; outer plate medium-sized, subovate, medial margin crenulate distally and straight with 2 spines proximally; palp 4-articulate; article 2 with 9 medially directed, serrate spines; article 3 with 4 medially directed, serrate spines.

Gnathopod 1: subchelate; coxa large, anterior margin slightly concave, anteroventral margin rounded, posterior margin straight; basis long, slender, length 3 x breadth; ischium, merus and carpus subequal; carpus subtriangular, short, length 1.6 x breadth; female propodus large, subtriangular, length 2.3 x breadth, anterior margin straight, palm defined by a stout spine, extremely acute, slightly concave, posterior margin slightly convex, giving the entire margin a sinuous shape, margin of palm slightly crenulate with 3 stout spines slightly medially and equidistant along margin, 2 stout setae on medial face, a stout seta on posterior margin; male propodus slightly more elongate (length 2.7 x breadth) with a more sinuous shape: anterior margin slightly concave, palm more acute, nearly parallel with anterior margin distally, posterior margin more convex; female and male dactyl with subterminal spine. *Gnathopod 2:* subchelate; subequal in size to coxa 3; ischium long, length 3.9 x breadth; carpus long, length 3.4 x breadth, posterior margin convex; propodus subquadrate, short, length 1.4 x breadth, palm transverse, about 10 long, strongly recurved, posteriorly serrate spines guard articulation with finger; dactyl short, reaching corner of palm, concave posterior margin fits convexity of palm.

Pereopod 3: coxa large; propodus with 2 distal locking setae; dactyl, long, slender, 0.6 x length of propodus. *Pereopod 4:* coxa large, with large truncate posterior lobe, anterior margin convex, posterior margin concave, ventral margin straight; propodus with 2 distal locking setae; dactyl long, slender, 0.5 x length of propodus. *Pereopod 5:* coxa convex anteriorly, straight posteriorly; basis grossly expanded, 5 stout setae interspersed among closely spaced fine setae along anterodistal margin, posterior margin crenate; merus expanded with fine setae along anterior margin, convex posterior margin, posterodistal projection extending halfway along carpus; carpus with sharp posterodistal angle; propodus with a distal locking seta; dactyl long, 0.5 x length of propodus. *Pereopod 6:* coxa subquadrate; basis expanded with crenate posterior margin; merus expanded, posterior margin convex, posterodistal projection extending halfway along carpus; propodus with a distal locking seta, dactyl long, 0.5 x length of propodus. *Pereopod 7:* articles 5–7 missing from all specimens; coxa subtriangular; basis with large, rounded, crenate, posterodistal lobe.

Pleonites: dorsally smooth. *Epimera:* posteroventral corner rounded. *Urosomites:* dorsally smooth, 2 and 3 fused. *Uropod 1:* peduncle slightly longer than outer ramus, with 1 dorsal, 1 apicolateral and 1 apicomedial robust seta; outer ramus slightly longer than inner, each with one dorsal robust seta. *Uropod 2:* peduncle length equal to outer ramus; outer ramus slightly longer than inner, ornamentation as for uropod 1, inner ramus without constriction. *Uropod 3:* without ornamentation; peduncle short, length 0.9 x outer ramus; outer ramus 1-articulate; inner ramus reduced, length 0.75 x outer ramus. *Telson:* entire; length 1.1 x breadth; distal margin rounded, with 2 robust setae.

Type material. Holotype, male, 2.5 mm, (BPBM-S12815); Paratypes, (described) 2

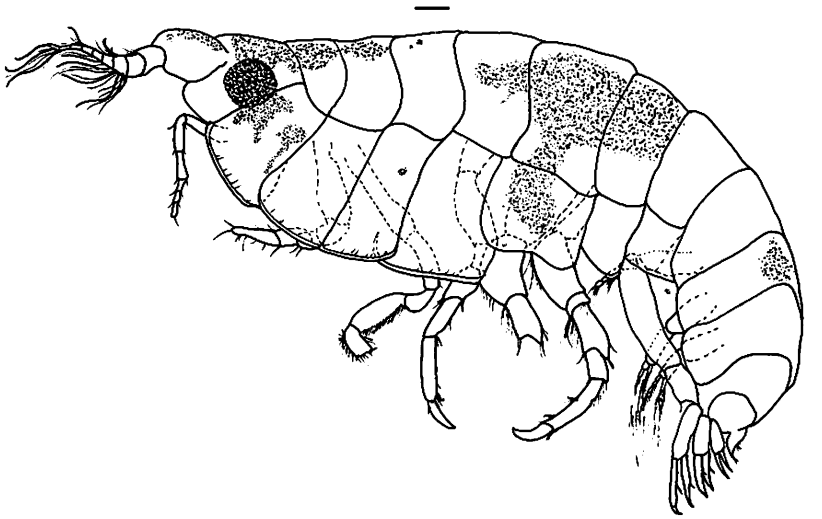

Figure 1. *Pseudambasia kalaupapa* Longenecker & Bolick n.sp., holotype male, 2.5 mm, BPBM-S12815, Kalaemilo Point, Kalaupapa NHP, Moloka'i. Bar = 0.1 mm.

females, each 2.6 mm (BPBM-S12814, BPBM-S12817); 2 males, 2.0 and 2.5 mm (BPBM-S12818, BPBM-S12816); (examined) 12 specimens (BPBM-S12819): **MOLOKA'I**: Kalaemilo Point, an embayment on the west coast of Kalaupapa Peninsula (UTM coordinates: 4N 0709347.21N, 2345785.62E), 11 Oct 2004, from intertidal rubble on a basaltic shoreline, S. Godwin, H. Bolick, M. Carnivale. Paratypes (examined) 2 specimens (BPBM-S13228): **O'AHU**: Kāne'ohe Bay (4N 0626569N 2375059E), 22 Feb 2001, 13 m on carbonate reef bench in spur and groove habitat of forereef, K. Longenecker.

Etymology. The name maintains the tradition, established by J.L. Barnard, of assigning names derived from the Hawaiian language to species discovered in Hawai'i. It is intended to honor the residents, past and present, of Kalaupapa Peninsula.

Distribution. Known only from the intertidal zone of Kalaemilo Point, Kalaupapa Peninsula, Moloka'i and from 13 m on the forereef of Kāne'ohe Bay, O'ahu.

Remarks. *Pseudambasia* contains four other species: *P. acuticauda* (Ledoyer, 1984), *P. indentata* (Ledoyer, 1986), *P. nui* (Myers, 1985), and *P. rossi* (Stephensen, 1927) all of which feature a constriction of the inner ramus of uropod 2 not found on *P. kalaupapa*.

The pigment pattern of *P. kalaupapa* superficially resembles *P. nui*. The strong pigmentation on coxa 5 and, frequently, pleon 2 of the former is not seen in the latter; only diffuse gray pigment is seen on coxa 5 (as well as coxae 1–4 and 6), and no pigment is reported from pleon 2 of *P. nui*. The inner plate of the maxilliped is subrectangular in *P. kalaupapa* but subtriangular in *P. nui*. *Pseudambasia kalaupapa* also lacks the central rounded lobe on the apex of telson of *P. nui*.

Pseudambasia rossi is also darkly pigmented, but the pattern differs markedly from *P. kalaupapa* in covering most of the body except for coxa 4 and the urosome.

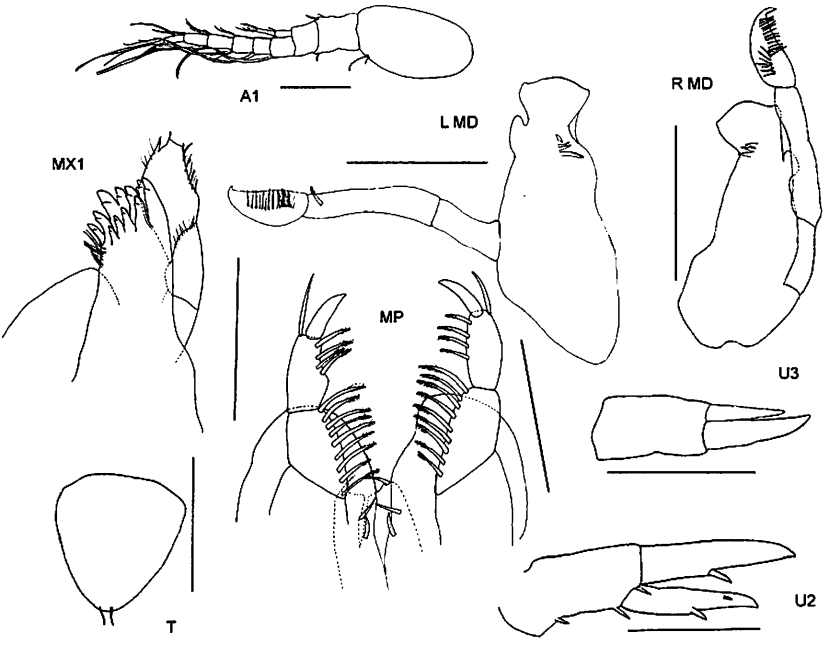

Figure 2. *Pseudambasia kalaupapa* Longenecker & Bolick n.sp., holotype male, 2.5 mm, BPBM-S12815, Kalaemilo Point, Kalaupapa NHP, Moloka'i. Bars = 0.1 mm.

Pseudambasia kalaupapa has fewer articles in the flagellum of antenna 1, an accessory flagellum with 2 rather than 3 articles, a different spination pattern on the mandibular palp, and lacks the strong wrinkle in mandibular palp article 3.

The setation pattern on the mandibular palp, the pattern and appearance of setal-teeth on the inner plate of maxilla 1, and the nearly simple and only slightly sexually dimorphic gnathopod 1 are similar to *P. acuticauda*. The pointed distal article of the maxilla 1 palp in *P. kalaupapa* differs from the terminally serrate one of *P. acuticauda*. *Pseudambasia kalaupapa* also lacks the toothed epimeron 3 of *P. acuticauda*.

Pseudambasia kalaupapa has a 3-articulate accessory flagellum rather than the 2 long articles found in that of *P. indentata*. *Pseudambasia kalaupapa* also lacks the tooth found on epimeron 3 of *P. indentata*.

The text and figures describing *Parambasia forbesi* Walker & Scott, 1903; the sole member of a dubious genus that once included all *Pseudambasia* species (Lowry & Stoddart, 1995); are remarkably similar to *Pseudambasia kalaupapa*. They differ in the 2 distal locking setae on the propodus of pereopods 1 and 2 of *Pseudambasia kalaupapa*; only 1 spine is found on the carpus (none on the propodus) of *Parambasia forbesi*.

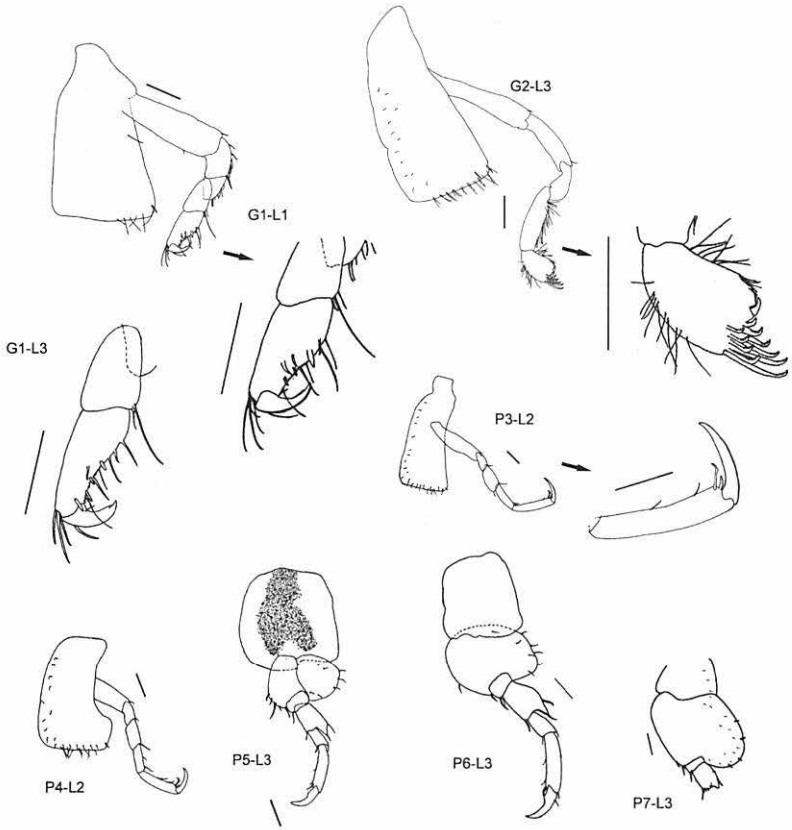

Figure 3. *Pseudambasia kalaupapa* Longenecker & Bolick n.sp., holotype male, 2.5 mm, BPBM-S12815 (L3), paratype female, 2.6 mm, BPBM-S12814 (L1), paratype male, 2.55 mm, BPBM-S12816 (L2), Kalaemilo Point, Kalaupapa NHP, Moloka'i. Bars = 0.1 mm.

KEY TO SPECIES IN THE GENUS *PSEUDAMBASIA*

1. No strong black pigment retained in alcohol (brown mottling may be present); epimeron 3 with a small posteroventral notch 2
–. Strong black pigment, retained in alcohol, on head and body; epimeron 3 rounded or serrate, not with a single posteroventral notch 3
2. Propodus of pereiopods 3 and 4 with a single, small, distal locking spine; telson entire ..... **acuticauda** (Ledoyer)
–. Propodus of pereiopods 3 and 4 with 2 long spines distally; telson cleft .... **indentata** (Ledoyer)

3. Pigment covering most of head and body, coxa 4 and urosome conspicuously unpigmented; epimeron 3 serrate posteroventrally; accessory flagellum 2-articulate ..... **rossi** (Stephenson)
–. Pigment concentrated in region of head and pereon 5; epimeron 3 rounded posteroventrally; accessory flagellum 3-articulate 4

4. Strong black pigment on coxa 5 (and frequently pleon 2); no constriction on inner ramus of uropod 2; inner plate of maxilliped subrectangular; no central rounded lobe on apex of telson ..... **kalaupapa, n. sp.**
–. No strong pigmentation on coxa 5 (but diffuse grey is found on coxae 1–6); a constriction on inner ramus of uropod 2; inner plate of maxilliped subtriangular; a central rounded lobe present on apex of telson ..... **nui** (Myers)

Acknowledgements

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