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Running head: WICKSTEN & BINGO*: PLATYMAIA* SWIMS

Platymaia Miers, 1885 (Decapoda: Brachyura: Inachidae) can swim

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ABSTRACT

Two small spider crabs belonging to a species of *Platymaia* Miers, 1885 (Inachidae) were photographed by video feed from the Nautilus Exploration Program vessel *Nautilus* at 706 m off American Samoa, Pacific Ocean. Individuals swam by extending and contracting their very long, slender legs, rising above the sea floor by an estimated 2 m. These crabs do not have paddles on the fifth pereiopods, but they have setose legs. This is the first report of swimming in the wild for a crab of this genus.

Key Words: American Samoa, Pacific Ocean, spider crabs, swimming behavior

Spider crabs (superfamily Majoidea) constitute a diverse group containing species varying in size from the gigantic *Macrocheira kaemperfi* De Haan, 1839 with a legspan of 3.7 m, to species with adult individuals as small as *Teleophrys pococki* Rathbun, 1924, with a legspan of 18 mm (including the carapace). Species of *Achaeus* Leach, 1817, *Inachu*s Weber, 1795, *Stenorhynchus* Lamarck, 1818, and other members of Inachidae MacLeay, 1838 are particularly spider-like, with leg lengths exceeding the width of the carapace by as much as nine times. *Stenorhynchus seticornis* (Herbst, 1788) can "parachute" downwards by spreading the legs and slowing its descent (MKW, unpublished data). If disturbed, *Metoporhaphis calcarata* (Say, 1818), another member of Inachidae, can swim by using its setose legs in a fashion like a "dog paddle" (Wicksten, 2011). Herein we report on swimming by two individuals of a species of *Platymaia* Miers, 1885.

We obtained video and video stills from the E/V *Nautilus* at 14.246 N, –169.537 W, 706.3 m depth; and 14.246 N, –169.532 W, 706.4 m depth, Pacific Ocean, American Samoa Exclusive Economic Zone. The images were taken by the remotely operated vehicle (ROV) *Hercules* on an Insite Pacific high-definition video channel on fiber-optic cable using a Zeus Plus camera with an Ikegami HDL-45A 10× zoom lens (https://nautiluslive.org/tech/rov-hercules) on July 26, 2019. The photos have a resolution of 1,080 dpi and there taken at a distance of l m or less. The original photographs and video are available on request through the Ocean Exploration Trust (https://nautiluslive.org/science/data-management).

The resolution and angle of the photographs are not sufficient to see the characteristic carapace tubercles or other features used to distinguish between the eight species of *Platymaia*. No specimens were collected. Species of *Platymaia* range from Madagascar to Japan, the

Philippines, and Australia (Guinot & Richer de Forges, 1986) but we could not find any records of any species of *Platymaia* from our study site.

In the photos, one of the *Platymaia* individuals lifts off vertically ("head down") from the silty sea floor. It swims by strokes of one or two legs at a time with the other legs hanging more or less vertically (Fig. 1A–C). The crab may have been disturbed by the near proximity of the ROV. The videos do not show the crab being swept upward by the thrusters of the ROV, but instead it seemed to have initiated swimming on its own. The crab rose to a distance of approximately 2 m from the sea floor. The video lasted 36 seconds and did not capture an image of the crab sinking back to the bottom. The second individual (Fig. 1 D) remained motionless on the sea floor while it was photographed.

Platymaia does not have swimming paddles like those found in crabs of the family Portunidae. *Metoporhaphis calcarata* swims "head up" and the legs move up and down more or less horizontally (Wicksten, 2011). Guinot & Richer de Forges (1986) illustrated *Platymaia remifera* Rathbun, 1916 showing fringes of setae on the third to fifth pereiopods, and suggested that species of *Platymaia* could swim. They nevertheless did not observe this behavior in a live crab. An unidentified species of *Platymaia* was observed as it "shuffled" along the sediment in Indonesia (P. Ng, unpublished data). It would not be surprising if other species of *Platymaia* and probably other long-legged majoid crabs, can swim.

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Figure captions

Figure 1. *Platymaia* swimming (video stills). Sequence of swimming showing movement of pereopods (**A**–**C**); crab at rest on the sea floor (**D**).