

A new record of *Pinnotheres bidentatus* Sakai, 1939 (Decapoda: Brachyura: Pinnotheridae), from Taiwan

Pan-Wen Hsueh and Jung-Fu Huang

Abstract. — The pea crab *Pinnotheres bidentatus* Sakai, 1939, previously known only from the type locality of Wakayama, Japan, is recorded for the first time from a coastal area in west central Taiwan. Its swimming ability and color patterns on the dorsal carapace are also noted.

Introduction

Pinnotheres bidentatus was first described by Sakai (1939) on the basis of one male and three females. These specimens were collected from the coast of Wakayama, Japan. No other data was provided by Sakai (1976) and the biology and ecology of this species is virtually unknown.

In early 1993, three specimens of an unidentified pea crab were collected from a sandy mud habitat on the coastal wetlands of Kaomei, Taichung County, Taiwan (24°39'N, 120°35'E). In the fall of 1994, numerous individuals (n=2254, size ranged 1–4 mm carapace width) of the same species were collected from water columns at the same area during flooding tides in a survey of brachyuran megalopae. The identity of this pea crab was eventually determined as *Pinnotheres bidentatus*. In this study, we report a new record for this species with some notes on its biology. Four representative specimens collected in fall of 1994 are used for the redescription, and they are deposited at National Museum of Natural Science, Republic of China (NMNS Cat. # 2129–154 to 157). The other specimens are kept by the first author for further analysis on the population dynamics of

this crab species.

***Pinnotheres bidentatus* Sakai, 1939**
(Figs. 1 A–J, 2A, B)

Pinnotheres bidentatus Sakai, 1939: 591, fig. 78a–c (Wakayama, Japan); 1976: 572, fig. 311a–c (no new locality); Silas and Alagarwami, 1967 (catalogued); Serène, R., 1968 (catalogued); Schmitt *et al.*, 1973 (catalogued); Miyake, S., 1982 (catalogued).

Material. — 1 male, NMNS 2129–157, carapace length (cl.) 3.2 mm, carapace width (cw.) 3.8 mm; 2 adult females, NMNS 2129–154, cl. 3.5 mm, cw. 4.1 mm and NMNS 2129–156, cl. 3.2 mm, cw. 3.8 mm; 1 subadult female, NMNS 2129–155, cl. 3.6 mm, cw. 4.3 mm, in tidal waters over Kaomei tidal flats, Taichung County, west central Taiwan, coll. P.-W. Hsueh, November–December 1994.

Description. — Carapace subcircular, upper surface convex and smooth, anterolateral and postero-lateral margins rounded. Small hallows present at frontal and brachial regions of dorsal carapace and anterior thoracic sternum. Front markedly depressed, its margin with a central tooth from anterior view. Orbits small, subcircular. Eyestalks short and thick, its diameter as broad as eyes. Antennule obliquely transverse; antenna small, protruded from inner orbits. Buccal frame crescentic, convergent at anterior part; cavity completely closed by external maxillipeds. Ischium and merus of external maxillipeds fused, only with indistinguishable groove, to form a single piece. Palp of external maxillipeds three jointed,

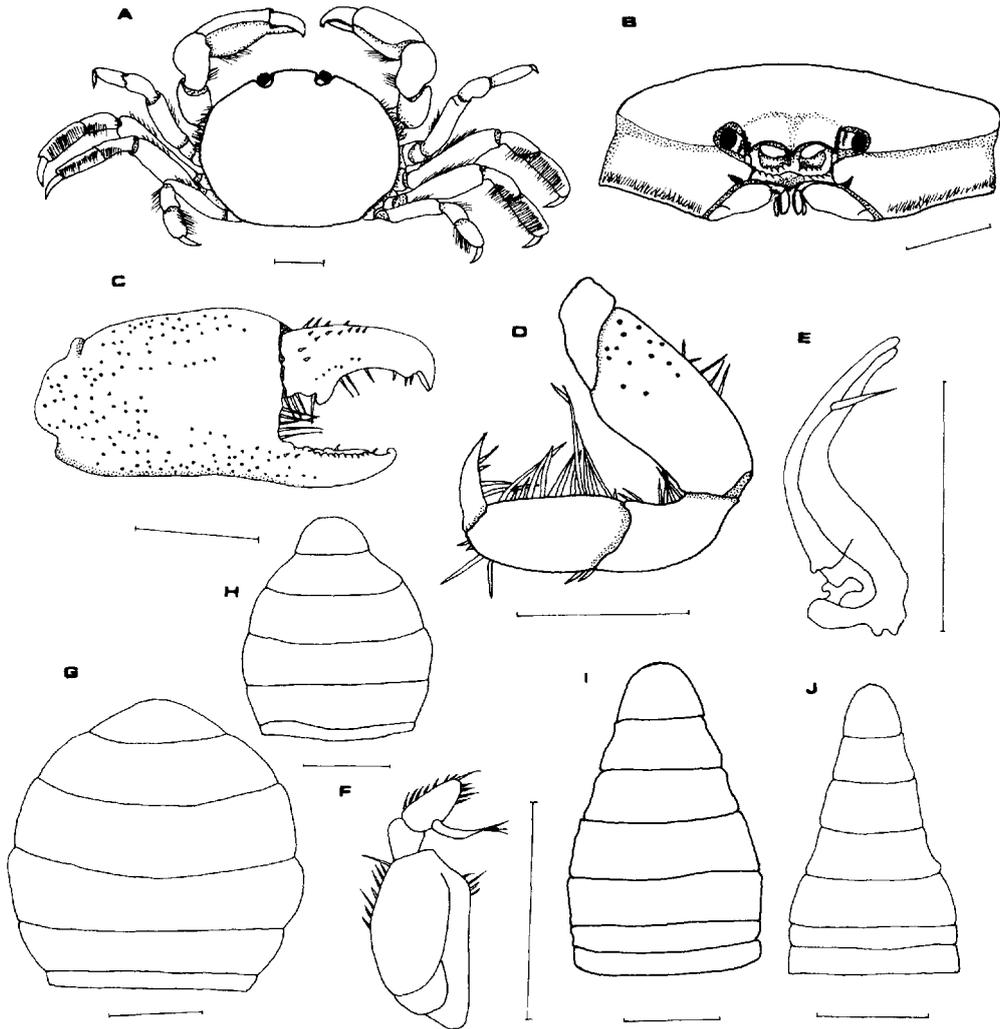


Fig. 1. *Pinnotheres bidentatus* Sakai, 1939; A, dorsal view; B, anterior view; C, right chela; D, 4th ambulatory leg; E, 1st pleopod of male; F, external maxilliped; G, H, I, abdomen of female; J, abdomen of male. (A, H, female, cl. 3.2 mm, cw. 3.8 mm, NMNS 2129-156; B, C, D, F, I, female, cl. 3.6 mm, cw. 4.3 mm, NMNS 2129-155; E, J, male, cl. 3.2 mm, cw. 3.8 mm, NMNS 2129-157; G, female, cl. 3.5 mm, cw. 3.8 mm, NMNS 2129-157; Scale line = 1 mm)

inserted at inner side of propodus. Chelipeds symmetrical and stout in both sexes; dorsal and outer surface of carpus and manus with a large number of small and rounded hollows; inner margin of moveable finger with two teeth, one basal and the other subdistal, and also with setae. The 4th ambulatory leg shortest in

length; merus of 2nd and 3rd ambulatory legs with short hair along its anterior margin, carpus and propodus with a row of setae on the dorsal surface. Outer surface of ambulatory legs with small hollows. Abdomen of female oval shape, with the 4th segment widest in length; the 7th segment varied from triangular to semi-



Fig. 2. *Pinnotheres bidentatus* Sakai, 1939: A. dorsal view of male, cl. 3.1 mm, cw. 3.8 mm; B. closed-up view of the same specimen.

circular shape. First male pleopod curved outward at the middle part, with a long setae at subdistal surface, and tapering at distal end.

Color. — Eyes reddish; carapace greenish with yellow spots scattered on the entire dorsal area; a strip of dark pigment extended from front toward back margins of the carapace and become a large elliptic spot at the heart area (Fig. 2); ventral view whitish.

Remarks. — Numerous individuals of *Pinnotheres bidentatus* with various sizes (1 to 4 mm in carapace width) and both sexes were collected at the coastal habitats of mid-western Taiwan, indicating (1) the presence of *P. bidentatus* population at these areas although there are only 4 specimens known to the world previously, (2) female crabs of this species may not necessary behaving as its congeners — commensal in bivalves, (3) they may emerge into water columns during flooding tides and, presumably, buried to substrata during ebb tides, since the watermargin retreats up to 3 km from the shoreline at this time.

Swimming ability of *P. bidentatus* appears to be good in both sexes. Individuals are often seen swimming voluntarily for several minutes in container in the laboratory. When swimming, they bend their chelae slightly inward and hold the first and fourth walking legs stationary in an inverted V-shaped, and fast stroking both side of the second and third walking legs back and forth sequentially. This swimming behavior of pea crab is also reported in several species in Pinnotherinae (Stauber, 1945; Christensen and McDermott, 1958; Pearce, J. B. 1966; Hartnoll, R. G. 1972.). The swimming mechanisms of *P. bidentatus* is similar to its congeners, *P. pisum*, described by Hartnoll (1972). Apparently, *P. bidentatus* is too small to break the water's surface tension and re-submerged itself when it is brought to the water sur-

face intentionally in the laboratory. Crab sinks into water when the water's surface tension is interrupted.

Acknowledgments

Comments and references provided by Drs. Peter K. L. Ng, Austin B. Williams and an anonymous reviewer greatly improves the quality of this manuscript. The Natural Museum of Natural Science is appreciated for providing logistic support. This study is also partial funded by grants of the National Science Council, Republic of China (grant # NSC84-2311-B-178-004 to PWH and grant # NSC85-2321-B-022-002 A16 to JFH).

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Addresses: (PWH) Department of Zoology, National Chung Hsing University, 250 Kuo Kuang Rd., Taichung, Taiwan ROC; (JFH) Department of Aquaculture, National Kaohsiung Institute of Marine Technology, Kaohsiung, Taiwan ROC.

E-mail: (PWH) pwhsueh@dragon.nchu.edu.tw

