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NOTES ON PARAPINNIXA AFFINIS HOLMES
AND ITS ALLIES

BY

STEVE A. GLASSELL

Research Associate in Crustacea, San Diego Society of Natural History

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The rare Pinnotherid crab, *Parapinnixa affinis* Holmes,¹ was described over thirty years ago from a single female specimen obtained by Mr. F. W. Bancroft in July, 1895, on Deadman Island, San Pedro Bay, California. The only authentic subsequent report of the occurrence of this elusive species, so far as I am aware, is that of Mr. G. E. MacGinitie, of the California Institute of Technology, who found both the male and female in a single worm tube at Newport Bay, Orange County, California, in January, 1930. This record has not yet been published. The failure of collectors to obtain and report this species during the thirty years following the discovery of the unique type specimen testifies as to its rarity, although its peculiar habitat suggests that possibly it may be more obscure than rare. During recent intensive collecting along the Southern California coast I was fortunate in securing a series of both males and females at Anaheim Landing, Newport Bay, and San Diego. This has enabled me to describe and figure the heretofore wholly unknown male and supply the much needed figures of the described but unfigured female.

"*Parapinnixa affinis*" was recently reported by Yokoya from Mitsu Bay, Japan, but, as explained below, his report is based upon a misidentification of a distinct and unnamed oriental species which I here rename *Parapinnixa yokoyai* in honor of Mr. Yokoya who labored under the disadvantage of having no figures or authentic specimens of Holmes' species for comparison.

Parapinnixa affinis Holmes

Female Holotype.—As S. J. Holmes' original description of the unique female type of *Parapinnixa affinis* is in a volume not readily accessible to some carcinologists I reproduce below the original description and notes, verbatim, as given by Dr. Holmes:

"*Parapinnixa affinis*, sp. nov."

"Closely allied to *P. nitida*, but the carapace is less than twice as wide as long, while in that species the width of the carapace is over twice its length; the

¹ Calif. Acad. Sci., Occas. Papers, Vol. 7, p. 95, 1900.

surface of the carapace is smooth and shining and the anterior margin straight. Front triangular, depressed, having a short median groove. Antennules oblique. Buccal area small, triangular, rounded in front, the posterior portion partly covered by a projection of the sternum. Chelipeds stout, smooth; hand thickened, smooth, rounded above and below; dactyl hooked at the tip and armed with a small tooth near the middle of the inner margin, the upper side smooth; pollex with two teeth at the tip. First pair of ambulatory legs larger than the others; dactyls short and stout. Next two pairs comparatively slender, having longer dactyls; last pair small, reaching about to the tip of the merus of the preceding pair; dactyls short and stout. Abdomen of the female widest at the third segment, behind which its shape is triangular, the tip broadly rounded."

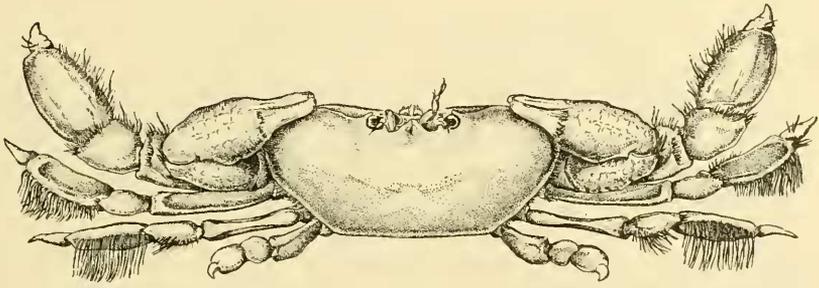
(NOTE) "Described from a single female specimen collected at Dead Man's Island, San Pedro, Calif., by Mr. F. W. Bancroft, July, 1895. Collection of the University of California."

(NOTE) "The maxillipeds in this species are similar to those of *nitida*. They were accidentally lost after I had removed them from the specimen; the palp appeared to have but two joints, but the examination was not made with sufficient care to make me feel sure of this point."

Male Allotype (Pl. 20, figs. 1 and 3; Pl. 21, figs. 1 and 6).—No. 346, collection of the San Diego Society of Natural History; Newport Bay, California; November 11, 1932; collected by Steve A. Glassell.

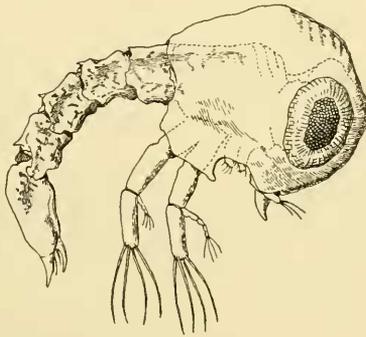
Description.—The carapace smooth and shining, transversely ovate and its antero-lateral corner dilated so as to make a straight line at the anterior margin. The front is broad, triangular in shape, depressed, having a short median groove and extending slightly in a dorsal aspect. The orbit is oval in shape; the inner hiatus is wide and partly filled by the basal segment of the antenna, which is very small and short. Antennule oblique. Buccal area small, broadly triangular, anterior concave, rounded in front, the posterior portion partly covered by a projection of the sternum. In the outer maxilliped, the ischium is rudimentary, while the merus is of large size and triangular in shape; at its antero-upper end a three segmented palp is articulated. Chelipeds stout, smooth; hand thickened, smooth, rounded above and below; dactyl hooked at the tip and armed with a small tooth near middle of the inner margin at basal end, upper side smooth; pollex with two teeth at the tip and a large triangular tooth extending from the tip to proximal side of center. A single row of bristles extends longitudinally from the margin of the carpus on to the pollex, while the gap of the dactyl is covered by a fringe of short bristles. First pair of ambulatory legs larger than the others; dactyls short and stout, next two pairs comparatively slender, having slightly longer dactyls; last pair small, reaching about to the tip of the merus of the preceding pair; dactyls short and stout. In the posterior three ambulatory legs the merus is compressed and broad. Abdomen with seven segments, widest at third segment, behind which its shape is triangular, with concave sides, the tip rounded; the seventh segment nearly twice as long as broad.

Color.—General appearance of carapace, light amber mottled with dark ochre. Protogastric and cardiac regions, light orange. Antero- and postero-lateral



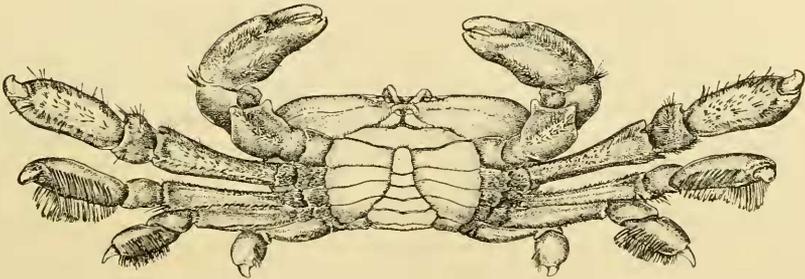
1

2 mm.



2

1/2 mm.



3

2 mm.

- Fig. 1. *Parapinnixa affinis*, male allotype, dorsal view.
 Fig. 2. First zoeal stage of *Parapinnixa affinis*, lateral view.
 Hatched from ovum in the laboratory.
 Fig. 3. *Parapinnixa affinis*, male allotype, ventral view.

regions mottled with a dark ochre. Meso- and meta-branchial regions, much lighter in color, almost a cream. Intestinal region a dark ochre, fingers light, toward the tip of dactylus, transparent. General color of legs, pale ochre with a greenish tinge, dactylus yellow with white tips. Abdomen a muddy yellow. Eyes red and black checkered. Hair on second and third ambulatory legs a reddish brown.

Measurements.—*Allotype*: Carapace 2.5 mm. long, 4.1 mm. wide. Average measurements of females, using a series of ten, are 2.5 mm. long, by 4.5 mm. wide. The largest female specimen in a group of fifty measured 3.6 mm. long, by 6.0 mm. wide.

Occurrence.—San Pedro (Holmes, female only); Newport Bay (MacGinitie, female and male); Anaheim Landing, Newport Bay, and San Diego (Glassell, females and males). Diligent search has been made on and about Deadman Island, the type locality, but without success, the former habitat not now being suitable on account of harbor refuse and oil.

Quite a number of both sexes were taken at Anaheim Landing, Newport Bay, and San Diego. Females outnumbered the males about three to one in one locality, while in another the males had a two to one majority.

In a series of one hundred specimens, 5% were albinos. This occurs irrespective of sex.

Habitat and Habits.—This minute crab is commensal with a marine worm which is now being described and named by Dr. A. L. Treadwell of the U. S. National Museum, as a new species of *Amphitrite*. This worm builds a slimy tube of mud and sand among clumps of shells and weeds at about mean low tide level in situations protected from the full force of the waves. Usually only one crab occurs in a tube but sometimes a male and female will be found together. In addition to *P. affinis*, which I have obtained only in these worm tubes, occasional visitors in these tubes include a Pollonoid worm and juvenile individuals of *Lophopanopeus lockingtoni* Rathbun. *P. affinis* itself sometimes bears colonies of a Bryozoan of the family Vesiculariidae attached to its hairy legs.

The figures reproduced on plates 20 and 21 were prepared from original drawings made with great care by Mr. Anker Petersen of Beverly Hills, under my direction. Dr. S. J. Holmes, Department of Zoology, University of California, Berkeley, kindly compared some of these figures with his type specimen and confirmed my identification.²

Parapinnixa nitida (Lockington)

Text figures 1, a to c

Pinnixa ? nitida Lockington, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 155, part: "male" (really female) only (type-locality, Angeles Bay, Gulf of California; type not extant).

Pseudopinnixa nitida (Lockington), Holmes, Proc. California Acad. Sci., ser. 2, vol. 4, 1894, p. 566, pl. 20, figs. 8, 9.

² Letter dated at Berkeley, California, January 30, 1933.

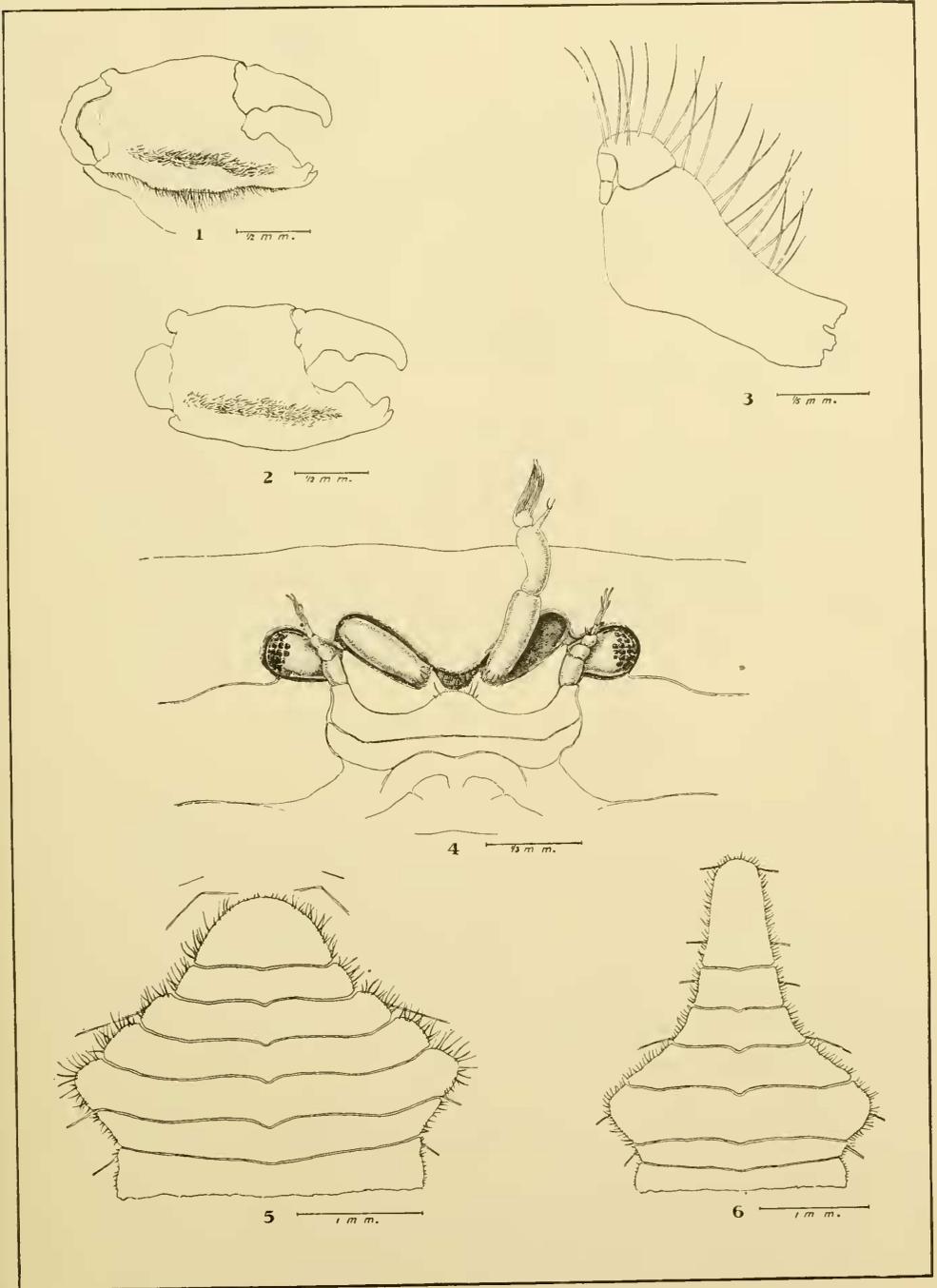


Fig. 1. *Parapinnixa affinis*, male allotype, right chela.
 Fig. 2. *Parapinnixa affinis*, female, right chela.
 Fig. 3. *Parapinnixa affinis*, male, outer maxilliped.
 Fig. 4. *Parapinnixa affinis*, antennal and buccal area.
 Fig. 5. *Parapinnixa affinis*, abdomen of female.
 Fig. 6. *Parapinnixa affinis*, abdomen of male allotype.

Parapinnixa nitida (Lockington), Holmes, Proc. California Acad. Sci., ser. 2, vol. 4, 1894, p. 587, explanation of figs. 8, 9.

Parapinnixa nitida (Lockington), Rathbun, Bull. U. S. Nat. Mus., No. 97, 1918, p. 107, text-fig. 58.

Parapinnixa nitida (Lockington), Rathbun, Bull. Amer. Mus. Nat. Hist., vol. XLVIII, art. XX, 1923, p. 628, text-fig. 6.

This species was found by Mr. W. J. Fisher in Angeles Bay, Gulf of California, Mexico, and described by Lockington and redescribed by Holmes, as above. The female holotype specimen was destroyed in the San Francisco fire of 1906.

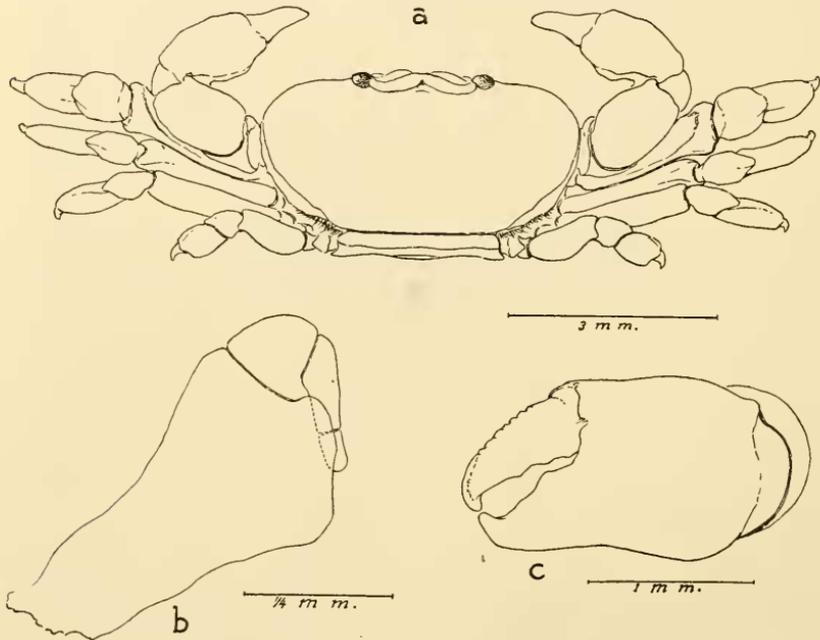


Fig. 1. *Parapinnixa nitida* (Lockington)

a, dorsal view of female from Magdalena Bay. b, left outer maxilliped. c, left chela.

The next record I have is the finding in 1911 of a male specimen, by the U. S. Fisheries Steamer "Albatross" in Pichilique Bay, near La Paz, Lower California, Mexico, by electric light. This specimen was figured and described by Dr. M. J. Rathbun of the U. S. National Museum in 1923. So far as I am aware no other records of this little crab exist.

In December, 1931, I was fortunate enough to secure six specimens, two males and four females, in Magdalena Bay, Lower California, Mex-

ico, in from 14 to 18 fathoms of water. On June 8, 1933, at San Felipe, Lower California, Mexico, in the upper end of the Gulf of California, I took seven more specimens, one male and six females, on shore at low tide. These last were commensal with a Terebellid worm that builds a slime tube thickly incrustated with broken shell bits, on the under side of partially buried stones, at about mean low tide. One of them I am designating the neotype.

Neotype.—Female; No. 347 collection of the San Diego Society of Natural History; San Felipe, Gulf coast of Lower California, Mexico; June 8, 1933; collected by Steve A. Glassell.

Measurements.—The type specimen far exceeded in size any other specimen thus far obtained, it being, carapace measurement, 5 mm. long, by 11 mm. wide. The "Albatross" specimen, which may be regarded as the male allotype, measured 2.6 mm. long, by 5.6 mm. wide. The largest of the specimens I obtained were those taken at San Felipe. The female neotype measured, carapace, 3.5 mm. long, by 7 mm. wide. The male measured, 2.2 mm. long, by 3.8 mm. wide.

Color.—Carapace, ground color golden ochre, covered with a number of red spots and also numerous fiber-like designs black in color, which are also scattered over the chelipeds and ambulatory legs. The general appearance is of moss agate. Ventral side, pale yellow, almost cream.

Parapinnixa yokoyai new name

Text figures 2, a to d

"*Parapinnixa affinis* Holmes," Y. Yokoya, Science Repts. Tôhoku Imperial Univ., Ser. 4, Biology, Sendai, Japan, Vol. 3, no. 4, fasc. 2, pp. 773-775, text fig. 5 a-d, Nov., 1928, "On the line between Benten Isl. and Cape Kurosaki, off Shukunobe 16 fms. Mud. August 10, 1926. 1 female."

A comparison of Yokoya's figures of "*affinis*" (which I reproduce here, see text figs. 2a-d) with the California specimens in my collection and with the figures on Plates 20 and 21, shows that the Japanese *Parapinnixa* is specifically distinct from the Californian *P. affinis* Holmes. In order to correct this anomalous report of *affinis* in oriental waters, I rename the Japanese crab *P. yokoyai*.

Some of the differences between *P. yokoyai* and *P. affinis* are as follows:

P. yokoyai is almost twice the size of *P. affinis* which has no minute teeth on the cutting edge of the dactyl of the cheliped as in *P. yokoyai*. *P. yokoyai* has no large tooth on the pollex of the cheliped as in *P. affinis*. In *P. affinis* the immovable finger of the cheliped is bidentate at the tip, while the text figure of *P. yokoyai* shows two teeth on the pollex, but the description does not mention this. The

third segment of the abdomen of *P. affinis* is the widest, while in the text figure, but not in the description, the third and fourth segments of the abdomen of *P. yokoyai* are of equal width at their upper and lower extremities respectively. The seventh segment of the abdomen of *P. yokoyai* is triangularly rounded, while in *P. affinis* this segment is broadly rounded.

The foregoing three species are the only ones known in the Pacific Ocean. In the Atlantic the genus is represented by the following three species:

Parapinnixa hendersoni Rathbun

Parapinnixa bouvieri Rathbun

Parapinnixa beaufortensis Rathbun

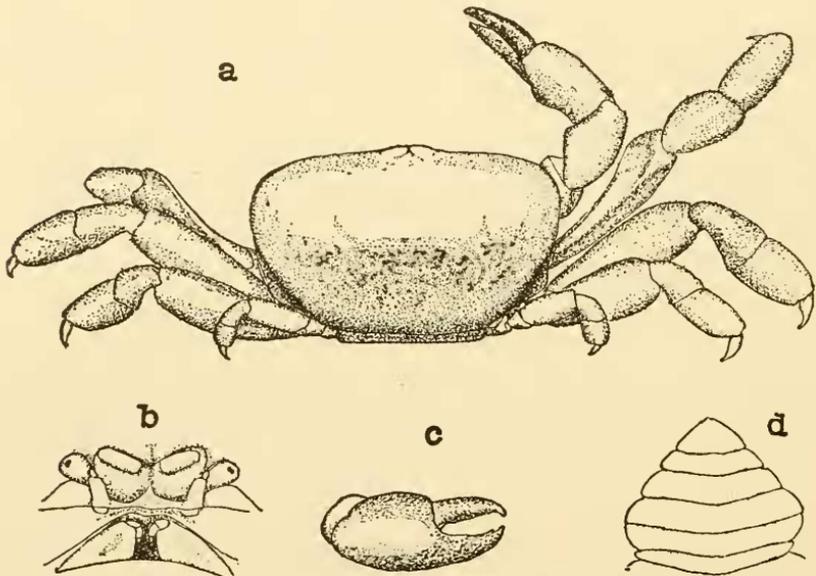


Fig 2. *Parapinnixa yokoyai* new name
 a, entire animal. b, antennal and buccal area. c, chela. d, abdomen of female.
 (a x3; b x6; c, d x4). These figures are reproductions of Yokoya's original text
 figures of "*Parapinnixa affinis* Holmes."

