

Pinnixa darwini, a New Species of Pinnotherid Crustacean from the Galapagos Islands

JOHN S. GARTH¹

WHILE REPORTING on the Crustacea Decapoda Brachyura of the Lund University Chile Expedition (Garth, 1957), the writer had occasion to review the status of the genus *Pinnixa* White on the west coast of South America, and, particularly, to re-examine specimens previously referred by various authors to *P. transversalis* (Milne Edwards and Lucas, 1842: pl. 10, figs. 3, 3a-e; 1844: 23). This proved to be a quasi-generic designation, or at least a species complex under which two or more valid species had been masquerading. It is not surprising, therefore, that when specimens from Darwin Bay, Galapagos Islands, so reported by the writer (Garth, 1946: 497), together with certain other Galapagos material more recently acquired, came under the same close scrutiny, it was discovered that in addition to the aforementioned *P. transversalis*, which has as its type locality the shores of Chile, a new and perhaps endemic species was represented among them. It being deemed inappropriate to include a Galapagos Islands species in a report on the fauna of Chile, its description was withheld at the time and is now presented in connection with the world-wide observance of the Darwin Centennial, the 100th anniversary of the publication in 1859 of "The Origin of Species."

Although Charles Darwin is not known to have collected decapod crustaceans in the Galapagos Islands, or elsewhere along the west coast of South America, during the celebrated voyage of the *Beagle*, his monograph on the Cirripedia (1851-1854) was a fundamental contribution to crustacean systematics. Had his genius for elucidating the obscure been directed toward the crabs instead of toward the barnacles, our present knowledge of the Pinnotheridae, a family of brachyurans living as commensals with poly-

chaetes, mollusks, and echinoderms, would have been immeasurably enriched. The revelation of their fascinating habits was left to a later group of nineteenth century investigators, notably Verill (1870), who referred to them quaintly, although not too correctly, as parasites. However, in view of Darwin's contribution to systematic carcinology and to Galapagan zoogeography, it seems entirely appropriate that a new species of pinnotherid crustacean from the bay that bears his name and the islands to which he brought lasting fame should be dedicated to the illustrious proponent of evolutionary theory and exponent of natural selection.

Family PINNOTHERIDAE Dana

Genus PINNIXA White

Pinnixa darwini, n. sp.

Fig. 1A-F

TYPE: Male holotype and ovigerous female allotype, A.H.F. No. 3812a and b, respectively, from Darwin Bay, Tower Island, Galapagos Islands, 40-70 fathoms, January 16, 1938, collected by the "Velero III" at station 783-38. Male paratype, same locality, date, and station number, to be deposited in the collections of the U. S. National Museum.

MEASUREMENTS: Male holotype, length 3.1 mm., width 5.8 mm., frontal width 0.9 mm., fronto-orbital width 2.15 mm., cheliped (ischium-merus-carpus 1.6 mm., manus-dactylus 3.0 mm.) 4.6 mm., chela 3.0 mm., superior margin 1.8 mm., height of palm 1.6 mm., dactyl 1.5 mm., merus of leg three: length 2.8 mm., width 1.2 mm. Female allotype, length 3.8 mm., width 8.2 mm.

DIAGNOSIS: Cardiac ridge obsolescent; antero-lateral margins forming a sharp, milled crest. Eyes and eyestalks large, filling orbits. Propodus of external maxillipeds short and broad, dactylus considerably longer. Chelae moderately robust, fingers enclosing an oval gape. Merus of

¹ Allan Hancock Foundation, University of Southern California, Los Angeles, California. Manuscript received September 5, 1958.

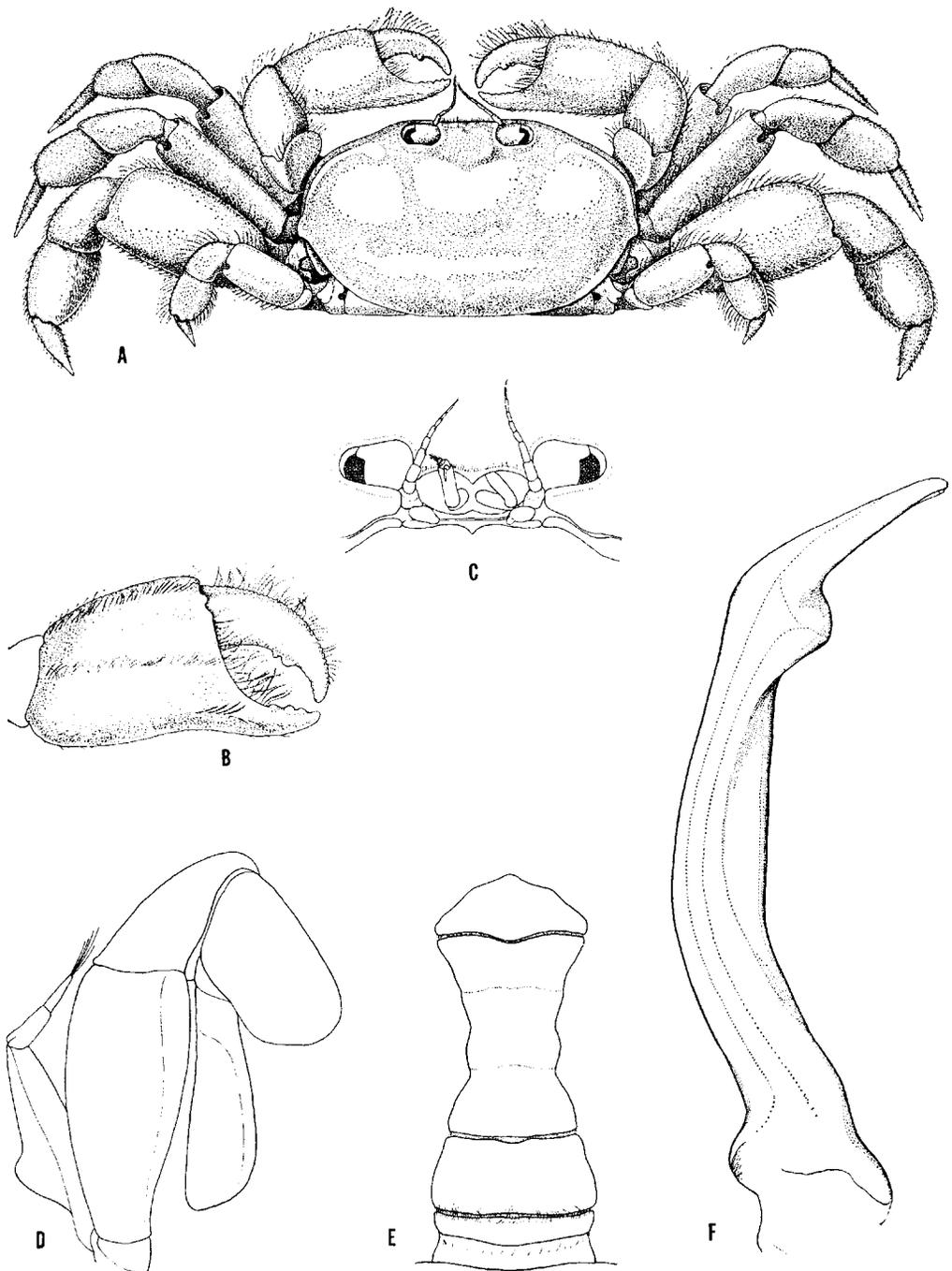


FIG. 1. *Pinnixa darwini*, male holotype, A.H.F. No. 3812a, station 783-38. A, dorsal view, $\times 8$; B, right chela, $\times 12$; C, frontal view, $\times 17.5$; D, right outer maxilliped, $\times 30$; E, abdomen, $\times 12$; F, first pleopod, $\times 45$. D-F with fringing hairs omitted. A-E drawn by Russel Cangialosi; F drawn by Anker Petersen.

leg three two and one-third times as long as wide; leg four not overreaching merus of leg three. Male abdomen terminally broadened, tip triangular. Male first pleopod with a terminal projection and a subterminal swelling.

DESCRIPTION: Carapace suboblong, width 1.87 times length in male, 2.16 times length in female, lateral angles forming prominent shoulders from which sides drop away steeply, surface smooth and porcellanous, minutely punctate, and laterally fringed with plumose hairs. Gastrocardiac trench shallow, cardiac region elevated but uncrested, anterolateral margins, from lateral angle of carapace to cervical suture, forming a continuous, sharply defined, granular crest. Front truncate, slightly advanced beyond orbits, bilobed, lobes fringed. Orbits wide, inclined transversely in dorsal view, somewhat obliquely in frontal view, and completely filled with unconstricted eyestalk and cornea.

External maxilliped with a short, broad propodus and a longer, spatulate dactylus broadening distally; all segments with fringing hairs.

Chelipeds of male well developed, merus triangular, inner surface concave; carpus smooth and, like merus, hairy; manus widening distally, height .88 times superior length, uncrested, hairs of outer surface arranged principally in three rows, the lower extending onto pollex, the middle terminating at gape, and the upper continuing on dactyl; fingers arching toward each other, pollex with three denticles, lower margin of hand sinuous; dactylus with two small teeth at middle of gape; gape choked with clavate hairs.

Dactyls of ambulatory legs one and two straight and slender, of leg three broad and slightly curved, of leg four broad and straight. First leg narrower than, and reaching mid-dactylus of, second; second leg reaching mid-propodus of third; third leg longest, merus 2.33 times long as wide, carpus and propodus correspondingly broadened, fourth leg greatly reduced, its merus not over half the length of, its dactyl not overreaching, the merus of leg three. All legs conspicuously hairy.

Male abdomen with somites four to six fused, edges sinuous; broadest at base of somite three, narrowest at base of somite five, broadening again to base of somite seven; seventh somite

triangular in outline. Line of hair on somite two continued across sternum.

Male first pleopod with a spinelike terminal process bent at a slight angle to the axis of the appendage; a bulbous subterminal swelling beneath.

Carapace of female broader than male, side walls less steep, shoulder less prominent; chelae more slender than male, palm narrower, fingers longer, gape less apparent.

REMARKS: At the time of publication of the "Littoral brachyuran fauna of the Galapagos Archipelago" (Garth, 1946), but one species of *Pinnixa*, *P. transversalis* (Milne Edwards and Lucas) was known to inhabit the Galapagos Islands. The basis for this record, and for the diagnosis and figures presented (*ibid.*: 498, pl. 84, figs. 6 and 8) was a male and female from Darwin Bay, Tower Island, 40–70 fathoms, "Velero III" station 783–38, identified by the late Steve A. Glassell, together with the tubes of *Chaetopterus variopedatus* (Renier) from which they were taken. Subsequently, two other lots of *Pinnixa* from the Galapagos Islands, both of Hancock expeditions origin, have come to hand: the first, a single male from Tagus Cove, Al-bemarle Island, 12 fathoms, December 10, 1934, "Velero III" station 330–35, identified by the late Mary J. Rathbun as *P. transversalis*, and the present group of two males and one ovigerous female, which, although coming from the same locality and station as the Glassell-identified specimens, represent a totally different and hitherto undescribed species.

The proposed new species finds its most closely related species in *Pinnixa faxoni* Rathbun (1918: 133, pl. 29, figs. 4–7, figs. 77a, b), type locality Trinidad, of which it is almost certainly the Pacific analogue. According to Dr. F. A. Chace, Jr., curator of marine invertebrates, U. S. National Museum, who made the comparison, the carapace, including the ridge across the hinder part, is practically identical with some of the type series of *P. faxoni*. Only three important differences between the two species were noted: first, the fingers of the chelae gape much more widely in the Galapagos species than in *P. faxoni*, those of the male of *P. faxoni* being very much like those of the female of the proposed new species, those of the female of *P.*

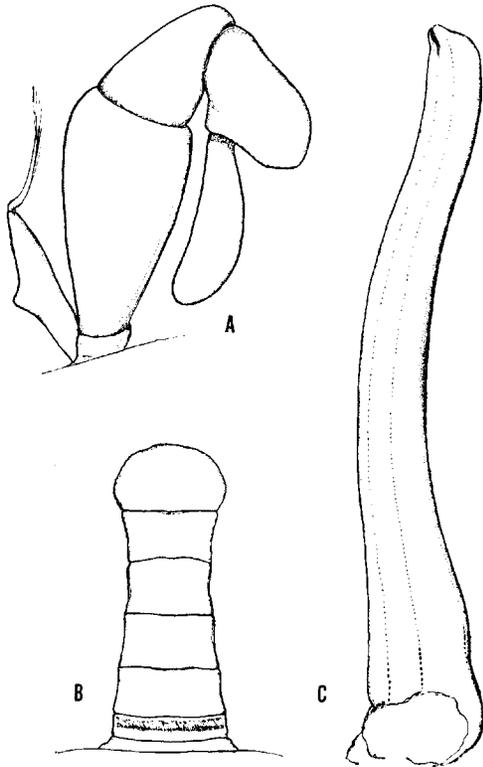


FIG. 2. *Pinnixa transversalis* (Milne Edwards and Lucas), male, station 783-38. A, right outer maxilliped, $\times 20$; B, abdomen, $\times 6$; C, first pleopod, $\times 26$. Fringing hairs omitted. Drawn by Anker Petersen.

faxoni meeting throughout their lengths; second, the male abdomen of the new species is more constricted in the central portion and more abruptly broadened distally than in *P. faxoni* (as shown in Rathbun's figure 77a); third, the male first pleopods are different in the two species, the distal, spinelike process in *P. faxoni* being much longer, more slender, and bent at nearly a right angle to the axis of the appendage. Furthermore, *P. faxoni* is apparently the shaggier of the two species, but how much so cannot be determined because of the matting of the hairs in the type series of *P. faxoni* with fine silt.

Pinnixa transversalis (Milne Edwards and Lucas) from the same locality (Fig. 2A-C) may be distinguished from the new species by the shape of the male abdomen, which is unconstricted medially and has a rounded terminal segment, by the external maxilliped, the pro-

podus of which is less quadrate, and by the male first pleopod, which lacks the spinelike extension with its bulbous base. The specimen from which these figures were made measures 4.8 mm. in length and 9.4 mm. in width and is without doubt the 5.0 \times 9.4 mm. specimen, erroneously recorded as a female (Garth, 1946: 498), of which measurements were given, since the female from the same station measures only 3.3 \times 6.8 mm. In addition, *P. transversalis* has a sharp ridge extending entirely across the posterior portion of the carapace, and the chelae in both sexes are narrow, thin, and straight, the fingers pointed.

Finally, it should be stated that, while the specimens of *Pinnixa transversalis* were recovered from the arenaceous tubes of *Chaetopterus*, the commensal host of the new species remains a subject for future investigation.

REFERENCES

- DARWIN, CHARLES R. 1851. A Monograph on the Sub-Class Cirripedia . . . The Lepadidae; or, Pedunculated Cirripedes. xi + 400 pp., 11 pls. Ray Society, London.
- 1854. A Monograph on the Sub-Class Cirripedia . . . The Balanidae (or Sessile Cirripedes); the Verrucidae, &c. viii + 684 pp., 31 pls. (col.). Ray Society, London.
- GARTH, JOHN S. 1946. Littoral brachyuran fauna of the Galapagos Archipelago. Allan Hancock Pacif. Exped. 5(10): 341-601, pls. 49-87.
- 1957. Reports of the Lund University Chile Expedition 1948-49. No. 29. The Crustacea Decapoda Brachyura of Chile. Lunds Univ. Årsskrift., n. s., Avd. 2, Bd. 53(7): 1-128, pls. 1-4, figs. 1-11.
- MILNE EDWARDS, HENRI, and PIERRE H. LUCAS. 1842-44. IN Voyage dans l'Amérique méridionale [Alcide d'Orbigny, ed.] 6(1): 1-39; 9 [Atlas], pls. 1-17. P. Bertrand, Paris; V^e Levrault, Strasbourg.
- RATHBUN, MARY J. 1918. The grapsoid crabs of America. Bull. U. S. Nat. Mus. 97. xxii + 461 pp., pls. 161, figs. 172.
- VERRILL, ADDISON E. 1870. On the parasitic habits of Crustacea. Amer. Nat. 3: 239-250, figs. 41, 42.