

LOWER MIOCENE CRUSTACEA FROM PEMBA ISLAND.

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BRACHYURA. Family CANCERIDÆ.

Genus **Palæocarpilius** Milne-Edwards, 1865.

Twelve specimens referable to this genus were collected by Messrs. E. J. Wayland and G. M. Stockley; they belong to an undescribed form possessing characters in common with one or other of two previously described species.

Palæocarpilius intermedius sp. nov.

PLATE XXII and PLATE XXIII, figs. 6-9.

Holotype, the female specimen (pl. xxii, figs. 1-2) numbered In. 26960 (Brit. Mus., Geol. Dept.).

Paratypes, the specimens numbered In. 26961-5 and 26968.

Diagnosis.—**Carapace**:—General form transversely ovate, proportion of breadth to length 10:8. General convexity of dorsal surface:—gently arched from side to side, more steeply convex in front, particularly in younger specimens, in which the front is almost perpendicularly deflected.

Surface markings:—The surface is smooth, but minute granules are visible with a lens; coarsely punctate in the region of the antero-lateral margin; no rugosities are seen, and the lobes of the carapace are indistinct, not even the semi-lunar depressions at the sides of the uro-gastric region being evident.

Front produced into a blunted point, the sides forming an angle of about 125°; only in one specimen (pl. xxiii, fig. 7) is a faint trace of median bituberculation visible; the margin is thickened and a projecting tubercle occurs at the inner orbital angle; the distance between these tubercles is approximately equal to the length of one antero-lateral margin. **Orbits** nearly circular, with a slightly thickened dorsal margin, and ventrally with a small sub-median tubercle. Counting from the outer orbital angle each antero-lateral margin bears eight tubercles, progressively but gradually increasing in size from the second tubercle outwards, the eighth being the largest and most pointed. **Costal ridges** fairly prominent, each nearly one-third of breadth of carapace and terminating laterally in the eighth lateral tubercle.

Basilar joint of antennæ long, ending with a truncate edge in the orbit between the inner angle and the sub-median tubercle. **Basilar joint of antennules** semilunar. **Epistome** almost linear, but rather depressed medianly behind and dorsally to the inter-antennular ridge. **Endostome** imperfectly known. **Outer maxillipedes** much as in *Palæocarpilius rugifer* Stoliczka.*

* Tertiary and Upper Cret. Fauna of Western India, Palæontologia Indica, ser. vii & xiv, vol. i, pt. i, 1871, pp. 8-10, pl. iv and v.

Chelæ strong, each having a total length equalling the maximum breadth of the carapace. **Forearm (carpus)**; dorsal outer surface may be somewhat rugose posteriorly, with traces of two lateral tubercles towards the middle; anteriorly and much nearer the median line there is a weak spine. **Hand**:—The major chela has the hand approximately as long as the minor, but is broader and more compressed. On the minor the fingers are longer, thinner and closer together. The upper edge of the major hand is crowned with six or seven large tubercles, that of the minor with five or six; towards the margin, the upper outer surface of each hand shows traces of more or less confluent transverse rugosities, and the lower outer surface shows a weak groove close and sub-parallel to the edge, with a pair of tubercles one above the other in the outer posterior angle. In all the specimens the major chela is on the right-hand side of the animal.

Ambulatory legs imperfectly known, distinctly compressed laterally, obtusely rounded dorso-ventrally.

Sternum long and relatively narrow, its greatest breadth being somewhat less than one-third the maximum breadth of the carapace.

Abdomen; in the female, of seven joints and almost completely covering the sternum; the first joint is the shortest, the next three a little longer, the fifth longer still, the sixth almost twice the length of the fifth, whilst the seventh joint, which has a semi-oval outline, is still longer than the sixth. The breadth of the first six joints is more or less similar, and all are slightly convex posteriorly and concave anteriorly. In the male, fusion occurs in the third, fourth and fifth joints, the sutures being sometimes delineated by a row of punctuations; this composite segment widens away from the telson, which has the outline of an equilateral triangle. The fourth to seventh abdominal segments of the male are distinctly narrower than those of the female.

Remarks:—In the character of the tuberculation and general ornamentation this species is intermediate between *Palæocarpilius macrocheilus* Desmaret* and *P. rugifer* Stoliczka†, for whilst *P. macrocheilus* shows no rugosities and has tubercles comparable in size with those seen here, *P. rugifer* has rugosities on the branchial regions of the carapace, strong rugosities on the outer surface of the hand and tubercles which are almost spines.

P. intermedius has only weak rugosities on the hand and sometimes on the forearm, otherwise, even in the most mature specimens, the surface is smooth. It differs essentially from *P. macrocheilus* in the position of the orbits, the front being wider here, and the angle between the basilar joints of the antennæ more obtuse, much as in the Indian species *P. rugifer*. Furthermore, the relation between the sternum and the abdomen of the male is more comparable with that seen in *P. rugifer* than with *P. macrocheilus*. Though *P. intermedius* resembles *P. rugifer* fairly closely, it differs not only in the ornamentation already mentioned, but in the absence of distinct frontal bituberculation, in the length to breadth proportions of the carapace, and in the breadth of the female abdomen; this last character also distinguishing *P. intermedius* from *P. macrocheilus*. All these species are distinguished from *P. aquitanicus* Milne-Ed. by the presence of eight tubercles on the antero-lateral margins instead of seven.

* Al. Milne-Edwards. Histoire Crust. Pédophthalmaires fossiles, vol. i, 1862, p. 186.

† Loc. cit. supra.

Occurrence and Horizon :—Collected from localities P. 92 and P. 64; Chake Chake Beds, Pemba Series, Lower Miocene.

Family PORTUNIDÆ.

Neptunus sp. ?

PLATE XXIII, fig. 10.

A crushed carapace possibly belonging to this genus has been collected by Mr. G. M. Stockley from Pemba, locality 47.

In conclusion I wish to thank Mr. T. H. Withers for most helpful advice and criticism, and for showing me the specimens of *Palæocarpilius* in the British Museum.

PLATE XXII.

Palæocarpilius intermedius sp. nov. from the Lower Miocene of Pemba. (p. 118).

- Fig. 1. Holotype, In. 26960, female specimen, ventral view showing 3rd-6th abdominal segments and right chela. Shelly limestone, Chake Chake Beds, Funzi Island. ($\times \frac{3}{4}$).
- Fig. 2. Same specimen, dorsal view of carapace showing tuberculation of antero-lateral margin, costal ridges, first and second abdominal segments (the costal tubercle is broken). ($\times \frac{3}{4}$).
- Fig. 3. Specimen In. 26962. Ventral view of male specimen showing outer maxillipedes, orbits (O), antennular pits (IAP), antennary pits (2AP), basilar joints of antennules (BA1), basilar joint of antennæ (BA2), epistome (EP), and inter-antennulary prolongation (IAR). Funzi Island ($\times 1$).
- Fig. 4. Specimen In. 26963. Ventral view of small male specimen showing right chela, inner orbital tubercle (IOT) and endostome (EN). Funzi Island. ($\times 1$).
- Fig. 5. Specimen In. 26968. Ventral view of female specimen showing 4th-7th abdominal segments; notice the large 7th segment. Wesha Road, Pemba. ($\times \frac{3}{4}$).

PLATE XXII.

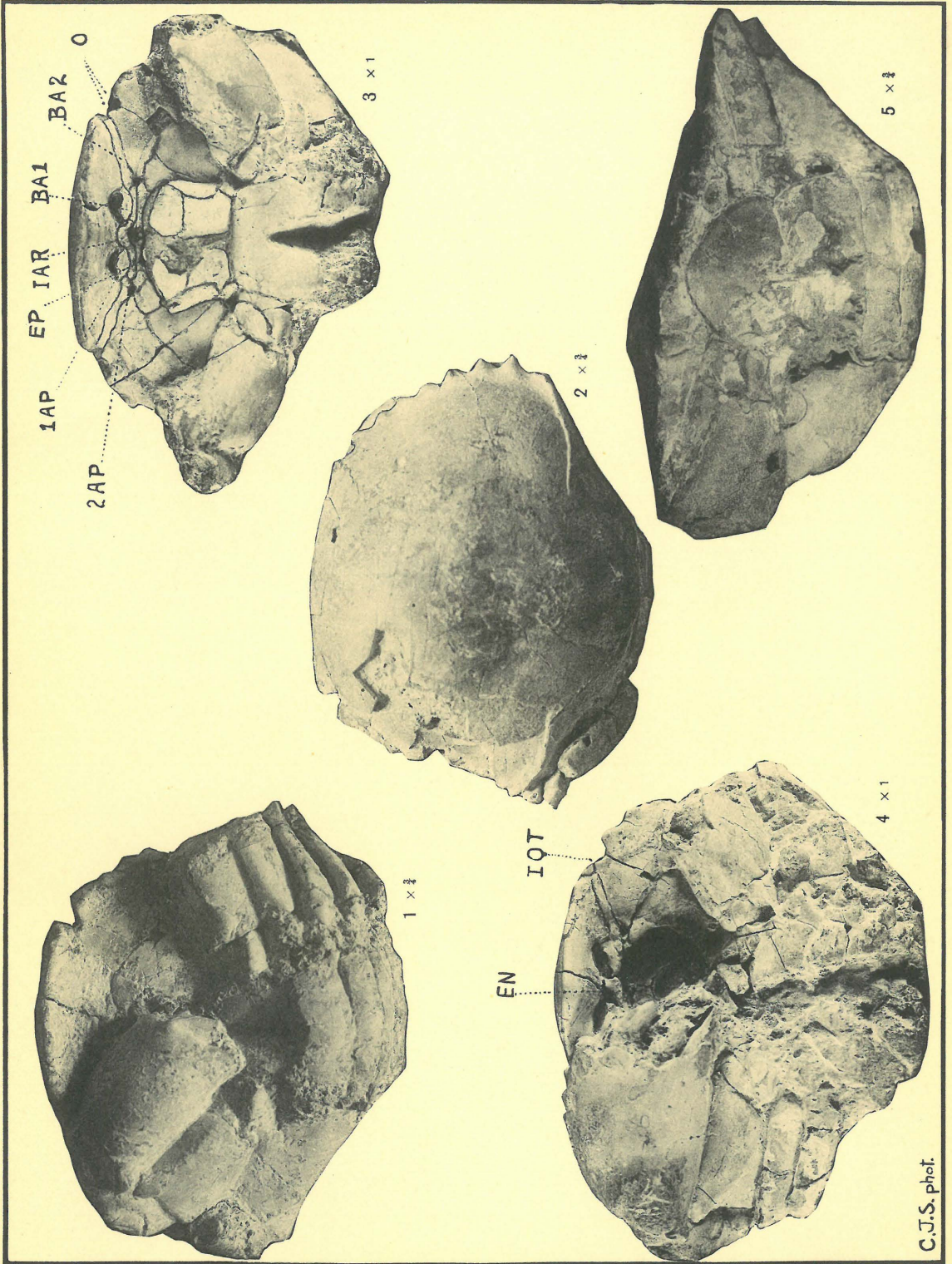
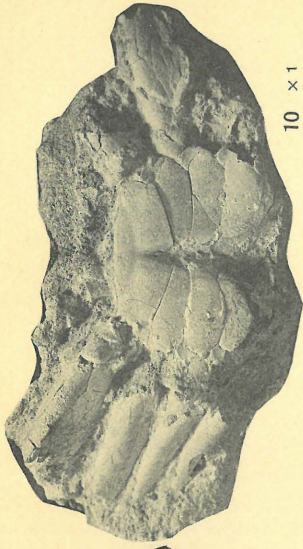


PLATE XXIII.

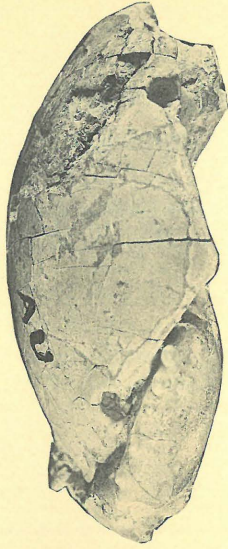
Palæocarpilius intermedius sp. nov. (figs. 6-9) and *Neptunus* sp.? from the Lower Miocene of Pemba.
(p. 118-20).

- Fig. 6. Specimen In. 26964. Ventral view of large male specimen showing relative configuration of the hands. Shelly limestone, Funzi Island? ($\times 1$).
- Fig. 7. Specimen In. 26963 (cf. pl. xxii, fig. 4). Front view of small male specimen showing the orbits, incipient median bituberculation, and right chela. Marly limestone, Funzi Island. ($\times 1$).
- Fig. 8. Specimen In. 26961. Ventral view of male specimen, showing legs and fused 3rd to 5th segment, also 6th and 7th segments of the abdomen. Cream-coloured marly limestone. Funzi Island.
($\times \frac{1}{2}$).
- Fig. 9. Specimen In. 26965. Ventral view of male specimen showing tuberculation of hands. Funzi Island.
($\times 1$).
- Fig. 10. *Neptunus* sp.? Specimen In. 26966. Ventral view of female. Kichwani Quarry. ($\times 1$).

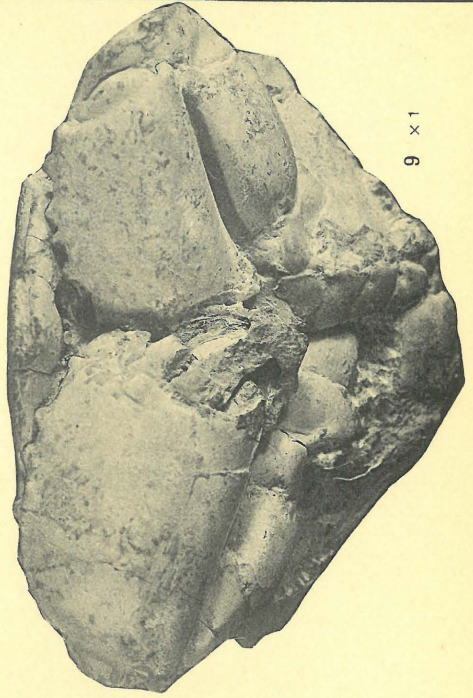
PLATE XXIII.



10 x 1



7 x 1



9 x 1



6 x 1



8 x 1