

✓ ARTHROPODA CRUSTACEA II

(62) TRANSACTIONS

OF

THE ZOOLOGICAL SOCIETY
OF LONDON.

DEPARTMENT OF ZOOLOGY
UNIVERSITY OF MALAYA

VOL. XX.—PART 8.

(TEXT-FIGURES 12 & 13.)

W. T. Calman

LONDON:

PRINTED FOR THE SOCIETY,

SOLD AT THEIR HOUSE IN REGENT'S PARK:

AND BY MESSRS. LONGMANS, GREEN, AND CO., PATERNOSTER ROW.

May 1914.

Price 3s.

Taylor and Francis, Printers.]

[Red Lion Court, Fleet Street.

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UNIVERSITY OF MALAYA

TRANSACTIONS OF THE ZOOLOGICAL SOCIETY OF LONDON.

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Continued on page 3 of Wrapper.



VIII. *Report on the River-Crabs (Potamonidæ) collected by the British Ornithologists' Union Expedition and the Wollaston Expedition in Dutch New Guinea.*
By W. T. CALMAN, D.Sc., F.Z.S. *

[Received February 17, 1914; Read April 7, 1914.]

(Text-figures 12 & 13.)

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THE freshwater Decapod Crustacea obtained by the two expeditions consist of nine Crayfishes, seventeen River-Crabs, and one mutilated and indeterminable Palæmonid. The Crayfishes have been reported on elsewhere †, and the River-Crabs form the subject of this paper. Thirteen of the specimens are referred to a species recently described by Dr. J. Roux from the Aru Islands, of which, by the kindness of Dr. Roux, I have been able to examine a co-type; and two species are described as new, each from a pair of specimens.

It is somewhat difficult to decide what generic names ought to be applied to the various species, according to the more recent schemes of Potamonid classification. All the species have the mandibular palp bilobed, the male abdomen considerably narrowed, with the sixth somite longer than wide, or only a very little shorter, and the telson tongue-shaped. They can, therefore, be referred, without any doubt, to Alcock's subfamily Gecarcinucinae. Their position within the subfamily is, however, not so clear. In all of them the front is wider by at least two-thirds than the orbit, the subterminal tooth on the upper border of the merus of the chelipeds is in most cases acute or spiniform, and the postorbital crests are obsolete. According to Alcock's synopsis of the Gecarcinucinae ‡, therefore, they should be referred to the genus (or subgenus) *Peritelphusa*, from the other species of which, however, they differ in the great reduction of the epibranchial tooth. If, on other hand, the

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† Ann. Mag. Nat. Hist. (8) viii. 1911, pp. 366-368.

‡ Rec. Indian Mus. v. 1910, p. 259.

subterminal tooth on the merus of the chelipeds be neglected (it is almost obsolete in *Parathelphusa plana*), then, since the exopodites of the maxillipeds are well developed, the species would fall into Alcock's subgenus *Liotelphusa*. In one species which he refers to this subgenus, *L. austrina*, Alcock states that "the free edge of the front is distinct from the edge that roofs the antennular fossæ." An arrangement similar to this is found in all the species here discussed. It may be expressed in other words by saying that the front is bent inwards to meet the inter-antennular septum, forming a transverse ridge which may be rounded or sharp, and may extend the whole width of the front or be confined to a short distance in the middle. Alcock says that among the Indian River-Crabs this arrangement is found in only a few species; I find it more or less distinctly developed in a good many Malaysian species, including some, at least, of those referred to *Peritelphusa*; whether it can be used as a basis for generic or subgeneric division is a question for future examination. The species which I described from New Guinea under the name of *Gecarcinucus ingrani**, and which Alcock, by implication, places in his subgenus *Cylindrotelphusa*, is intimately related to the species described below as *Parathelphusa wollastoni*. In the proportions of its front it halts between the limits that Alcock assigns to *Gecarcinucus* and to *Parathelphusa* respectively, and I am now convinced that it has no very close affinity with the Indian *Gecarcinucus*. I think that, along with the species discussed in this paper, it is best referred to the genus *Parathelphusa*, *sensu latiore*, and that, of the subgenera at present recognized, *Liotelphusa* is the one in which all these species may most naturally be placed.

It may be noted that in all the male specimens mentioned below (with the exception of the male *P. plana*, in which the part in question is broken) the sternum corresponding to the first pair of walking-legs has a median longitudinal slit-like depression. In some other Malaysian species examined for the purpose of comparison this slit is paired, and it seems likely that this character may be useful as a specific distinction.

The measurements of all the specimens examined are given together in the table at the end of the paper (p. 313).

PARATHELPHUSA (LIOTELPHUSA ?) ARUANA (Roux) †.

Potamon (Geotelphusa) aruanus Roux, Notes Leyden Mus. xxxiii. 1911, p. 91.

As Dr. Roux has still to publish the detailed description of this species, I only note here the characters in which the specimens that I record under this name differ from the co-type with which I have compared them.

* P. Z. S. 1908 (1909), p. 960.

† [The parentheses around the names of authors placed after scientific names in this paper are used in accordance with Article 23 of the International Rules of Nomenclature (Proc. 7th Int. Cong. Boston, 1907, p. 44 (1912).—EDITOR.]

(a) Aru Islands. 1 male.

This specimen differs from Dr. Roux's type chiefly in the disposition of the epigastric lobes, which are rather more oblique and extend forwards nearly to the line of the posterior orbital margins. The carapace is relatively a little narrower and deeper, the front wider, and the horizontal frontal ridge extends nearly the whole width of the front, instead of being distinct only for a short distance in the middle, as in the type. The dactylus of the larger cheliped is slightly less arched and more distinctly dentate. The abdomen is not quite so narrow as in the type, and the sixth somite is hardly wider at its distal end than at its proximal end.

(b) Mimika River. 7 males, 2 females.

As regards the direction and position of the epigastric lobes, these specimens agree rather better with the type than with the Aru specimens described above. They differ from both in the greater depth of the carapace, which is never less than twice as wide as it is deep, although most of the specimens are relatively narrower, in proportion to length, than the type. The dorsal surface is rather more convex, both from before backwards and from side to side, and the antero-lateral portions of the cervical groove are inclined at a more acute angle to each other. The frontal ridge is well defined and extends the whole width of the front, which is, in most cases, distinctly narrower than in the type. In a large male the fingers of the larger chela gape even more widely than in the type, but are very similar in form and armature. In some of the males the abdomen resembles that of our specimen from the Aru Islands, in others it is more like that of the type, the sides being more concave and the penultimate segment distinctly narrower at its proximal end.

(c) Utakwa River. 2 males, 1 female.

These specimens differ considerably from all those discussed above, especially in the greater length of the walking-legs, those of the second pair being more than twice the length of the carapace. The carapace is rather more convex anteriorly, but flatter behind and also from side to side, with the inter-regional grooves better marked; near the antero-lateral margins it is much more rugose. The epigastric lobes are obscure, transverse, and rugose. The front is inflected towards the epistome, but the transverse ridge thus formed is much less sharp than in the specimens described above. The larger of the two males has the palm of the larger chela inflated, the fingers gaping at the base, and somewhat feebly toothed, the whole suggesting that a better-grown male would have a chela of the *aruana*-type. The abdomen of the males resembles that of the type.

The specimens of this group approach, in the greater relative length and slenderness of the walking-legs, the specimens of *P. wollastoni* which were collected along with them. They differ from them, however, in practically all the other characters enumerated below as distinguishing that species from *P. aruana*. It is possible that they ought to be held as distinct from *P. aruana*, but in the absence of more material I

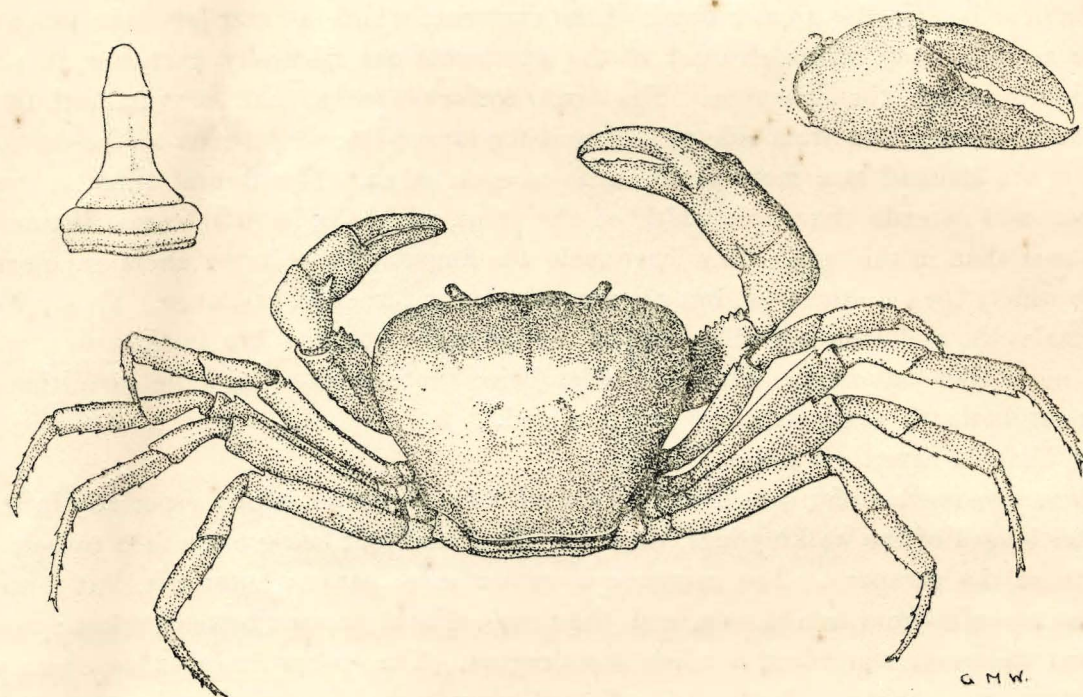
record them provisionally under that name. In the greater rugosity of the antero-lateral regions of the carapace they resemble *P. beauforti* Roux, of which I have examined two female co-types; they differ from that species in having the carapace deeper and much more convex, the front narrower, and the frontal ridge less marked, and the fingers of the chelæ longer and more slender, as well as in the much longer walking-legs.

PARATHELPHUSA (LIOTELPHUSA?) WOLLASTONI, sp. n. (Text-fig. 12.)

Utakwa River. 1 male, 1 female.

Description. Carapace strongly convex antero-posteriorly, less so from side to side,

Text-figure 12.



Parathelphusa (Liotelphusa) wollastoni. Holotype, ♂, $\times 1\frac{1}{2}$.

Above, the larger chela and the abdomen, on same scale.

its depth more than half its width. Surface smooth and polished, with oblique lines near the lateral margins. Cervical groove faintly marked, its lateral limbs inclined at a more acute angle to each other than in the type of *P. aruana*. Branchial regions hardly inflated. Epigastric lobes rounded, a little more prominent than in *P. aruana*, less rugose, not oblique, separated by a deep and sharply defined mesogastric groove. Front narrower than in *P. aruana*, the horizontal ridge well marked, extending the whole width of the front, concave in the middle as seen from above. Orbits slightly

oblique; seen from in front, the line joining the exorbital angles touches the lower edge of the front. Exorbital angles hardly at all prominent. Epibranchial tooth indicated only by a very slight notch. Antero-lateral marginal line not extending behind the anterior fourth of the length of the carapace, faintly granulated. Continuation of cervical groove hardly to be detected on lower surface of carapace.

Third maxillipeds with a strong groove near inner margin of ischium; merus much broader than long.

Chelipeds of male very unequal, merus with a sharp subterminal spine on its upper edge, which is more sharply granulated than the lower, less so than the inner edge. Inner tooth of carpus sharp and spiniform, with a small sharp tooth below it. Larger chela recalling in shape that of "*Gecarcinucus*" *ingrami*, especially in having a prominent, rounded, interdigital tubercle on outer surface, but the tooth at proximal end of lower edge almost obsolete, and the fingers, though rather deep and flattened, not so strongly toothed.

Walking-legs very long and slender, those of second pair about two and a half times as long as carapace. Merus with a subterminal spiniform tooth above and propodus with a few spines on upper and lower edges.

Abdomen of male narrow, the sixth segment slightly widened distally, where its width is equal to its length; telson linguiform, with convergent sides, slightly longer than sixth somite.

Holotype. Male, Reg. No. 1914.3.12.6 in British Museum.

Remarks. This species is clearly related to that which I described as *Gecarcinucus ingrami* from the St. Joseph River, New Guinea, standing, in respect of most of its characters, midway between that species and *P. aruana*.

PARATHELPHUSA (LIOTELPHUSA?) PLANA, sp. n. (Text-fig. 13.)

Utakwa River. 1 male, 1 female.

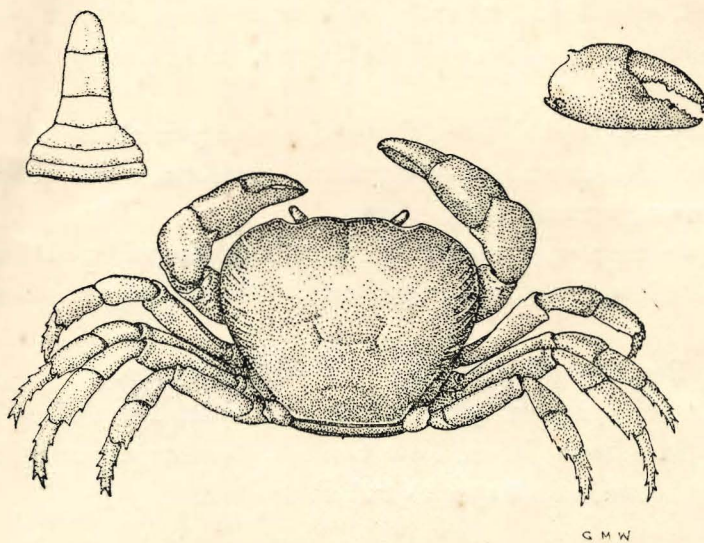
Description.—Carapace very flat, only the anterior region, from a line a little way behind the epigastric lobes, strongly curved downwards; depth much less than half of the width. Surface everywhere closely punctate, with sharply-cut raised oblique lines near the lateral borders. Central part of cervical groove well marked, but the antero-lateral limbs almost obsolete. Epigastric lobes not at all prominent, their position only marked by a slight rugosity and by the sharply-cut groove that separates them. Frontal ridge rounded and not extending the whole width of the front. Orbits small and their outer angles not at all prominent. Exorbital width very little more than half the width of the carapace. Antero-lateral margins strongly curved anteriorly, so that the greatest width of the carapace is rather further forward than in allied species. There is, at most, a microscopic vestige of a notch to indicate the position of the epibranchial tooth. Antero-lateral marginal line obscurely granulated. Postero-lateral borders with marginal line more distinct, and extending for a greater part of

their length than in *P. aruana*. Continuation of cervical groove on under surface of carapace faintly marked.

Eyes small, the peduncles narrowing distally.

Merus of chelipeds rugose on its upper edge, with a subterminal ridge, but no distinct spine; its lower and inner edges smooth. Tooth on inner angle of carpus sharp, but not spiniform, accompanied by a small blunt tubercle. Smaller chela of male and both chelæ of female with the fingers shorter and stouter than in *P. aruana*. Larger chela of male with the palm slightly swollen, the interdigital lobe on its outer surface not prominent, and the fingers gaping a little at the base.

Text-figure 13.



Parathelphusa (Liotelphusa) plana. Holotype, ♂, $\times 1\frac{1}{2}$.
Above, the larger chela and the abdomen, on same scale.

Walking-legs relatively short and stout, with a blunt subterminal tooth on upper edge of merus.

Abdomen of male broader than in any specimen referred to *P. aruana*, with the sixth somite parallel-sided, little broader than long, and slightly longer than the telson, which is linguiform, with slightly convergent sides.

Holotype. Male, Reg. No. 1914. 3. 12. 4 in the British Museum.

Remarks. Although the two specimens are probably not fully adult, and the characters of the male abdomen and chela are therefore not to be relied on, the flattening of the carapace, the complete disappearance of the epibranchial tooth, and the small size of the eyes give this species an aspect very different from that of any other with which it might be compared.

Table of Measurements (in millimetres).

	Sex.	Length.	Breadth.	Depth.	Exorb. width.	Front width.	Second walking- leg.	Ratios.	
								Breadth Length.	2nd leg Length.
<i>Parathelphusa aruana.</i>									
(a) Aru Islands	♂	23.00	29.50	14.25	16.75	8.75	1.28
(b) Mimika River	♀	28.50	35.00	18.00	20.50	9.50	50.00	1.22	1.75
" " 	♂	27.00	33.50	17.00	19.00	9.50	48.00	1.24	1.77
" " 	♂	26.50	33.25	17.50	18.75	9.25	1.29
" " 	♂	25.75	31.50	16.25	18.00	9.00	46.00	1.22	1.78
" " 	♂	24.50	31.00	16.50	18.00	8.75	1.26
" " 	♂	24.50	31.50	16.00	17.75	8.75	45.00	1.28	1.87
" " 	♂	24.50	31.00	16.00	17.50	8.75	42.50	1.26	1.73
" " 	♀	24.00	31.00	15.75	17.00	8.50	41.50	1.29	1.72
" " 	♂	21.00	26.00	13.00	15.00	7.50	38.00	1.23	1.80
(c) Utakwa River	♀	21.00	27.50	13.75	16.00	7.50	44.50	1.30	2.11
" " 	♂	17.50	23.50	11.75	13.50	6.25	38.00	1.34	2.17
" " 	♂	14.75	19.50	9.75	11.75	5.75	35.50	1.32	2.40
<i>P. wollastoni.</i>									
Utakwa River	♂	21.50	28.50	15.50	16.00	7.50	54.50	1.32	2.53
" " 	♀	21.50	28.00	15.00	16.00	7.00	53.90	1.30	2.46
<i>P. plana.</i>									
Utakwa River	♂	20.00	26.00	10.50	13.50	7.00	35.00	1.30	1.75
" " 	♀	20.00	25.75	11.00	13.50	6.75	34.00	1.28	1.70

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THE PUBLICATIONS OF THE ZOOLOGICAL SOCIETY OF LONDON.

THE scientific publications of the Zoological Society of London are of two kinds—"Proceedings," published in an octavo form, and "Transactions," in quarto.

According to the present arrangements, the "Proceedings" contain not only notices of all business transacted at the scientific meetings, but also all the papers read at such meetings and recommended to be published in the "Proceedings" by the Committee of Publication. A large number of coloured plates and engravings are issued in the "Proceedings," to illustrate the new or otherwise remarkable species of animals described in them. Among such illustrations, figures of the new or rare species acquired in a living state for the Society's Gardens are often given.

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May, 1914.

P. CHALMERS MITCHELL,
Secretary.