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Notes on Decapoda in the Indian Museum, II.

By

S. KEMP.

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II. NOTES ON DECAPODA IN THE INDIAN MUSEUM.

II.—Descriptions of two new Crangonidae with Observations on the Mutual Affinities of the Genera *Pontophilus* and *Philocheras*.

By Stanley Kemp, *B.A., Assistant Superintendent, Indian Museum.*

(Plate ii.)

In the present paper two new species of Crangonidae, one from New Zealand and the other from the Andaman Islands, are described from material in the Indian Museum.

An examination of these species and of others which occur on the coasts of Australia and New Zealand has induced me to reconsider the generic status of *Pontophilus* and *Philocheras*, with the result that the distinctions between the two genera are found to be so trivial that the only possible course is to revert to the view expressed by Ortmann in 1895,[1] and to classify all the various forms under *Pontophilus*, though it will not be necessary to follow him in placing *Aegeon* in the same category.

So far as I am aware, the sole distinction which can be relied upon for the separation of the two genera rests in the presence or absence of the appendix interna on the endopod of the last four pairs of pleopods, and this, in the two species found on the New Zealand coasts (*P. australis*, Thomson, and *P. chiltoni*, sp. nov.), is greatly reduced in size, rudimentary on the fourth pair and entirely missing from the fifth. Consequently, in the case of Crangonidae, the importance of this character seems small in any natural scheme of classification, though in other families of Decapoda, such as the Callianassidae, it affords indications of great systematic value.

PONTOPHILUS, Leach.

Pontophilus chiltoni,[2] sp. nov.

(Plate ii, figs. 6—10.)

Among a small sample of *Pontophilus* labelled "New Zealand," and received here many years ago from the Canterbury Museum, two ovigerous females occur, which evidently represent a species

[1] Ortmann, *Proc. Ac. Nat. Sci. Philadelphia*, xlvii, 1895, p. 182.

[2] I take pleasure in associating with this species the name of Dr. Chas. Chilton, whose valuable work on the Crustacea of New Zealand is known to every carcinologist.

hitherto undescribed. The other specimens in the same bottle are to be referred to *Pontophilus australis*,[1] and as this species is extremely closely allied to the new form, it will be convenient to express the differences between the two in parallel columns—

P. australis (Thomson).	*P. chiltoni*, sp. nov.
Rostrum narrow (fig. 1).	Rostrum broad (fig. 6).[2]
Two mid-dorsal spines of carapace situated close together in anterior third (fig. 1).	Two mid-dorsal spines of carapace widely separate; posterior spine situated exactly in middle of carapace (fig. 6).
Antennal scale a trifle more than twice as long as wide (fig. 3).	Antennal scale considerably less than twice as long as wide (fig. 8).
Propodus of first peraeopod not narrowed anteriorly: *i.e.*, as broad behind subchelate termination as at base (fig. 2).	Propodus of first peraeopod evidently narrowed anteriorly: *i.e.*, distinctly broader at base than behind subchelate termination (fig. 7).
Sixth abdominal somite more than one and a half times length of fifth and bearing dorsally a pair of distinct but blunt longitudinal carinae (fig. 5).	Sixth abdominal somite less than one and a half times length of fifth, with a median longitudinal depression, but without distinct carinae (fig. 10).
Apex of telson narrow.[3]	Apex of telson broader.[3]

In addition, *P. chiltoni* is a trifle stouter in build than *P. australis*, the terminal joint of the fourth pair of peraeopods is a little shorter and broader, and the spinous processes on the postero-inferior margin of the fifth abdominal somite are distinctly blunter.

Two specimens, ovigerous females, 30 and 32 mm. in total length, from New Zealand. (Regd. Nos. $\frac{7029-30}{10}$.)

Pontophilus sabsechota,[4] sp. nov.

(Plate ii, figs. 11—14.)

The general form is short and stout. Measured dorsally, the carapace (including the rostrum) is longer than the first five abdominal somites, and its breadth is almost as great as its length.

[1] *Pontophilus australis* (Thomson), *Trans. Linn. Soc. London* (2), viii, 1903, p. 434, pl. 27, figs. 1—5.

[2] In the second specimen the rostrum is a trifle narrower than is shown in this figure, but is still very evidently broader than in *P. australis*.

[3] The distinctions afforded by the comparative length of the telson and uropods, as seen in figs. 5 and 10, cannot be relied upon for differentiating the two species.

[4] Hindustani, "*sab se chota*": the smallest of all.

The rostrum is extremely broad and, in dorsal view (fig. 11), is constricted behind the squarely truncate apex; its distal breadth is about one-third the total length of the carapace. The lateral margins are greatly elevated and form a sort of hood covering the bases of the eye-stalks.

The carapace (figs. 11, 12) is sharply carinate in the median line, the carina terminating in a spine a little behind the rostral base. On either side there are three lateral carinae, all of which are well-defined and are continued as far as the posterior margin. The first of these commences a short distance behind the orbital notch and runs downwards and backwards; it bears no spines, but is abruptly notched near its middle point. The second lateral carina is more or less parallel with the first, and is continuous anteriorly with the acute orbital angle; it bears a sharp spine, a trifle in advance of that in the median line, and further back, near the middle of the carapace, a notch similar to, but well in front of, that on the first lateral carina. The third consists of two distinct carinae, of which the upper is sharp and runs from the apex of the branchiostegal spine to the middle of the carapace, while the lower, which is less prominent, starts beneath the posterior termination of the upper one and reaches to the hinder margin. The branchiostegal spine is very prominent, and extends a little beyond the apex of the rostrum.

In the female the sternal plates of the last three thoracic somites are very broad and form the roof of a chamber, continuous with that between the pleopods, which is used for the accommodation of eggs. From the anterior margin of the third thoracic sternum a sharp spine extends forwards as far as the base of the outer maxillipedes.

The eyes are well pigmented. The lateral process from the basal joint of the antennular peduncle is rounded anteriorly. The antennal scale (fig. 14) is broad, little more than one and a half times as long as wide, and its convex outer margin terminates in a minute spine, which does not exceed the apex of the lamella. The third maxillipedes extend beyond the distal end of the scale by the ultimate joint and about one-half of the antepenultimate.

The first pair of peraeopods reaches about as far forwards as the third maxillipedes. The merus is very broad, and does not possess the small spine at the distal end of its upper margin, which occurs in most of the allied species. The second pair is comparatively stout, and reaches beyond the carpus of the first pair; the ischium is unusually short, and the fingers of the chelae, which are not curved and meet throughout their length when the claw is closed, are twice the length of the palm.

There are six gills on either side, as in the Atlantic species.

The abdomen, as will be seen from figs. 11 and 12, is rather elaborately sculptured; the third, fourth and fifth somites are carinate, the sixth bicarinate.

The endopod of the last four pairs of pleopods (fig. 13) does not possess an appendix interna; it is, however, remarkable for its length, being only a trifle shorter than the exopod. The telson

is sulcate above and very long, extending beyond the distal end of the outer uropods. In addition to two pairs of dorso-lateral spinules, there is another pair defining the outer angles of the narrow apex. Between the two latter spinules there are four long setae.

The eggs measure about ·51 × ·33 mm. in longer and shorter diameter.

The above description was drawn up from a single ovigerous female, only 9·3 mm. in length, which was obtained by the Marine Survey at S. Sentinel Island, Andamans (Regd. No. $\frac{2213}{6}$.)

Pontophilus sabsechota is one of the smallest Macrura known. It may easily be distinguished from all species hitherto described by the details of the carination and spinulation of the carapace.

The mutual affinities of *Pontophilus* and *Philocheras*.

The separation of the genera *Pontophilus* and *Philocheras* is almost an impossibility in the case of the species inhabiting Asiatic waters, and, as I have had an opportunity of examining a number of the species which occur in this region, the following notes bearing on the generic status of the forms concerned may be found useful.

In addition to those preserved in Calcutta, I have been able, thanks to the good offices of Mr. R. Etheridge, Curator of the Australian Museum, to examine the types of three very interesting species described in 1902 by Messrs. Fulton and Grant, and I have also added a few notes, which were kindly supplied me by Dr. W. T. Calman, concerning Spence Bate's *Crangon intermedius*, the only known example of which is preserved in the British Museum.

In the N. E. Atlantic the two genera may, with one important exception, be distinguished from one another by the use of the following characters:—

Pontophilus.	*Philocheras*.
Basal process of antennular peduncle sharply pointed distally.	Basal process of antennular peduncle distally truncate or rounded.
First peraeopods with small exopod.	First peraeopods without exopod.
Second peraeopods very short, not reaching to distal end of merus of first pair; chela well-formed with palm of good length; fingers concave internally, meeting only at tips.	Second peraeopods reaching at least as far as distal end of carpus of first pair; chela weak with palm very short; fingers parallel internally, meeting throughout their length.
Endopod of last four pairs of pleopods only a little shorter than exopod and with appendix interna at base.	Endopod of last four pairs of pleopods little, if at all, more than half length of exopod and without appendix interna at base.

According to my own observations, *P. spinosus* (Leach), *norvegicus* (M. Sars), *brevirostris*, Smith, *gracilis*, Smith and *abyssi*, Alcock,[1] agree in possessing the characters of *Pontophilus* as here defined, while *P. echinulatus* (M. Sars), *trispinosus* (Hailstone), *bispinosus* (Hailstone and Westwood) and *obliquus*, Fulton and Grant, are equally typical representatives[2] of *Philocheras*.

P. sabsechota, sp. nov., resembles *Philocheras*, except that the endopod of the pleopods is long, only a trifle shorter than the exopod (fig. 13).

Dr. Calman has kindly supplied me with the following information concerning the type of Spence Bate's *Crangon intermedius*,[3] which was found on the coast of S. Australia. The lateral process of the basal joint of the antennular peduncle terminates in a small point at its antero-external angle. There is no exopod at the base of the first pair of peraeopods; the second pair reaches to the end of the carpus of the first, and the dactylus is more than half the length of the propodus. The endopod of the last four pairs of pleopods does not exceed half the length of the exopod, and does not possess an appendix interna.

From this it will be seen that the species is closely allied to typical examples of *Philocheras*; it differs from them only in the shape of the basal process of the antennule, and also, if Spence Bate's figure is correct, in the form of the chela of the second peraeopods.

In the two New Zealand species, *P. australis* (Thomson) and *P. chiltoni*, sp. nov., the basal process of the antennular peduncle is sharply pointed anteriorly. There is no exopod on the first pair of peraeopods. The second pair is slender (fig. 9), and reaches to the end of the carpus of the first pair; the palm is of moderate length, but shorter than the fingers, and the latter are only very slightly curved internally. The endopod of the last pair of pleopods is scarcely half the length of the exopod, and bears a very small appendix interna (fig. 4), which is quite rudimentary on the fourth pair and entirely absent from the fifth.

These two species appear to be exactly intermediate in character between the typical examples of *Pontophilus* and *Philocheras* occurring in European waters.

P. victoriensis, Fulton and Grant,[4] resembles the New Zealand species in most of the characters just mentioned, but the palm of

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1 Alcock's statement (*Desc. Cat. Indian Deep-sea Macrura*, 1901, p. 114) that no exopod exists at the base of the first peraeopods in *P. gracilis* and *abyssi* is, I think, due to an oversight.

2 I have not at hand any examples of *P. fasciatus* (Bell); the characters of this species are, I believe, quite typical of *Philocheras*.

3 *Crangon intermedius*, Spence Bate (*nec* Stimpson), *Proc. Zool. Soc. London*, 1863, p. 503, pl. xli, fig. 6 = *Crangon batei*, Kingsley, *nom. nov.*, *Bull. Essex Inst.*, xiv, 1882, p. 129.

4 Fulton and Grant, *Proc. Roy. Soc. Victoria* (n.s.), xv, p. 65, pl. x, fig. 2.

the second peraeopods is a trifle shorter, and the appendix interna is well-developed on all the last four pairs of pleopods.

P. flindersi, Fulton and Grant,[1] is closely similar to *P. victoriensis*, but the palm of the second peraeopods is still shorter; the basal process of the antennule is, moreover, rounded anteriorly, and not pointed as in that species.

Allied to the above is the Atlantic and Mediterranean species *P. sculptus* (Bell), the characters of which are wrongly indicated in my account of the Decapoda Natantia of the coasts of Ireland.[2] Though included under *Philocheras*, this species differs from the definition of the genus, as there given, in the possession of a well-developed appendix interna on the last four pairs of pleopods. In all other respects the species bears the closest resemblance to typical *Philocheras*; it is the only form occurring in the N. E. Atlantic which shows any character of an intermediate nature.

In the table on p. 11 an attempt has been made to summarize the foregoing observations. From this it seems sufficiently clear that, failing the discovery of new characters, no basis remains for the retention of two separate genera. It is true that the species may be separated into two groups, divided by the presence or absence of the exopod on the first pair of peraeopods and by the comparative length of the second pair, but the evidence afforded by these characters cannot be reconciled with that offered by the appendix interna. The latter character appears to hold such high importance in other groups that it is impossible to ignore it in the present instance.

The genus *Aegeon*, Guérin-Méneville (= *Pontocaris*, Spence Bate), which possesses seven C-shaped branchiae is, I believe, quite distinct from the group of species dealt with in this paper. All the forms here considered appear to have only six gills,[3] the inferior apices of which are directed backwards.

Sixteen species belonging to the genus *Pontophilus* have been recorded from Asiatic waters. Nine of these have already been mentioned, and are included in the table on p. 11; the remaining seven are—

P. bidentatus (de Haan), in Siebold's *Fauna Japonica*, Crust., 1849, p. 183, pl. xlv, fig. 14. Japan.

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[1] *Ibid.*, p. 67, pl. x, fig. 3.

[2] Fisheries, Ireland, Sci. Invest., 1908, i [1910], pp. 144, 148. A feature of this species, to which I have drawn special attention, is the presence of a stout spine in the middle of the outer margin of the antennal scale. This is, I believe, found in all British specimens, but, curiously enough, is quite absent in an example from the Mediterranean preserved in the Indian Museum. I leave it to those better situated than myself as regards material to determine whether distinct species exist in these two localities. Both forms possess the appendix interna.

[3] The gill-formula of *P. intermedius* is unknown and that of the three species described by Fulton and Grant could not be determined satisfactorily owing to the poor condition of the type specimens.

Species.	Characters typical of *Pontophilus*.					Characters typical of *Philocheras*.					Distribution.
	Antennular process pointed.	Exopod on first peraeopods.	Second peraeopods short.	Endopod of pleopods long.	Appendix interna present.	Antennular process rounded or truncate.	No exopod on first peraeopods.	Second peraeopods long.	Endopod of pleopods short.	Appendix interna absent.	
1. *spinosus*	X	X	X	X	X	..	..	..	..	..	N.E. Atlantic and Mediterranean.
2. *norvegicus*	X	X	X	X	X	..	..	..	..	..	N.E. and N.W. Atlantic.
3. *brevirostris*	X	X	X	X	X	..	..	..	..	..	N.W. Atlantic.
4. *gracilis*	X	X	X	X	X	..	..	..	..	..	N.W. Atlantic and B. of Bengal.
5. *abyssi*	X	X	X	X	X	..	..	..	..	..	N.W. Atlantic and B. of Bengal.
6. *victoriensis*	X	..	..	X	X	..	X	X	..	..	Victoria.
7. *sculptus*	..	..	..	..	X	X	X	X	X	..	N.E. Atlantic and Mediterranean.
8. *flindersi*	..	..	..	..	X	X	X	X	X	..	Victoria.
9. *australis*	X	..	..	..	rud.	..	X	X	X	..	New Zealand.
10. *chiltoni*	X	..	..	..	rud.	..	X	X	X	..	New Zealand.
11. *intermedius* ..	X	..	..	..	..	..	X	X	X	X	South Australia.
12. *sabsechota*	..	..	..	X	..	X	X	X	..	X	Andaman Islands.
13. *obliquus*	..	..	..	..	..	X	X	X	X	X	Victoria.
14. *bispinosus*	..	..	..	..	..	X	X	X	X	X	N.E. Atlantic and Azores.
15. *trispinosus*	..	..	..	..	..	X	X	X	X	X	N.E. Atlantic and Mediterranean.
16. *echinulatus*	..	..	..	..	..	X	X	X	X	X	N.E. Atlantic.

P. japonicus, Doflein, *Abhandl. d. kön. bayer. Akad. Wiss.*, xxi, 1902, p. 621, pl. iii, fig. 6, and text-fig., p. 622. Japan.

P. carinicauda (Stimpson), *Proc. Acad. Nat. Sci. Philadelphia*, xii, 1860, p. 25. Hong-kong.

P. challengeri, Ortmann, *Decap. u. Schizop.-Plankton Exped.*, 1893, p. 49 = *P. gracilis*, Spence Bate (*nec* Smith), *Rep. Voy. H.M.S. "Challenger,"* xxiv, Crust. Macr., 1888, p. 487, pl. lxxxvii. Altantic: Tristan da Cunha, Cape Verde Islands; Pacific: New Zealand, near Torres Str., near Philippine Islands.

P. profundus, Spence Bate, *Rep. Voy. H.M.S. "Challenger,"* xxiv, Crust. Macr., 1888, p. 490, pl. lxxxviii, fig. 1. Off Sydney.

P. junceus, Spence Bate, *Rep. Voy. H.M.S. "Challenger,"* xxiv, Crust. Macr., 1888, p. 491, pl. lxxxviii, figs. 2—4. Between Philippine Islands and Borneo.

P. modumanuensis, Rathbun, *Bull. U. S. Fish. Comm. for* 1903, xxiii, pt. iii, 1906, p. 910, text-fig. 63. Hawaiian Islands.

There is reason to believe that the last four of these species resemble *P. spinosus* and the other typical representatives of the genus in their more important structural features.

EXPLANATION OF PLATE II.

Pontophilus australis (Thomson).

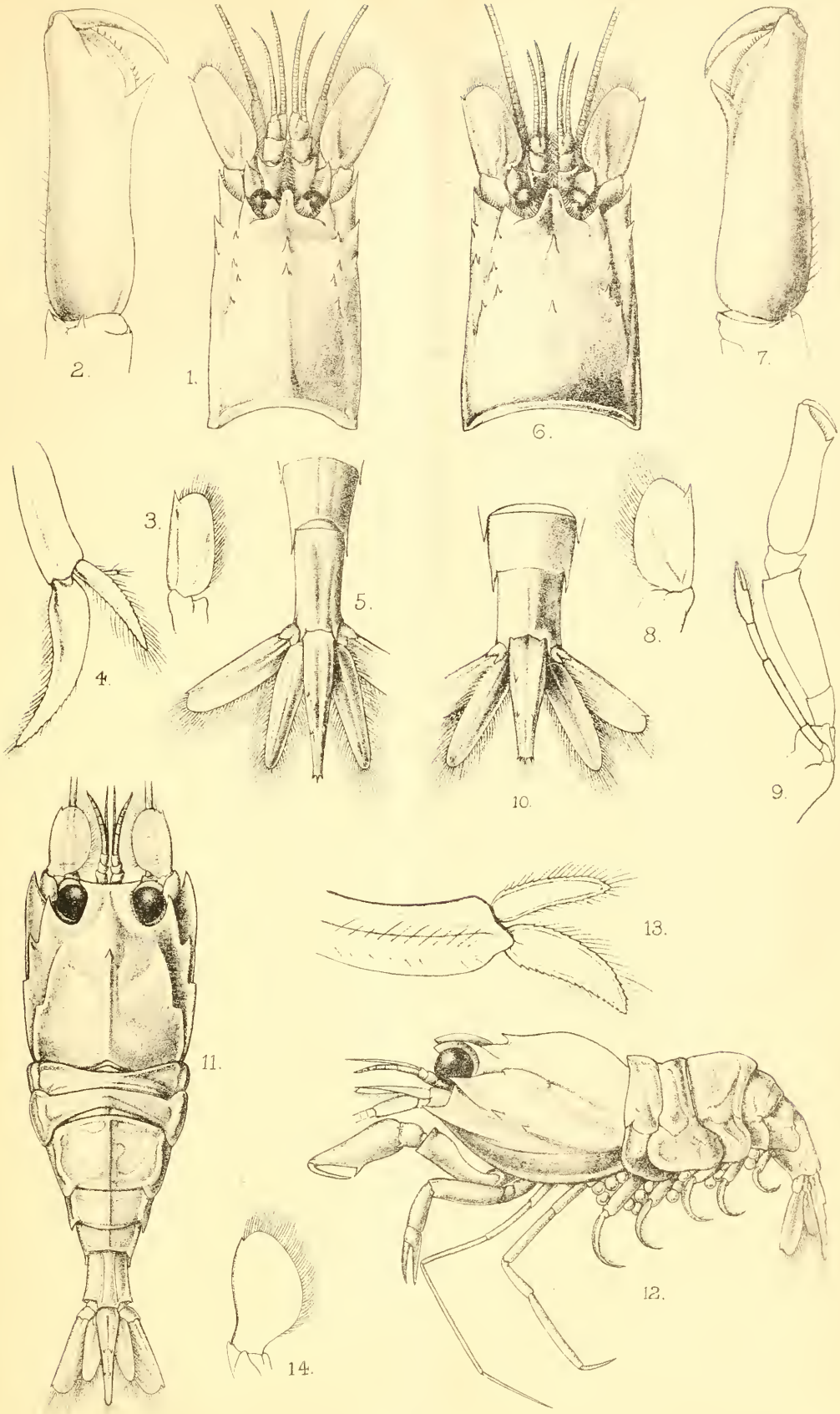
FIG. 1.—Carapace of an ovigerous female in dorsal view, ×4.
,, 2.—Propodus and dactylus of first peraeopods, ×8.
,, 3.—Antennal scale, ×4.
,, 4.—Third pleopod, ×8.
,, 5.—Last two abdominal somites and caudal appendages, ×4½.

Pontophilus chiltoni, sp. nov.

FIG. 6.—Carapace of an ovigerous female in dorsal view, ×4.
,, 7.—Propodus and dactylus of first peraeopods, ×8.
,, 8.—Antennal scale, ×4½.
,, 9.—First and second peraeopods, ×4.
,, 10.—Last two abdominal somites and caudal appendages, ×4½

Pontophilus sabsechota, sp. nov.

FIG. 11.—Dorsal view of the type specimen, ×9.
,, 12.—Lateral view of the same, ×9.
,, 13.—Third pleopod, ×30.
,, 14.—Antennal scale, ×12.



A.C. Chowdhary, del. et lith.

1-5, Pontophilus australis. 6-10, Pontophilus [illegible]

11-14, Pontophilus sabsechota.