XXXV. CRUSTACEA AMPHIPODA.

By WALTER M. TATTERSALL, *D.Sc., Keeper of the Manchester Museum.*

(Plate xxviii).

The Amphipoda collected by Mr. Stanley W. Kemp on the Abor expedition may all be referred to a single species, which, after much hesitation, I have described as new to science. They are of further interest inasmuch as they are the first semi-terrestrial Amphipoda which have ever been collected in the Indian Empire, to my knowledge. The species shows very close affinity with those described by Weber from Java and other islands of the Dutch East Indies and in particular, with *Orchestia parvispinosa* from Java.

I desire to express my thanks to Dr. Annandale and Mr. Kemp for the privilege of examining and describing these specimens.

Talorchestia kempii, sp. nov.

(Plate xxviii, figs. 1–16).

Locality of capture :

Reg. No. $\frac{8089}{10}$, Dibrugarh, N. E. Assam, November 1911, under stone, one male, adult, 8 mm.

Reg. No. $\frac{8135}{10}$, Rotung, near Sireng stream, eleven females, six adult males and six immature males, 6·5–9 mm. (coll. *M. de Courcy*).

Body smooth, without dorsal ridges of any kind; eyes of moderate size, pigment black; postero-lateral angle of the third segment of the pleon (fig. 1) quadrate, with a slightly produced point and the hind margin straight, without serrations.

First antenna with the flagellum shorter than the peduncle, three jointed.

Second antenna with the third joint of the peduncle longer than the second; flagellum about one fifth as long again as the peduncle and composed of about thirteen joints.

First gnathopod of the female (figs. 2 and 3) simple, without any appreciable palm; propodus shorter than the carpus with three or four groups of two strong spines on the inner margin, and a row of about six or seven setae on the inner face just inside the margin.

Second gnathopod of the female (figs. 4 and 5) with the usual shagreened lobes on the merus, carpus and propodus, that on the latter extending considerably beyond the short oblique palm; setae very few and short.

First gnathopod of the adult male (figs. 6 and 7) with the third joint not widening towards the distal end; merus with a well marked shagreened lobe on its hinder margin; carpus slightly longer than the propodus with a well marked produced shagreened lobe on the distal end of the hinder margin, and a few setae scattered on its inner face; the propodus widens distally to the usual rounded shagreened lobe which itself increases in width distally; the finger not covering the whole apex of the propodus; the arrangement of setae on the limb can best be seen on the figures.

In specimens which I take to be immature males, the first gnathopod has the form seen in fig. 10. It is subchelate, but the propodus is much less dilated than in the adult so that the dactylus is at least as long as, or a little longer, than the distal margin of the propodus. The shagreened lobes on the merus, carpus and propodus are also less developed than in the adult.

Second gnathopod of the adult male (figs. 8 and 9) with about seven quite small setae on the margin of the side plate; third joint widening somewhat distally; propodus broadly oval, about one and a half times as long as broad, anterior margin convex, without setae, posterior margin convex with the palm slightly oblique, not excavate, not defined by a tooth, fringed with about nine small setae and furnished with a groove or excavation into which the distal end of the finger fits; finger more than half as long as the posterior margin of the propodus, strongly curved and tapering at the end.

The second gnathopods of the immature male (fig. 11) do not differ markedly from those of the adult female.

Fifth peraeopods (fig. 12) with the second joint slightly broader than long, its anterior margin bearing six or seven spinules in addition to one long and one short spinule on the distal corner, its posterior margin well rounded and bearing about eight minute serrations, a small seta being placed in each serration; fifth joint longer than broad; fourth and fifth joints not expanded or incrassated in any way; the arrangement and number of setae on the limb are shown on the figure.

First uropods (fig. 13) with the peduncle longer than the subequal rami and bearing two rows of four spines one row on each ridge of the posterior margin; inner ramus with three lateral spines and one long, one medium and two short spines at the apex; outer ramus with two or three spines at the apex only.

Second uropods (fig. 14) with the peduncle longer than the rami and bearing four strong spines on its inner edge; inner ramus with two spines on the margin and two large and three small spines at the apex; outer ramus with two lateral spines and two large and one small spine at the apex.

Third uropods (fig. 15) with the peduncle somewhat swollen and slightly longer than the single-jointed ramus; peduncle with one large and one small spine at the centre of the lateral margin and one small spine at the outer distal corner; ramus with one large and two or three small spines at the apex.

Telson (fig. 16) triangular in shape, about as broad as long, slightly notched at the apex, a long and a short spine at the tip of each lobe of the apex, a single rather strong spine somewhat distal to the centre of each lateral margin.

Length of an adult male and female, 9 mm.

The determination of the generic position of this species has been a matter of some difficulty. The fourth joint of the palp of the maxilliped is distinctly present, but exceedingly small and cannot be called anything more than a vestige. The value of the presence or absence of this joint in the classification of the genera of the Talitridae has never been satisfactorily set forth. Stebbing (1906) separates the genus *Parorchestia* from the *Orchestia* group of genera on the ground that the fourth joint of the palp of the maxilliped is "distinct though very small, conical and having a spine on the truncate apex." In *Orchestia* the same joint is described as an "obscure rudiment." Unfortunately there does not seem to be any published figure of the maxilliped palp of *Parorchestia* and, having no material of this genus at my disposal, I have not been able to form any opinion as to the amount of difference implied in the above two descriptions. I have, therefore, decided that in the present species the fourth joint of the maxilliped palp is 'an obscure rudiment" and referred it to the *Orchestia* group of genera. In this group, consisting of *Talitrus*, *Orchestoidea*, *Orchestia* and *Talorchestia*, it seems to belong to the last genus by the combination of the characters of the first and second gnathopods in the two sexes, namely, first gnathopod simple in the female, subchelate in the male, the second gnathopod feebly chelate in the female, strongly subchelate in the male. But, among described species, *T. kempii* comes nearest to *Orchestia parvispinosa* which seems to me to be certainly congeneric with the present form. This species was placed by its describer, Weber (1892), in the genus *Orchestia* and both Stebbing (1906) and Chilton (1912), who examined specimens from the type locality, have retained it in this genus. But the figures of the first gnathopod of the female given by both Weber and Chilton, illustrate, in my opinion, a limb which can only be described as simple and, therefore, of a form which would exclude the species from the genus *Orchestia*. I propose, therefore, to transfer the species *O. parvispinosa*, Weber, to the genus *Talorchestia* and to include the present species in the same genus.

The problem is, however, still further complicated by the form of the first and second gnathopods in the specimens which I have called immature males (figs. 10 and 11). I do not know what other interpretation can be placed on these specimens though it is unfortunate that the sex of immature specimens of the Talitridae is exceedingly difficult to determine, for want of an external label in the form of copulatory organs. We know from the researches of Barrois (1887) that the males of some species, at any rate, of this group of Amphipoda, do not attain the full development of their gnathopoda till the final moults, up till which

stage they resemble more or less closely, those of the female. I, therefore, regard the present specimens as males which have not yet undergone complete metamorphosis. It will be seen from the figures that the first gnathopods of these immature specimens differ from those of the females in being subchelate instead of simple, but they have not yet attained the full subchelate form of the adult male, in that the nail more than covers the palm whereas in adult males, the nail is shorter than the palm. The shagreened lobes on the merus, carpus and propodus, moreover, are not so completely developed. The second gnathopods, on the other hand, resemble those of female specimens almost completely. The interest of these specimens lies in the fact that their gnathopods have the form characteristic of females of the genus *Orchestia*. In other words, if my interpretation of their nature is the correct one, we have here a species of *Talorchestia* in which the male passes through a female *Orchestia* stage during metamorphosis. I do not think it is a question of two species living together. All the specimens were collected together, in the same place, at the same time and agree closely in all details except in the form of the gnathopods. It does seem to me to indicate how very slender are the grounds on which certain genera of Talitridae have been instituted, and how very important it is to have a complete range of specimens before attempting to increase the number of genera. If only the immature and mature males of *T. kempii* had been collected, the species would have been referred to the genus *Orchestia*. On the other hand, if only females and mature males had been found, the species would, with equal justice, have been referred to *Talorchestia*. May not the validity of these two genera be justly questioned in the light of the present material and may not one go further and inquire how many species of either genera have been instituted on specimens of the nature of those I have interpreted as immature males?

For the rest, *T. kempii* is very closely related to *T. parvispinosa* and only differs in the rather different form of the propodus of the second gnathopod of the male and in the armature of the telson. We are indebted to Chilton (1912) for a description of the telson of *T. parvispinosa* and his figure depicts three long spines on each margin in addition to the apical spines. In *T. kempii* there is but one spine on each lateral margin, and this character is constant in all the specimens in the collection. It may be useful to indicate the position of these two species in Stebbing's key to the genus. They come at the end of the table which may therefore be extended as follows:—

18	Gnathopod 2 in the male, palm excavate near finger-hinge ...	18.	*T. novaehollandiae.*
	Gnathopod 2 in the male, palm not excavate near finger-hinge ...	19.	
19	Gnathopod 1 in the male, nail longer than the apex of the 6th joint ...	19.	*T. martensii.*
	Gnathopod 1 in the male, nail shorter than the apex of the 6th joint ...	20.	

20	Telson with three spines on the lateral margins	20.	*T. parvispinosa.*
	Telson with a single spine on the lateral margins	21.	*T. kempii.*

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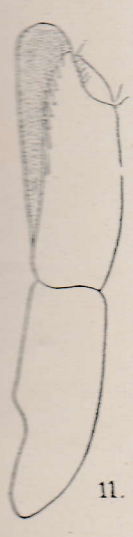
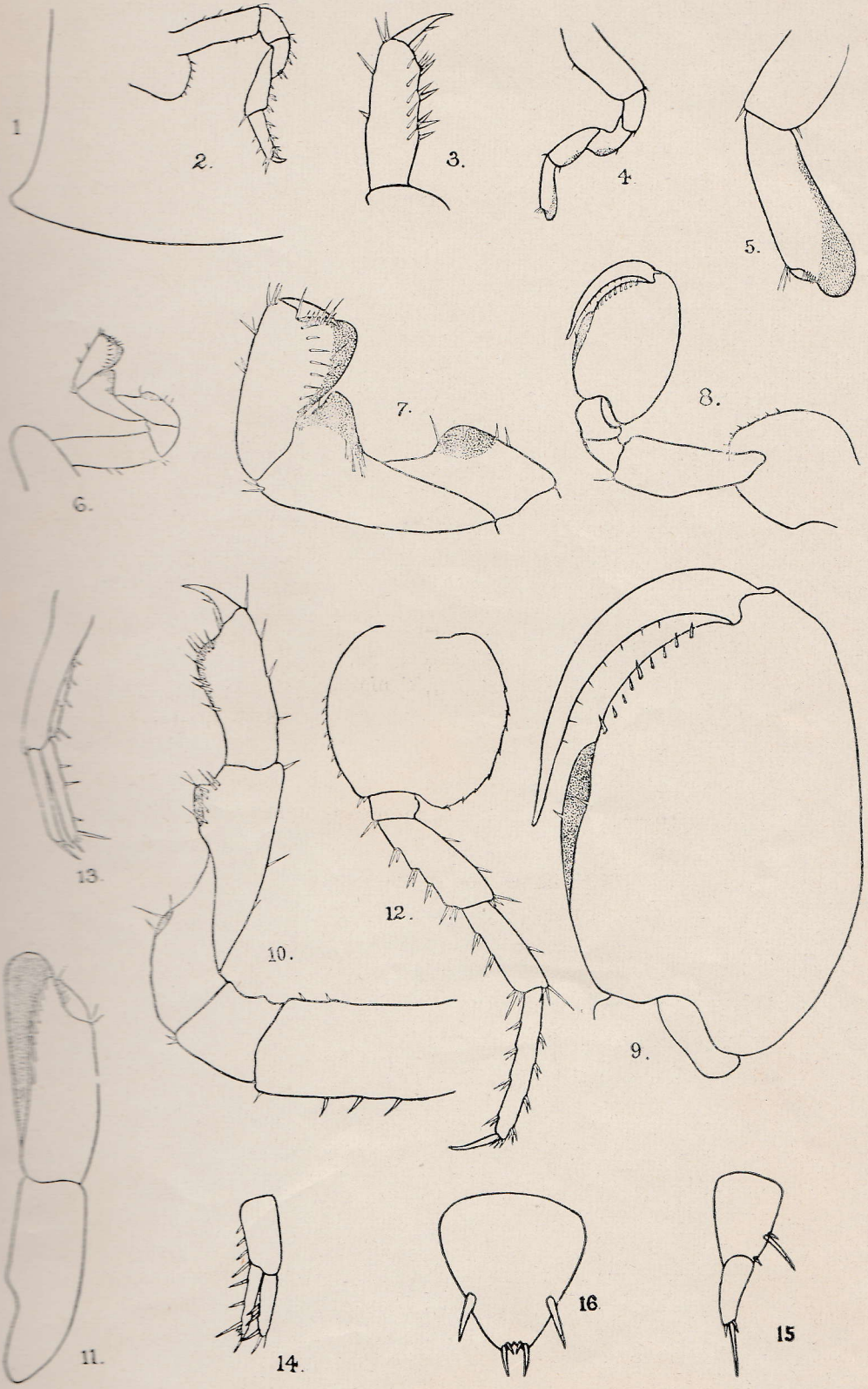
EXPLANATION OF PLATE XXVIII.

Talorchestia kempii, sp. nov.

FIG. 1.—Epimeral plate of the third segment of the pleon, ×68.
,, 2.—Gnathopod 1 of the female, ×21.
,, 3.— ,, ,, ,, ,, ,, , terminal joints, ×68.
,, 4.— ,, 2 ,, ,, ,, ×21.
,, 5.— ,, 2 ,, ,, ,, , terminal joints, ×68.
,, 6.— ,, 1 ,, ,, male, ×21.
,, 7.— ,, 1 ,, ,, ,, , terminal joints, ×68.
,, 8.— ,, 2 ,, ,, ,, ×21.
,, 9.— ,, ,, ,, ,, ,, , terminal joints, ×68.
,, 10.— ,, 1 ,, of immature male, ×68.
,, 11.— ,, 2 ,, ,, ,, , terminal joints, ×68.
,, 12.—Fifth peraeopod of the female, ×21.
,, 13.—First uropod, ×21.
,, 14.—Second uropod, ×21.
,, 15.—Third uropod, ×68.
,, 16.—Telson, ×68.





TALORCHESTIA KEMPII, sp. nov.

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