FRESHWATER AMPHIPODA FROM THE ANDAMAN ISLES.

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In January 1924 I received from the late Dr. Annandale a small collection of freshwater amphipods which he had collected in the Andaman Islands, with a request that I would work them out for a projected work on the freshwater fauna of these islands, which he was contemplating. Only two species were found in the collection, but one of these is of considerable interest, representing a new genus and species which I wish to dedicate to the memory of the late Director of the Zoological Survey of India, whose magnificent work on the fauna of fresh and brackish water in Asia has done so much to extend our knowledge of this unexplored field of work.

Family TALITRIDÆ.

Genus **Talorchestia** Dana.

? **Talorchestia malayensis** Tattersall.

T. malayensis, Tattersall, 1922, p. 453, pl. xxi, figs. 11-20.

Localities.—S. Andamans, December 1923, Dr. Annandale.

(*a*) Mount Harriet, 500-800 ft., among matted rootlets of trees growing over rocks covered by a thin trickle of water, in a jungle stream, several specimens.

(*b*) West slopes of Mount Harriet, 500 ft., edge of a rocky pool below waterfall in dense jungle, one specimen.

(*c*) Mount Harriet, 500 ft., among dead leaves at edge of small jungle stream, several specimens.

Remarks.—These specimens differ from the types in having fewer serrations on the hind margin of the second joint of pereiopod 5, only 19 teeth instead of 29-30, and in having more spinules on the uropods generally. They agree with *T malayensis* rather than with *T kempii* or *T parvispinosa* in the form of the telson and for the moment I refer them provisionally to the first named species.

Family GAMMARIDÆ.

Genus **Paraniphargus,** nov.

Body compressed, smooth, eyes absent. First antenna longer than the second, with a rudimentary (small) accessory flagellum. Peduncle of the second antenna not unduly elongate, flagellum short. Anterior margin of the upper lip convex. Lower lips with the inner lobes well developed. Mandibles with the cutting edge and molar process well developed, palp short, slender and feebly armed. Inner lobe of the first maxilla not expanded, armed with three setæ at the apex, palp two-jointed, apex

armed with a few feeble setæ. Second gnathopods larger than the first. Last three thoracic limbs of subequal size, basal joint expanded. Uropods one and two well developed with the rami subequal. Uropod three longer than uropods one and two, inner branch rudimentary and scale-like, outer branch one-jointed. Telson cleft to the base.

This genus is closely related to the *Niphargus* group of genera but differs from hitherto described forms in points which appear, in the present state of our knowledge, to be of generic value.

It differs from *Niphargus* in having the gnathopods unequal in size and the outer ramus of the third uropods one-jointed. Chilton (1923 (1)), however, has recently described a species of *Niphargus* from India, *N. indicus*, in which the third uropods are one-jointed but the gnathopods are more or less subequal in development.

On the other hand, Chilton has described three species of *Niphargus*, *N. chilkensis*, *N. philippensis*, and *N. australiensis*, in which the second gnathopods are larger than the first and differ from them considerably in shape. The outer ramus of the third uropod is, however, at least in the first two species, two-jointed and of the typical *Niphargus* form. Chilton does not describe the uropods of *N. australiensis*.

Paraniphargus differs from *Neoniphargus* by the absence of eyes and by the unequal development of the gnathopods, and from *Niphargopis*, Chevreux (1922), by the form of the first maxilla and by the single-jointed outer ramus of the third uropod. In *Niphargopsis* the inner lobe of the first maxilla is armed with one seta and the outer lobe is very broad with eleven pectinate and twenty-six simple spines.

In *Pseudoniphargus* Chevreux (1901), the outer ramus of the third uropods is one-jointed but in the male the whole appendage is greatly elongated and simulates the true *Niphargus* type. But this genus may be distinguished from *Paraniphargus* at once by the telson which in *Pseudoniphargus* is almost entire with a shallow emargination at the apex whereas in *Paraniphargus* it is cleft to the base into two distinct halves.

Paraniphargus shows no kind of affinity with *Bathyonyx* (Vejdovsky, 1905) another freshwater Amphipod, found in Ireland, and obscurely related to the *Niphargus* group.

It may be distinguished at once from the *Crangonyx* group of genera by the telson, which is entire or but slightly cleft in the latter group and cleft to the base in *Paraniphargus*.

Paraniphargus annandalei, sp. nov.

(Figs. 1-13.)

Body delicate, fragile and compressed, no trace of colour in preserved specimens.

Head equal in length to the first two free thoracic somites, lateral lobes slightly produced and rounded.

Eyes absent.

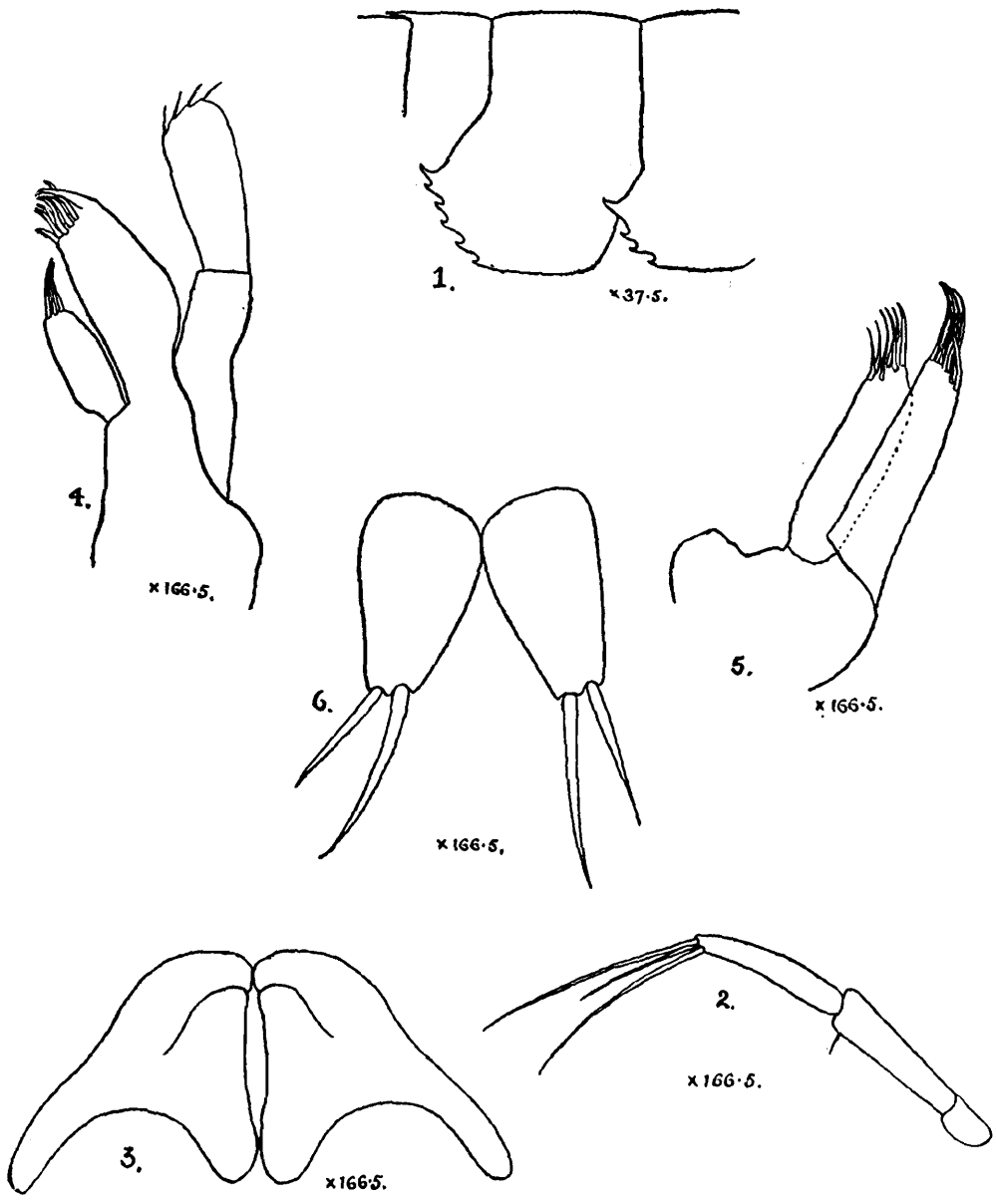
Coxal plates of the first four free thoracic somites rather deeper than their somites ; first three rectangular in shape with a few scattered setæ on the lower and hinder margins ; fourth plate (fig. 11) as wide as high,

deeply excavate on the posterior margin, produced part rounded, a few scattered setæ on the lower margin.

Fourth abdominal somite (fig. 1) produced in the mid-dorsal line to a short acute spine.

Epimeral plates of the first three abdominal somites (fig. 1) with the lower portion of the hind free margin serrate, the teeth coarse, sharp and distantly placed, 2-3 teeth on the first plate, 3-4 on the second and 4-6 on the third.

Antennules (fig. 7) about two thirds of the length of the animal, basal joint of the peduncle about equal in length to the head; second joint



TEXT-FIGURES 1-6.

Paraniphargus annandalei, gen. et sp. nov. :—Fig. 1, Epimeral plates 2 and 3 and spine on the posterior dorsal border of the fourth abdominal somite; fig. 2, mandibular palp; fig. 3, lower lip; fig. 4, first maxilla; fig. 5, second maxilla; fig. 6, telson.

FIG. 1. × 37·5. FIGS. 2-6. × 166·5.

of the peduncle slightly longer than the first and one and a half times as long as the third; flagellum longer than the peduncle, composed of

15-17 joints ; accessory flagellum hardly as long as the first joint of the main flagellum, two-jointed, second joint minute.

Antennae (fig. 8) shorter than the antennules; peduncle equal in length to the peduncle of the antennules, fourth and fifth joints subequal in length ; flagellum shorter than the peduncle, composed of 7-9 joints.

Upper lip with the free border regularly convex.

Lower lip (fig. 3) with well developed internal lobes, lateral lobes rounded, posterior projections rather narrow and bluntly pointed.

Mandible with the molar process well developed ; palp (fig. 2) short and slender and altogether feebly developed, second and third joints subequal in length, third joint armed with three long setæ at the apex, no other armature, except a single short seta on the second joint.

First maxilla (fig. 4) with the inner lobe small and narrow, with three setæ at the apex and none on either margin ; outer lobe armed with six barbed spines at the apex ; palp not longer than the outer lobe, two-jointed, second joint longer than the first with four to six feeble spinules at the apex.

Second maxilla (fig. 5) composed of two equal lobes armed with setæ at the apex but none on the margins.

Maxilliped quite normal and typical ; lobe from the second joint well developed and extending to the middle of the fifth joint ; lobe from the third joint longer and broader than that from the second, hardly extending to the distal end of fifth joint ; fifth joint larger than the sixth or seventh, latter dactyliform.

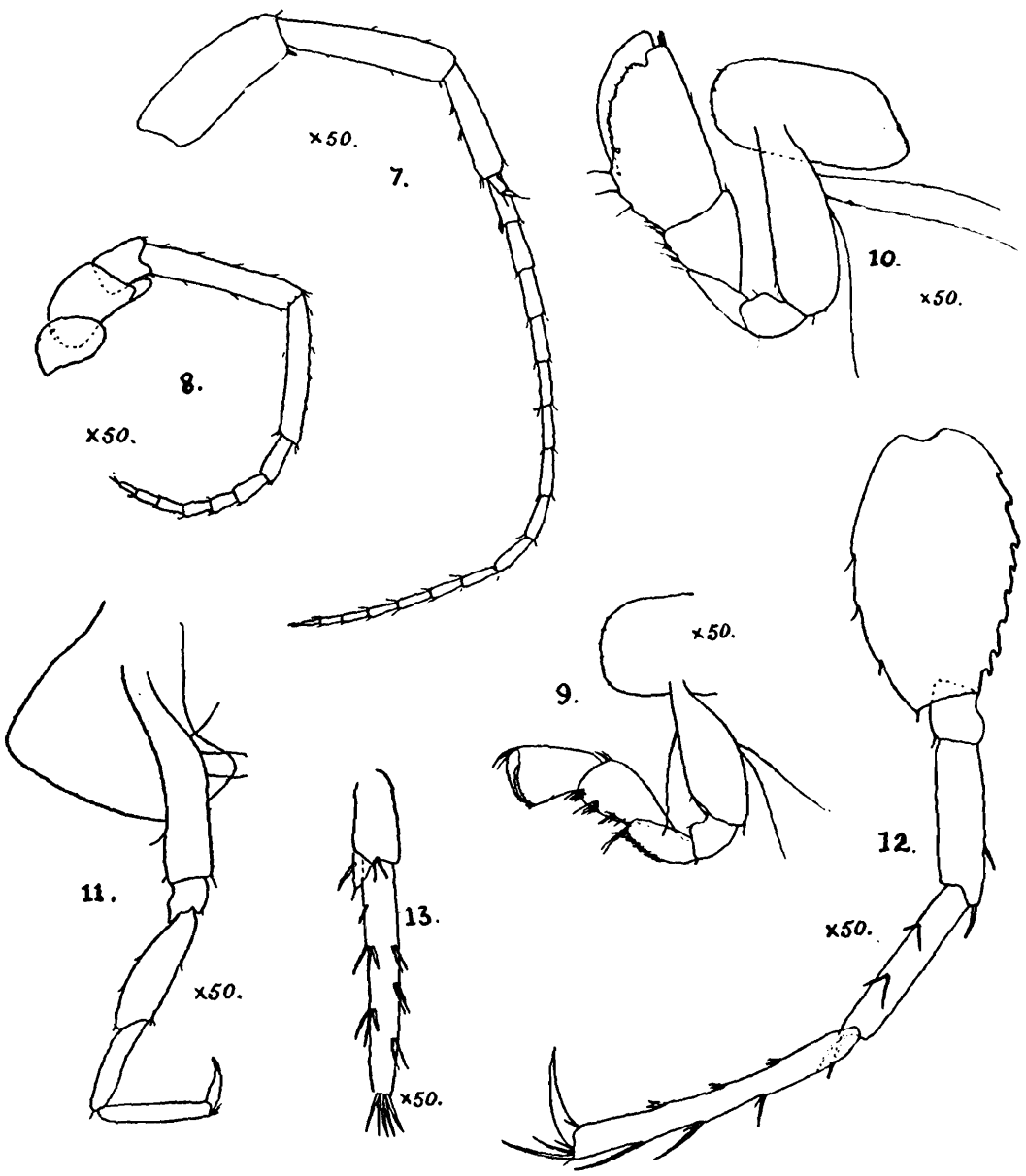
Gnathopod 1 (fig. 9) small and not greatly developed ; second joint very narrow at the point of attachment to the coxal plate, one long seta on the upper margin and two on the lower ; fourth joint with a group of four or five long spiniform setæ on the distal end of the lower (inner) margin, proximal to which are a number of short very fine setæ ; fifth (carpal) joint larger than the fourth, its inner margin armed with three groups of 5-6 setæ ; sixth (propodal) joint rhomboidal in shape, not larger than the fifth, its outer and inner margins practically straight and diverging to a truncate, straight palmar margin which is about two-thirds to three quarters as wide as the joint is long, inner angle of the palm almost a right angle and armed with one seta ; seventh joint (dactylus) recurved, equal in length to the palmar margin on which it impinges.

Gnathopod 2 (fig. 10) larger and more robust than gnathopod 1 and considerably different in shape ; second joint with a narrow attachment to the coxal plate, with three long setæ on the lower margin ; fifth (carpal) joint with three groups of setæ on the inner margin ; sixth (propodal) joint twice as long as the fifth and more robust, inner margin less than half as long as the outer so that the palmar margin is long and oblique, inner margin armed with a few short rather stout setæ, palmar margin lightly crenulate and armed with about 10-12 short fine setæ ; on the inner face of the sixth joint just inside the angle of the palm is a single short stout spine ; seventh joint (dactylus) long and slender, as long as the palmar margin.

Pereiopods 1 *and* 2 (fig. 11) (fourth and fifth thoracic limbs) similar in size and form, second joint longer than any of the others, fourth joint

as long as but wider than the sixth and both somewhat longer than the fifth; seventh joint scarcely half as long as the sixth; whole limb very feebly armed with a few scattered setæ.

Pereiopods 3-5 (fig. 12) (sixth to eighth thoracic limbs) essentially of the same form and structure, long and slender limbs, the third shorter than the fourth and fifth which are subequal in length; in all the second joint is expanded and bears 4-5 spines on the front margin, the hind margin serrate with 7-9 rather coarse teeth; the fourth joint is shorter



TEXT-FIGURES 7-13.

Paraniphargus annandalei, gen. et sp. nov.:—Fig. 7, Antennule; fig. 8, antenna; fig. 9, first gnathopod; fig. 10, second gnathopod; fig. 11, second pereiopod; fig. 12, fifth pereiopod; fig. 13, third uropod.

All × 50.

than the fifth and the fifth shorter than the sixth while the joints are successively narrower in that order and their armature consists of few setæ scattered or in small groups; the seventh joint is not more than one-third of the length of the sixth and slightly curved.

Uropod 1 with the rami shorter than the peduncle and equal in size; peduncle armed with three spines; the outer ramus with two lateral and four terminal spines, the inner with one lateral and four terminal.

Uropod 2 with the rami subequal in length to the peduncle and to each other; outer ramus with one lateral and two terminal spines, the inner with two lateral and a group of four or five terminal spines.

Uropod 3 (fig. 13) longer than either of the others; inner ramus small and scale-like and having a single seta at the apex; outer ramus nearly three times as long as the peduncle, one-jointed, with three lateral groups of spines on each margin and a terminal group of five or six spines.

Telson (fig. 6) small, cleft to the base, with two divergent lobes each armed with two apical spines.

Length of the largest specimen, 4 mm.

Locality.—S. Andaman Islands, Mount Harriet, 500-800 feet, among matted rootlets of trees growing over rocks covered by a thin trickle of water in a jungle stream, December 1923, Dr. Annandale, several specimens.

Remarks.—The generic position of this interesting species has already been discussed. It approaches most nearly to *Niphargus indicus* among described forms but can be distinguished from that species by the spine on the fourth abdominal somite, the serrated epimeral plates of the first three abdominal somites and the very different form of the gnathopods. It is an extremely interesting open water form which, in its fragility and absence of colour and eyes, resembles those species which are characteristic of wells and underground waters generally.

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