females, some bearing eggs. The length of the carapace varied from 12 to 20 mm., and there was no correspondence between the size of the individuals and the number of joints in their antennæ.

No two of the abnormal antennæ were exactly alike. Thanks to the excellent diagnoses given by de Man (*loc. cit.*) for the *testudinarius*-group of *Remipes*, I have been able to satisfy myself that all the above specimens, including the first-mentioned with three-jointed flagella on both the second antennæ, were true *R. pacificus*.

On Plate XXXVI. fig. 3*a* represents a normal second antenna in this species; figs. 3*b-i* show the abnormal specimens in the order in which I have alluded to them.

Twenty-nine males and eleven females from Funafuti; eighteen males and fifty-eight females from Rotuma.

EXPLANATION OF PLATE XXXVI.

Fig. 1. *Petrolisthes lamarcki* (Leach), $\times 1\frac{1}{2}$, p. 464.

1*a*. " " " right third leg.

1*b*. " " var. *asiaticus* (Leach), right third leg, p. 467.

2. " " var. *fimbriatus*, nov., $\times 3$, p. 467.

3*a-i*. *Remipes pacificus*, Dana, second antennæ, $\times 7$, p. 467.

a, normal form; *b-i*, abnormal.

b-g, right antennæ; *h* & *i*, left antennæ.

a-h, ♀; *i*, ♂.

NOTE.—Errata in Part I. of this paper:—On pp. 33, l. 30, and 37, l. 4, for "Blanche Bay, Loyalty Islands," read "Blanche Bay, New Britain." On p. 34, l. 25, omit "smooth."

2. Report on the Gephyrean Worms collected by Mr. J. Stanley Gardiner at Rotuma and Funafuti. By ARTHUR E. SHIPLEY, F.Z.S., Fellow and Tutor of Christ's College, Cambridge, and University Lecturer in the Advanced Morphology of the Invertebrata.

[Received May 13, 1898.]

(Plate XXXVII.)

The Gephyrea collected by Mr. J. Stanley Gardiner during his visits to Rotuma and Funafuti in the years 1896–97 comprise specimens of two species of the Echiuroidea and twelve of the Sipunculoidea. Of the latter, two species of *Sipunculus* are in my opinion new, whilst a third, *Physcosoma*¹ *varians* Kef., is, so far as I know, recorded for the first time from the Pacific.

In nearly all the cases where species are common to the two localities, the specimens from Funafuti were considerably smaller than those from Rotuma.

¹ The reason for adopting the generic name *Physcosoma* in place of *Phymosoma* (*Phymosomum* Quatrefages) is given by Selenka in the Zool. Anz. Band xx. No. 546, 1897, p. 460.

Edwin Wilson, Cambridge.

MACRURA ANOMALA FROM THE SOUTH PACIFIC.

1. *SIPUNCULUS VASTUS* Sel. & Bülow.

One specimen from Rotuma, numerous smaller specimens from Funafuti.

In the analytical key in Selenka's "Sipunculiden"¹ the number of longitudinal muscles in this species is given as 31, but in the description of the species the number is 27. In the present specimens the number varies from 25 to 27 in different regions of the body, neighbouring bands sometimes, though not very often, fusing with one another. The characteristic diverticula on the hind-gut are well marked.

The numerous specimens from Funafuti are all comparatively small, being about 5-7 cm. in length; the single example from Rotuma measured 16 cm. in length with its introvert retracted. Mr. Gardiner reports that this species is extremely common on the outer reef under the loosely cemented masses of rock.

Besides the specimens from Rotuma and Funafuti, the species is also recorded from Jaluit and Mauritius.

2. *SIPUNCULUS ROTUMANUS*, n. sp. (Plate XXXVII. figs. 1, 2, & 3.)

Eight specimens from Rotuma.

This species is closely allied to *S. cumanensis* Kef. and *S. edulis* (?) Lamarck. It, however, differs from them in having but 14 longitudinal muscle-strands instead of 21. It is perhaps more closely allied to *S. cumanensis*, but it has no dissepiments and no diverticulum of the alimentary canal.

This species is very long and slender. The largest specimens are between 21 and 22 cm. in length when fully extended, and vary from 1 cm. to 1.5 in breadth. Of this the introvert forms perhaps $\frac{1}{6}$. The skin is glistening grey, with certain blackish papillæ scattered over the surface (fig. 3); these, however, become closely and regularly arranged in rows on the proboscis. The cuticle has in many places separated from the underlying skin. The circular muscles are in rings with very numerous anastomoses. The head has numerous (some 40-60) short pointed tentacles which surround the excentrically placed mouth (fig. 1). The external opening of the anus is conspicuous (fig. 2), and the brown tubes open very slightly in front of it. The rectum is attached by numerous strands to the body-wall. The alimentary canal has many coils (30-40), and is not attached by any muscle-strands except at the posterior end, where there is a spindle-muscle running to the hind end of the body-wall.

The ventral retractors are very long, half as long as the body; they take their origin from the 2nd and 3rd longitudinal muscles, counting the muscle which lies next the nerve-cord as the 1st. The dorsal retractors are much shorter, not more than $\frac{2}{3}$, and some-

¹ Reisen im Archipel der Philippinen, II. Theil, iv. Band, 1 Abth. Wiesbaden, 1883.

times but $\frac{1}{2}$ as long as the ventral. They arise some distance in front of the ventral retractors. The ova are spherical.

This species is found fairly common under the thrown-up masses of coral-rock close to the edge of the reef.

3. *SIPUNCULUS FUNAFUTI*, n. sp. (Plate XXXVII. figs. 4 & 5.)

Numerous specimens from Funafuti.

These forms are from 5–8 cm. long, and 5 cm. broad; they taper at the posterior end into a sharp tail (fig. 4). All the specimens were limp and flabby when placed in my hands, but when immersed in water they became plump and regained their form. They are silvery white in colour and rather transparent. With one exception (fig. 4) the introvert is retracted, but this exception shows the circle of tentacles surrounding the mouth. The cuticle in many cases is separate from the skin, which bears scattered papillæ (fig. 5). The number of longitudinal muscles is 14 or 15 and there are few anastomoses. The two ventral retractors arise from two longitudinal muscles some way behind the two dorsal retractors, each of which has its origin in a single muscle. There are no hooks in the introvert, but the papillæ tend to range themselves in circular rows near the mouth. The intestine has few coils, 8–12, and is free but for the spindle-muscle attached to the tip of the tail. There are no diverticula. The brown tubes are small and free, they open at the same level as the anus.

The habitat of this species is the same as that of *S. vastus*, with which it is usually found.

4. *PHYSCOSOMA NIGRESCENS* Kef.

Several examples from Funafuti. The species extends through the Pacific and Indian Oceans to the Red Sea.

The members of this species and of the three following are found under the loosely massed rocks of the outer reefs, and also in tubes excavated in solid coral-rock.

5. *PHYSCOSOMA PACIFICUM* Kef. (Plate XXXVII. fig. 6.)

One specimen from Rotuma and numerous specimens from Funafuti. This species has previously been described from the Pacific and Indian Oceans and from the Red Sea.

The Rotuma specimen was without its head, and although the introvert was not fully extended it attained a length of 16 cm., considerably longer than any of the Funafuti specimens (fig. 6). The posterior sixth of the same specimen was curiously narrowed by the contraction of the circular muscles, so that a sort of tail, which bristles with the closely compressed papillæ, is formed. The brown tubes extend into this portion, which is traversed by the spindle-muscle, but the intestine does not extend into it.

6. *PHYSCOSOMA SCOLOPS* Sel. & de Man.

Several specimens of varying size, all with their introvert retracted, from Funafuti. This species also occurs at Singapore, the Philippines, and in the Red Sea.

7. *PHYSCOSOMA VARIANS* Kef.

One specimen from Funafuti. Selenka describes this species from several centres in the West Atlantic, but I have met with no mention of its occurrence in the Pacific Ocean.

8. *PHYSCOSOMA MICRODONTOTON* Sluit.¹ (Plate XXXVII. fig. 7.)

Several specimens from Funafuti and Rotuma.

Mr. Gardiner's specimens agree well with Sluiter's diagnosis of this species, except in the matter of size. Several of them are over 5 cm. in length, whereas Sluiter gives 1.5 cm. for the length of his Malayan forms; but as no reproductive organs were observed in his specimens, it is possible that they were immature forms. The gonads are very visible in the forms at my disposal at the base of the ventral muscles. In all other respects these specimens agreed with Sluiter's description.

9. *PHYSCOSOMA DENTIGERUM* Sel. & de Man.

Many specimens from Funafuti and Rotuma.

The species is very characteristic and easy to recognize from its large papillæ confined to the back of the introvert and trunk, and from its coloration. Selenka records it from the Philippines.

10. *ASPIDOSIPHON ELEGANS* Cham. & Eysenh. (Plate XXXVII. fig. 8.)

Seven specimens from Funafuti. Previously described from the Pacific, Philippines, and the Red Sea. Both this and the next named species were found in tubes bored in the dead coral of the reef.

11. *ASPIDOSIPHON KLUNZINGERI* Sel. & Bülow. (Plate XXXVII. fig. 9.)

One specimen from Funafuti. Previously described from Koseir.

The specimen had been injured and the alimentary canal and brown tubes protruded from a hole in the body-wall, and were broken: consequently it was impossible to see some of the characteristic features of this species. The shape of both anterior and posterior shields, the position and structure of the retractors, the number and shape of the longitudinal muscles left, however, little doubt that the specimen belonged to the species *A. klunzingeri* Sel. & Bülow.

12. *CLÆOSIPHON ASPERGILLUM* Quatr. (Plate XXXVII. fig. 10.)

One specimen from Funafuti. Previously described from numerous localities in the Indian and Pacific Oceans.

The specimen is about 6 cm. in length, apparently a medium size, as those described by Sluiter² varied from 3.5 cm. to 7.5 cm.

¹ Beitr. z. d. Kenntniss der Gephyreen, IV. Mitth., Natuurk. Tijdschr. Nederl. Ind., Bd. xliii.

² Natuurk. Tijdschr. Nederl. Ind., Bd. xliii. p. 26.

Shipley, A. E. 1898. "Report on the Gephyrean Worms collected by Mr. J. Stanley Gardiner at Rotuma and Funafuti." *Proceedings of the Zoological Society of London* 1898, 468–473.

<https://doi.org/10.1111/j.1096-3642.1898.tb03167.x>.

View This Item Online: <https://www.biodiversitylibrary.org/item/97095>

DOI: <https://doi.org/10.1111/j.1096-3642.1898.tb03167.x>

Permalink: <https://www.biodiversitylibrary.org/partpdf/72651>

Holding Institution

Natural History Museum Library, London

Sponsored by

Natural History Museum Library, London

Copyright & Reuse

Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.