

## On a Collection of Polychaeta in the Raffles Museum, Singapore

By C. C. A. MONRO, M. A.

(with 12 text-figures)

(Published by permission of the Trustees of the British Museum)

This report was made at the request of the authorities of the Raffles Museum, who very kindly entrusted me with their collection of *Polychaeta*. The great majority of the specimens are from the neighbourhood of Singapore; a few are from the Malay Archipelago and the China Sea.

There are no new species or varieties. I have however been able to give an account of the heteronereids of *Perinereis singaporiensis*, *Perinereis nancaurica* and *Perinereis cultrifera*, var. *perspicillata*, all of which are new to science. Moreover I have extended the range of *Pseudonereis variegata* from the Atlantic to the Indian Ocean.

### LIST OF SPECIES

#### Amphinomidae

- Chloicia flava* (Pallas).  
*Chloicia flava*, var. *tumida* Baird.  
*Eurythoe complanata* (Pallas).

#### Polynoidae

- Iphione muricata* (Savigny).

#### Phyllodocidae

- Eulalia magalhaensis* Kinberg.  
*Phyllodoce quadraticeps* Grube.

#### Nereidae

- Perinereis singaporiensis* Grube.  
*Perinereis nancaurica* (Ehlers).  
*Perinereis nuntia* var. *brevicirris* Grube.  
*Perinereis cultrifera* var. *perspicillata* Grube.  
*Pseudonereis variegata* (Grube).  
*Leonnates jousseaumei* Gravier.

#### Eunicidae

- Eunice aphroditois* (Pallas).  
*Marphysa mossambica* Peters.  
*Lysidice collaris* Grube.

#### Sabellidae

- Sabellastarte indica* (Savigny).

## EXPLANATION OF THE FIGURES

- I. *Perinereis singaporiensis*.
  - A. Twentieth foot.
  - B. Sixth foot of epitocous male.
  - C. Modified foot of epitocous male.
2. *Perinereis nancaurica*.
  - A. Head and proboscis from above.
  - B. Head and proboscis from below.
  - C. Twentieth foot.
  - D. Posterior foot.
  - E. Third foot of epitocous male.
  - F. Modified foot of epitocous male.
3. *Perinereis cultrifera* var. *perspicillata*.
  - A. Modified foot of epitocous male.
  - B. Modified foot of epitocous female.
4. *Leonnates jousseumei*.
  - A. Anterior foot.

## THE COLLECTION

## Family Amphinomidae

*Chloeia flava* (Pallas).

McIntosh, 1885, p. 8, pl. III, figs. 1-3 and pl. IA, figs. 7-9.

Fauvel, 1917, p. 190.

Monro, 1924, p. 71.

*Occurrence*:—"Pulau Sambu, near Singapore and Tanjong Rhu, Singapore, 1896." (1). ✓

*Remarks*:—The bottle with the above locality-label contained this specimen and three colourless examples of *Chloeia*. I am unable to say from which of the two places referred to the present specimen was collected. It measures 83 mm. by 18 mm. at the widest part without the feet. The tips of the bristles are tinged with yellow and there is a row of median dorsal purple spots. Both in this specimen and in the colourless examples the lateral spur of the serrated dorsal bristles appears to be smaller and less distinct behind about the 15th chaetiger than it is more anteriorly.

*Chloeia flava*, var. *tumida* Baird.

*Chloeia tumida*, Baird, 1868, p. 232, pl. IV, fig. 7a-d.

Fauvel, 1917, p. 191.

*Occurrence*:—Pulau Sambu, near Singapore and Tanjong Rhu, Singapore, 1896. (3). ✓

Singapore, 1906. (1). ✓

*Remarks*:—All these specimens are colourless. The largest measures 110 mm. by 15 mm. at the widest part without the feet. The one marked Singapore, 1906 is pale brown and the remainder are a milk-white. I have examined Baird's type and in my opinion the subterminal enlargement of the dorsal bristles recorded by Baird and Fauvel is an artifact. It may be present or absent from bristles of the same foot. On the other hand I am inclined to believe that the absence of colour is a character of the animal in life and is not due to fading and the action of the preservative. The British Museum collection contains a number of examples of *C. flava* which have been preserved in spirit for more than fifty years and still retain their purple markings. It would of course be more satisfactory if we had collector's notes on the colour of these animals in life. Moreover if my assumption that we are dealing with a colourless variety of *C. flava* is true, I do not know whether they constitute a local race or if their occurrence is sporadic and they should be classed as a form.

*Eurythoe complanata* (Pallas).

*Eurythoe alcyonia*, Gravier, 1901, pp. 248-254, pl. 9, figs. 140-143; pl. 10, figs. 144-146.

*Occurrence*:—Pulau Renggis near Blakang Mati, Singapore, 29.9.30. (1). ✓ 13.10.30. (6). ✓

## Family Polynoidae

*Iphione muricata* (Savigny).

Gravier, 1901, p. 226, pl. 9, figs. 129 and 130.

*Occurrence*:—Pulau Renggis near Blakang Mati, Singapore, 13.10.30. (1). ✓

Suitan Shoal Light House. (1). ✓

*Remarks*:—I think that the specimens from New Caledonia described by Pruvot (1930, p. 3) as belonging to this species are probably examples of *I. ovata* Kinberg, for Pruvot writes:—"Les bords (des élytres) sont entièrement dépourvus de franges".

## Family Phyllodocidae

*Eulalia magalhaensis* Kinberg.

Fauvel, 1919, p. 364, fig. 3, with synonymy.

*Occurrence*:—Telok Berhala, Pulau Aor, China Sea.  $3^{\circ} 19'$  N.,  $103^{\circ} 41'$  E.

*Remarks*:—A single specimen measuring 80 mm. by 2 mm. The colour is dark green with a pale transverse band across the middle of each segment. The ventral cirrus of the second segment is compressed but not bordered. There is only one specimen and I have not been able to ascertain the distribution of the bristles and acicula in the tentacular segments. The latter are distinctly separated.

With the material at my disposal I have no means of judging whether Fauvel is justified in uniting the tropical *Eulalia tenax* Grube, with which *Pterocirrus ceylonicus* Michaelsen is probably identical, with the southern and Antarctic *E. magalhaensis*. Both Bergstrom and Augener regard them as distinct.

I have compared the present specimen with some examples of Kinberg's species from South Georgia. The latter are a more or less uniform brown in colour and lack the light transverse segmental band. Moreover they have cream-coloured probosces, whereas the proboscis of the example from the China Sea is dark green. Furthermore the head and especially the eyes of the tropical specimen are relatively smaller than those of the examples from South Georgia. In the shape and arrangement of the tentacular cirri, of the feet and of the bristles they are very similar. On the crucial question of the tentacular formula in the two forms I can throw no light.

*Phyllococe quadraticeps* Grube.

Gravier, 1900, p. 198, pl. X, figs. 22—24. Text figs. 56—60.

Fauvel, 1930, p. 511.

*Occurrence*:—Sipora Island, off West Sumatra; (10) ✓

*Remarks*:—The average measurements of these specimens is about 240 mm. by 2 mm. The species has a wide Indo-Pacific distribution.

## Family Nereidae

*Perihereis singaporensis* Grube.

Pruvot, 1930, p. 55, pl. III, figs 62—64. Textfig. 5.

*Occurrence*:—Pulau Renggis, near Blakang Mati, Singapore. 29.9.30. (1) ✗ 13.10.30. (11) ✓

*Remarks*:—Pruvot has given a careful account of this species. The average size is about 80 mm. by 3 mm. at the widest part without the feet. In some of the specimens the colouring has not completely disappeared. The back in the anterior part of the body is dark grey with an almost black longitudinal median dorsal stripe. The pigment is interrupted between the segments by rather wide bands without colour. I figure a 20th foot (Fig. 1, a.) for purposes of comparison with that of the allied *P. naucaurica* (Ehlers).

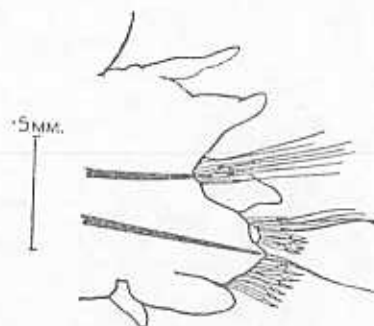


Fig. 1. a.

One specimen is beginning to show signs of sexual modification. It is a male and shows certain differences in colour. Dorsally it is colourless for about the first seven chaetigers. Then a median longitudinal dark brown stripe appears which gradually widens out so that the colour is diffused over the whole dorsal surface. At about the 15th chaetiger the dorsal stripe divides into two, thus leaving a median colourless band down the middle of the back. By about the 60th chaetiger all the pigment has disappeared.

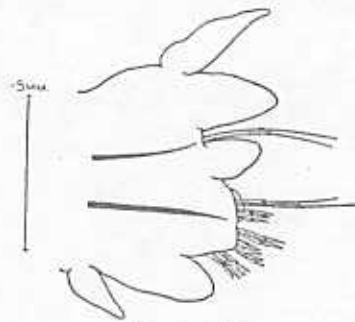


Fig. 1. b.

The cirri of the first seven chaetigers (Fig. 1, b.) are slightly thickened; from the 8th to the 19th chaetiger the feet resemble

those of the atocous form: the 20th and succeeding feet (Fig. 1c)

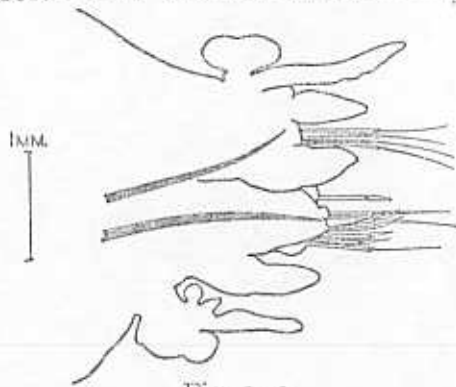


Fig. 1. c.

are modified except for the bristles. There are no swimming bristles developed. The details of the modified feet are given in the figure.

**Perinereis nancaurica** (Ehlers).

*Nereis (Perinereis) nancaurica*, Augener, 1922, p. 23.

*Occurrence*:—Pulau Renggis, near Blakang Mati, Singapore. 29.9.30. (1). 13.10.30. (9).

*Remarks*:—This species, which seems to occur together with *P. singaporiensis*, and, if the present collection is a true sample, in almost equal numbers, has an average length of about 80 mm. and a breadth of 3 mm. at the widest part excluding the feet. As in *P. singaporiensis*, there is a dark median dorsal stripe in the anterior segments, but the general pigmentation of the back is not so dark as in Grube's species, nor are the intersegmental interruptions of the colour pattern so wide. The longer of the tentacular cirri are relatively a little shorter than in *P. singaporiensis*, reaching to the second chaetiger when laid along the back, whereas in Grube's species they reach to about the 4th chaetiger. The general

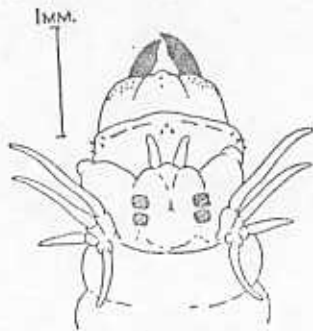


Fig. 2. a.



Fig. 2. b.

arrangement of the paragnaths (Fig. 2, a. and b.) is very similar

in the two species. In *P. nancaurica* however there are 3 paragnaths in V; there are in VII and VIII a number of very small paragnaths absent in *P. singaporiensis*, and all the paragnaths of the maxillary ring are noticeably smaller than in Grube's species. moreover there are no distinct teeth on the jaw-plates, the cutting

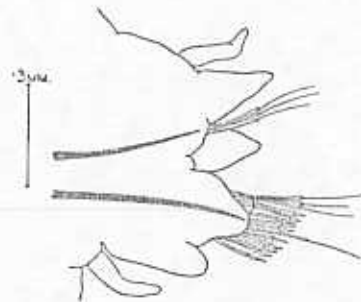


Fig. 2. c.

edges being serrated rather than denticulated. The feet (Fig. 2, c.) in the anterior and middle segments have a short dorsal cirrus of about the same length as the conical upper dorsal lamella, a lower dorsal lamella shorter than the upper, a ventral lamella which is considerably shorter than the rather prominent ventral chaeta-sac and a ventral cirrus that does not reach to the end of the ventral lamella.

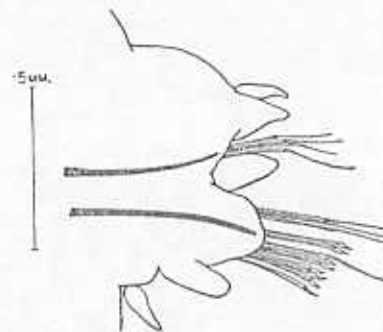


Fig. 2. d.

In the posterior feet (Fig. 2, d.) the increase in size in the upper dorsal lamella is slight and the pedal gland is seen as a small dark patch. In *P. singaporiensis* in the posterior feet the increase in size in the upper dorsal lamella is much greater and the black pedal gland is very conspicuous.

The structure and arrangement of the bristles appear to be indistinguishable from those of *P. singaporiensis*. The dorsal ramus has homogomph spinigers, the upper ventral ramus has homogomph spinigers and heterogomph falcigers, and the lower ventral ramus has heterogomph spinigers and heterogomph falcigers. The hairs of the blades of the falcigers are perhaps continued a little further up towards the apex than they are in Grube's species.

One specimen, a male, shows signs of sexual modification. For the first ten chaetigers the back is pale brown in colour; at about the 11th chaetiger a median white longitudinal stripe appears. This widens from before backwards, so that at about the 20th chaetiger the pigment is confined to a pair of dark patches in each segment above the feet. At about the 80th chaetiger the pigment

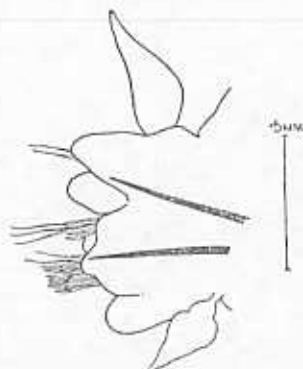


Fig. 2. e.

disappears. The cirri of the first seven chaetigers (Fig. 2, e.) are considerably thickened. The modified feet begin at the 16th chaetiger, but no swimming bristles are developed. I figure a modified foot (Fig. 2, f.).

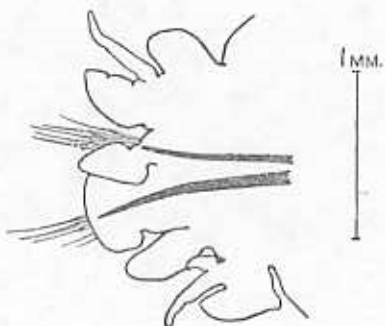


Fig. 2. f.

*Perinereis aibuhitensis* (Grube) is very close to this species, but according to Horst (1924, p. 169) there are falcigers in the notopodium. *Perinereis horsti* Gravier I am inclined to regard at the most as a variety of the present species. In a previous publication I have discussed the history of the specific name *nancaurica*.

*Perinereis nuntia* var. *brevicirris* Grube.

Fauvel, 1919, p. 417, with synonymy.

*Occurrence*:—Siglap, Singapore, 15.10.30. (13)<sup>7</sup>; Pulau Renggis, near Blakang Mati, Singapore, 29.9.30. (1)<sup>7</sup> x

*Remarks*:—I have nothing to add to Fauvel's comprehensive study of Savigny's *Perinereis nuntia* and its varieties.

*Perinereis cultrifera* var. *perspicillata*, Grube.

*Perinereis perspicillata*, Grube, 1878, p. 90, pl. IV, fig. 10.

*Occurrence*:—Telok Berhala, Pulau Aor, China Sea, 3° 19' N, 103° 41' E. (7)<sup>3</sup>; Pulau Renggis, near Blakang Mati, Singapore (4)<sup>1</sup> x

*Remarks*:—Of those species allied to *Perinereis cultrifera*, which were described by Grube from the Philippines, *P. perspicillata* is distinguished by having a triangular group of three rather large paragnaths in V and a group of 4 to 8 paragnaths in I. Fauvel (1930, p. 527) regards it as a synonym of *P. cultrifera*. A study of the epitocous forms has however led me to treat it as deserving of at least a varietal status. Of the four specimens from Pulau Renggis one is a large atocous example measuring 70 mm. by 3 mm. at the widest part for about 90 chaetigers. Of the other three two are epitocous females and one an epitocous male. The larger of the two females measures 25 mm. by 2 mm. at the widest part for about 65 chaetigers, and the epitocous male is of about the same size.

I have no suggestion to account for the fact that these smaller specimens are epitocous while the large specimen remains unmodified.

In all the epitocous specimens the pigment has largely disappeared from the head and the eyes have increased greatly in size. Moreover in the part of the body in which the feet are modified there is a pair of small round black spots in every segment above the feet.

In the male the dorsal cirri of the first six chaetigers are thickened and the epitocous feet begin at the 15th chaetiger. In addition to swimming bristles there are a few normal bristles remaining in the feet. Unfortunately the condition of the pygidium

renders it useless for purposes of comparison. I figure a modified foot, (Fig. 3, a.) which may however be somewhat distorted owing to the condition of the specimen.

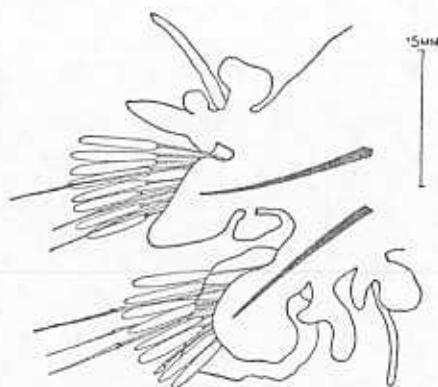


Fig. 3. a.

In the females the dorsal cirri of the first five chaetigers are thickened and the epitocous feet begin at the 18th chaetiger.

The normal bristles have disappeared. I figure a modified foot of an epitocous female (Fig. 3, b.). Here again the possibility of

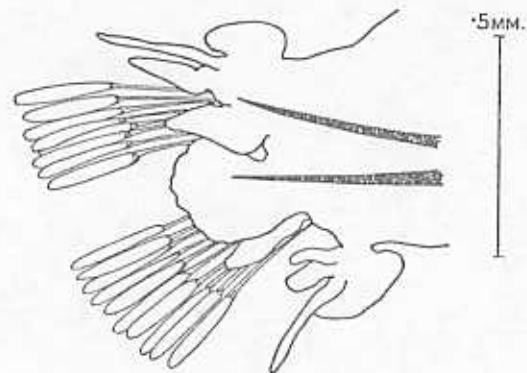


Fig. 3. b.

distortion is not eliminated, as the specimen is in bad condition. In *P. cultrifera*, in both male and female heteronereids the modified feet begin at the 19th to 20th chaetigers. I, therefore, cannot agree with Fauvel that the present form is identical with *P. cultrifera*.

*Pseudonereis variegata* (Grube).

*Nereis variegata*, Ehlers, 1901, p. 112, pl. XIV, figs. 1—21; with synonymy.

*Pseudonereis ferox* Fauvel, 1914, p. 120, pl. VII, figs. 13—17.

*Occurrence*:—Telok Teloran, Pulau Aor, China Sea. (4).<sup>2</sup>

*Remarks*:—There is nothing I can add to the numerous accounts of this well characterised species. *Pseudonereis trimaculata* Horst (1924, p. 187) is very probably a synonym of this species. My specimens however lack the black spots on the feet which he records. With the possible exception of Horst's description, I believe this to be the first record of this species from the Indian Ocean. *Pseudonereis anomala* Gravier appears to be the common Pacific representative of the genus.

*Leonnates jousseaumei* Gravier.

Gravier, 1901, pl. XI, figs. 34—37, figs. 162—165.

Fauvel, 1919, p. 400.

Horst, 1924, p. 150.

Fauvel, 1930, A, p. 18.

*Occurrence*:—Pulau Rēnggis, near Blakang Mati, Singapore. (1).<sup>2</sup> Off East Coast of Malay Peninsula. 34 fms. (1).<sup>×</sup>

*Remarks*:—The paragnaths of the maxillary ring are imperfectly corneous, and there appears to be no sulcus interrupting the bands of papillae in the mid-ventral line of the oral ring, so that these are absent from Group V only.

The notopodia of the anterior feet (Fig. 4, a.) have spinigerous bristles only, for the falcigers do not appear in the dorsal ramus before the middle of the body.

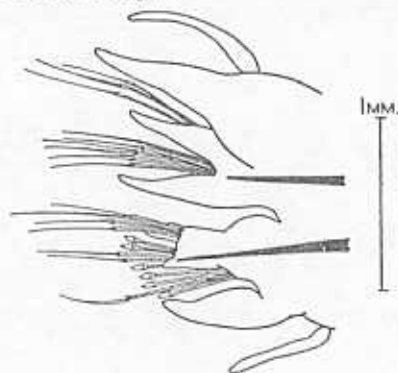


Fig. 4. a.

One of the present specimens is from the type locality of *Leonnates indicus*, Kinberg. Unfortunately Kinberg's description is insufficient for recognition.

I think it possible that both Kinberg's species and *Leonnates virgata* Grube may be identical with *L. jousseaumei*.

The chief difference between Grube's and Gravier's descriptions lies in the fact that Grube's species is figured with papillae instead of paragnaths in Group IV of the oral ring. The paragnaths of the maxillary ring are in the present specimens imperfectly corneous, and there is probably variation in the extent to which they are hardened. In other respects there is little to distinguish the two species.

#### Family Eunicidae

##### *Eunice aphroditois* (Pallas).

Fauvel, 1917, p. 215, pl. VII, with synonymy; 1930, p. 533.

*Occurrence*:—Blakang Mati, Singapore, 1896, (1); Blakang Mati, Singapore, 4.1.1897, (1); Singapore, 1897, (1).

*Remarks*:—The specimen dated 1896 is a magnificent example of this species. It measures 80 cms. by 2 cms. without the feet. The pygidium is damaged; otherwise it is complete.

The specimen dated 4-1-1897 is an anterior fragment measuring 43.5 cms. by 2 cms.

The specimen dated 1897 is much smaller and also incomplete; it measures 23 cms. by 1 cm.

These specimens illustrate Fauvel's contention that in the larger and older examples the acicular chaetae occur further back in the body than in the younger specimens.

The example measuring 80 cms. in length has about 330 chaetigers and the acicular chaetae do not appear before the 212th chaetiger. Moreover, at the 210th chaetiger a sudden change occurs in the shape of the body.

The segments appear much shorter and the whole posterior region seems greatly contracted. The last 120 chaetigers have a length of 17 cms., less than a quarter of the total length of the specimen. The contracted posterior region may be a regenerated area.

The specimen measuring 43.5 cms. in length has the acicular chaetae beginning at the 148th chaetiger. It has 212 segments in all.

The specimen measuring 23 cms. in length, has a total of 165 chaetigers and the acicular chaetae begin at the 55th chaetiger. In this specimen as in the very large example there is a sudden change in the length and degree of contraction of the segments; this occurs at the 140th chaetiger and here again may mark a regenerated area.

Nothing is to be gained by re-opening the discussion as to the relation of this species to *E. roussaei*: Fauvel has gone into this matter at length.

##### *Marphysa mossambica*, Peters.

Fauvel, 1917, p. 232, fig. 22, with synonymy.

*Occurrence*:—Jugra, Selangor, F. M. S.; 1892 (2), 1897 (2)†; Pulau Renggis, Blakang Mati, Singapore, 13-10-30. (10).<sup>7</sup>

*Remarks*:—This species is characterised by the absence of compound bristles in all but the anterior segments.

##### *Lysidice collaris*, Grube.

Fauvel, 1917, p. 236; 1930, p. 539, with synonymy.

*Occurrence*:—Pulau Renggis, near Blakang Mati, Singapore, 29-9-30. (1), 13-10-30. (5).<sup>8</sup>

#### Family Sabellidae

##### *Sabellastarte indica* (Savigny).

Fauvel, 1930, p. 555, with synonymy.

*Occurrence*:—Singapore, 1897. (1).

#### List of papers cited

- Augener, H. 1922. "Australische Polychaeten des Hamburger Zoologischen Museums." Arch. Natg. Berlin, 88, (7), pp. 1-37, 33 textfigs.
- Baird, W. 1868. "A Monograph of the *Amphinomacea*." J. Linn. Soc. Zool. London, pp. 215-246, pls. IV-VI.
- Ehlers, E. 1901. "Die Polychaeten des magellanischen and chilenischen Strandes." Festschr. Ges. Gottingen, 232 pp., 25 pls.
- Fauvel, P. 1914. "Annélides Polychètes de San Thomé (Golfe de Guinée) recueillies par M. Ch. Gravier." Arch. Zool. Paris, LIV, pp. 105-155, pls. 7 and 8.
- " 1917. "Annélides polychètes de l'Australie méridionale." Arch. Zool. Paris, LVI, pp. 159-278, pls. 4-8.
- " 1919. "Annélides Polychètes de Madagascar, de Djibouti et du Golfe Persique." Arch. Zool. Paris, LVIII, pp. 315-473, pls. 15-17.
- " 1930. "Annélides Polychètes de Nouvelle-Calédonie." Arch. Zool. Paris, LXIX, pp. 501-62, 9 textfigs.
- " 1930a. "Annelida Polychaeta of the Madras Government Museum." Bull. Madras Govt. Mus. N. S. (Nat. Hist.) I, (2), 1, pp. 1-72, 18 textfigs.
- Gravier, C. 1900. "Contribution à l'étude des Annélides Polychètes de la Mer Rouge." Nouv. Arch. Mus. Hist. Nat. Paris, (4), II, pp. 137-282, pls. 9-14; and 1901 (4), III, pp. 147-268, pls. 7-10.
- Grube, E. 1878. "Annulata Semperiana." Mem. Acad. Imp. Sci. St. Petersburg. (7), XXV, 8, 300 pp., 15 pls.

N. SMEDLEY

- Horst, R. 1924. "Polychaeta errantia." 'Siboga' Exped. Monograph XXIV C., 198 pp., 7 pls.
- McIntosh, W. C. 1885. "Report on the Annelida Polychaeta collected by H. M. S. Challenger during the years 1873—76." 'Challenger' Rep. Zool. XII, 554 pp., 94 pls.
- Monro, C. C. A. 1924. "On the Polychaeta collected by H. M. S. 'Alert', 1881—82." J. Linn. Soc. London, Zool. XXXVI, pp. 37—77, 31 textfigs.
- Pruvot, G. 1930. "Annélides polychètes de Nouvelle-Calédonie." Arch. Zool. Paris LXX, pp. 1—94, pls. 1—3.