

**MARINE COPEPODS FROM THE REPUBLIC OF MALDIVES :  
I. *SYNGASTES SPINIFER* SP. NOV. FROM BAROS ISLAND,  
NORTH MALÉ ATOLL  
(Copepoda : Harpacticoida)**

by

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**ABSTRACT**

A new copepod, *Syngastes spinifer* sp. nov. found off the coast of Baros Island, North Malé Atoll, Republic of Maldives, is described and compared with other species of the genus.

**RÉSUMÉ**

Un nouveau copépode, *Syngastes spinifer* sp. nov. de la côte de l'île de Baros, North Malé Atoll, République des Maldives, est décrit et comparé avec des autres espèces du genre.

**INTRODUCTION**

During an expedition in 1980 to the Maldives, thirteen littoral and sublittoral benthos samples, yielding a rich copepod fauna, were collected. These samples contain several species, originally described by SEWELL (1940), from the Addu Atoll. Since SEWELL'S material of the JOHN MURRAY Expedition seems to be lost, these copepods are of great systematical interest.

The first paper deals with a new species of the Tegastidae Sars, a family which at present is only poorly understood, merely due to the insufficient descriptions of some species.

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**MATERIAL**

The following list gives a brief description of the sampling-sites, at Baros Island, where *Syngastes spinifer* sp. nov. occurs. The samples were collected by Dr. J. VAN GOETHEM.

- Mal. 80/5 : Western reeftop; 14-1-1980 : many extended sand-patches, covered with algae of the genus *Halimeda* (3 ♂♂).
- Mal. 80/6 : Western reeftop; 16-1-1980 : idem (6 ♀♀, 6 ♂♂).
- Mal. 80/22 : North Beach; 19-1-1980 : sand-patches between dead coral branches at — 1 m, covered with red and green algae and algae of the genus *Halimeda* (2 ♀♀).
- Mal. 80/32 : North side, 23-1-1980 : offshore dead coral branches covered with red and green algae (3 ♂♂).
- Mal. 80/33 : North side, 23-1-1980 : idem as Mal. 80/32 but with algae of the genus *Halimeda* (3 ♂♂).

The type-material is deposited in the collections of the Recent Invertebrates Section of the « Koninklijk Belgisch Instituut voor Natuurwetenschappen » in Brussels.

#### DESCRIPTION

Locus Typicus — Republic of Maldives, North Malé Atoll : Baros Island, Western reeftop.

Holotype — an ovigerous female dissected on one slide (polyvinylalcohol medium), labelled : Mal. 80/6 Baros Island, Western reeftop 16-1-1980, nr. P2215.

Paratypes — 9 ♂♂ and 6 ♀♀ (of which 4 are ovigerous).

Derivatio nominis — Lat. : *spiniifer* refers to the spiniform setules on the modified spine of the P<sub>4</sub>.

Diagnosis — a species of the genus *Syngastes* : cephalothorax deep with rounded postero-lateral edges; genital segment extended in a foot-shaped structure; maxilliped with sharp teeth on the posterior margin; male without an extended genital segment and with a haplocer antennule.

Female (holotype) — length 465 µm : cephalothorax deep with smooth and blunt postero-lateral edges; genital somite extended in a large foot-shaped process; first and second abdominal segment separated from the genital segments by an internal, less pigmented band; abdominal segments strongly reduced. The whole integument is areolated and the, formalin preserved, specimen is reddish-brown. The brood-pouch contains four eggs, with a mean diameter of 123 µm (measurements of free eggs).

*Furcal rami* (Fig. 1 c) short, square, bearing six setae and a small external bump. *Antennule* (Fig. 2 a and 2 b) consisting of seven segments with proportional lengths as follows :

1	2	3	4	5	6	7
31	20	20	14	5	4	6 = 100

All segments furnished with non-plumose setae; an aesthetasc occurring on the fourth (118 µm) and on the ultimate segment (42 µm). *Antenna* (Fig. 2 c, 2 d and 2 e) : basis with a transversal row of small teeth on the internal surface : exopodite distinctly two-segmented, first exopodite segment with a strong seta, second armed with one strong and one slender apical seta. The endopodite is two segmented and bears four rows of fine hairs. First endopodite segment with one seta, implanted

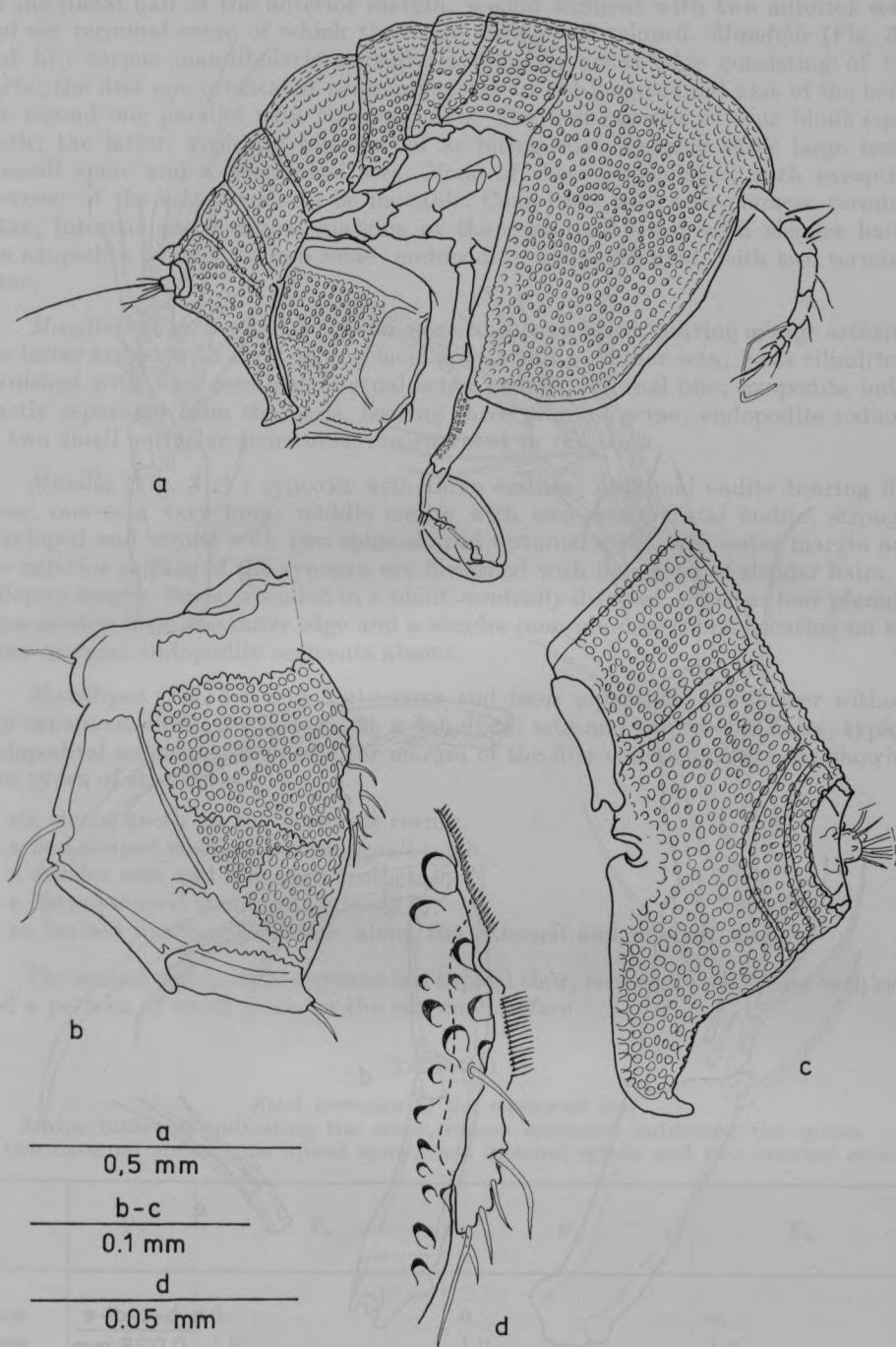


Fig. 1. — *Syngastes spinifer* sp. nov.  
Female : a, habitus; b, P<sub>5</sub>; c, abdominal segments; d, exopodite of P<sub>5</sub>.

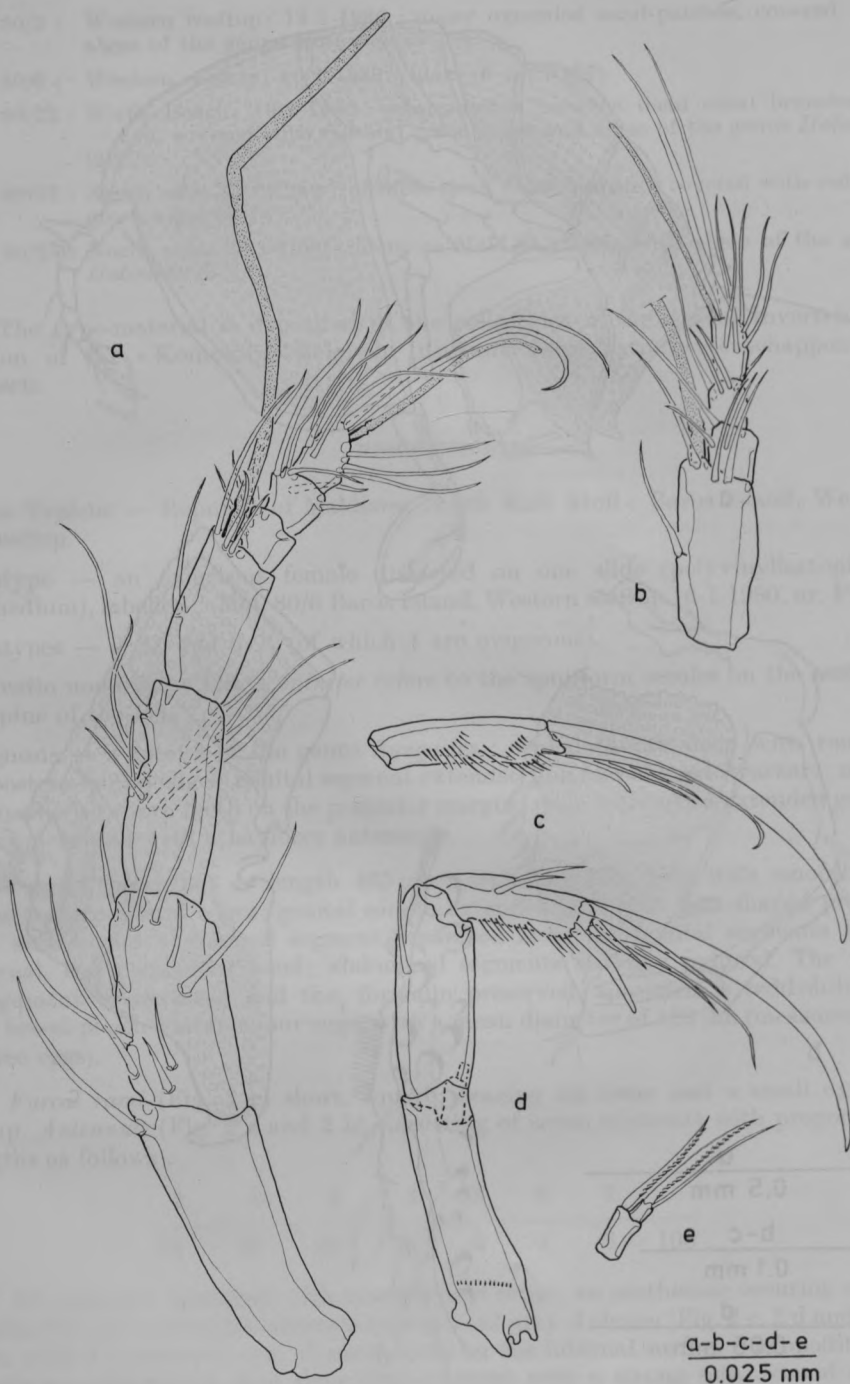


Fig. 2. — *Syngastes spinifer* sp. nov.

Female : a, antennule; b, ultimate segments of antennule;  
c, ultimate segment of antenna; d, antenna; e, exopodite of antenna.

on the distal half of the anterior margin; second segment with two anterior setae and six terminal setae of which three are strongly developed. *Mandible* (Fig. 3 a and b) : corpus mandibularis strongly developed; distal edge consisting of two parts; the first one orientated perpendicularly to the longitudinal axis of the body, the second one parallel with the body axis. The first consists of four blunt equal teeth; the latter, typically constructed as biting edge, bearing three large teeth, a small spine and a accessorial seta. None of these appendages, with exception however of the seta, seems to be movable. Coxa-basis with two plumose terminal setae; internal and external margins of the coxa-basis lined with slender hairs; the exopodite reduced to two setae; endopodite, one-segmented, with two terminal setae.

*Maxillule* (Fig. 3 e and 3 f) : pre-coxa and coxa fused, bearing a large arthrite; the latter armed with eight strong bend spines and a slender seta; basis cylindrical, furnished with four terminal internal setae and an external one; exopodite indistinctly separated from the basis, bearing three plumose setae; endopodite reduced to two small cuticular structures, incorporated in the basis.

*Maxilla* (Fig. 3 c) : syncoxa with three endites; proximal endite bearing five setae, one seta very long; middle endite with two setae; distal endite, strongly developed and armed with two spine-shaped terminal setae. The outer margin and the anterior surface of the syncoxa are furnished with four rows of slender hairs, of different length. Basis extended in a blunt, ventrally directed, process; four plumose setae arising from the outer edge and a slender (non-plumose?) one occuring on the inner margin; endopodite segments absent.

*Maxilliped* (Fig. 3 d and 3 g) : coxa and basis separated; the former without any ornamentations, the latter with a sub-distal seta and two rows of hairs; typical endopodital segments; the posterior margin of the first endopoditesegment showing four types of structures :

- 1) six strong teeth on the posterior corner,
- 2) a bud-shaped cushion bearing small teeth,  
a slender seta and a spongy aesthetasc,
- 3) a funnel-shaped structure and
- 4) an incised hyaline membrane along the external and internal margin.

The second endopodital segment is a typical claw, bearing two setae on each side and a pattern of small teeth on the external surface.

TABLE 1

*Setal formulae of the natatorial legs*

Arabic numerals indicating the setae, roman numerals indicating the spines.  
(\* two external spines, one apical spine, two internal spines and two internal setae).

	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>
Coxa	0.	0.	0.	0.
Basis	1.1.	1.0.	1.0.	1.0.
Exo	3.1.1.	II.2. — II.I.3.	II.2. — II.I.4.	1.0. — I.1. — 7. (*)
Endo	2.1.3.	0.1. — 0.2. — II.I.2.	0.1. — 0.2. — II.I.3.	0.1. — II.1.

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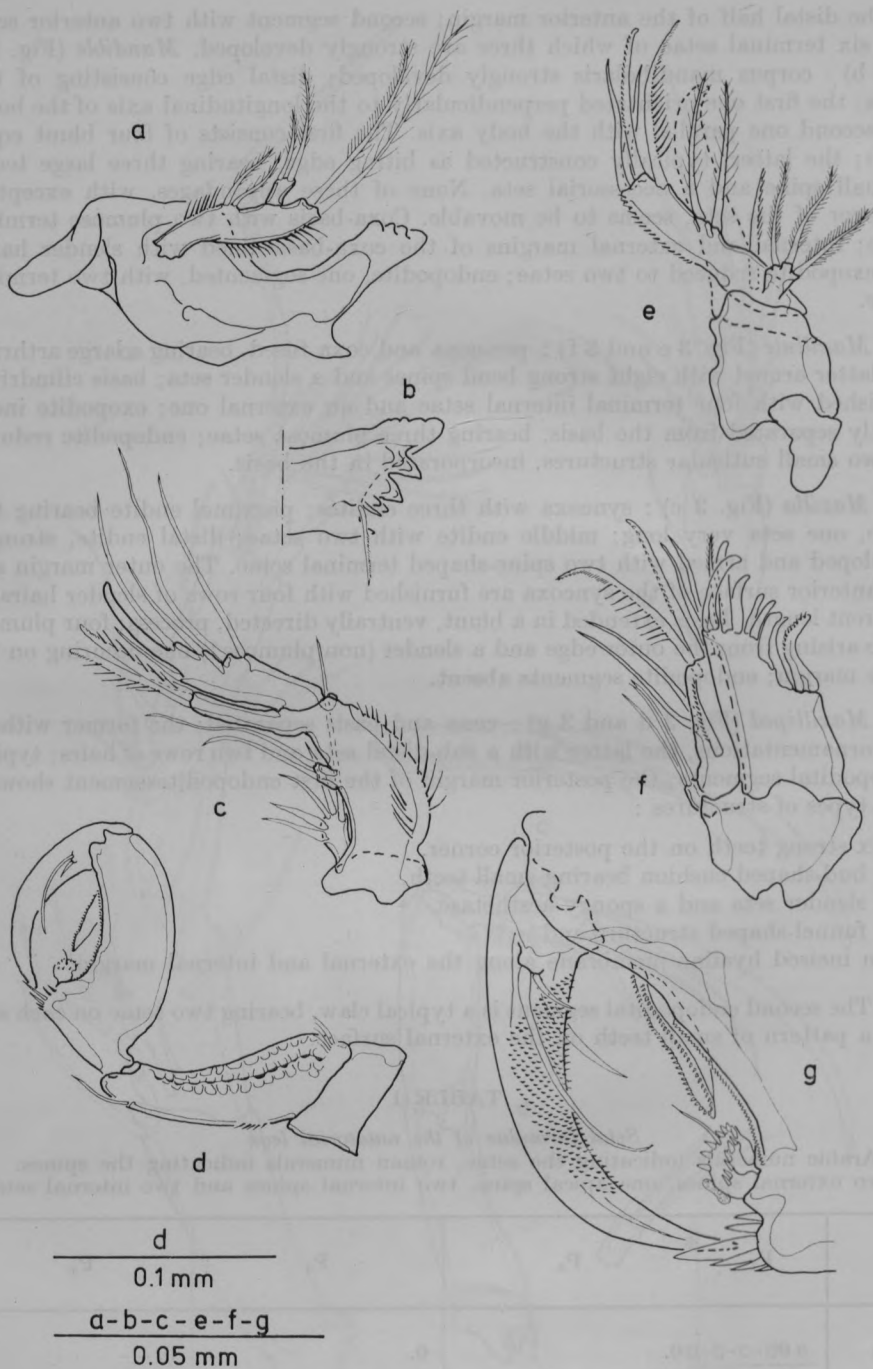


Fig. 3. — *Syngastes spinifer* sp. nov.

Female : a, mandibula; b, pars molaris; c, maxilla;

d, maxilliped; e, maxillula; f, maxillula; g, maxilliped.

(plumose aspect of setae on maxilla and maxillula not drawn).



Legs (table 1) :

P<sub>1</sub> (Fig. 4 a and 4 b) with a bare coxa; basis with a small external seta and a long internal one; the latter plumose with long fine setules along its inner stem; exopodite narrow, one segmented; endopodite, one segmented and with a convex external border. Almost the whole surface of the rami and the basis is covered with fine hairs arranged in a distinct pattern.

P<sub>2</sub> (Fig. 4 c) : coxa triangular-shaped with a tuft of slender hairs near the apex; basis carrying an external seta and three rows of strong hairs; exopodite two-segmented, endopodite three-segmented.

P<sub>3</sub> (Fig. 4 e) : resembling to the proceeding leg, except for the setal formulae and some small rows of hairs on the basis; two-segmented exopodite and a three-segmented endopodite.

P<sub>4</sub> (Fig. 4 d, 4 f, and 4 g) : coxa sub-quadrate with a small row of hairs along the internal border and on the posterior surface; exopodite three-segmented; first segment quadrate, ultimate and penultimate segments rectangular as normal, modified spine on the third segment with long spiniform setules along the distal third of its stem; endopodite consisting of two segments; first segment oval and strongly chitinized, second segment cylindrical, bearing three spines, two distally and one sub-distally implanted.

P<sub>5</sub> (Fig. 1 b and 1 d) of the usual form; divided in regions by distinct cuticular structures; the baseoendopodite bearing six bare setae and the exopodite bearing five non-plumose setae and two different rows of strong hairs.

Male (Paratype) —

Sexual dimorphism was only observed in the following respects :

Length 448  $\mu$ m : habitus differing from the female in the shape of the abdominal segments, without a foot-shaped process in the male; spermatophore reservoir constructed by several folds of thin integument.

Antennule (Fig. 5 b and 5 e) : seven-segmented; first and second segment identical with those of the female; one aesthetasc on third segment, two aesthetascs on the fourth segment and one aesthetasc on the ultimate segment; penultimate and ultimate segment curved, forming a haplocer apparatus;

Legs showing no differences with those of the female, except for the typical spine on the P<sub>4</sub>, bearing only three spiniform setules in the male.

P<sub>5</sub> (Fig. 5 c) small, sub-cylindrical; baseoendopodite with one bare setae, exopodite with four bare setae.

#### Variability

No morphological variations could be observed on nine dissected specimens. The colour, however varies from reddish-brown (as in the holotype) to greyish and translucent.

The length of the animals ranges from 450  $\mu$ m to 488  $\mu$ m ( $m = 466 \mu$ m,  $n = 4$ ) in the females; from 442  $\mu$ m to 459  $\mu$ m ( $m = 451 \mu$ m,  $n = 4$ ) in the males.

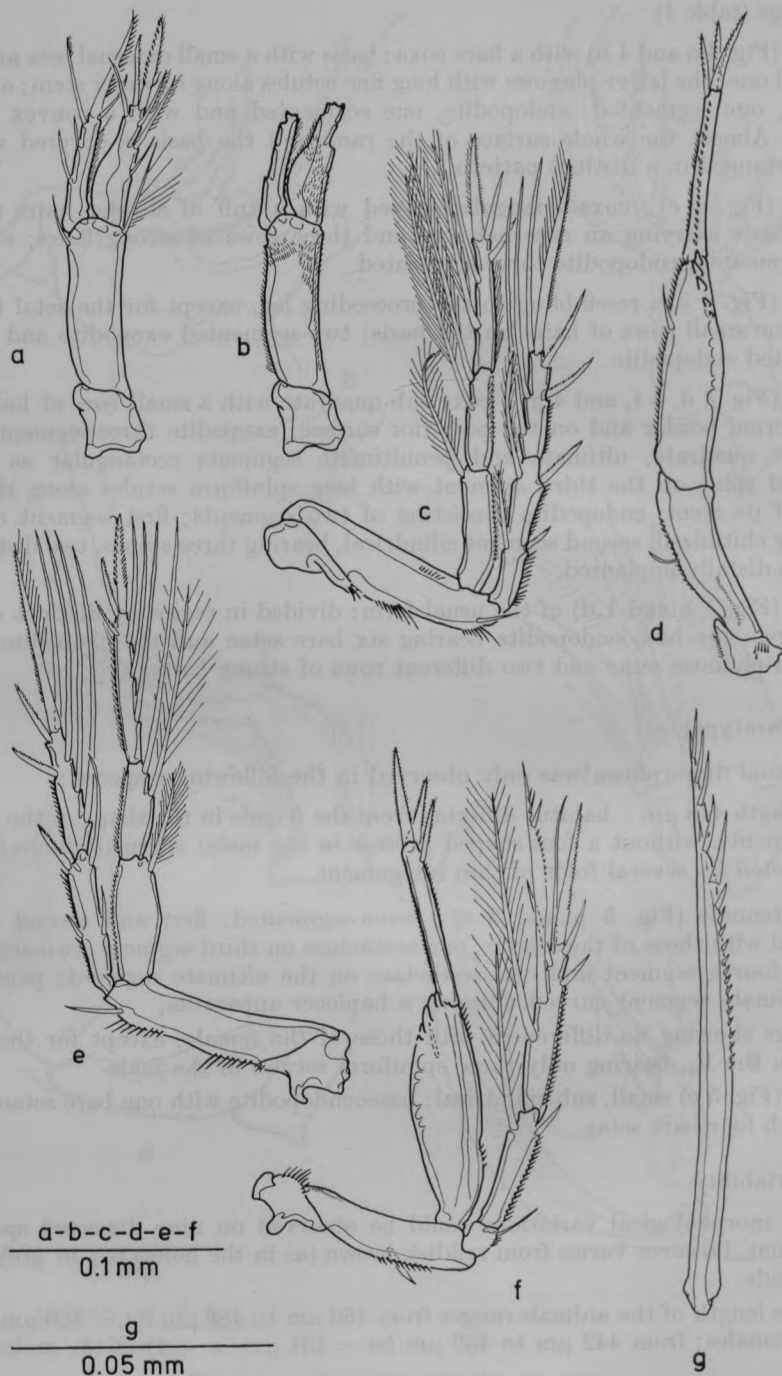


Fig. 4. — *Syngastes spinifer* sp. nov.  
 Female : a,  $P_1$ ; b, cuticular structures on  $P_1$ ; c,  $P_2$ ; d,  $P_4$  lateral view;  
 e,  $P_3$ ; f,  $P_4$ ; g, modified exopodital spine of the  $P_4$ .  
 (Plumose aspects of internal setae not drawn).



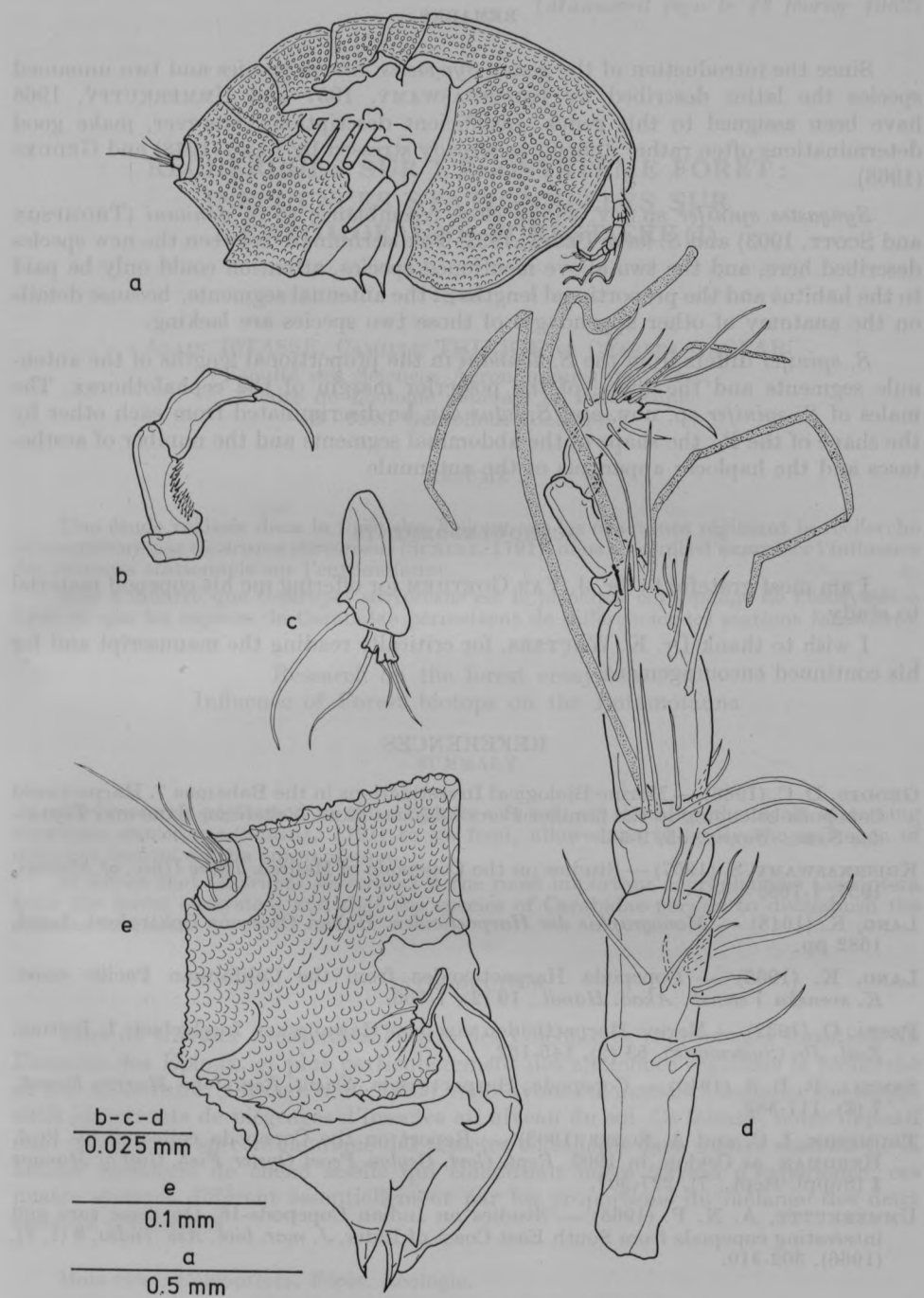


Fig. 5. — *Syngastes spinifer* sp. nov.

Male : a, habitus; b, ultimate segments of antennule;  
c, P<sub>5</sub>; d, abdominal segments; e, antennule.

## REMARKS

Since the introduction of the genus *Syngastes*, fifteen species and two unnamed species the latter described by KRISHNASWAMY, 1957 and UMMERKUTTY, 1968 have been assigned to this genus. Insufficient descriptions, however, make good determinations often rather difficult as already stressed by LANG (1948) and GEDDES (1968).

*Syngastes spinifer* sp. nov. shows close resemblance to *S. donnani* (THOMPSON and SCOTT, 1903) and *S. latus* PESTA, 1932. To discriminate between the new species described here, and the two above mentioned species, attention could only be paid to the habitus and the proportional lengths of the antennal segments, because details on the anatomy of other appendages of those two species are lacking.

*S. spinifer* differs from the *S. donnani* in the proportional lengths of the antennule segments and the shape of the posterior margin of the cephalothorax. The males of *S. spinifer* sp. nov. and *S. latus* can be discriminated from each other by the shape of the  $P_1$ , the shape of the abdominal segments and the number of aesthetascs and the haplocer apparatus of the antennule.

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