

## **Paraonidae (Annelida: Polychaeta) from the Yellow Sea**

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### **ABSTRACT**

The present study was based on the specimens collected from the Yellow Sea between Sept. 17 and Oct. 2, 1992 within the framework of Korea-China Yellow Sea Research Joint Program. Additional materials were also provided from the benthic samples collected from the tidal mud flats surrounding Incheon, Korea and from the subtidal shallow waters of the Kwang-yang Bay in the southern coast of Korea.

Paraonid polychaetes have not been previously reported from Korean waters. Here, a total of six species in two genera are described and illustrated, and they are newly recorded in Korean polychaetous fauna: *Cirrophorus furcatus*, *Cirrophorus armatus*, *Cirrophorus branchiatus*, *Aricidea (Aedicira) pacifica*, *Aricidea (Aricidea) wassi*, and *Aricidea (Acesta) assimilis*.

Keywords: Systematics, Polychaeta, Paraonidae, Yellow Sea, Kwang-yang Bay, Tidal mud flat, Korea

### **INTRODUCTION**

During September 1992, the authors participated on the oceanographic cruise of the Korea-China Yellow Sea Research Cooperative Joint Program, and numerous collections of polychaetes were made in the Yellow Sea. Examination of these collections together with the other polychaetous annelids from Kwang-yang Bay in the southern coast and from the tidal mud flat, Incheon, Korea, has resulted in the finding of six paraonid polychaetes in Korean waters. The family Paraonidae has not been previously reported from Korean waters. The present paper describes six species in two genera of paraonid polychaetes and information is presented on their distribution as well.

The paraonid polychaetes are present in almost all oceans of the world, including the Arctic and Antarctic. They are small, threadlike, elongate burrowing worms that rarely exceed 20 mm in length. These animals usually occur on sandy or silty substrates from the intertidal zone to abyssal depth (Strelzov, 1979). Paraonids are considered to be subsurface deposit feeders (Gaston *et al.*, 1992).

The family is presently organized into seven genera with four subgenera and approximately 85 described species (Blake, 1996). The important reviews of paraonid systematics are those of Hartman (1957) and Strelzov (1979). Particularly, Strelzov's monograph stimulated considerable research on paraonids, including further revision to the genera and descriptions of numerous additional new species. Even though some polychaete taxonomists do not completely agree with Strelzov's system at some points, the taxonomic scheme used herein retains his systematic system revised by Gaston (1984) and Blake (1996) and therefore Strelzov's separation of the genus *Aricidea* into four subgenera that appears to have been accepted.

## MATERIALS AND METHODS

The present study was based on the specimens collected in the Yellow Sea from Sept. 17 to Oct. 2, 1992. Additional materials were provided from the benthic samples collected from the tidal mud flats surrounding Incheon, western coast and from the subtidal mud bottom of Kwang-yang Bay, southern coast of Korea (Fig. 1).

Specimens were collected by 0.1m<sup>2</sup> van Veen grab in subtidal shallow waters, Yellow Sea and Kwang-yang Bay and by rectangular can core (15 x 20 x 30 cm) in macrotidal mud flat, Incheon, Korea. Samples were sieved through 1.0 mm mesh and preserved in 10% formalin. The specimens examined have been deposited in the Benthic Ecology Laboratory, Department of Oceanography, Inha University, Korea.

## SYSTEMATIC ACCOUNT

**Class Polychaeta Grube, 1850** 다모강

**Family Paraonidae Cerruti, 1909** 별난가시갯지렁이과(신칭)

Body long and slender with lateral parapodia. Prostomium with a single antenna or without one. Branchiae present on a limited number of median setigers in most species. All setae simple, including capillaries and various, usually postbranchial, hook or otherwise modified setae.

### Key to the genera and species of Paraonidae from the Yellow Sea

- |                                                         |                             |
|---------------------------------------------------------|-----------------------------|
| 1a Modified setae present in notopodia .....            | <i>Cirrophorus</i> 2        |
| 1b Modified setae, if present, neuropodia .....         | 4                           |
| 2a Modified setae lyrate .....                          | <i>Cirrophorus furcatus</i> |
| 2b Modified acicular setae with subterminal spine ..... | 3                           |

3a	3 prebranchial setiger .....	<i>Cirrophorus armatus</i>
3b	4 prebranchial setiger .....	<i>Cirrophorus branchiatus</i>
4a	Modified setae absent .....	<i>Aricidea (Aedicira) pacifica</i>
4b	Modified setae present .....	5
5a	Anntenae articulated .....	<i>Aricidea (Aricidea) wassi</i>
5b	Anntenae not articulated .....	<i>Aricidea (Acesta) assimilis</i>

**Genus *Cirrophorus* Ehlers, 1908** 등다리별난가시갯지렁이 속(신칭)

Lyrate setae or modified setae derived from them in dorsal parapodium. Median antenna short or absent. Longitudinal nuchal grooves present. Eyes present or absent. Three to five prebranchial segments. All notopodia with postsetal lobe; neuropodial lobes absent. Notosetae include capillaries and either lyrate setae or modified spine. Branchiae from setiger 4 - 6, numbering 6 - 30 or more pairs.

***Cirrophorus furcatus* (Hartman, 1957)** 두갈래별난가시갯지렁이(신칭) (Fig. 2)

*Aricidea (Cirrophorus) furcata* Hartman, 1957, 324-325, pl. 43, fig. 6.

*Cirrophorus furcatus* : Hartman, 1969, 69-70, 1fig.; Strelzov, 1979, 140-142, fig. 50A-E; Katzmann and Laubier, 1975, 584-586, fig. 6a-c; Blake, 1996, 40, fig. 2.5A-B.

**Materials examined.** Intertidal mud flat, Tongchun-dong, Inchon, Korea (37° 25' 00" N, 126° 37' 30" E): 2 specimens, Sept. 1990; 6 specimens, Nov. 20, 1990; 3 specimens, Apr. 2, 1991; 4 specimens, Nov. 23, 1991; 2 specimens, Jan. 24, 1992; 1 specimens, Mar. 21, 1992; 16 specimens, July 26, 1994; 2 specimens, Yellow Sea A3 (37° 00' 00" N, 125° 30' 00" E), 49 m, Oct. 1, 1992.

**Description.** Anterior fragment of largest specimen about 110 setigers, 24 mm long with greatest width of 0.4 mm. Preserved specimen reddish brown or speckled with brown color. Prostomium conical. Median antenna cirriform, short, not protruding beyond limits of head. Nuchal slits crescent shaped at the posterior margin. Eyes absent (Fig. 2. a, b). Branchiae first present from 4th setiger and 25 - 33 pairs (Table 1), acutely pointed, approximately equal in length; first and last few pairs generally shorter, marginally fimbriated by cilia (Fig. 2. d). Notopodial postsetal lobes of prebranchial segments small, increasing in size from setiger 1 to setiger 3. Postsetal lobes from setiger 4 digitiform, becoming longer on the middle branchial region and thereafter slightly decreasing. No neuropodial postsetal lobe (Fig. 2. e). Lyrate seta appearing from the 3rd - 4th setiger in notopodium. Lyrate seta with two unequal tines, each tine provided with inner rows of spines (Fig. 2. f). No neuropodial hook. All other setae capillary.

**Remarks.** *Cirrophorus furcatus* is close to *C. miyakoensis* Imajima, 1973 from Japan in having branchiae appearing from setiger 4 and lyrate setae in notopodial fascicles. However, these two species differ from the number of branchial pairs; *C. furcatus* with 25 - 33 pairs of branchiae, but *C. miyakoensis* with 39 - 42.

**Distribution.** Yellow Sea, Korea, from intertidal to a depth of 49 m, sandy mud and muddy sand bottoms; Central and Northern California, 20 - 1820 m; Mediterranean Sea, 23 - 200 m; Adriatic

Sea, 40 m.

**Table 1.** Numbers of branchial pairs for *Cirrophorus furcatus*.

Number of branchial pair	Number of specimens examined
25	2
26	12
27	17
28	23
29	21
30	15
31	5
32	2
33	1

***Cirrophorus armatus* (Glémarec, 1966) 민코별난가시갯지렁이(신칭) (Fig. 3)**

*Paraoneis armata* Glémarec, 1966, 1046-1049, figs. 1b-c, 2a-c; Laubier and Ramos, 1973, 168.

*Cirrophorus armatus*: Strelzov, 1979, 131-133, fig. 47A-E.

**Materials examined.** 20 specimens, Yellow Sea F6 (32° 00' 00" N, 124° 30' 00" E), 42 m, Sept. 19, 1992; 6 specimens, Yellow Sea F5 (32° 00' 00" N, 124° 30' 00" E), 35 m, Sept. 19, 1992.

**Description.** Complete specimen 12 mm long and 0.4 mm wide for about 100 setigers. Prostomium bluntly conical, slightly longer than wide, anterior rounded margin. Median antenna absent. Eyes not visible. Nuchal silts present in posterior part of prostomium (Fig. 3. a). Branchiae first present 4th setiger and 14 - 19 pairs (Table 2), cylindro-conical, equal in length to distance between branchial bases; first and last few pairs slightly shorter (Fig. 3. b). Notopodial postsetal lobes small in prebranchial setiger. Elongate and cirriform in middle branchial region and diminished in size posteriorly (Fig. 3. b), but long in preanal segments (Fig. 3. e). Neuropodial postsetal lobes absent. Modified lyrate-shape setae present in notopodium; bayonet setae absent (Fig. 3. f).

**Remarks.** The present specimens agree well with *Cirrophorus armatus* (Glémarec, 1966) in median antenna, number of prebranchial segments, number of branchial pairs and modified lyrate setae. However, it could be noted that our specimens differ from *C. armatus* in lacking bayonet setae.

**Distribution.** Yellow Sea at a depth of 42 m in muddy sands; Atlantic coast of French Brittany, intertidal.

**Table 2.** Numbers of branchial pairs for *Cirrophorus armatus*.

Number of branchial pair	Number of specimens examined
14	2
15	5
16	8
17	5
18	4
19	2

***Cirrophorus branchiatus* Ehlers, 1908** 채찍별난가시갯지렁이(신칭) (Fig. 4)

*Cirrophorus branchiatus*: Laubier, 1966, 469-476, fig. 1-2; 1971, 259-262, fig. 1d-f; Glémarec, 1966, 1050-1052, fig. 1a; Day, 1967, fig. 24.3a-e; Imajima, 1973, 274-275, fig. 11a-f; Strelzov, 1979, 127-131, fig. 46a-h; Blake, 1996, 38-40, fig. 2.4A-E.

*Cirrophorus (Cirrophorus) branchiata*: Hartman, 1957, 323.

**Materials examined.** 8 specimens, Yellow Sea F8 (32°00'00" N, 123°30'00" E), 35 m, Sept. 19, 1992

**Description.** Largest specimen about 12 mm long, about 100 setigers, about 0.3mm wide in branchial region. Intersegmental constrictions very marked in posterior part of body. Prostomium conical with blunt anterior end. Median antenna short, less than half of the prostomial length. A pair of nuchal slits at the posterior margin of the prostomium. Eyes lacking (Fig. 4. a). Branchiae first present from 5th setiger and 16 - 19 pairs (Table 3), cylindro-conical, tapering with long cilia; first and last two to three pairs shorter (Fig. 4. b, c, d). Postsetal lobe of notopodia small and short in prebranchial segment but slender and cirriform, and well developed in middle branchial segment, decreased in posterior branchial segments (Fig. 4. b). Anterior setae up to 7th setiger distally pointed, fine capillaries in both rami. Modified acicular seta appearing from 8th setiger in notopodium. Modified setae composed of thick acicular stem with long curved spine attached below terminal tip, spine serrated along inner side (Fig. 4. f).

**Remarks.** *Cirrophorus branchiatus* is closely related to the *C. armatus* (Glémarec, 1966) in the number of branchiae and the same type of modified setae. However the two species differ in the number of prebranchial setigers.

**Distribution.** Yellow Sea at a depth of 35 m in sandy muds; Japan, 60m; Atlantic Ocean; western Canada to southern California, 27 - 976 m.

**Table 3.** Variation in number of branchial pairs for *Cirrophorus branchiatus*.

Number of branchial pair	Number of specimens examined
16	3
17	2
18	2
19	1

**Genus *Aricidea* Webster, 1879** 긴코별난가시갯지렁이 속 (신칭)

Prostomium more or less conical; median antenna present; a pair of nuchal slits present. Three prebranchial segments. Parapodia biramous, lacking distinct setal lobes, but with digitiform to filiform postsetal notopodial lobes; with or without postsetal neuropodial lobes on same anterior segments. Setae including simple capillaries in both noto- and neuropodia and modified neurosetae of various types in postbranchial segments.

**Subgenus *Aedicira* Hartman, 1957** 민별난가시갯지렁이 아속(신칭)

Median antenna present on prostomium. Branchiae present from the fourth setiger. Modified

neurosetae entirely absent. Setae capillaries without fringe or basal enlargement.

***Aricidea (Aedicira) pacifica* Hartman, 1944 태평양별난가시갯지렁이(신칭) (Fig. 5)**

*Aricidea pacifica* Hartman, 1944, 316-317, pl. 27, fig. 8, 9.

*Aricidea (Aedicira) pacifica*: Hartman, 1957, p. 326; Strelzov, 1979, 66-68, fig.2.5a-e; Blake, 1996, 47, fig.2.9 A-C.

*Aedicira pacifica*: Hartman, 1969, 53-54, fig. 1-3; Imajima, 1973, 279-281, fig. 14a-l.

**Materials examined.** Intertidal mud flat, Tongchun-dong, Incheon, Korea (37° 25' 00" N, 126° 37' 00" E): 1 specimen, Mar. 21, 1990; 5 specimens, Sept. 1990; 5 specimens, Nov. 20, 1990; 1 specimen, Jan. 25, 1991; 1 specimen, Sept. 28, 1991; 3 specimens, Nov. 23, 1991; 1 specimen, Mar. 21, 1992; 4 specimens, July 21, 1992; 25 specimens, July 26, 1994.

**Description.** All specimens lacking posterior end. Largest fragment 17 mm long, 1.0 mm wide in the middle branchial regions, about 100 setigers. Prostomium truncate along anterior margin, with short lateral horns. Median antenna slender, cirriform, extends to 3 - 4 setigers. A pair of nuchal slits present in posterior margin of the prostomium. Eyes not visible (Fig. 5. a). Branchiae present from the fourth setiger and 29 - 40 pairs (Table 4), long, attenuate with slender filamentous tips in posterior branchial region (Fig. 5. d). Small, digitate in last branchial setiger (Fig. 5. e). Notopodial postsetal lobes long from setiger 1. Branchiae basally thickened in branchial region, becoming long, filamentous posteriorly. Neuropodial postsetal lobes absent. Setae of both rami similar in anterior segments, geniculate with a broad blade. Notopodial setae longer than neuropodial setae (Fig. 5. f, g). Posteriorly, setae becoming very slender and long. Modified setae absent.

**Remarks.** This species is easily distinguished from other species by its truncated prostomium and absence of modified setae.

**Distribution.** Intertidal mud flat, Incheon, Korea, in muddy sands; California, intertidal; Japan, intertidal.

**Table 4.** Numbers of branchial pairs for *Aricidea (Aedicira) pacifica*.

Number of branchial pair	Number of specimens examined
29	1
31	1
33	4
34	9
35	6
36	7
37	7
38	4
39	4
40	3

**Subgenus *Aricidea* Webster, 1879** 긴코별난가시갯지렁이 아속(신칭)

Prostomium elongate; median antenna cirriform, often articulate. Modified neurosetae pseudocompound or hooked with subterminal spine attached on concave side of stem.

***Aricidea (Aricidea) wassi* Pettibone, 1965** 왓스킨코별난가시갯지렁이(신칭) (**Fig. 6**)

*Aricidea (Aricidea) wassi* Pettibone, 1965, 135-136 fig. 9a-d, fig. 10a-d, fig. 11a-c; Hobson, 1971, 247; Strelzov, 1979, 70-72. fig. 23c-e; Katzmann and Laubier, 1975, 582-584, fig. 5; Blake, 1996, 44-45, fig. 2.7A-F.

*Aricidea wassi*: Imajima, 1973: 265-267. fig. 6.

**Material examined.** 1 specimen, Yellow Sea A4 (37° 00' 00" N, 125° 30' 00" E), 56 m, Oct. 1, 1992; 10 specimens, Yellow Sea A5 (37° 00' 00" N, 124° 30' 00" E), 74 m, Oct. 1, 1992.

**Description.** Largest specimen in anterior fragment about 70 setigers, 10 mm long, 0.4 mm wide. Prostomium triangular with slightly rounded anterior margin. Median antenna long, articulated, with 3 - 7 joints, extending posteriorly to 2nd - 3rd segments. Nuchal slits present in posterior part of prostomium. Eyes not visible (Fig. 6. b). Branchiae first present from 4th setiger and 9 - 10 pairs (Table 5), conical, distally tapering, fringed by cilia (Fig. 6. c).

Notopodial postsetal lobe on first two segments tuberculate, short. Lobes digitiform from 3rd setiger to middle branchial setiger, becoming filiform posteriorly (Fig. 6. a, d). Neuropodial postsetal lobes absent.

Modified neurosetae in lower part of fascicles in middle and posterior segments unidentate with long arista emerging from their concave side (Fig. 6. e).

**Remarks.** *Aricidea (Aricidea) wassi* differ from other species of the genus in its articulated median antenna and characteristic modified neuropodial setae.

**Distribution.**

Yellow Sea from 56 to 74 m in muddy sands; Japan, 60 m; southern California, 80 m; western Atlantic Ocean, 10-111 m; Gulf of Farallones, 1480 m.

**Table 5.** Numbers of branchial pairs for *Aricidea (Aricidea) wassi*.

Number of branchial pair	Number of specimens examined
9	1
10	11

**Subgenus *Acesta* Strelzov, 1973** 솜털별난가시갯지렁이 아속(신칭)

Median antenna not branched and not articulate. Ventral parapodial rami of postbranchial segment bearing hooked setae whose shape and thickness sharply differ from dorsal setae and accompanying ventral capillary setae; without subterminal spine on concave side of stem.

***Aricidea (Acesta) assimilis* Tebble, 1959** 솜털별난가시갯지렁이(신칭) (**Fig. 7**)

*Aricidea assimilis*: Day, 1961, 482.

*Aricidea (Acesta) assimilis*: Strelzov, 1979, 108-110, fig. 39a-h.

**Material examined.** Kwangyang Bay (34° 52' 00" N, 127° 49' 00" E), 22 m deep: 2 specimens,

Oct. 1983; 4 specimens, Aug. 1984; 15 specimens, Oct. 1984; 2 specimens, Dec. 1984; 10 specimens, Feb. 1985; 2 specimens, Yellow Sea B2 (36°00'00" N, 126°30'00" E), 38 m, Sept. 29, 1992.

**Description.** All specimens bearing anterior fragments. Anterior fragments of moderate-sized species about 90 setigers measuring 16 mm long with greatest width of 1.0 mm. Prostomium conical, triangular, a little longer than wide and slightly pointed anteriorly. Median antenna elongate, tapering distally, extending to setiger 2 - 3. Nuchal slits present near the posterior margin. Eyes not visible (Fig. 7. a). Branchiae first present from 4th setiger and 20 - 38 pairs (Table 6). A pair among them overlapping in mid-dorsal line. Anterior branchiae longer, slender, and distally tapered (Fig. 7. b). Notopodial postsetal lobes small in setiger 1 - 2. Postsetal lobes from 4th setiger long, cirriform, and well developed. Lobes very long and slender at the end branchial region. Neuropodial postsetal lobes absent (Fig. 7. b. e). Modified setae acicular, with narrow sheath along convex side and numerous fine bristles around apex (Fig. 7. g, h).

**Remarks.** The present specimens come closest to *Aricidea (Acesta) assimilis* Tebble, 1959 in modified acicular setae with numerous fine bristles around apex.

**Distribution.** Yellow Sea at a depth of 38 m in muddy sands; Kwang-yang bay, Korea, at a depth of 22 m in muddy sands; Atlantic Ocean, 105 m.

**Table 6.** Numbers of branchial pairs for *Aricidea (Acesta) assimilis*.

Number of branchial pair	Number of specimens examined
20	1
21	4
22	6
23	6
24	14
25	2
26	3
27	4
31	1
38	1

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## REFERENCE

- Blake, J. A., 1996. 2. Family Paraonidae Cerruti, 1909. In: Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and the Western Santa Barbara Channel. Volume 6. The Annelida Part 3. Polychaeta:



- Orbiniidae to Cossuridae (Eds., J. A. Blake, B. Hilbig, and P. H. Scott). pp. 27-70. Santa Barbara Museum of Natural History, Santa Barbara, California.
- Day, J. H., 1961. The polychaete fauna of South Africa. Part 6. Sedentary species dredged off Cape coasts with a few new records from the shore. *J. Linn. Soc. London*, **44**(229): 463-560.
- Day, J. H., 1967. A Monograph on the Polychaeta of Southern Africa. Part 2: Sedentaria. Trustees British Museum. 878pp.
- Gaston, G., 1984. Chapter 2. Family Paraonidae Cerruti, 1909. *In*: Taxonomic guide to the polychaetes of northern Gulf of Mexico. Vol. 1 (Eds., J. M. Uebelacker and P. G. Johnson). pp. 2-1 to 2-53. Barry A. Vittor & Associates, Inc. Mobile, AL.
- Gaston, G., J. A. McLelland and R. W. Heard, 1992. Feeding biology, distribution, and ecology of two species of benthic polychaetes: *Paraonis fulgens* and *Paraonis pygoenigmatica* (Polychaeta: Paraonidae). *Gulf Research Reports*, **8**: 395-399.
- Glémarec, M., 1966. Paraonidae de Bretagne. Description description de *Paraonice armata* nov. sp. *Vie et Milieu*, Sér. A, *Biol. Mar.*, **17**(2A): 1045-1052.
- Hartman, O., 1944. Polychaetous annelids. Part 6. Paraonidae, Magelonidae, Longosomidae, Ctenodrilidae, and Sabellariidae. *Allan Hancock Pacific Exped.*, **10**(2, 3): 311-388.
- Hartman, O., 1957. Orbiniidae, Apistobranchidae, Paraonidae and Longgosomidae. *Allan Hancock Pacific Exped.*, **15**(3): 211-392.
- Hartman, O., 1969. Atlas of the Sedentariate Polychaetous Annelids from California. Allan Hancock Foundation, University of Southern California, Los Angeles, 812pp.
- Hobson, K. D., 1971. Polychaeta new to New England, with additions to the description of *Aberranta enigmatica* Hartman. *Pro. Biol. Soc. Wash.* **55**: 549-556.
- Imajima, M. 1973. Paraonidae (Polychaeta) from the Japan. *Bull. Nat. Sci. Museum* **16**: 253-292.
- Katzmann, W. and L. Laubier, 1975. Paraonidae (Polychètes Sédentaires) de l'Adriatique. *Ann. Naturhistor. Mus. Wien*, **79**: 567-588.
- Laubier, L., 1966. Sur la présence du genre *Cirrophorus* (Polychètes, Paraonidae) en Méditerranée. *Bull. Soc. Zool. France*, **90**: 467-477.
- Laubier, L., 1971. A propos d'une espèce de *Paradoneis* (Polychète, Paraonidae) nouvelle pour la Méditerranée occidentale. *Vie et Milieu*, **22**(2A): 259-262.
- Laubier, L. and J. Ramos, 1973. Paraonidae (Polychètes, Sédentaires) de Méditerranée. *Bull. Mus. Nat. Hist. Nat.* 3<sup>e</sup> séries, No. 168, *Zool.*, **113**: 1097-1148.
- Pettibone, M. H., 1965. Two new species of *Aricidea* (Polychaeta, Paraonidae) from Virginia and Florida, and redescription of *Aricidea fragilis* Webster. *Proc. Biol. Soc. Wash.*, **78**: 127-140.
- Strelzov, V. E., 1979. Polychaete worms of the family Paraonidae Cerruti, 1909 (Polychaeta, Sedentaria). Oxonian Press Pvt. Ltd., New Delhi, pp. 212. (Translated from Russian and published by the Smithsonian Institution and the National Science Foundation, Washington, D. C.).

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## 황해산 별난가시갯지렁이과 (환형동물문, 다모강)

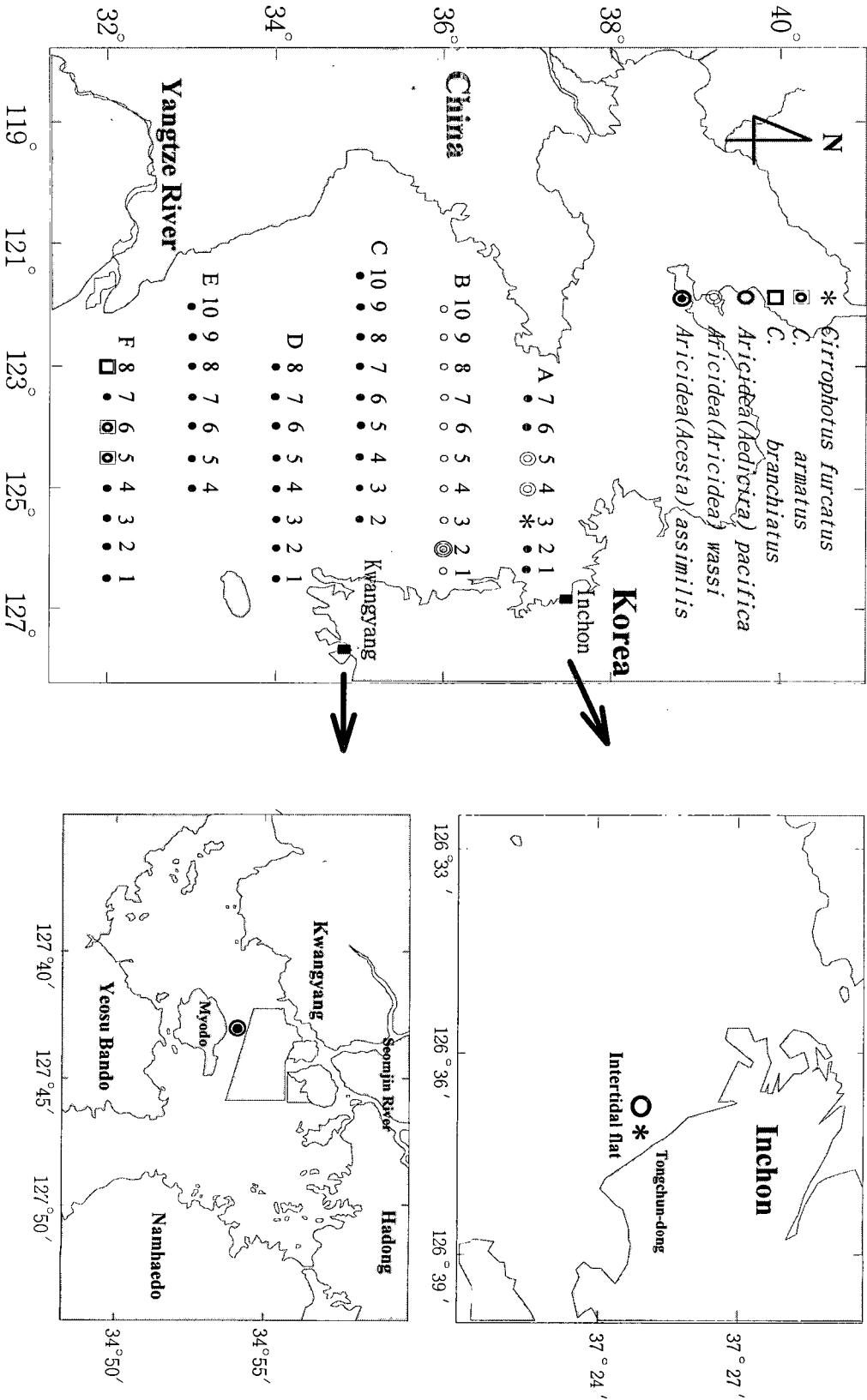
정래홍 · 최병미 · 홍재상  
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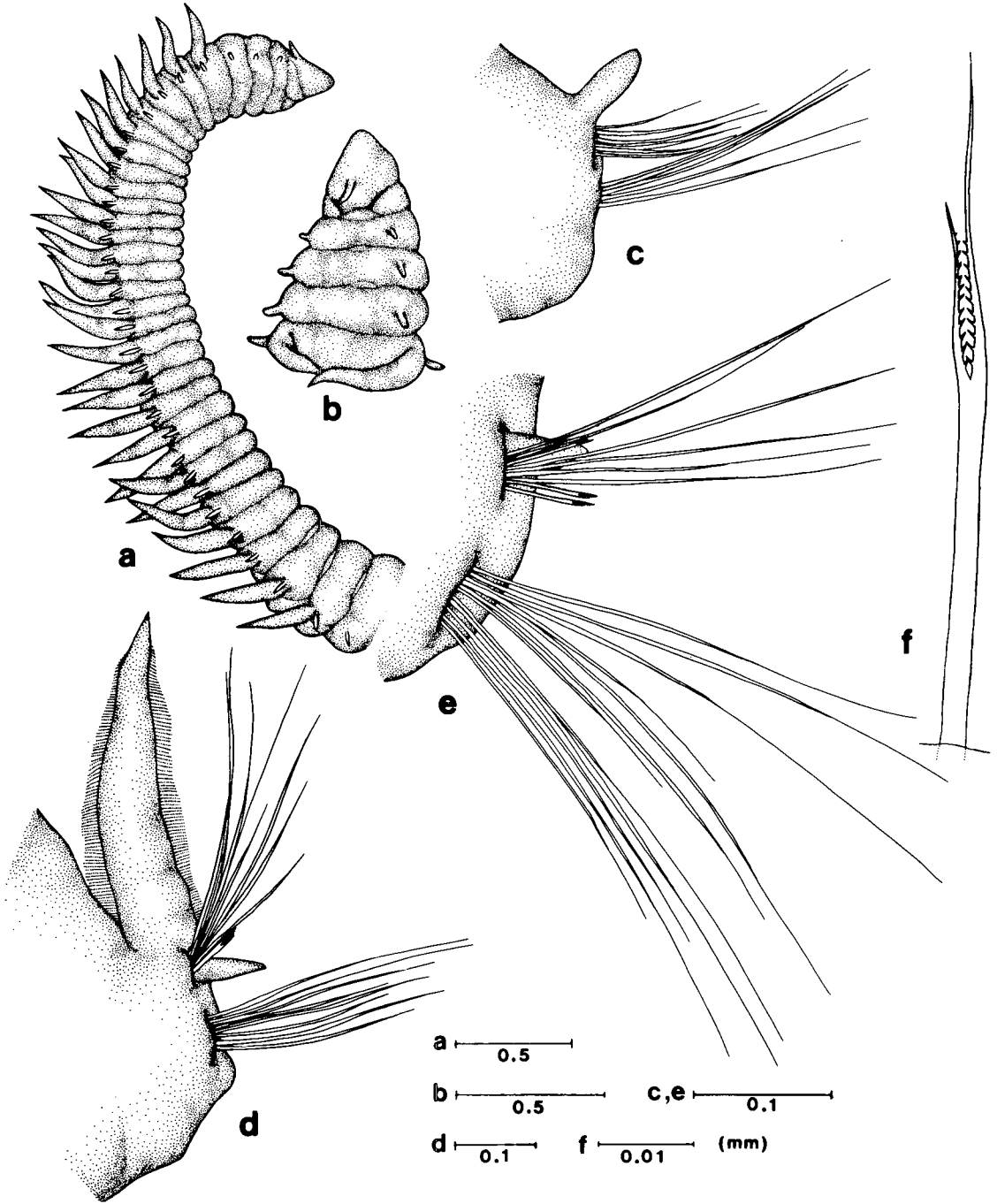
## 요 약

본 연구는 한·중 황해 국제 공동연구 사업의 일환으로, 1992년 9월 17일부터 10월 2일 사이에 황해의 49개 정점에서 채집된 저서다모류와 그 밖의 남해에 위치한 광양만 및 인천지역 갯벌 간석지에서 채집된 시료를 대상으로 하였다.

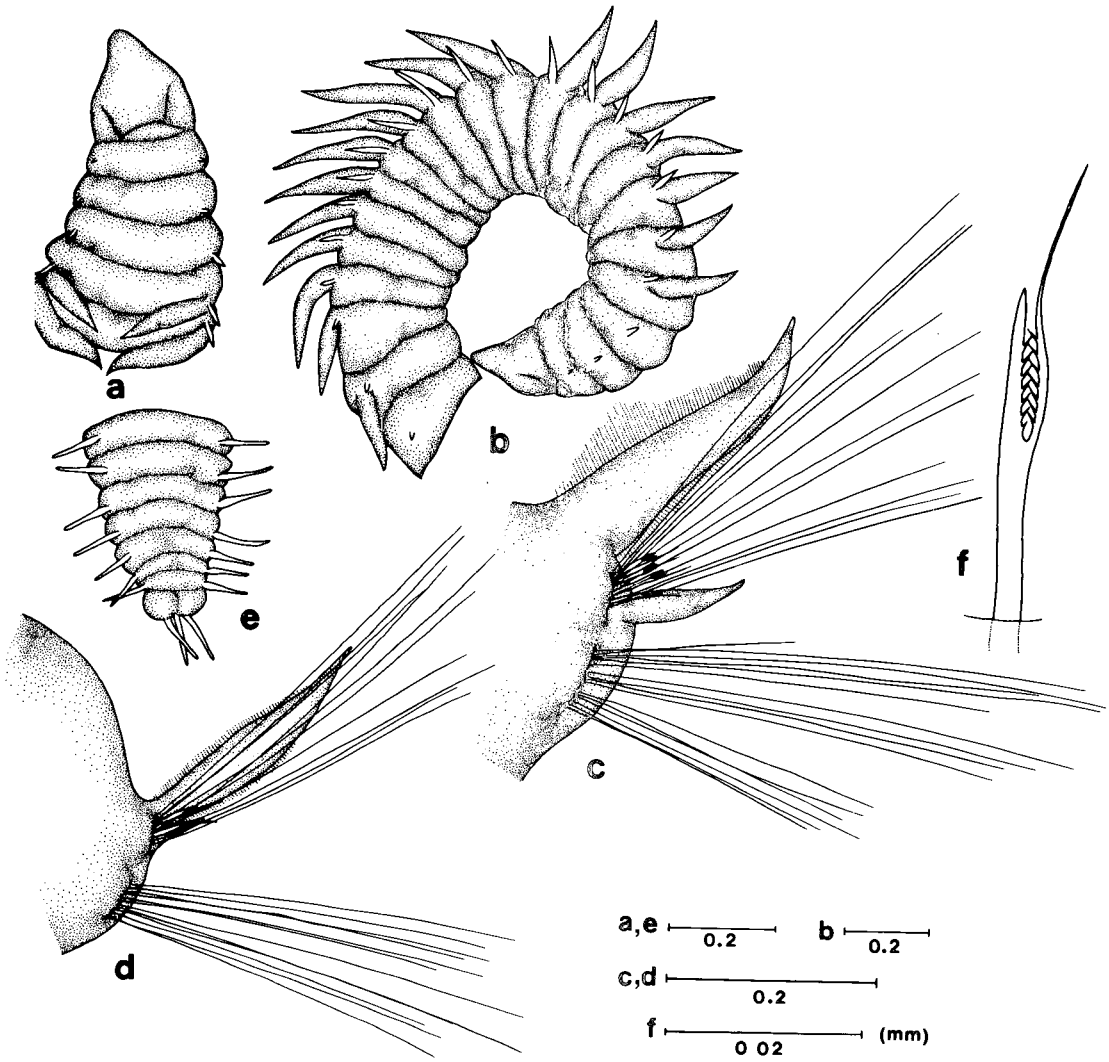
환형동물문 다모강에 속하는 별난가시갯지렁이과 (환형동물문, 다모강)는 한국에서는 아직 보고되지 않은 과 (科)로서 본 연구에서 다음의 2속, 3아속에 속하는 6종을 새로이 보고한다: 두갈래별난가시갯지렁이 *Cirrophorus furcatus*, 민코별난가시갯지렁이 *Cirrophorus armatus*, 채찍별난가시갯지렁이 *Cirrophorus branchiatus*, 태평양별난가시갯지렁이 *Aricidea (Aedicira) pacifica*, 왓스별난가시갯지렁이 *Aricidea (Aricidea) wassi*, 슝털별난가시갯지렁이 *Aricidea (Acesta) assimilis*.

Fig. 1. Distribution of species of Paraonidae in Korea.

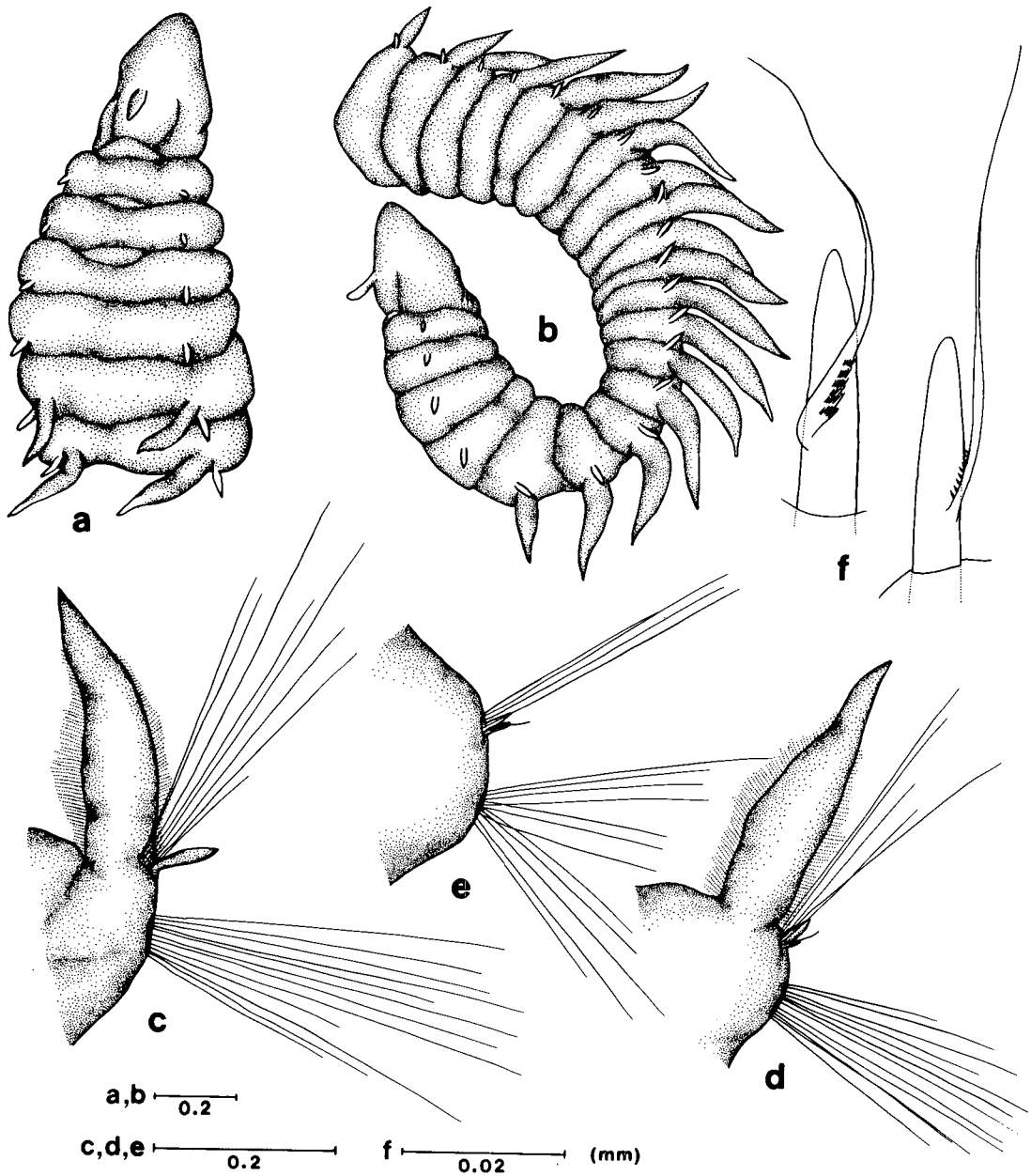




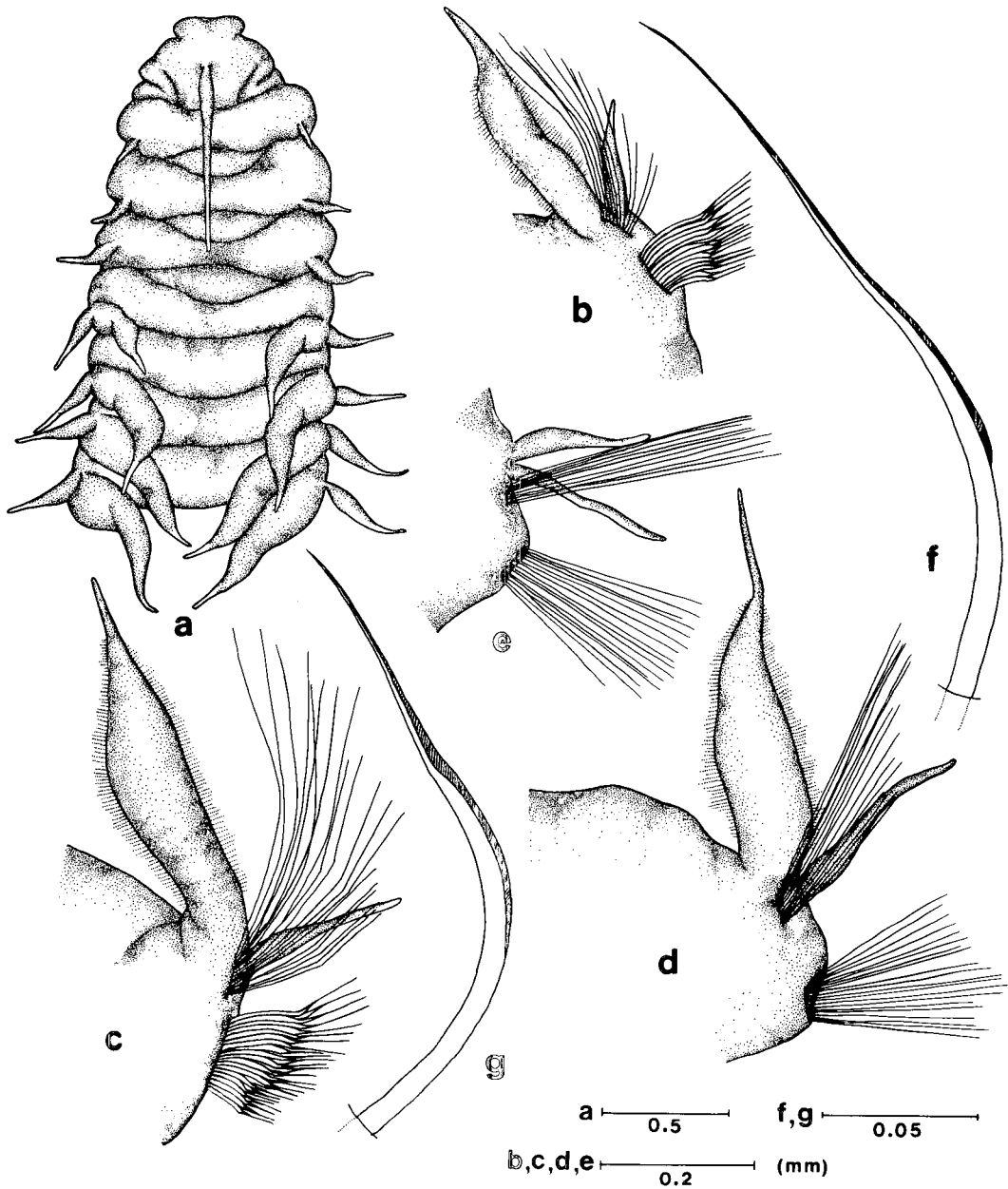
**Fig. 2.** *Cirrophorus furcatus* (Hartman), a, anterior end, lateral view; b, anterior end, in dorsal view; c, second parapodium, anterior view; d, median branchial parapodium, anterior view; e, 40th parapodium, anterior view; f, notopodial lyrate seta



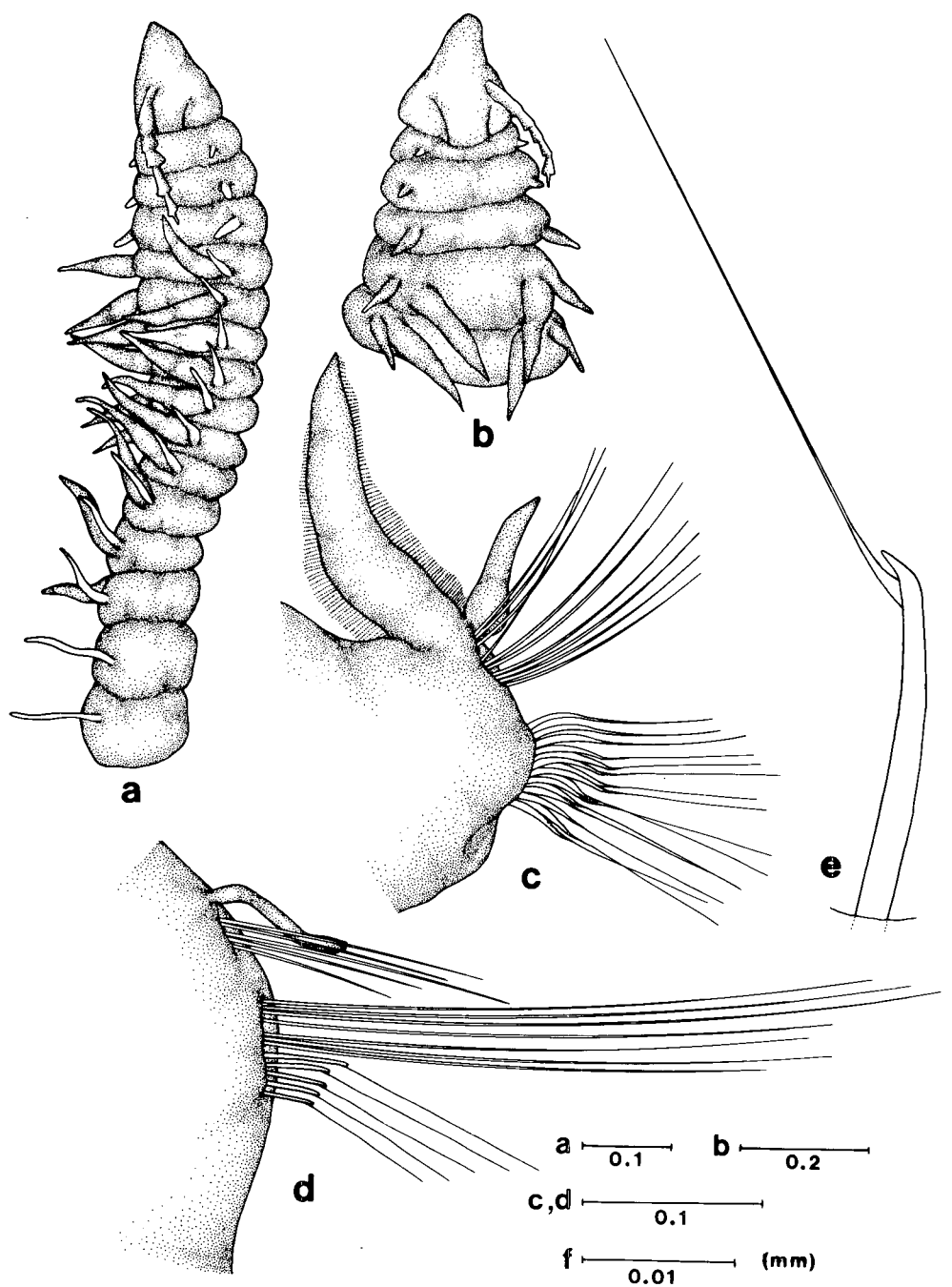
**Fig. 3.** *Cirrophorus armatus* (Glémarec), a, anterior end, dorsal view; b, anterior end, lateral view; c, 12th parapodium, anterior view; d, 20th parapodium, anterior view; e, posterior end, anterior view; f, notopodial modified seta



**Fig. 4.** *Cirrophorus branchiatus* Ehlers, a, anterior end, dorsal view; b, anterior end, lateral view; c, 4th branchial parapodium, anterior view; d, 13th parapodium, anterior view; e, 22th parapodium, anterior view; f, notopodial modified acicular seta

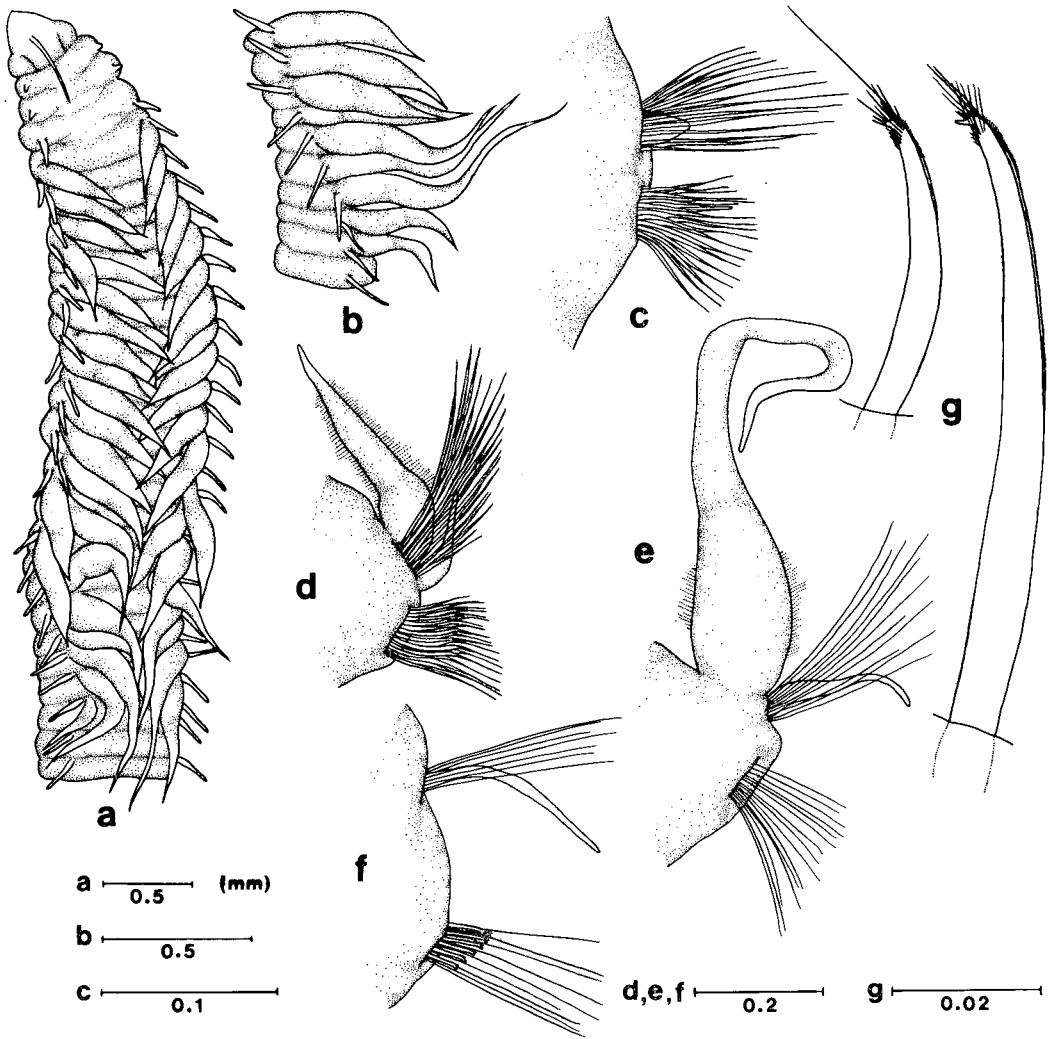


**Fig. 5.** *Aricidea (Aedicira) pacifica* Hartman, a, anterior end, dorsal view; b, first branchial parapodium, anterior view; c, 16th parapodium, anterior view; d, 21th parapodium, anterior view; e, last branchial parapodium, anterior view; f, notopodial seta, g, neuropodial seta



**Fig. 6.** *Aricidea (Aricidea) wassi* Pettibone, a, anterior end, lateral view; b, anterior end, dorsal view, c, 12th parapodium, anterior view, d, posterior parapodium, anterior view, e, neuropodial modified seta





**Fig. 7.** *Aricidea (Acesta) assimilis* Tebble, a, anterior end, dorsal view, b, posterior branchial setigers, lateral view, c, second parapodium, anterior view, d, 5th parapodium, anterior view, e, posterior branchial parapodium, anterior view, f, posterior parapodium, anterior view, g, neuropodial modified seta