

New and rare *Metridia* from Antarctic and Subantarctic waters (Copepoda, Calanoida: Metridinidae)

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Metridia ferrarii sp. n. and *M. pseudoasymmetrica* sp. n. are described from females and males, both species collected in the South Atlantic and South-Eastern Pacific (Southern Ocean). Redescriptions are given for *M. asymmetrica* Brodsky, 1950, *M. ornata* Brodsky, 1950, *M. princeps* Giesbrecht, 1889 and *M. macrura* Sars, 1905. Females of *M. ferrarii* are clearly distinguished from the related metridinids in the presence of collar on both sides of cephalosome; males differ from those of *M. princeps* in the strongly asymmetrical P5 left coxopod, absence of pointed attenuations on left and right second segments of antennule and some other characters. *M. ferrarii* differs from *M. ornata* mostly in the longer caudal rami, longer hook-like spines at P2 Enp and the shape of the genital somite. Females of *M. pseudoasymmetrica* differ from those of the related species *M. asymmetrica* mainly in the shape and location of spermathecae (oval and overlapping in lateral view in *M. pseudoasymmetrica* vs. round and not overlapping in *M. asymmetrica*) and in presence of distinct indentation of the genital somite (in lateral view); males of *M. pseudoasymmetrica* are very similar to those of *M. asymmetrica*, but differ in setation of left P5 and absence of short spinules at the second urosomal somite on the right and presence of short hairs at the fourth urosomal somite on the left.

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The genus *Metridia* includes 21 species (Bradford-Grieve, 1999), plus *M. andraeana* and *M. trispinosa* so poorly described by Brady (1918) that their status is not clear. Six species in the genus *Metridia* are characterized as large-sized, between 5.8 mm (*M. ignota* Esterly, 1906) and 10.5 mm (*M. macrura* Sars, 1905). Total lengths of other species typically are about 2-3 mm; 4.5 mm of *M. longa* (Lubbock, 1854) and *M. okhotensis* Brodsky, 1950 are the largest mean in this group. Large-sized species of *Metridia* are difficult to identify, due to incomplete original descriptions and a limited number of figures.

Eight *Metridia* species, of them the large-sized *M. princeps* Giesbrecht, 1889 and *M. macrura* Sars, 1905, have been reported from the Antarctic and Subantarctic waters by Razouls (1995) and Seret (1979) respectively.

Metridinids from the samples collected in the 4th, 5th, 8-12th and 23rd cruises of Eltanin south of 55°S in the South Atlantic and South-Eastern Pacific (Southern Ocean) and deposited in the National Museum of Natural History, Smithsonian Institution (Washington,

D.C.) were examined (Table 1). Six known species of *Metridia* were found in the collection: *M. curticauda* Giesbrecht, 1889, *M. gerralchei* Giesbrecht, 1902, *M. lucens* Boeck, 1864, *M. ornata* Brodsky, 1950 (recorded from Antarctic and Subantarctic for the first time), *M. princeps* Giesbrecht, 1889, and *M. venusta* Giesbrecht, 1889. Two new species, *M. ferrarii* sp. n. and *M. pseudoasymmetrica* sp. n., are described here. The latter is related to *M. asymmetrica* Brodsky, 1950, which is redescribed here.

A redescription of *M. ornata* Brodsky, 1950 and of *M. asymmetrica* Brodsky, 1950 are given from the type specimens at the Zoological Institute, Russian Academy of Sciences (St. Petersburg); brief redescriptions of *M. princeps* Giesbrecht, 1889 and *M. macrura* Sars, 1905 are given, to make possible comparisons with other large-sized *Metridia* species (*M. alata* Roe, 1975; *M. bicornuta* Davis 1949 and *M. ignota* Esterly, 1906).

The following abbreviations are used in the descriptions: *A1*, antennule; *A2*, antenna; *Enp*, endopod; *Exp*, exopod; *Gn*, gnathobase; *Md*, mandible; *Mdp*, mandibular palp; *Mx1*, maxil-

Table 1. ELTANIN stations where large-sized species of *Metridia* and *M. pseudoasymmetrica* sp. n. were collected

Cruise	Station	Date	Coordinates		Depth (m)	Species
4	99	12.07.1962	51°30'S	77°35'W	1208-1219	<i>M. princeps</i> (2 ♀, 1 ♂)
	123	28.07.1962	57°09'S	63°43'W	2439	<i>M. ferrarii</i> (6 ♀, 2 ♂) <i>M. pseudoasymmetrica</i> (5 ♀)
	149	12.08.1962	58°31'S	65°17'W	2105	<i>M. ornata</i> (1 ♀) <i>M. ferrarii</i> (3 ♀) <i>M. pseudoasymmetrica</i> (4 ♀, 1 ♂)
	154	16.08.1962	56°43'S	64°28'W	2105	<i>M. ferrarii</i> (3 ♀) <i>M. pseudoasymmetrica</i> (2 ♀)
5	262	19.10.1962	62°26'S	67°45'W	2428	<i>M. ornata</i> (3 ♀, 3 ♂)
	296	28.10.1962	63°57'S	71°19'W	2489	<i>M. ferrarii</i> (1 ♀)
8	578	19.04.1963	57°17'S	27°22'W	1464-1867	<i>M. ferrarii</i> (1 ♀)
	580	21.04.1963	57°23'S	23°11'W	3074	<i>M. ornata</i> (3 ♀, 3 ♂) <i>M. ferrarii</i> (1 ♀)
	636	20.05.1963	59°37'S	24°28'W	5722-5856	<i>M. pseudoasymmetrica</i> (1 ♀, 1 ♂)
9	687	26.08.1963	55°24'S	37°57'W	2214	<i>M. ornata</i> (7 ♀, 3 ♂, 1 CV) <i>M. ferrarii</i> (1 ♀) <i>M. pseudoasymmetrica</i> (2 ♀, 1 ♂)
10	868	25.11.1963	57°06'S	78°56'W	997-1230	<i>M. ferrarii</i> (2 ♀) <i>M. princeps</i> (3 ♀, 1 CIV)
	874	27.11.1963	56°06'S	79°04'W	1491	<i>M. ferrarii</i> (2 ♀, 1 ♂)
11	891	04.01.1964	59°50'S	114°53'W	1347-1702	<i>M. ferrarii</i> (1 ♀)
	895	06.01.1964	60°48'S	114°51'W	2315	<i>M. ferrarii</i> (14 ♀, 6 ♂) <i>M. princeps</i> (1 ♀, 1 CV)
	901	07.01.1964	62°11'S	115°02'W	3477-3678	<i>M. ornata</i> (5 ♀, 3 ♂) <i>M. ferrarii</i> (2 ♀, 1 ♂) <i>M. pseudoasymmetrica</i> (7 ♀)
	918	15.01.1964	66°44'S	115°13'W	1885	<i>M. ferrarii</i> (10 ♀, 5 ♂) <i>M. pseudoasymmetrica</i> (8 ♀, 2 ♂)
	941	23.01.1964	70°01'S	98°43'W	2562	<i>M. ornata</i> (1 ♀) <i>M. ferrarii</i> (1 ♀, 1 ♂)
	944	24.01.1964	69°06'S	95°02'W	3029	<i>M. ornata</i> (4 ♀, 2 ♂) <i>M. ferrarii</i> (3 ♀, 1 ♂) <i>M. pseudoasymmetrica</i> (2 ♀)
12	1014	19.03.1964	65°08'S	47°45'W	1025-1153	<i>M. ferrarii</i> (1 ♀) <i>M. pseudoasymmetrica</i> (1 ♀)
23	1610	07.04.1966	63°28'S	94°13'W	1250	<i>M. ferrarii</i> (4 ♀, 1 ♂) <i>M. pseudoasymmetrica</i> (1 ♀)
	1615	09.04.1966	62°13'S	95°39'W	800-1025	<i>M. princeps</i> (2 ♀)
	1666	26.04.1966	62°30'S	108°35'W	1783-2117	<i>M. ferrarii</i> (3 ♀, 1 ♂)

lule; *Mx1 Li1*, praecoxal arthrite (= first internal lobe); *Mx1 Li2*, coxal endite (= second internal lobe); *Mx1 Li3-4*, basal endites (= third and fourth internal lobes); *Mx1 Le1*, coxal epipodite (= first external lobe); *Mx1 Le2*, basal exite (= second external lobe); *Mx2*, maxilla; *Mx2 Li1-2*, praecoxal endites (= first and second lobes); *Mx2 Li3-4*, coxal endites (= third and fourth lobes); *Mx2 Li5-6*, basal endites (= fifth and sixth lobes); *Mxp*, maxilliped; *P1-P4*, swimming legs 1-4; *Pr*, prosome; *Ur*, urosome.

The names of the institutions in which the material is deposited are abbreviated as fol-

lows: USNM – National Museum of Natural History, Smithsonian Institution, Washington, D.C.; ZISP – Zoological Institute, Russian Academy of Sciences, St.Petersburg.

All scale lines equal 0.1 mm. Small italic numbers on the figures of antennule designate the successive number of articulated segments.

Metridia ferrarii sp.n.

(Figs 1-59)

Holotype. ♀, 9.5 mm, 69°06'S, 95°02'W, from IKMWT tows taken in Eltanin cruise 11, Sta. 944, 3029 m vertical haul, 24.1.1964, USNM No. 296429.

Paratypes. 2 ♀, 1 ♂, same data, USNM No. 296430; 6 ♀, 2 ♂, 57°09'S, 63°43'W, from IKMWT tows taken in Eltanin cruise 4, Sta. 123, 2439 m vertical haul, 28.VII.1962, ZISP, No. 90699.

Additional specimens. See Tables 1 and 2.

Description. Female. Total length 8.8-9.7 mm. Prosome 1.06-1.25 times as long as urosome (Figs 1-2). Cephalosome with collar-like extension of both left and right lateral margins (Figs 1, 3, 30-31). Rostrum of two filaments with setules at the subdivided base (Fig. 4). Genital somite nearly twice as long as wide, with elongated spermathecae, left one often darker (Figs 1, 5-9). Caudal rami about 6-7 times as long as wide (Figs 10-11). A1 of 24 articulated segments, exceeding the body length by 3-5 distal segments (Figs 12-17). Setal elements in A1 are setae and aestethascs, often difficult to distinguish between them as many setae are weakly sclerotized and apparently transformed into aestethascs. Setation of A1 articulated segments from the 1st to 24th is as follows: 10, 3, 3, 3, 3, 3, 6, 3, 3, 3, 3, 3, 3, 3, 3, 3, 1, 1, 2, 3, 2, 5. Proximal left and right segments of A1 with 3 well and 2 weakly pronounced attenuations respectively (Figs 12, 17); 2nd segment of right A1 with short denticle-like attenuation (Fig. 17). A2 of 9 articulated segments, 1st-8th segments with 1 seta each, 9th segment with 3 terminal setae (Fig. 18). Md: Mdp basis with 4 setae (Fig. 19); Enp1 and Enp2 with 4 and 8 terminal setae plus 2 posterior setae respectively (Fig. 20); Gn as in Fig. 27. Mx1 Li1 with 9 terminal, 4 posterior and 2 anterior setae; Li2 with 5 setae (Fig. 22); Li3 and Li4 with 4 and 5 setae respectively; Enp with 6+11 setae; Exp with 11 setae; Le2 with 1 seta (Fig. 21); Le1 with 7+2 setae (Fig. 23). Mx2 with 4+5 setae at Li1; Li2-Li4 with 3 setae each; Li5 with 4 setae (1 spine-like); Li6 with 4 setae; exopod with 7 setae (Fig. 24). Mxp syncoxa from proximal to distal with 1, 2, 4 and 4 setae in distal group and lateral distal seta (Fig. 25); basis with 3 medial setae and row of spinules at their base; 2 setae distally at Enp1 which is incompletely

incorporated into basis; Enp of 5 articulated segments with 4, 4, 3, 3 and 4 setae (Fig. 26). P1-P4 with 3-segmented rami. P1 basipod with curved anterior setae and 1 lateral distal seta; Enp1 with row of spinules in the medial distal corner; Enp2 with semicircular sclerotized ridge (Fig. 28). Enp1 P2 with 2 well developed hook-like spines, distal one subdivided, with horns nearly equal in length (Fig. 32). P3-P4 as in Figs 33-39. P5 with spinules at coxopod; basipod with lateral seta covered with setules; Exp1 with short spine; Exp2 with 3 terminal setae, medial is the longest; all setae covered with setules (Fig. 29).

Male. Total length 8.75-8.95 mm. Prosome 1.08-1.20 times as long as urosome (Figs 40-41). Lateral collar not developed (Figs 42-44). Genital somite with small projection on the left covered with spinules (Fig. 45). Caudal rami about 7 times as long as wide (Fig. 46). Left A1 of 24 articulated segments reaching the end of caudal rami, or exceeding it by 2 distal segments (Figs 47-51); some segments supplied with additional aestethascs as compared with females. Right A1 of 21 articulated segments, geniculated (Figs 52-55), reaching the middle length or the end of caudal rami. Oral parts and swimming legs as in females. P5 with spinules at coxopod on the left longer segment; left basipod with spinules in the medial distal part. Left and right basipods with lateral setae supplied with setules distally. Left P5 Exp1 with small spine in lateral distal part of the segment; Exp2 with hairs proximally and 1 proximal setule; Exp3 with 2 distal setules (Figs 56, 59). Right P5 Exp1 with small lateral spine and long attenuation exceeding the length of Exp2, the latter supplied with tiny spinule in proximal half of the segment; Exp3 with 1 and 2 tiny spinules in distal part (Figs 56-57).

Remarks. Females of *M. ferrarii* sp. n. differ from all other large-sized *Metridia* species in the presence of collar on both sides of cephalosome (in *M. alata* Roe, 1975, cephalosome in right lateral view is produced in a very con-

Table 2. Specimens of *Metridia ferrarii* from the collection of ZISP

Collection No.	Locality	Layer (m)	Date	Station	Vessel
40897	44°55'N 152°24'E	0-8500	11.10.1949	162	Vitjaz
65194	19°S 63°E	0-4300	29.05.1956	135	Ob'
65204	64°24'S 92°48'E	0-2700	12.05.1956	111	Ob'
65301	30°48'N 153°02'E	0-5500	1954	3206	Vitjaz
-	41°50'N 155°02'E	0-4000	15.10.1949	166	Vitjaz
-	62°56'S 118°52'E	0-3700	13.03.1956	36	Ob'
-	01°20'S 55°05'E	0-3000	04.06.1956	144	Ob'
-	37°35'N 144°44'E	-	1954	3226	Vitjaz

spicuous wing; however, it differs significantly in shape from that in *M. ferrarii*).

Females of *M. ferrarii* differ from females of *M. ornata* Brodsky, 1950 in the much longer spermathecae (Figs 5-9; cf. Figs 196-197, 199-203) and larger hook-like spines at P2 Enp1 (Fig. 32; cf. Figs 213-214). They differ from females of *M. princeps* in the less swollen genital somite (Figs 6-9; cf. Fig. 153); presence of a short denticle-like attenuation on the second segment of right A1 (Figs 12, 17; cf. Fig. 157), and absence of short spinules on the lateral distal part of P1 Enp2 (Fig. 32; cf. Fig. 162). Males of the new species differ from those of *M. princeps* in the strongly asymmetrical P5 left coxopod (Fig. 56), much longer than right (nearly symmetrical in *M. princeps*, Fig. 176); absence of sharp attenuation on left and right second segments of A1 (Figs 47, 52) (at least one of A1 is with sharp attenuation in *M. princeps*, Figs 177, 183); absence of suture in the left P5 Exp3 (Fig. 57) (the suture subdividing the segment into more or less sclerotized parts is present in *M. princeps*, Fig. 175); presence of spinules only at left P5 coxopod (Fig. 56) (in *M. princeps*, spinules present on both left and right coxopod, Fig. 176). Males of *M. ferrarii* differ from those of *M. ornata* mostly in the longer caudal rami (length/width ratio about 7.0 in *M. ferrarii* vs. 4.8-6.6 in *M. ornata*), longer hook-like spines at P2 Enp compared to those in *M. ornata* (Fig. 226), and shape of genital somite (Fig. 45; cf. Fig. 224).

Type locality. Antarctic, 69°06'S, 95°02'W.

Etymology. The name honours Frank D. Ferrari's contributions to the systematics of calanoid copepods.

***Metridia pseudoasymmetrica* sp. n.**

(Figs 60-110)

Holotype. ♀, 3.8 mm, 69°06'S, 95°02'W, from IKMWT tows taken in Eltanin cruise 11, Sta. 944, 3029 m vertical haul, 24.I.1964, USNM No. 296447.

Paratypes. 1 ♀, 3.8 mm, same data, USNM No. 296448; 4 ♀ (3.31, 3.39, 3.42, 3.6 mm), 1 ♂ (2.87 mm), 58°31'S, 65°17'W, from IKMWT tows taken in Eltanin cruise 4, Sta. 149, 2105 m vertical haul, 12.VIII.1962, USNM No. 296449; 8 ♀ (3.55, 3.6, 3.7, 3.8 mm), 2 ♂ (3.45 and 3.5 mm), 66°44'S, 115°13'W, from IKMWT tows taken in Eltanin cruise 11, Sta. 918, 1885 m vertical haul, 15.I.1964, ZISP No. 90700.

Additional material. See Table 1.

Description. Female. Total length 3.31-3.80 mm. Prosome 1.6-2.3 times as long as urosome, similar in shape to that of *M. asymmetrica* (Fig. 111). Genital somite nearly twice as long as wide, with asymmetrical oval spermathecae, left one situated more anterior than

right one (Figs. 60-66). Caudal rami about 1.7 times as long as wide (Fig. 60). A1 of 24 articulated segments reaching Ur3 or the end of caudal rami; 1st proximal segment of A1 without well pronounced attenuations; 2nd, 4th, 5th and 6th segments with short sharp attenuation each (Figs 79-80). Setation of A1 segments from proximal to distal is as follows: 10, 4, 4, 4, 4, 6, 4, 3, 4, 3, 3, 3, 3, 3, 3, 1, 1, 2, 3, 6. A2 of 9 articulated segments; 1st-8th segments with 1 seta each; terminal segment with 3 terminal setae (Figs 71-72). Md: basis with 4 setae; Enp1 and Enp2 with 4 and 8 terminal plus 2 posterior seta respectively; Gn as in Fig. 73. Mx1 Li1 with 9 terminal, 4 posterior and 2 anterior setae; Li2 with 5 setae; Li3 and Li4 with 3 and 5 setae respectively; Enp with 6+10 setae; Exp with 11-12 setae (Figs 74-75); Le2 with 1 small short seta; Le1 with 7+2 setae (Fig. 74). Mx2 with 4+5 setae at Li1; Li2-Li4 with 3 setae each; Li5 with 4 setae (1 spine-like); Li6 with 3 setae (Fig. 77); Exp with 7 setae (Fig. 76). Mxp syncoxa from proximal to distal with 1, 2, 4 and 4 setae medially and lateral distal seta; basis with 3 medial setae and row of spinules at their base; Enp1 with 2 setae; Enp2-6 with 4, 4, 3, 3 and 4 setae (Fig. 78). P1-P4 with 3-segmented rami (Figs 67, 86-89, 91). P1 basipod with curved anterior setae and distal lateral seta; Enp1 with row of hairs in the outer corner (Fig. 67). Enp1 P2 with 1 well developed, subdivided, hook-like spine and proximal triangular attenuation of the segment (Figs 83-86). P3-P4 as in Figs 87-91. P5 without spinules at coxopod; basipod with thin lateral seta; Exp1 usually without, rarely with seta (Fig. 69); Exp2 with 3 terminal setae, medial is the longest, usually they have setules, but in some specimens are nude (Figs 68, 70).

Male. Total length 2.87-3.5 mm. Prosome 1.4-1.5 times as long as urosome (Figs 92-93). Urosome with small spinulated swellings on the left side of Ur2-Ur4 (Fig. 94). Caudal rami about twice as long as wide (Fig. 94). Left A1 20-segmented, geniculated, reaching the end of caudal rami (Figs 95-99). Shape of P5 segments strongly varies depending on view (Figs 100-109). Left P5 Exp1 with long attenuation in the medial part of the segment; Exp2 with small spine and Exp3 with tiny setules terminally (Figs 100-105). P5 with hairs at medial swelling of right basipod (Figs 100, 107, 110). Right P5 Exp1 with small lateral spine in distal part; Exp2 with 2 lateral spine-like attenuations; Exp3 with 1 and 2 tiny spinules in distal part (Figs 100, 106-109).

Remarks. *M. pseudoasymmetrica* sp. n. is similar to *M. asymmetrica* Brodsky, 1950, but

females of the new species differ in the shape and location of spermathecae (oval and overlapping in lateral view in *M. pseudoasymmetrica*, Figs 63-66 vs. round and not overlapping in lateral view in *M. asymmetrica*, Figs 114, 116), distinct indentation in the posterior third of the genital somite in lateral view (Fig. 61) (indentation weakly pronounced in *M. asymmetrica*, Figs 114, 116), and the subdivided hook-like spine at P2 Enp1 with markedly unequal horns (Figs 83-86) (the horns are slightly unequal in length in *M. asymmetrica*, Figs 125-126). Males of these 2 species are very similar, but *M. pseudoasymmetrica* differs in the presence of small setae supplied with setules in left lateral distal part of P5 basipod and small distal lateral seta at P5 left Exp 1, and absence of short spinules at Ur2 on the right and presence of short hairs at Ur4 on the left.

Type locality. Antarctic, 69°06'S, 95°02'W.

Etymology. The name of the species alludes to its similarity to *M. asymmetrica*.

Metridia asymmetrica Brodsky, 1950
 (Figs 111-147)

Material examined. Syntypes, ♀ and ♂, Pacific Ocean, Kamchatka, 90 miles SE off cape Shipunsky, collected by ice-breaker "Severny Polyus" in 1946, vertical haul 4000-1000 m, ZISP No. 40672.

Description. Female. Total length 3.9-4.2 mm. Prosome nearly twice as long as urosome (Fig. 111). Rostrum of two well developed filaments (Fig. 112). Genital somite 1.7-1.8 times as long as wide, asymmetrical, with left side more swollen (Figs 111, 113), with round spermathecae situated asymmetrically: left one directly above right one (Figs 113-116). Caudal rami about twice as long as wide (Fig. 113). A1 of 24 articulated segments reaching anal somite or nearly the middle length of caudal rami; proximal segments of A1 with well pronounced attenuations (Figs 121, 123). Oral parts and Mxp as described for *M. pseudoasymmetrica*. P1 very similar to that of *M. pseudoasymmetrica* (Figs 117-118). Enp1 P2 with 1 well pronounced, subdivided, hook-like spine and proximal hook-like attenuation of the segment (Figs 125-126). P3-P4 as in *M. pseudoasymmetrica* (Fig. 127). P5 without spinules on coxopod; basipod with thin lateral seta in distal corner; Exp1 without seta; Exp2 with 3 terminal setae without setules, medial is the longest, small subterminal seta is present at right P5 (Fig. 120).

Male. Total length 3.0-3.5 mm. Prosome 1.8-2.0 times as long as urosome. Ur2 with small anterior swelling covered with spinules on the

left and on the right; Ur3 with short spinules in left lateral anterior part (Fig. 130). Caudal rami about 1.9 times as long as wide (Fig. 130). Left A1 20-segmented, geniculated, reaching Ur4 (Figs 132-135); right A1 reaching caudal rami. Shape of P5 segments strongly varies depending of view (Figs 136-147). P5 with spinules at medial swelling of right basipod (Figs 136-137). Left P5 Exp1 with long attenuation in the medial part of the segment; Exp3 with tiny setules terminally (Figs 142-143, 146-147). Right P5 Exp1 with lateral spine (Fig. 138); Exp2 with 2 lateral spine-like attenuations (Figs 137, 139), Exp3 with 1 and 2 tiny spinules in distal part (Figs 139-141).

Metridia princeps Giesbrecht, 1889
 (Figs 148-183)

Material examined. see Tables 1 and 3.

Description. Female. Total length 7.4-7.8 mm (8.1-8.5 after Bradford-Grieve, 1999). Prosome 1.33-1.47 times as long as urosome. Cephalosome without collar on both left and right sides (Figs 148-149, 150). Rostrum of 2 filaments at subdivided base (Fig. 152). Genital somite 1.8-2.0 times as long as wide, with elongate spermathecae, right one usually darker (Figs 153-156). Caudal rami about 6 times as long as wide. A1 of 24 articulated segments, exceeding the body length by 4-5 distal segments (Figs 157-161). In both left and right A1, 1st articulated segment with 3 well pronounced attenuations, 2nd segment with a long, pointed, denticle-like attenuation, 4th segment with a smaller denticle-like attenuation, (Fig. 157). Oral parts and Mxp as in *M. ferrarii*. P1 basipod with curved anterior setae; Enp1 with row of spinules at anterior corner; both Enp1 and Enp2 with well sclerotized lateral parts of segments, those of Enp2 with short spinules (Fig. 162). Enp1 P2 with 2 well developed hook-like spines, distal one subdivided, with long horns (Figs 163-164). P3-P4 Exp as in Figs 165-166. P5 with spinules at coxopod, basipod with lateral seta covered with setules, Exp1 with short spine, Exp2 with 3 terminal setae, medial is the longest, all setae with setules (Fig. 167).

Male. Total length 7.4 mm (7.0-8.0 mm after Bradford-Grieve, 1999). Cephalosome collar absent (Figs 168-169). Genital somite with small projection on the right lacking spinules; spinules present at the posterior prosomal somite on the left (Fig. 170). Urosomal somites lacking spinules (Figs 170-171). Caudal rami about 6 times as long as wide (Fig. 173). Right A1 geniculated (Figs 177-182); denticle-like

Table 3. Specimens of *Metridia princeps* from the collection of ZISP

Collection No.	Locality	Layer (m)	Date	Station	Vessel
40898	41°50'N 55°02'E	0-4000	15.10.1949	166	Vitjaz
65190	06°50'N 87°37'E	0-500	09.06.1957	-	Ob'
65191	06°44'S 59°21'E	0-2700	02.06.1957	141	Ob'
65192	05°44'S 87°06'E	-	08.05.1957	321	Ob'
65193	19°09'S 63°07'E	0-2700	29.05.1956	135	Ob'
65195	00°51'N 54°27'E	0-1500	04.06.1956	145	Ob'
65197	63°19'S 135°11'E	0-2600	22.03.1956	48	Ob'
65199	45°26'S 125°52'E	0-2200	04.05.1956	97	Ob'
65200	37°12'S 67°28'E	0-2000	24.05.1956	127	Ob'
65201	34°18'S 66°49'E	0-1100	25.05.1956	128	Ob'
65202	19°09'S 63°07'E	0-3300	29.05.1956	135	Ob'
65203	03°09'N 53°45'E	0-3350	05.06.1956	146	Ob'
65206	31°20'S 66°04'E	0-2200	25.05.1956	129	Ob'
65207	01°20'S 55°05'E	0-3000	04.06.1956	144	Ob'
65208	05°05'S 57°34'E	-	02.06.1956	142	Ob'
65210	10°54'S 94°57'E	0-1000	01.05.1957	312	Ob'
65212	32°27'S 75°44'E	0-1900	20.05.1958	442	Ob'
65213	31°38'S 80°42'E	0-2300	18.05.1958	439	Ob'
65214	31°59'S 78°27'E	0-2300	19.05.1958	440	Ob'
90695	37°35'N 144°44'E	-	1954	3226	Vitjaz

attenuations at proximal segments are developed to different extent in different specimens and in the specimens from different localities (Figs 177, 182-183). P5 in the specimens examined with long attenuation at left Exp1. P5 with spinules at coxopod on the left and on the right; right basipod with hairs in the medial part distally. Both left and right basipods with lateral seta distally; setae covered with setules (Figs 174, 176). Left P5 Exp3 with weakly pronounced suture (Fig. 175) subdividing segment into better and weaker sclerotized parts, however, contrary to Sars (1924-1925), segment is not subdivided into two separate parts.

Remarks. Differences between *M. princeps* and *M. ferrarii* are listed in the remarks to the description of *M. ferrarii* (see above). Females of *M. princeps* differ from those of *M. ornata* in the larger spines at P2 Enp1 (Figs 163-164; cf. Figs 212-214), more swollen genital somite, which is about 1.8 times as long as wide (Fig. 153) (about 2.3 times as long as wide in *M. ornata*, Figs 196, 201-203). In both males and females of *M. princeps*, the second segment of at least one of A1 is with a pointed, long attenuation (Figs 157, 183), while in *M. ornata* this attenuation is shorter (Figs 204, 233).

Geographical distribution. The species is widely distributed in the Pacific, Atlantic and Indian Oceans and in the Southern Ocean (Razouls, 1995). It was not found north of 65°N (Jespersen, 1940) and is not reported south of

71°S (Farran, 1929). The type locality of this species is the tropical Pacific at about 3°S, 99°W (after Giesbrecht, 1892). Probably the distributional range for this species is not so wide, as it could have been mixed with other large-sized *Metridia*, the taxonomic status of which are not clear.

Metridia ornata Brodsky, 1950 (Figs 184-243)

Material examined. See Tables 1 and 4.

Description. Female. Total length 7.5-8.1 mm. Prosome 1.2-1.4 times as long as urosome. Cephalosome without collar on either side (Figs 184-187, 192-194). Rostrum of two haired filaments at subdivided base (Fig. 198). Genital somite nearly 2.1 times as long as wide (dorsal view), with elongate spermathecae, both either dark or light (Figs 196-203). Caudal rami about 5-6 times as long as wide (Figs 189-191). A1 of 24 articulated segments, by 2-3 distal segments exceeding the body length (Figs 204-209). Both left and right proximal segments of A1 with 3 pronounced attenuations (Fig. 204). Oral parts and Mxp as in *M. ferrarii*. P1-P4 with 3-segmented rami (Figs 210-212, 215). P1 basipod with curved anterior setae; Enp1 with row of spinules in anterior lateral corner; Enp2 with semicircular sclerotized ridge (Fig. 210). Enp1 P2 with 2 hook-like spines, distal one subdivided, horns

Table 4. Specimens of *Metridia ornata* from the collection of ZISP

Collection No.	Locality	Layer (m)	Date	Station	Vessel
40763 (syntypes)	Pacific Ocean, Kamchatka, 90 mil SE of Shipunsky	1000-4000	25.08.1946	1	Severnyi Polyus
40765	57°25'N 175°43'E	1000-3700	23.08.1950	524	Vitjaz
65298	37°35'N 144°44'E	—	1954	3226	Vitjaz
65299	46°07'N 155°16'E	—	24.05.1953	2119	Vitjaz
65304	62°56'S 118°52'E	0-3700	13.03.1956	36	Ob'
90690	41°50'N 155°02'E	0-4000	15.10.1949	166	Vitjaz
90691	44°55'N 152°24'E	0-8500	11.10.1949	162	Vitjaz
90692	46°22'N 145°54'E	0-3000	30.04.1932	9	Gagara

are very short (Figs 212-214). P5 with spinules at coxopod; basipod with setuled or nude lateral seta; Exp1 with short spine latero-distally; Exp2 with 3 terminal setae, medial is the longest, setae with or without hairs (Figs 216-220).

Male. Total length 7.0-7.4 mm. Prosome 1.10-1.20 times as long as urosome. Collar absent (Figs 221-222). Genital somite without hairs at small projection on the right (Fig. 224). Caudal rami about 4.8-6.6 times as long as wide (Figs 224, 225). Left A1 geniculated, reaching the end of anal segment (Figs 228-232). Right A1 reaching the middle length of caudal rami. P5 with spinules at the right, longer coxopod; right basipod with spinules in the medial distal part. Both left and right basipods with setuled lateral setae distally. Right P5 Exp1 with small spine in lateral distal part of the segment; Exp2 with hairs; Exp3 with 3 tiny setules distally (Figs 242-243). Left P5 Exp1 with small lateral spine and long medial attenuation exceeding the length of the Exp2, the latter supplied with tiny spinule in the middle; Exp3 with 1+2 tiny spinules in distal part (Figs 237-241).

Remarks. Differences between *M. ornata* and *M. ferrarii* are listed in the remarks for *M. ferrarii*, these with *M. princeps* are listed in the remarks to *M. princeps*. In the original description of *M. ornata* (Brodsky, 1950), the type locality is given as 35°N, 125°W, however the original label of the type specimen is as following: Pacific Ocean, Kamchatka, 90 miles SE of cape Shipunsky. This species apparently can be considered as bipolar: its northernmost record is at 57°N in the Bering Sea (Table 4) and southernmost at 70°S (see Table 1).

***Metridia macrura* Sars, 1905**
(Figs 244-246)

Material examined. 1 ♀, 19°09'S, 63°07'E, total vertical haul 4300 m, 29.V.1956, Sta. 135, R/V Ob', ZISP.

The female specimen available for examination was damaged and thus not measured. The species differs from all large-sized *Metridia* species in the longest caudal rami: they are nearly 9 times as long as wide in the examined specimen and are known as about 12 times as long as wide (Sars, 1924, fig. 5).

Acknowledgements

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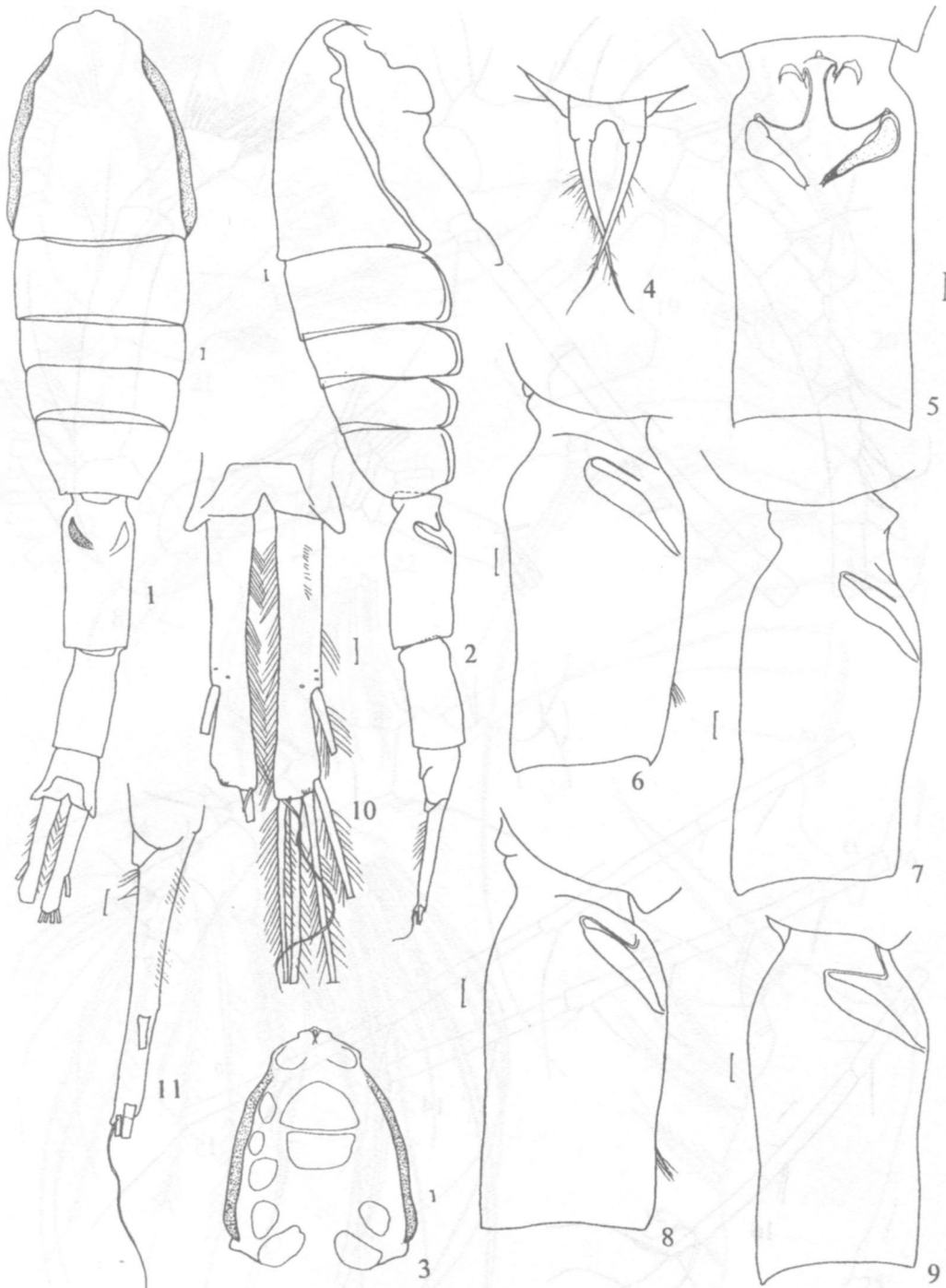
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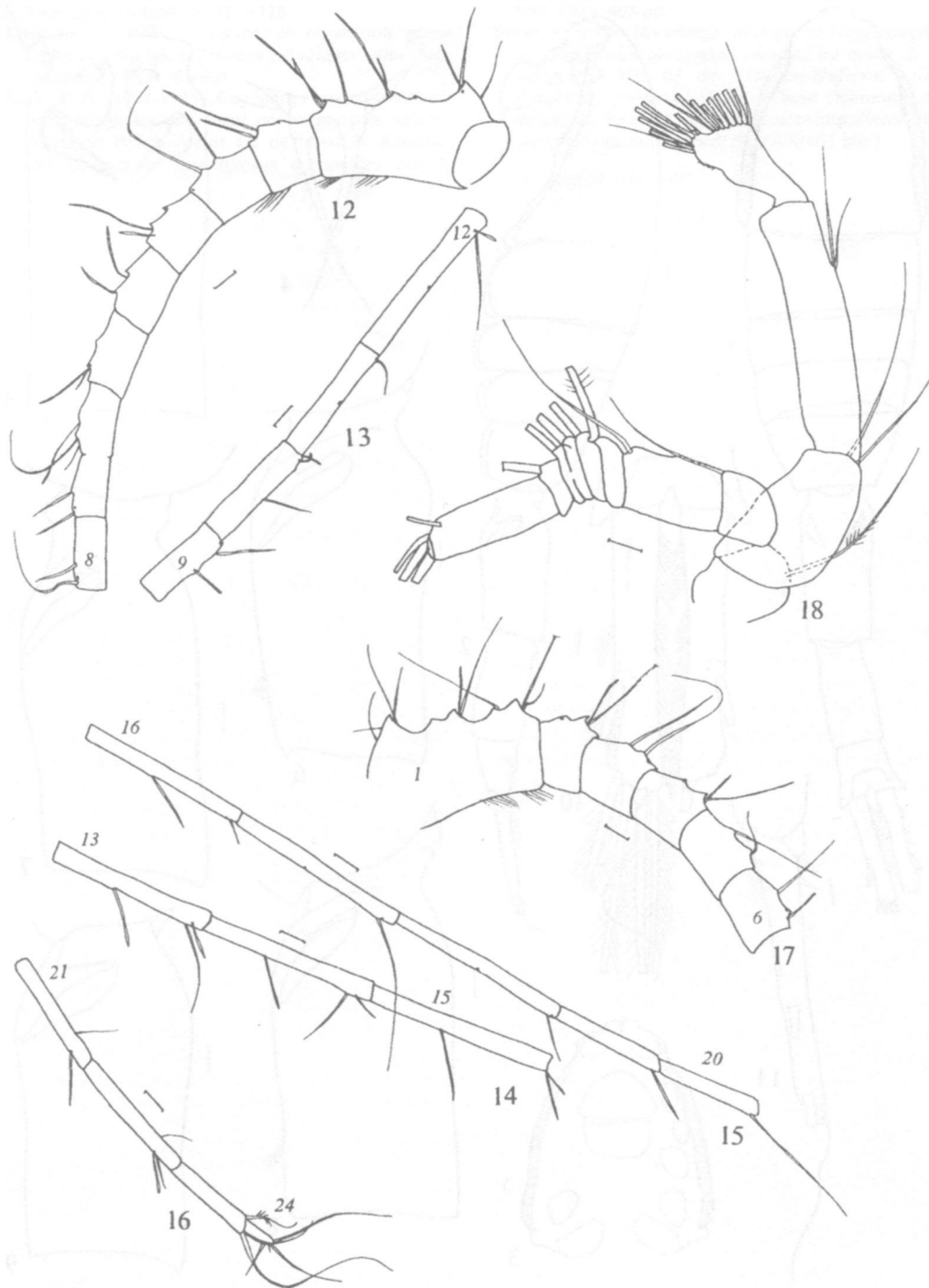
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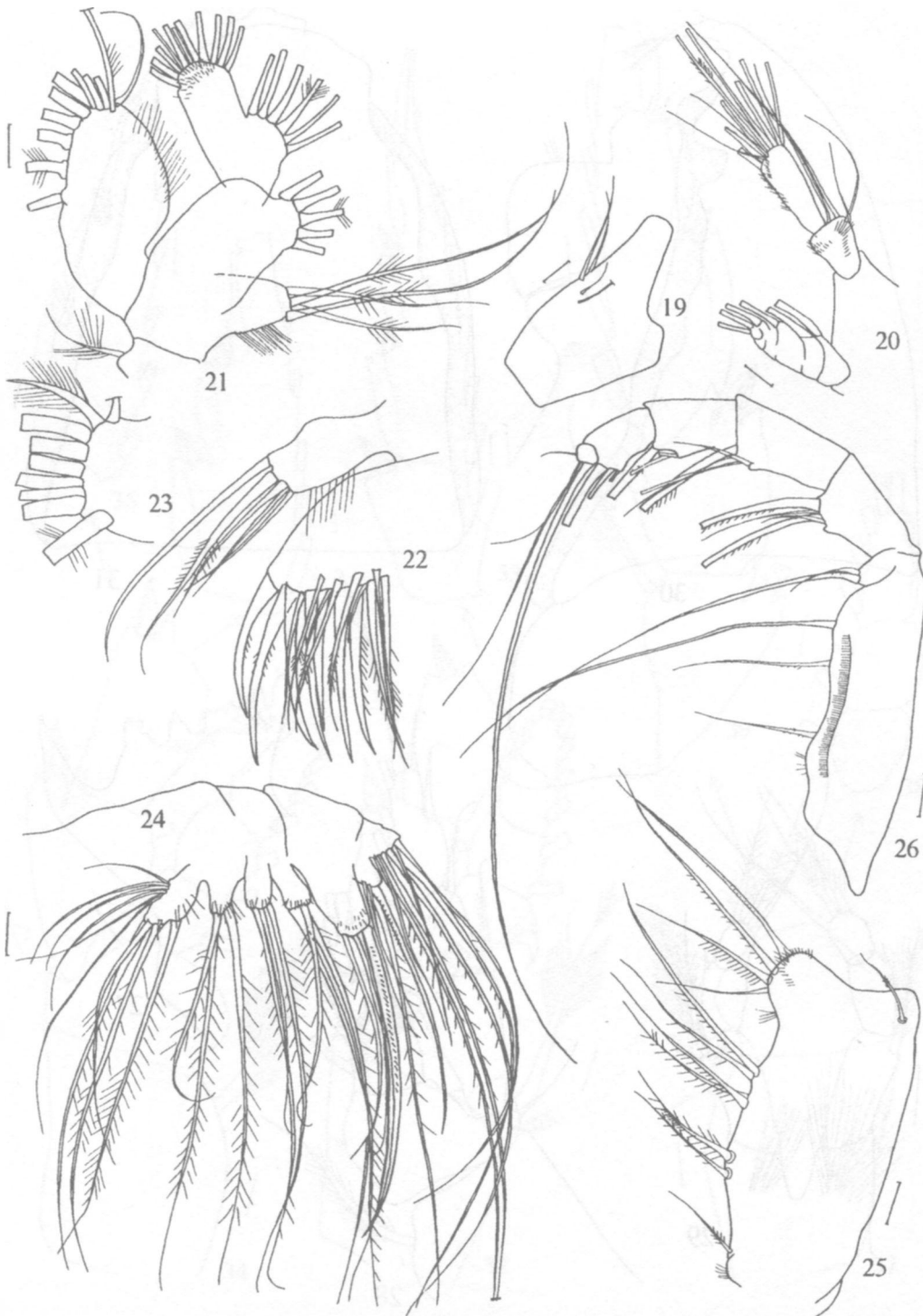
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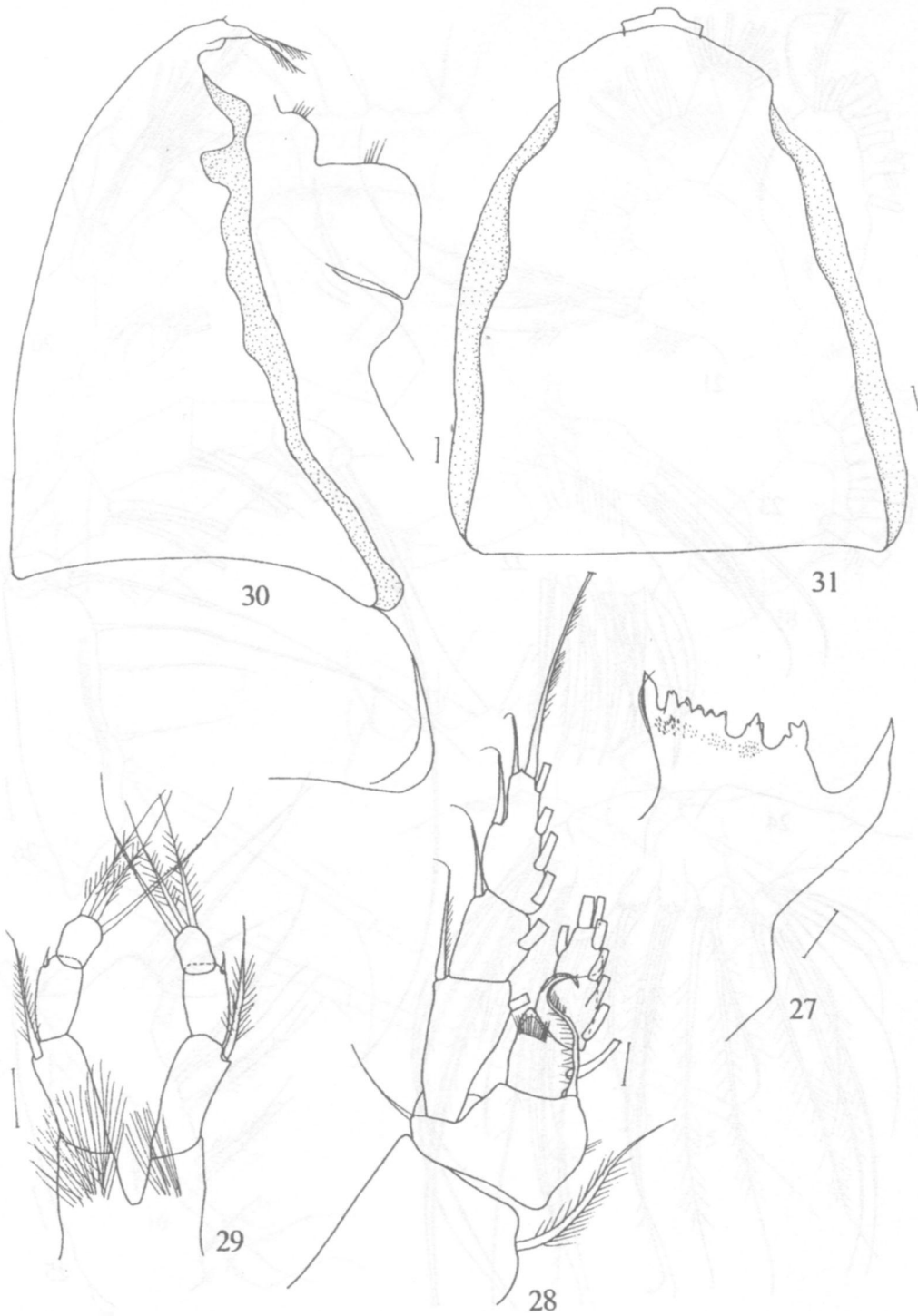
Figs 1-11. *Metridia ferrarii* sp. n., female. 1, 2, general view (dorsal and left lateral); 3, cephalosome (ventral view); 4, rostrum; 5, genital somite (ventral view); 6-9, the same (right lateral view); 10, 11, caudal rami (dorsal and right lateral view). Fig. 6 after female from Sta. 1014; Figs 8-9 after females from Sta. 154 (Table 1); other figures from holotype.



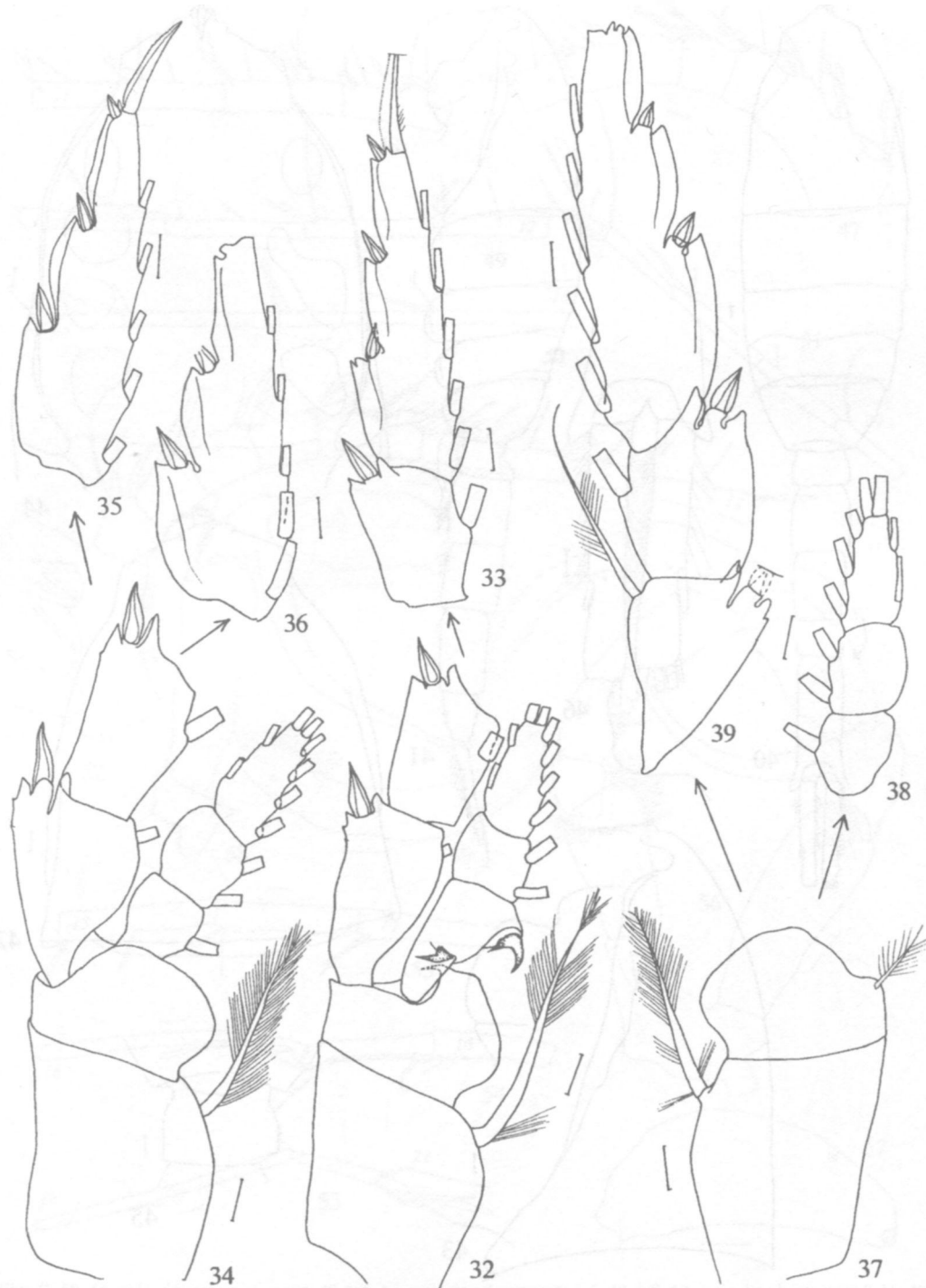
Figs 12-18. *Metridia ferrarii* sp. n., female, holotype. **12**, left A1, articulated segments 1-8; **13**, left A1, articulated segments 9-12; **14**, left A1, articulated segments 13-15; **15**, left A1, articulated segments 16-20; **16**, left A1, articulated segments 21-24; **17**, right A1 articulated segments 1-6; **18**, A2.



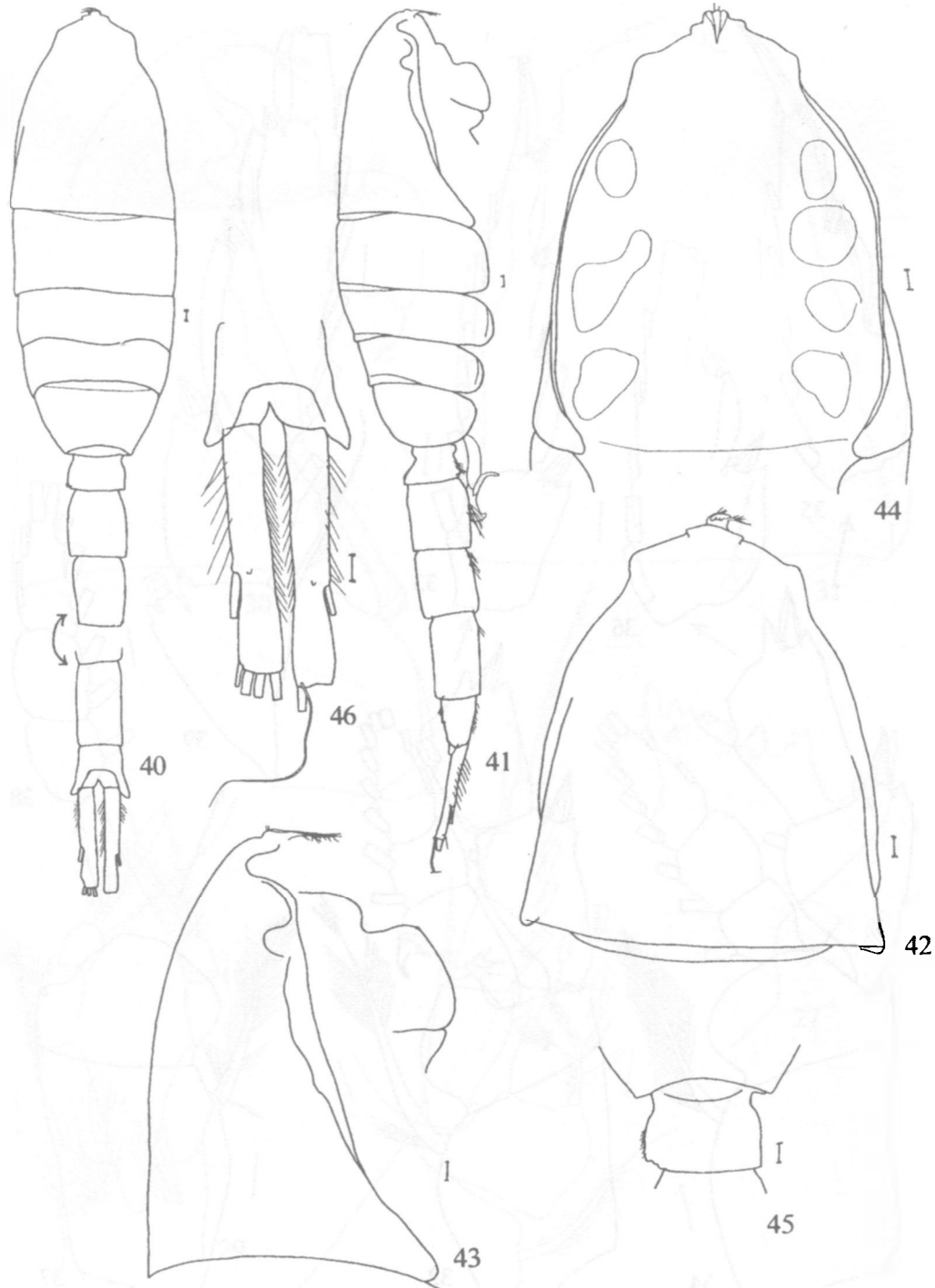
Figs 19-26. *Metridia ferrarii* sp. n., female, holotype. 19, Mdp, basis; 20, Md, Enp and Exp; 21, Mx1, Li3, Li4, Enp, Exp and Le2; 22, Mx1, Li1 and Li2; 23, Mx1, Le1; 24, Mx2; 25, Mxp, syncoxa; 26, Mxp, basis and Enp.



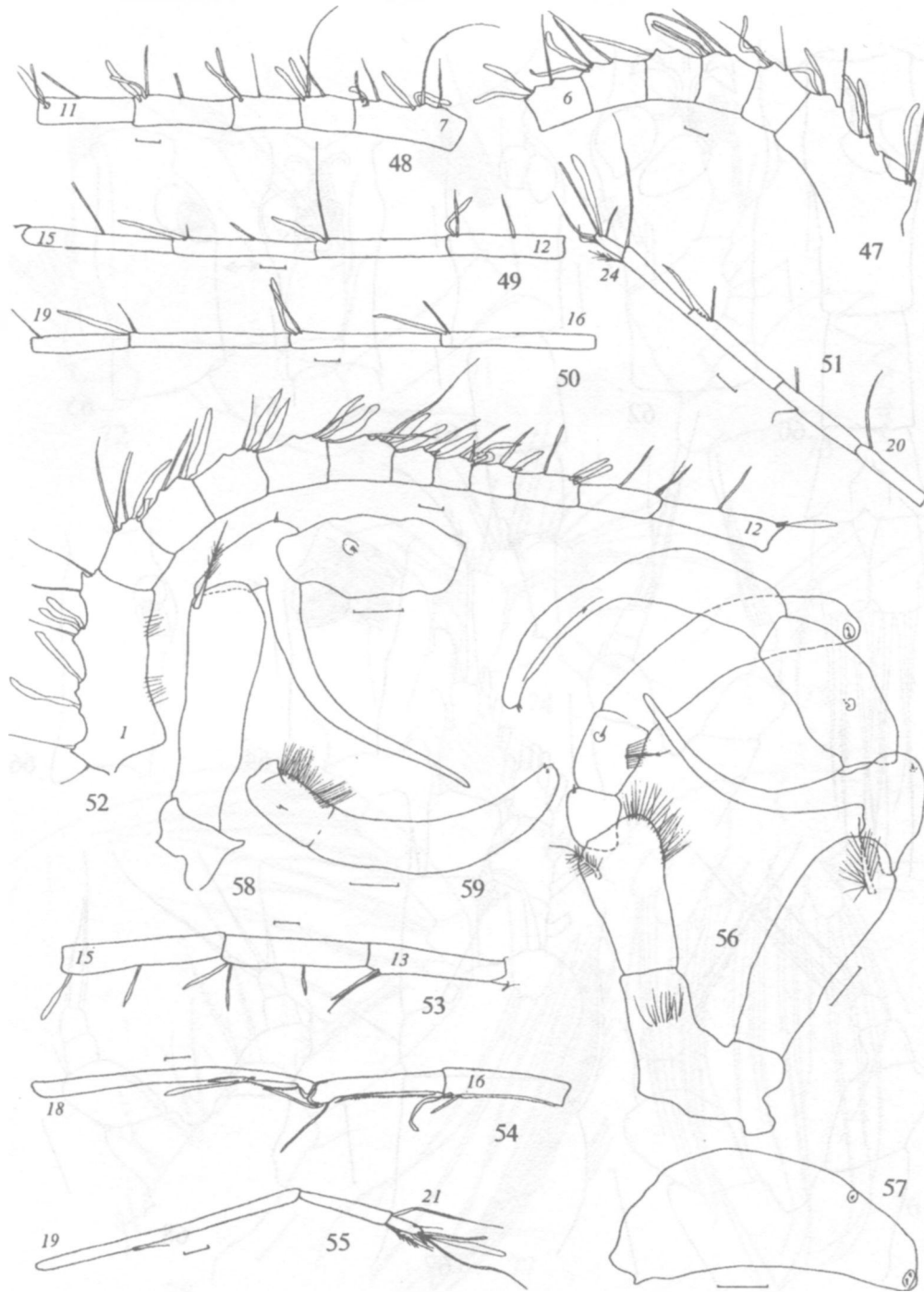
Figs 27-31. *Metridia ferrarii* sp. n., female, holotype. 27, Md Gn; 28, P1; 29, P5; 30, 31, cephalosome (lateral and dorsal views).



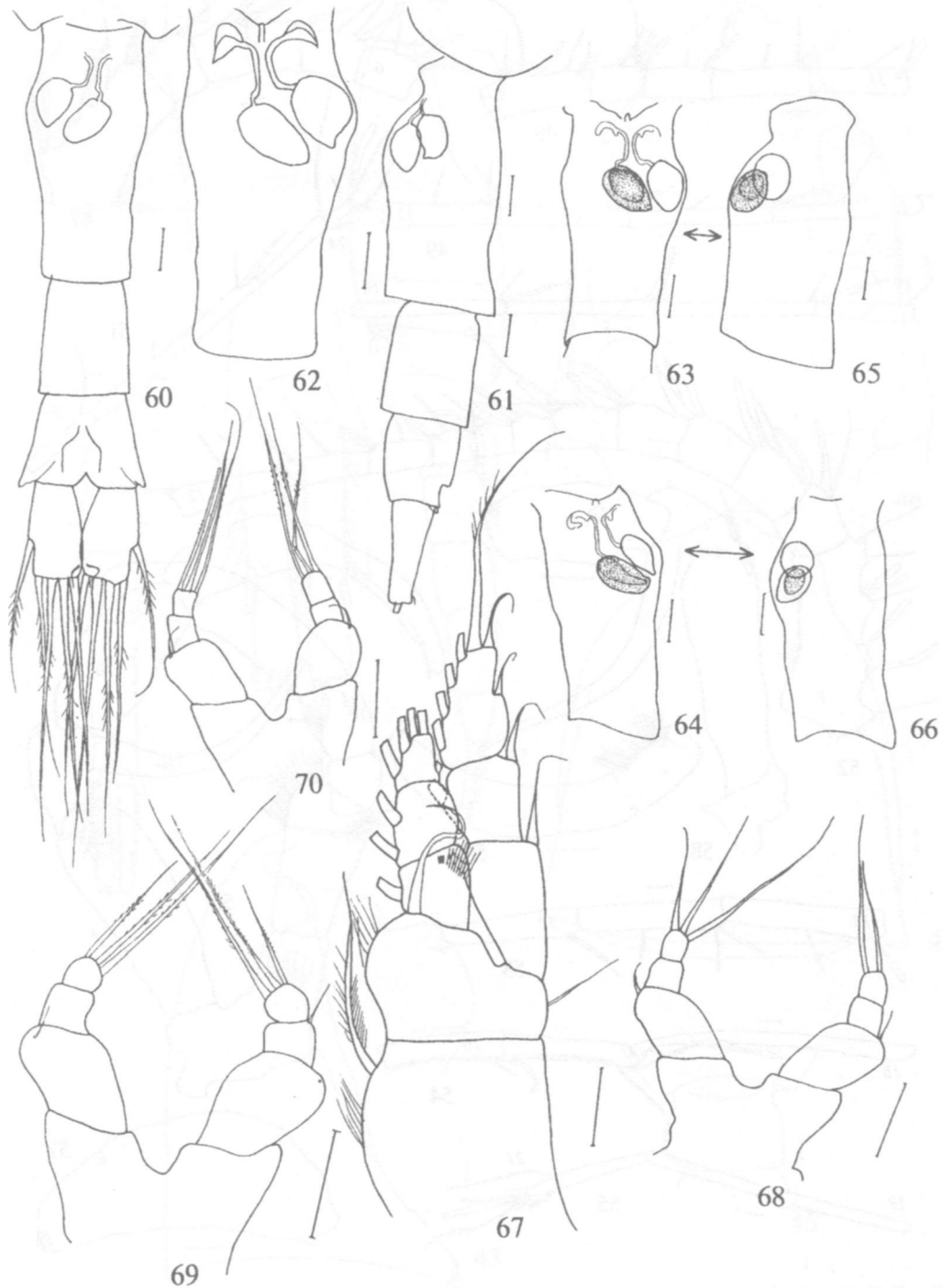
Figs 32-39. *Metridia ferrarii* sp. n. female. **32**, P2, coxopod, basipod, Enp and Exp1-2; **33**, P2, Exp2-3; **34**, P3, coxopod, basipod, Enp and Exp1-2; **35-36**, P3, Exp3; **37**, P4, coxopod and basipod; **38**, P4, Enp; **39**, P4, Exp. Fig. 36 after paratype No. 296430; other figures after holotype.



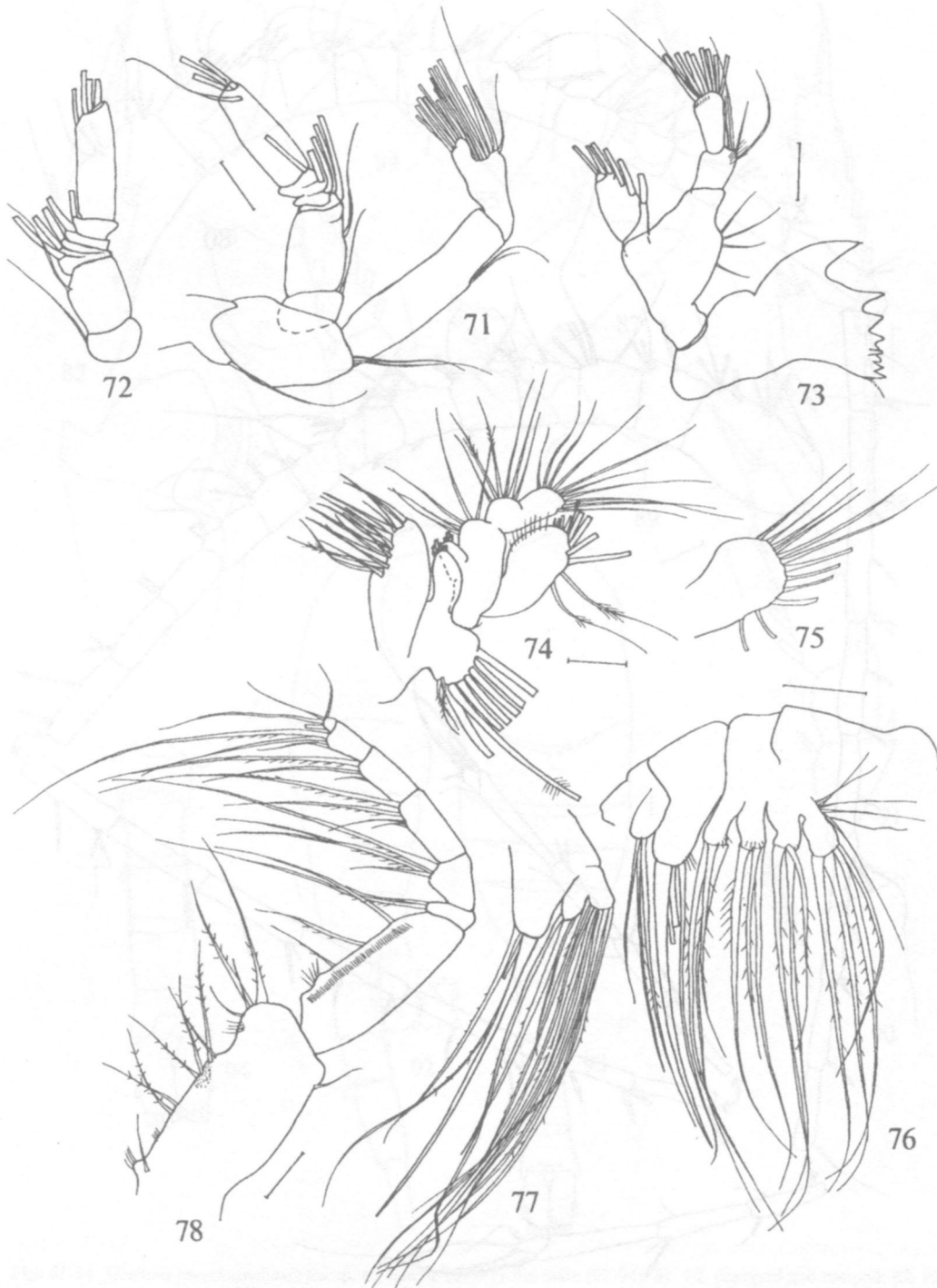
Figs 40-46. *Metridia ferrarii* sp. n., male. **40, 41**, general view (dorsal and left lateral); **42**, cephalosome (dorsal view); **43**, cephalosome (right lateral view); **44**, cephalosome (ventral view); **45**, posterior prosomal and genital somite (dorsal view); **46**, caudal rami (dorsal view). Fig. 42 after male from Sta. 895 (Table 1); other figures after paratype No. 296430.



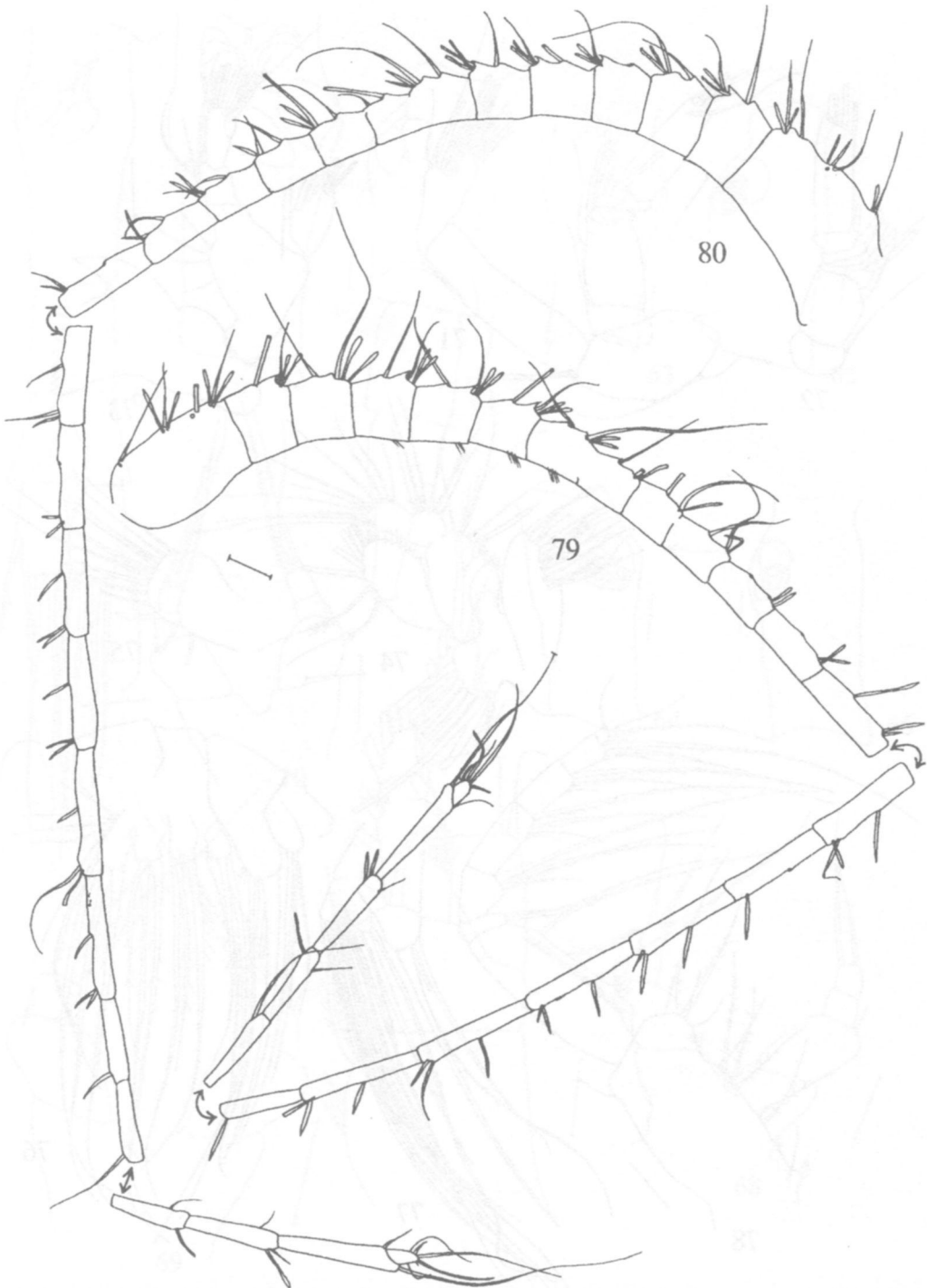
Figs 47-59. *Metridia ferrarii* sp. n., male. 47, left A1, articulated segments 1-6; 48, left A1, articulated segments 7-11; 49, left A1, articulated segments 12-15; 50, left A1, articulated segments 16-19; 51, left A1, articulated segments 20-24; 52, right A1, articulated segments 1-12; 53, right A1, articulated segments 13-15; 54, right A1, articulated segments 16-18; 55, right A1, articulated segments 19-21; 56, P5; 57, right P5, Exp3; 58, right P5, coxopod, basipod and Exp1-2; 59, left P5, Exp2-3. Fig. 56 after male from Sta. 895 (Table 1); other figures after paratype No. 296430.



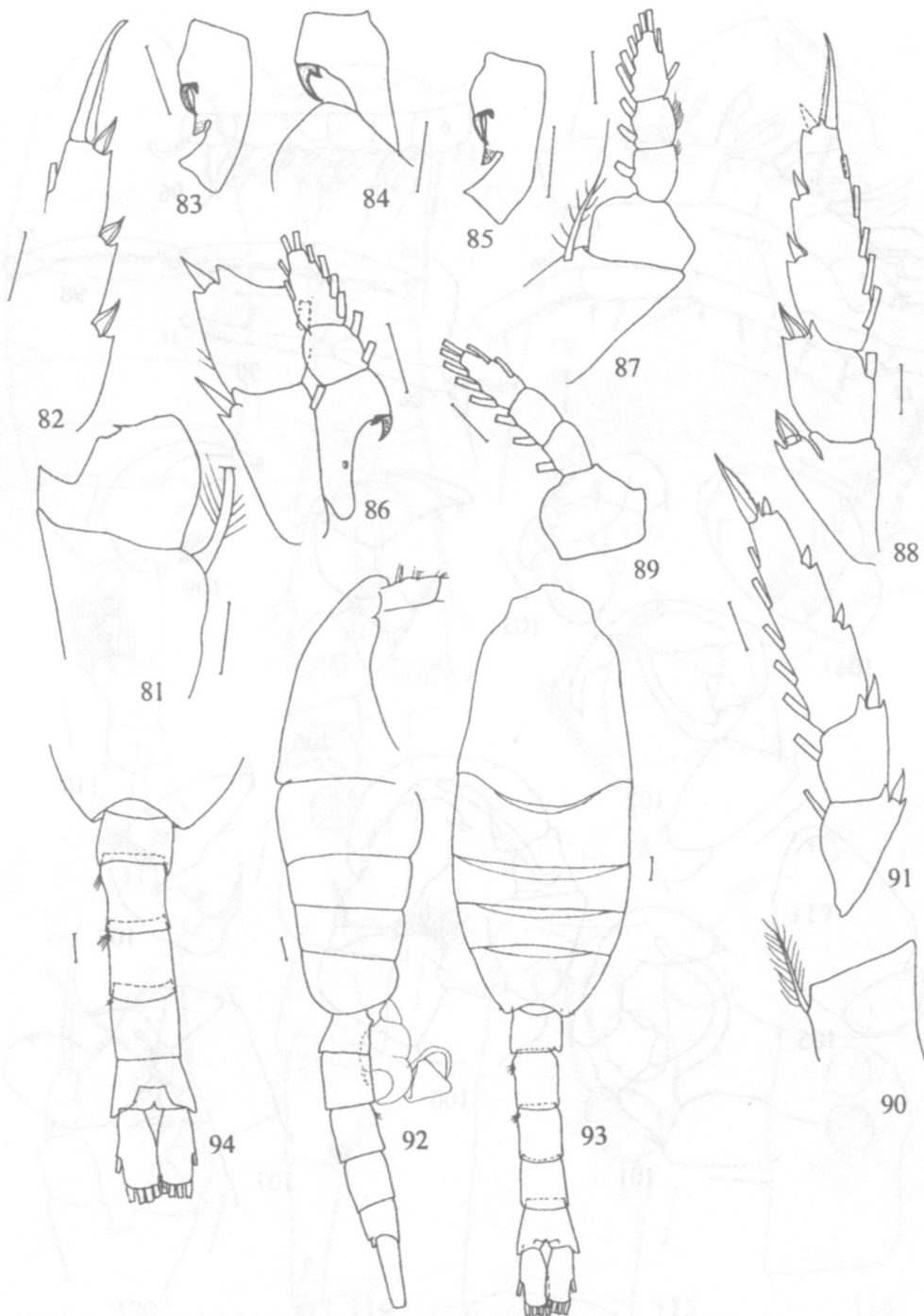
Figs 60-70. *Metridia pseudoasymetrica* sp. n., female. **60**, Ur (dorsal view); **61**, Ur (left lateral view); **62-64**, genital somite (ventral view); **65-66**, genital somite (left lateral view); **67**, P1; **68-70**, P5. Figs 60-62, 67-68 after holotype; Fig. 70 after female from Sta. 123; other figures after female from Sta. 154 (Table 1).



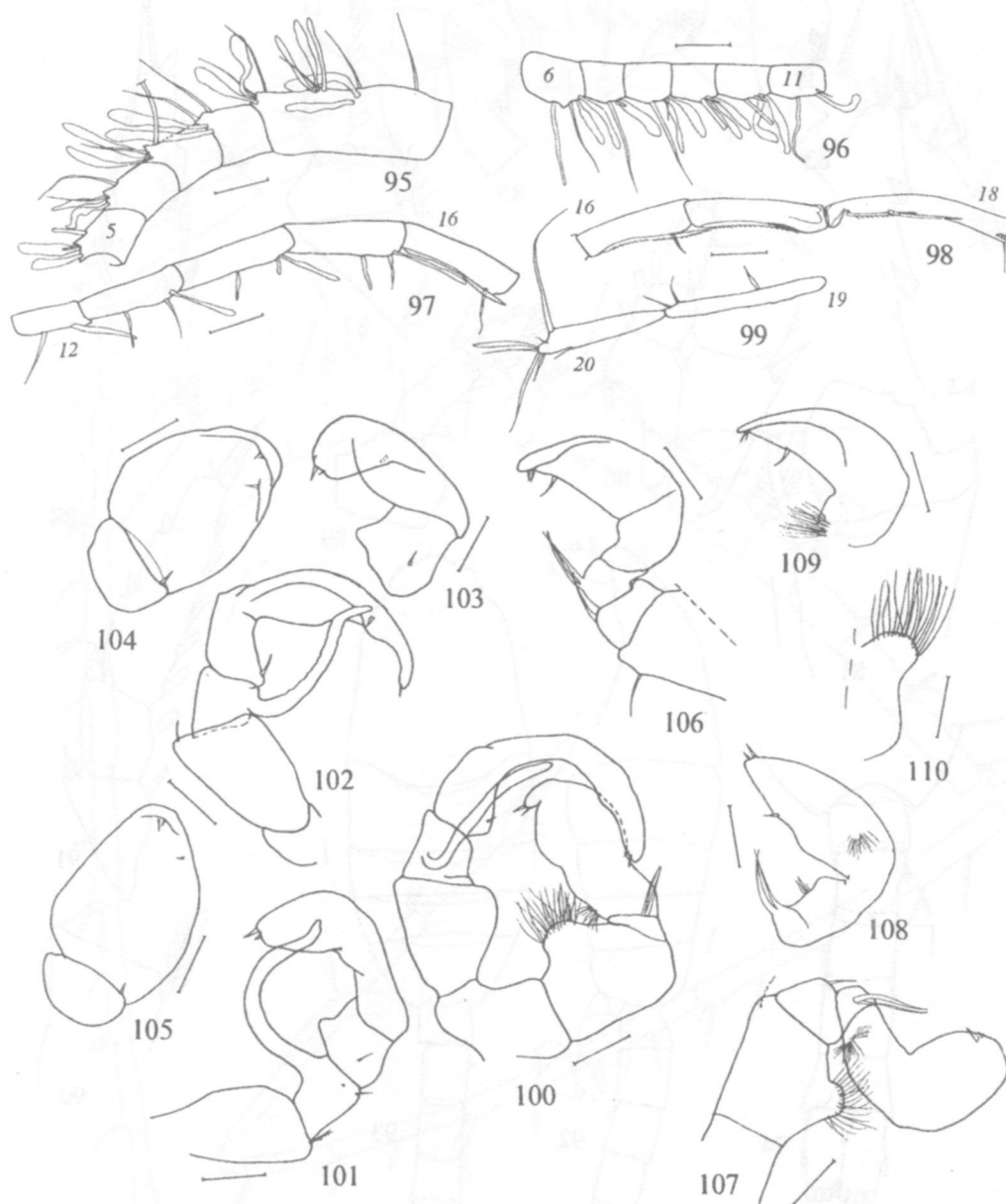
Figs 71-78. *Metridia pseudoasymmetrica* sp. n., female, holotype. 71, A2; 72, A2, Exp (other position); 73, Md; 74, Mx1; 75, Mx1, Exp (other limb of holotype); 76, Mx2, Li1-Li6; 77, Mx2, Li5-6 and exopod; 78, Mxp.



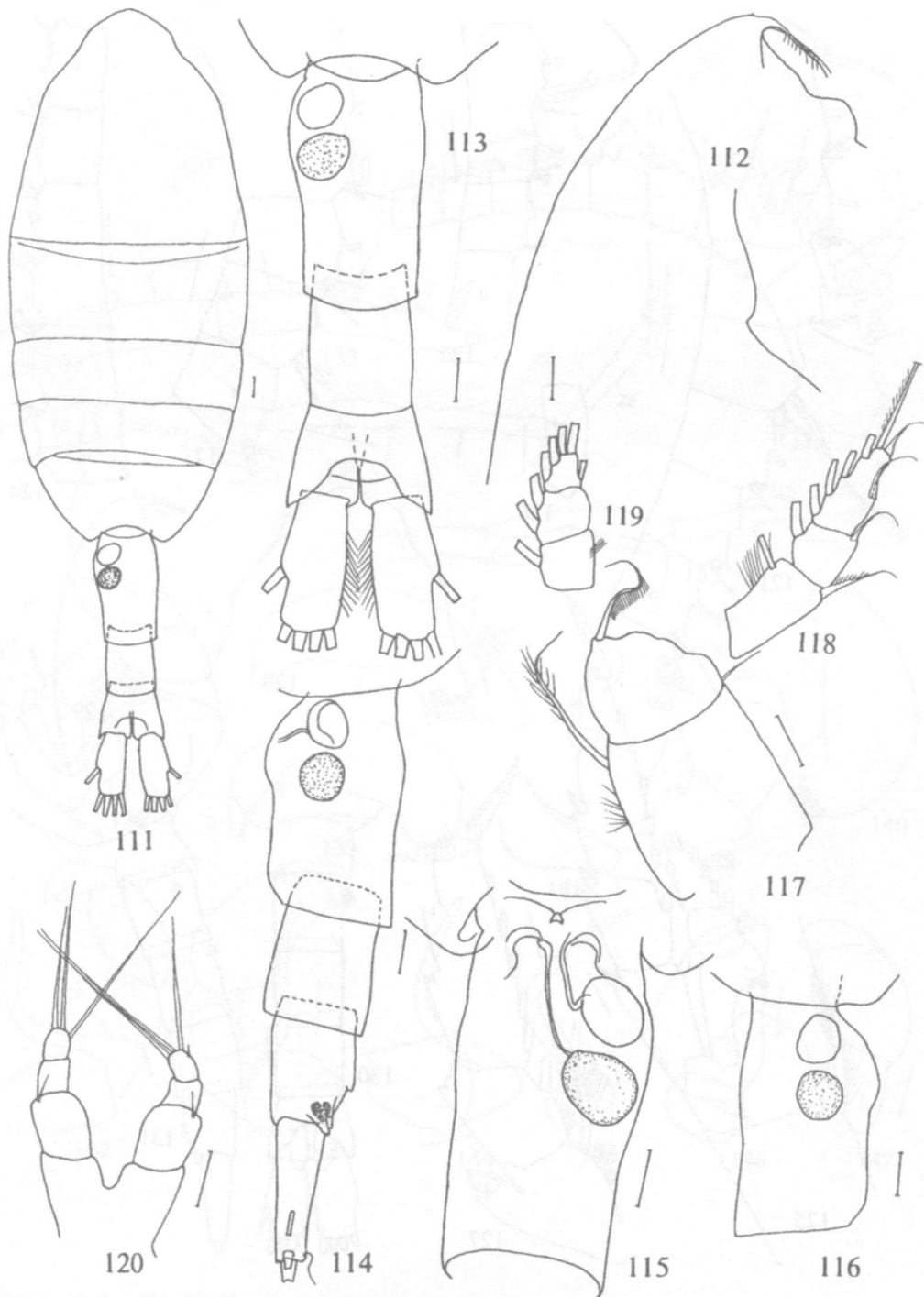
Figs 79-80. *Metridia pseudoasymmetrica* sp. n., female from Sta. 918 (Table 1). 79, right A1; 80, left A1.



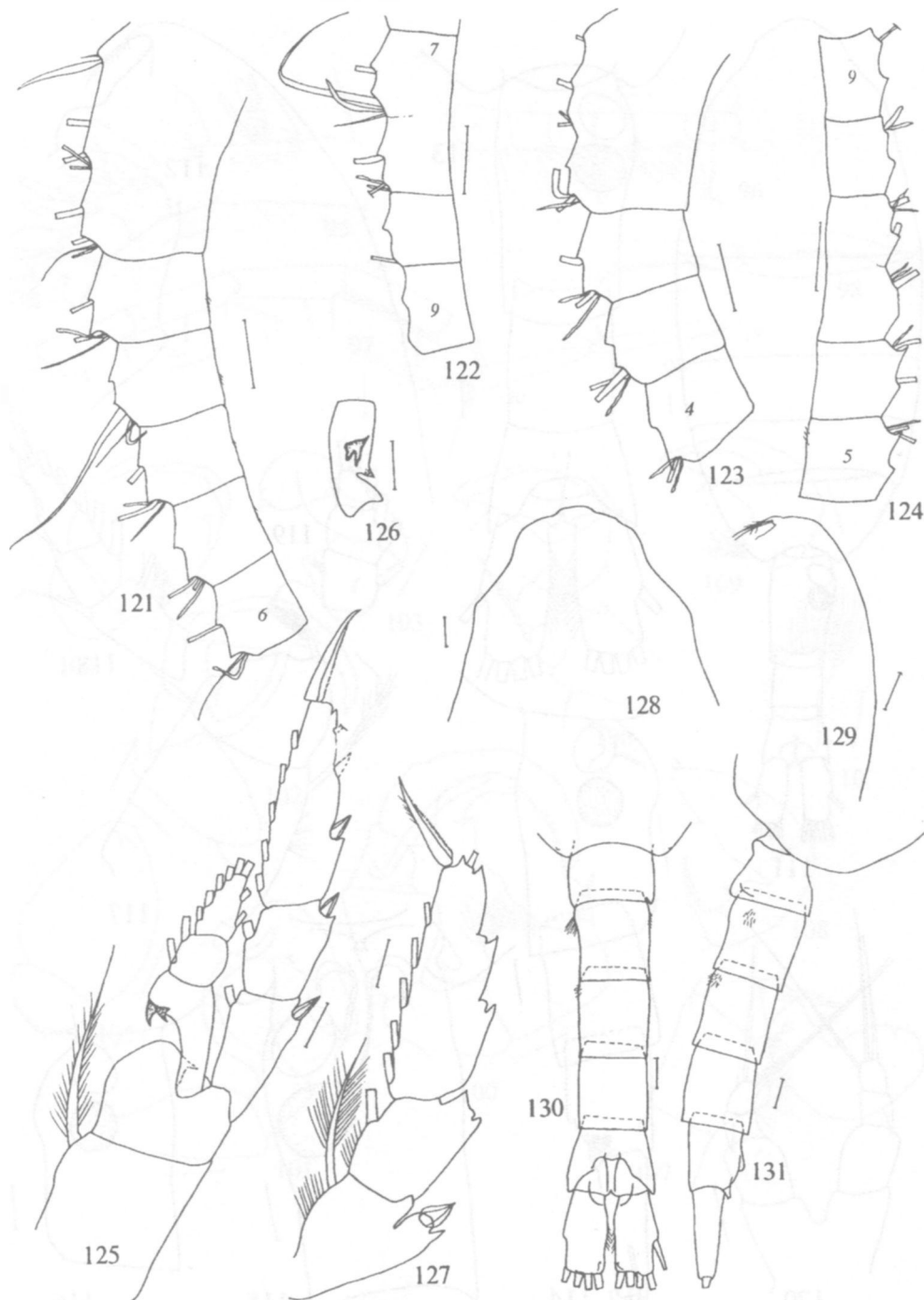
Figs 81-94. *Metridia pseudoasymetrica* sp. n., female (81-91) and male (92-94). 81, P2, coxopod and basipod; 82, P2, margin of Exp3 laterally; 83-85, P2, Enp1 (different positions); 86, P2, Exp2-3 and Enp; 87, P3, coxopod, basipod and Enp; 88, P3, Exp; 89, P4, basipod and Enp; 90, P4, coxopod; 91, P4, Exp; 92, general lateral view; 93, general dorsal view; 94, Ur (dorsal view). Figs 82-85, 87-91 after holotype; Figs 81, 86 after female from Sta. 123 (Table 1); Figs 92-93 after male from Sta. 918 (Table 1); Fig. 94 after male from Sta. 687 (Table 1).



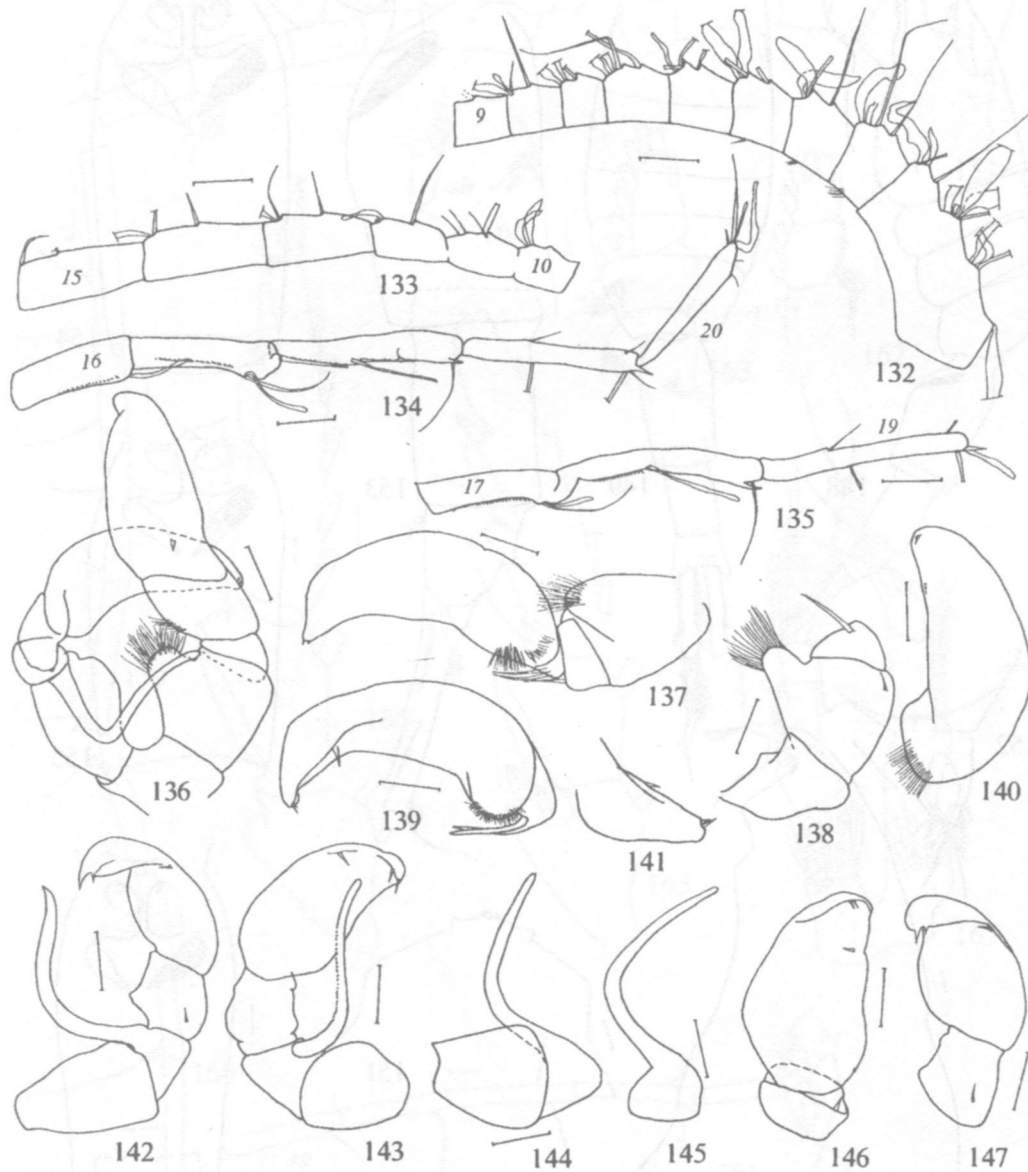
Figs 95-110. *Metridia pseudoasymetrica* sp. n., male. 95, left A1, articulated segments 1-5; 96, left A1, articulated segments 6-11; 97, left A1, articulated segments 12-16; 98, left A1, articulated segments 16-18; 99, left A1, articulated segments 19-20; 100, P5; 101-102, left P5 (different positions); 103-105, left P5, Exp2-3 (different positions); 106-107, right P5 (different positions); 108, right P5, Exp2-3; 109, right P5, Exp3 (other view than 108); 110, right P5, basipod, lateral swelling. Figs 102-104, 106 and 109-110 after male from Sta. 687 (Table 1); other figures after male paratype No. 90700.



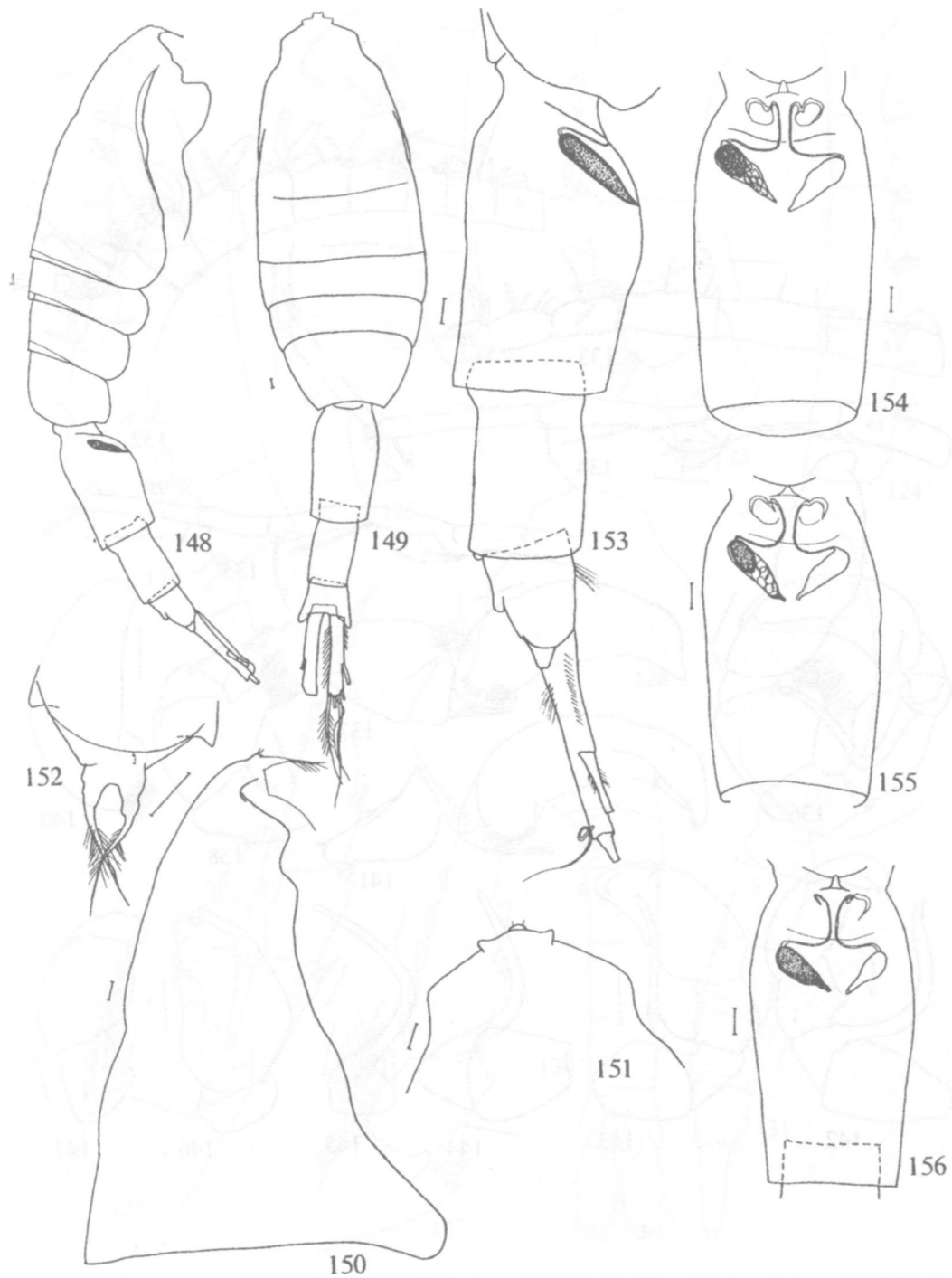
Figs 111-120. *Metridia asymmetrica* Brodsky, female (syntype). **111**, general dorsal view; **112**, cephalosome (right lateral view); **113**, posterior somite of prosome and Ur (dorsal view); **114**, the same (left lateral view); **115**, genital somite (ventral view); **116**, genital somite (right lateral view); **117**, P1, coxopod and basipod; **118**, P1, Exp; **119**, P1, Enp; **120**, P5.



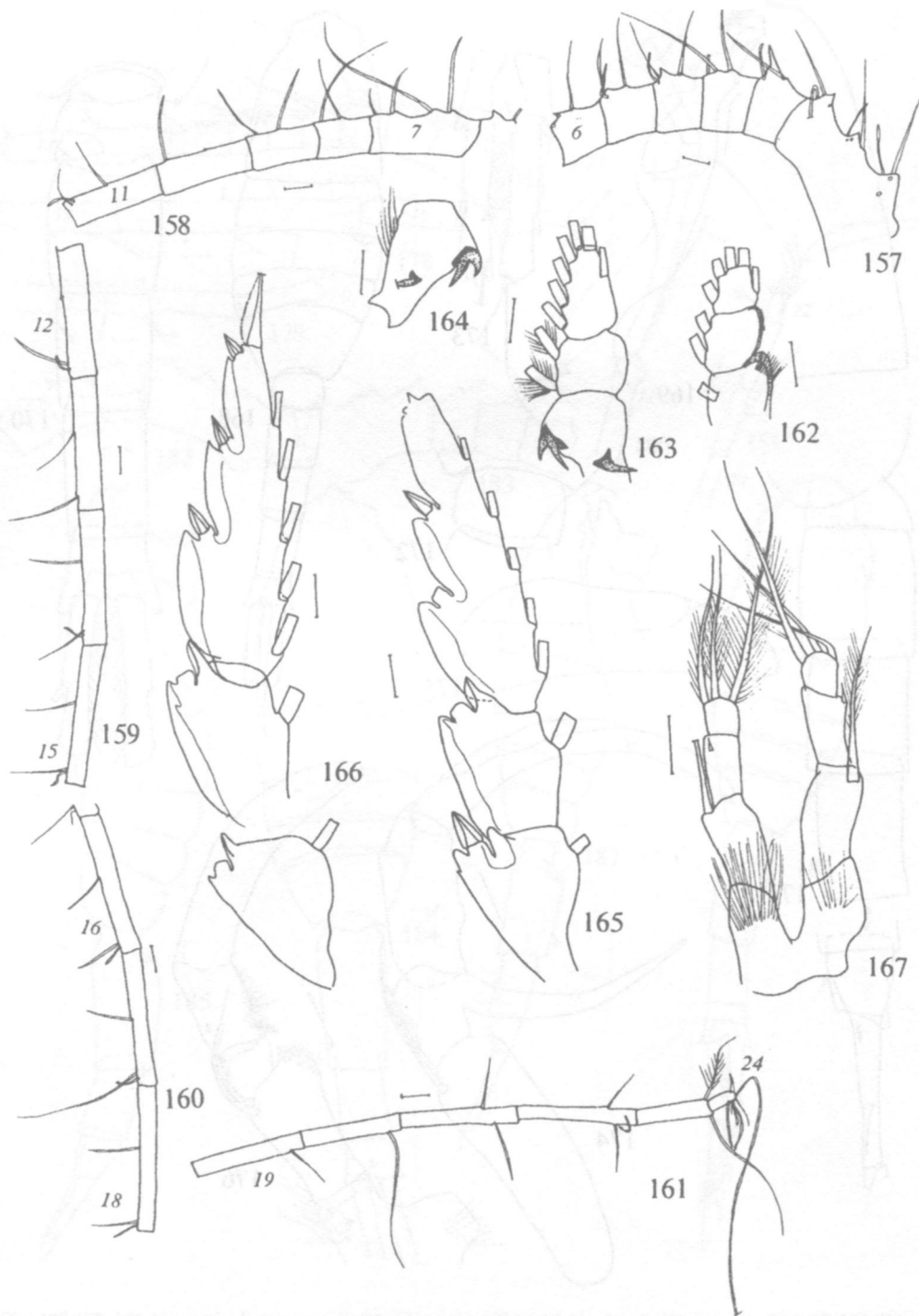
Figs 121-131. *Metridia asymmetrica* Brodsky, syntypes, female (121-127) and male (128-131). **121**, right A1, articulated segments 1-6; **122**, right A1, articulated segments 7-9; **123**, left A1, articulated segments 1-4; **124**, left A1, articulated segments 5-9; **125**, P2; **126**, P2, Enp1; **127**, P3, Exp; **128**, cephalosome (dorsal view); **129**, cephalosome (left lateral view); **130**, posterior somite of prosome and urosome (dorsal view); **131**, posterior somite of prosome and urosome (left lateral view).



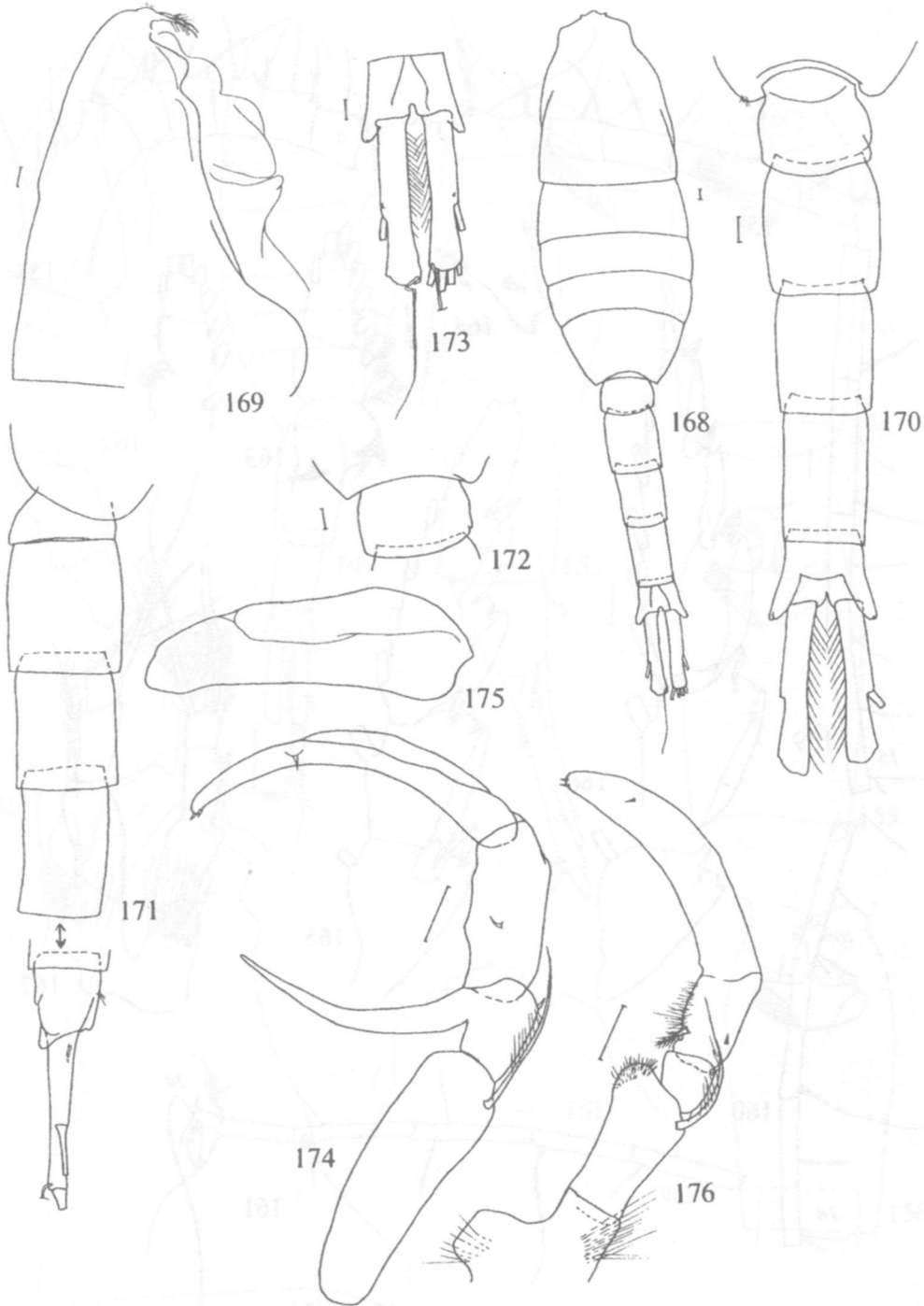
Figs 132-147. *Metridia asymmetrica* Brodsky, male (syntypes). **132**, left A1, articulated segments 1-9; **133**, left A1, articulated segments 10-15; **134**, left A1, articulated segments 16-20; **135**, left A1, articulated segments 17-19 (other view); **136**, P5; **137**, right P5; **138**, right P5, coxopod, basipod and Exp1; **139**, right P5, Exp2-3; **140**, right P5, Exp3; **141**, right P5, distal part of Exp3; **142-143**, left P5 (different positions); **144**, left P5, basipod and Exp1; **145**, left P5, Exp1; **146-147**, left P5, Exp2-3 (different positions).



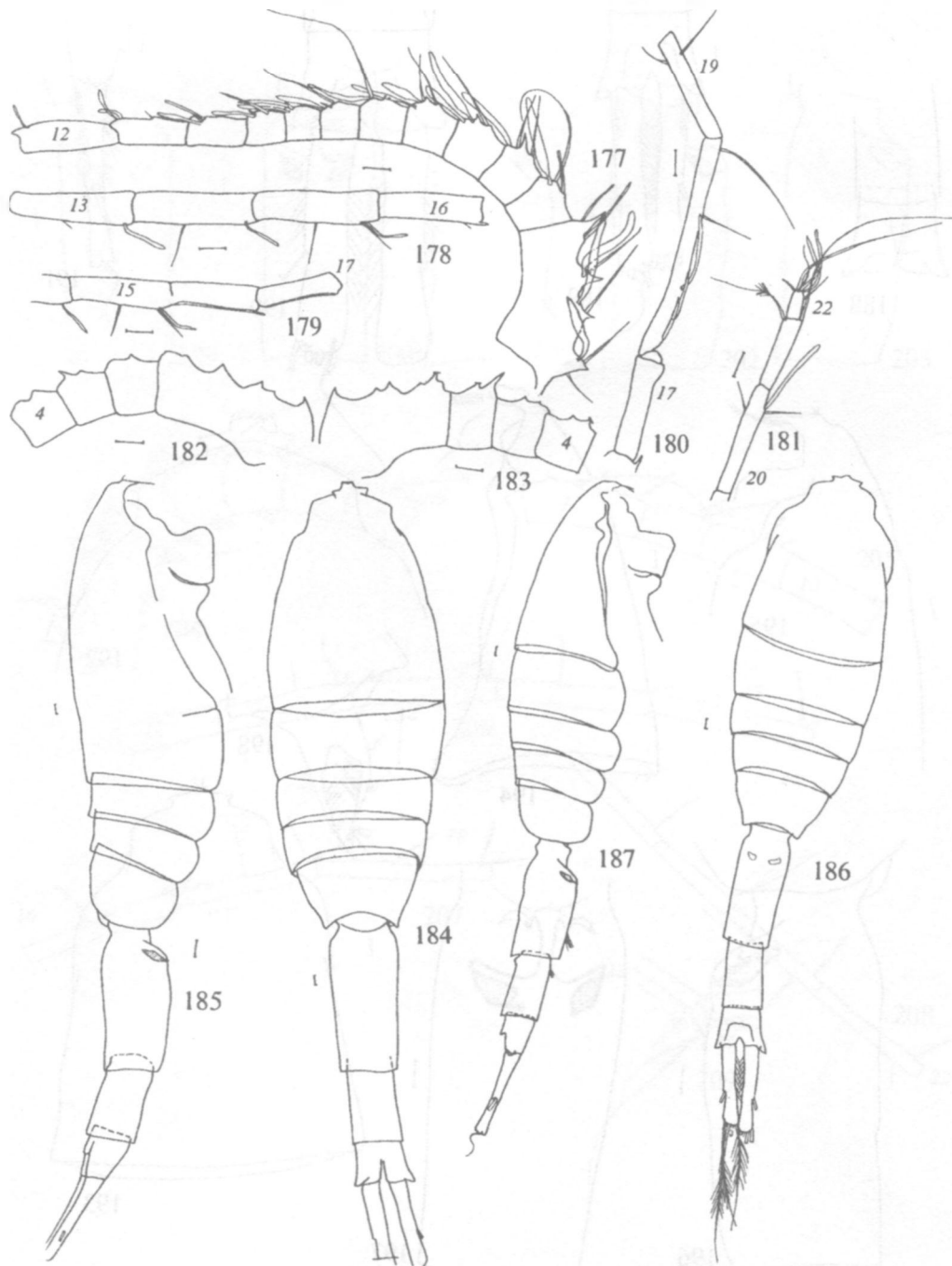
Figs 148-156. *Metridia princeps* Giesbrecht, female. **148**, general right lateral view; **149**, general dorsal view; **150**, cephalosome (right lateral view); **151**, anterior part of cephalosome; **152**, rostrum; **153**, urosome (right lateral view); **154-156**, genital somite (ventral view). Figs 148, 150-151, 153-154 after specimen from Sta. 99; Figs 149, 152, 155 after specimen from Sta. 1615 (Table 1); Fig. 156 after specimen No. 40898 (Table 3).



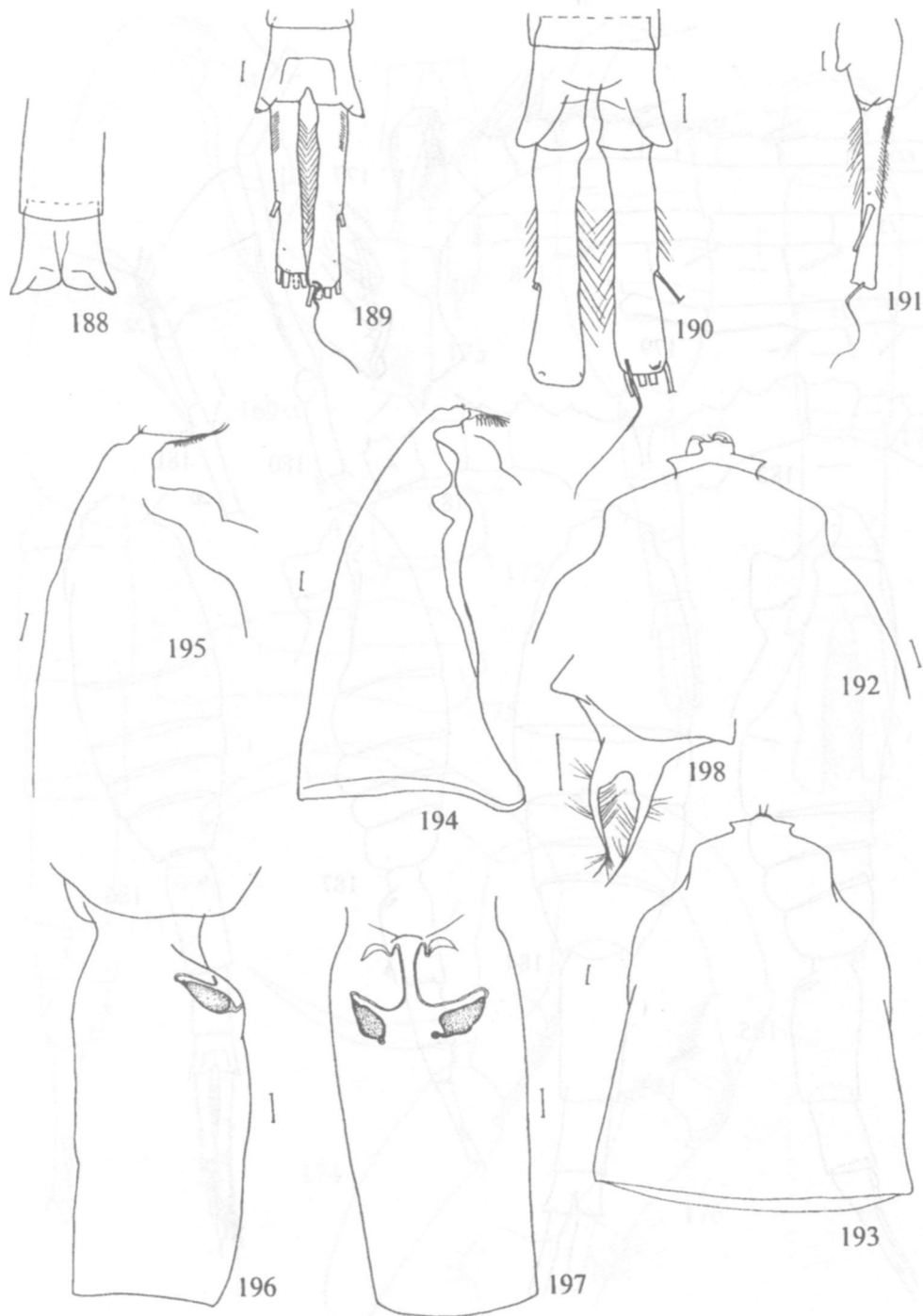
Figs 157-167. *Metridia princeps* Giesbrecht, female. **157**, left A1, articulated segments 1-6; **158**, left A1, articulated segments 7-11; **159**, left A1, articulated segments 12-15; **160**, left A1, articulated segments 16-18; **161**, left A1, articulated segments 19-24; **162**, P1, Enp; **163**, P2, Enp; **164**, P2, Enp1; **165**, P3, Exp; **166**, P4, Exp; **167**, P5. Figs 157-164, 167 after specimen from Sta. 99; Figs 165-166 after specimen from Sta. 1615 (Table 1).



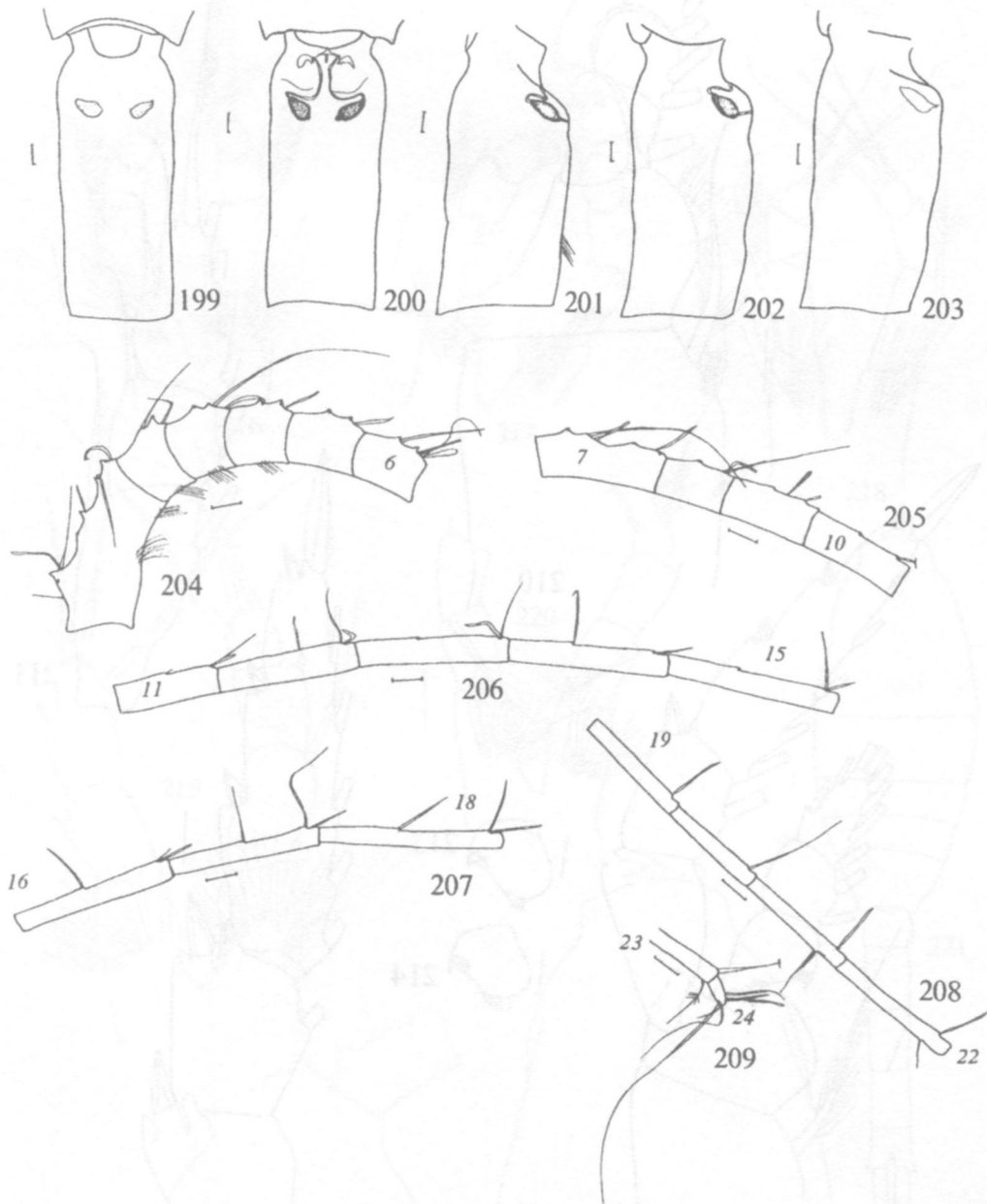
Figs 168-176. *Metridia princeps* Giesbrecht, male. **168**, general dorsal view; **169**, cephalosome (right lateral view); **170**, posterior prosomal somite and urosome; **171**, the same, right lateral view; **172**, posterior prosomal somite and genital somite (dorsal view); **173**, anal somite and caudal rami (dorsal view); **174**, left P5; **175**, left P5, Exp3; **176**, P5, coxopod and right leg. Fig. 170 after specimen No. 40898 (see Table 3); other figures after specimen from Sta. 99 (Table 1).



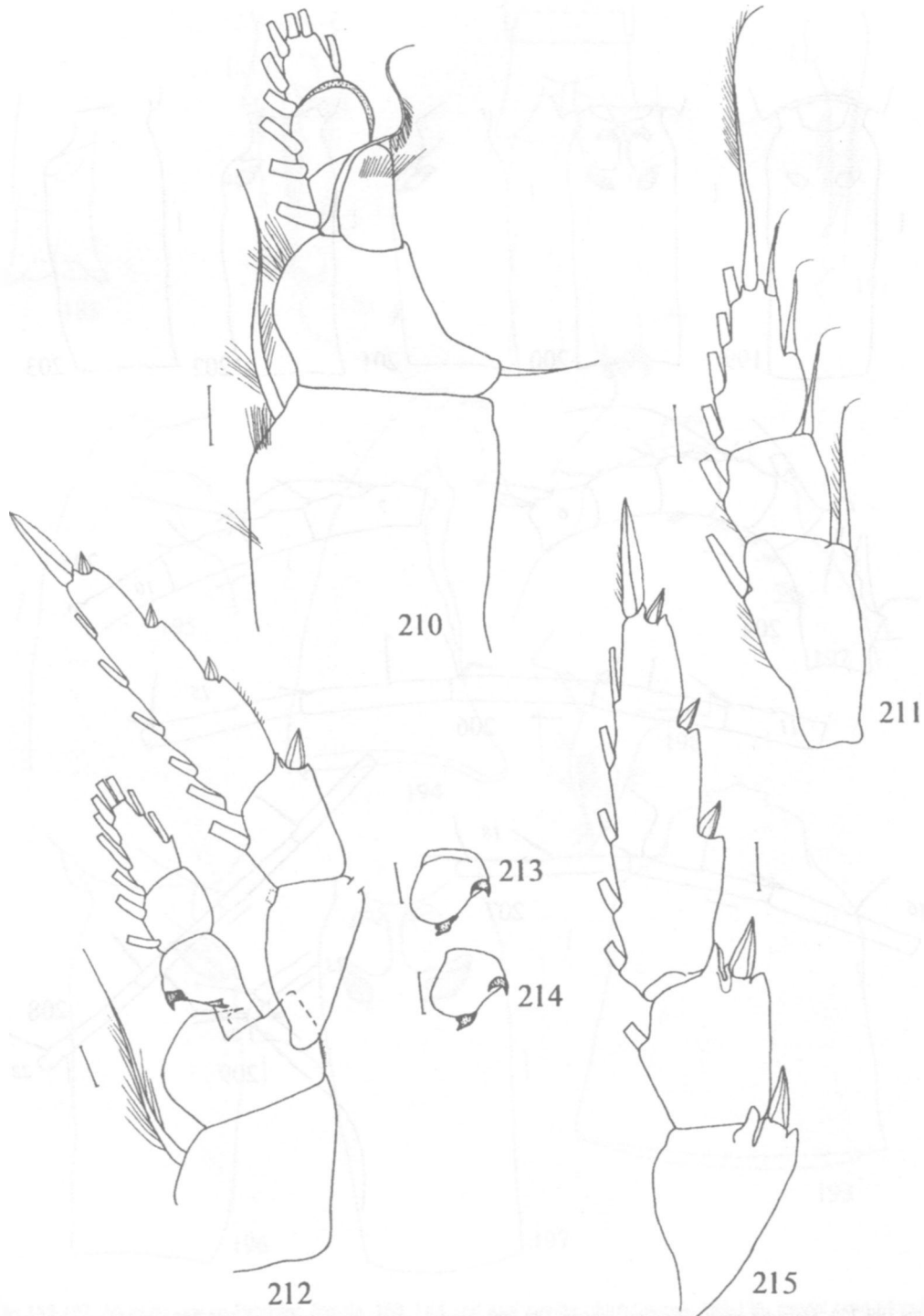
Figs 177-187. 177-183. *Metridia princeps* Giesbrecht, male. 177, right A1, articulated segments 1-12; 178, right A1, articulated segments 13-16; 179, right A1, articulated segments 15-17; 180, right A1, articulated segments 17-19; 181, right A1, articulated segments 20-22; 182, left A1, articulated segments 1-4; 183, right A1, articulated segments 1-4. 184-187. *M. ornata* Brodsky, female. 184, 186, general dorsal view; 185, 187, general right lateral views. Figs 182-183 after specimen from Sta. 99 (Table 1); Figs 177-181 after specimen 40898 (Table 3); Figs 184-185 after specimen No. 90690 (Table 4); Figs 186-187 after specimen from Sta. 944 (Table 1).



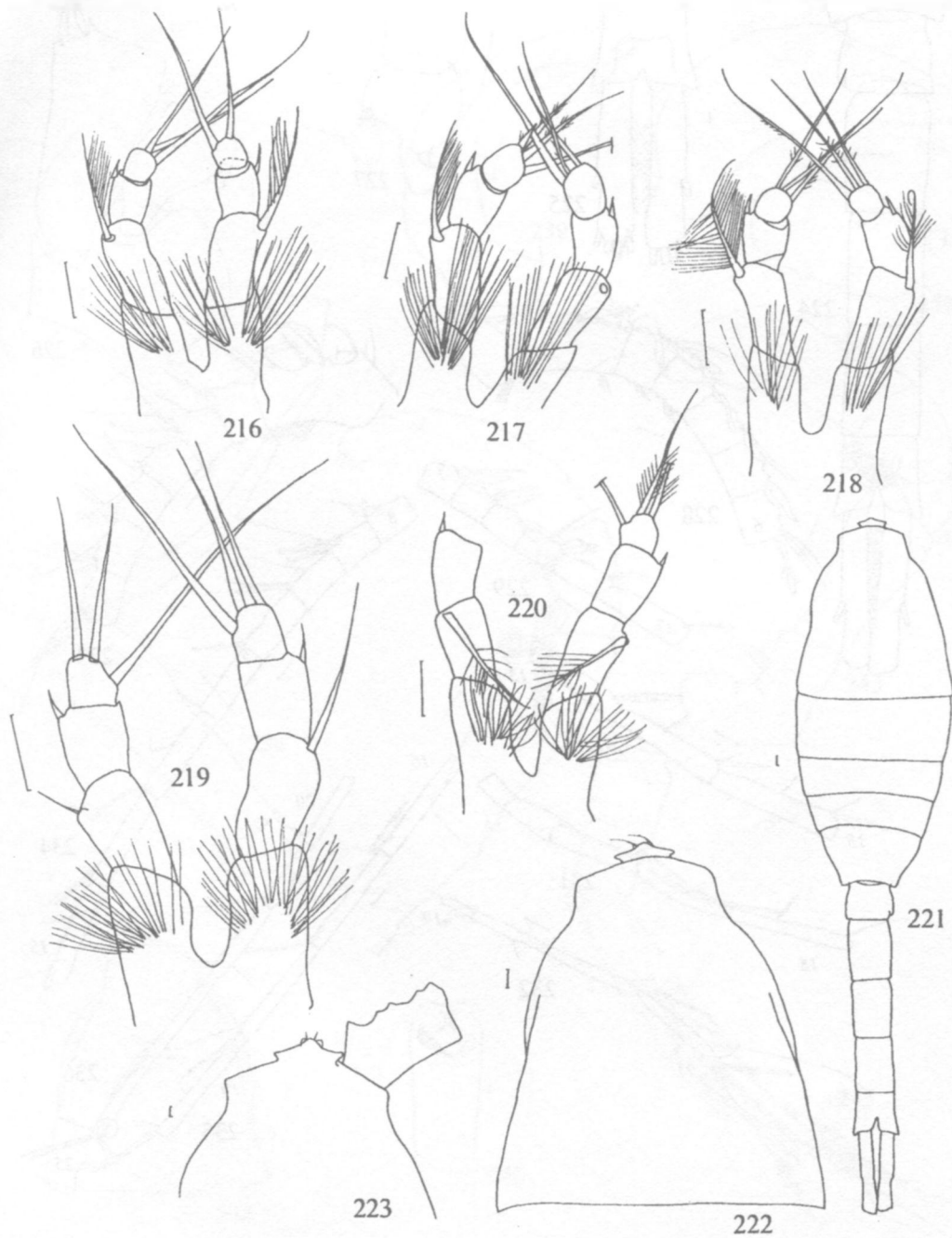
Figs 188-197. *Metridia ornata* Brodsky, female. **188,** Ur4 and anal somite (dorsal view); **189-190,** caudal rami (dorsal view); **191,** caudal rami (right lateral view); **192-193,** cephalon in anterior view; **194-195,** cephalosome in right lateral view; **196,** genital somite in right lateral view; **197,** genital somite in ventral view; **198,** rostrum. Figs 190, 192, 195-197 after specimen No. 90690 (Table 4); Fig. 188 after specimen No. 40765 (Table 4); other figures after specimens from Sta. 944 (Table 1).



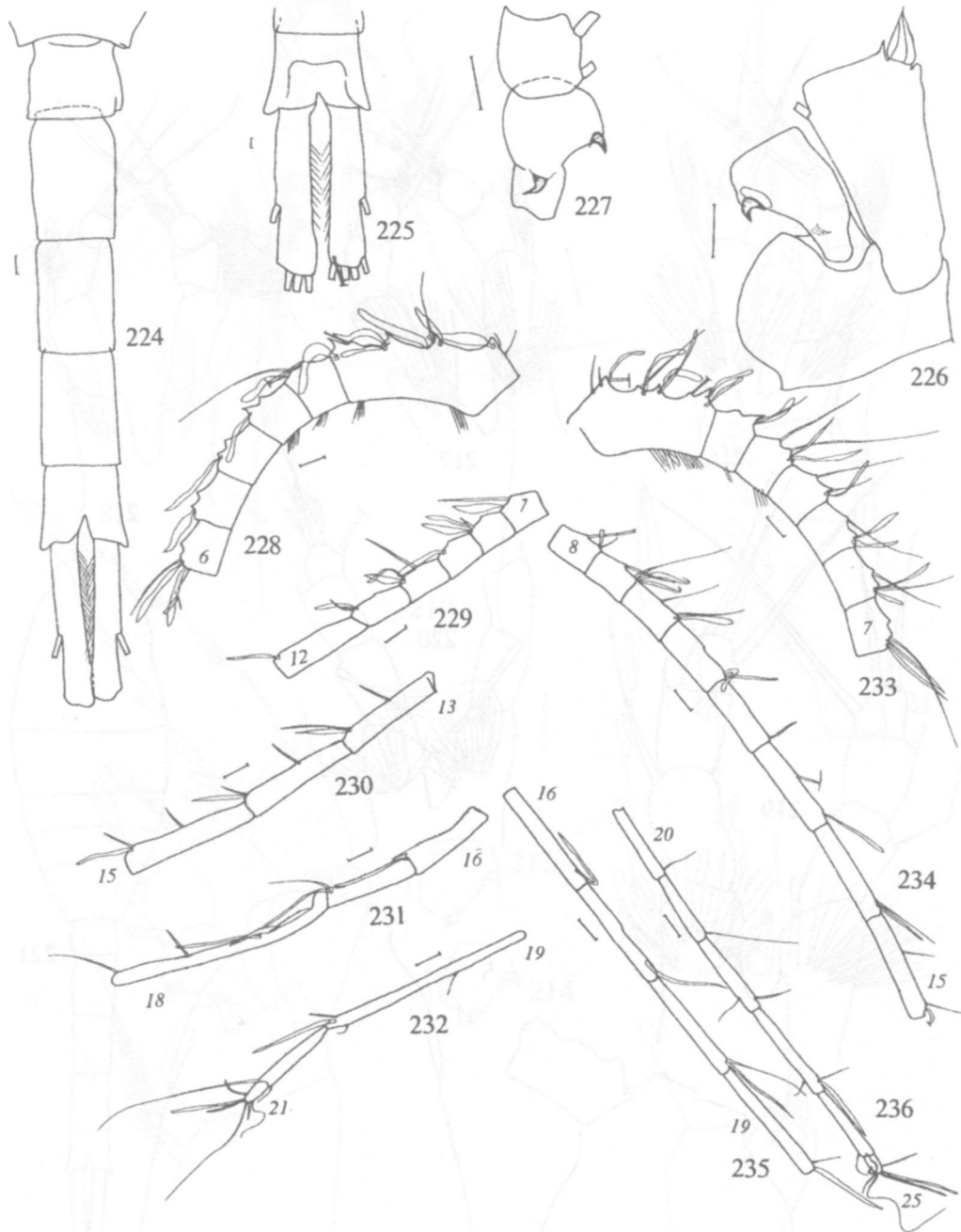
Figs 199-209. *Metridia ornata* Brodsky, female. 199-200, genital somite in ventral view; 201-203, genital somite in right lateral view; 204, right A1, articulated segments 1-6; 205, right A1, articulated segments 7-10; 206, right A1, articulated segments 11-15; 207, right A1, articulated segments 16-18; 208, right A1, articulated segments 19-22; 209, right A1, articulated segments 23-24. Figs 204-209 after specimen No. 90690 (Table 4), Figs 202-203 after specimens No. 40765 (Table 4); other figures after specimens from Sta. 944 (Table 1).



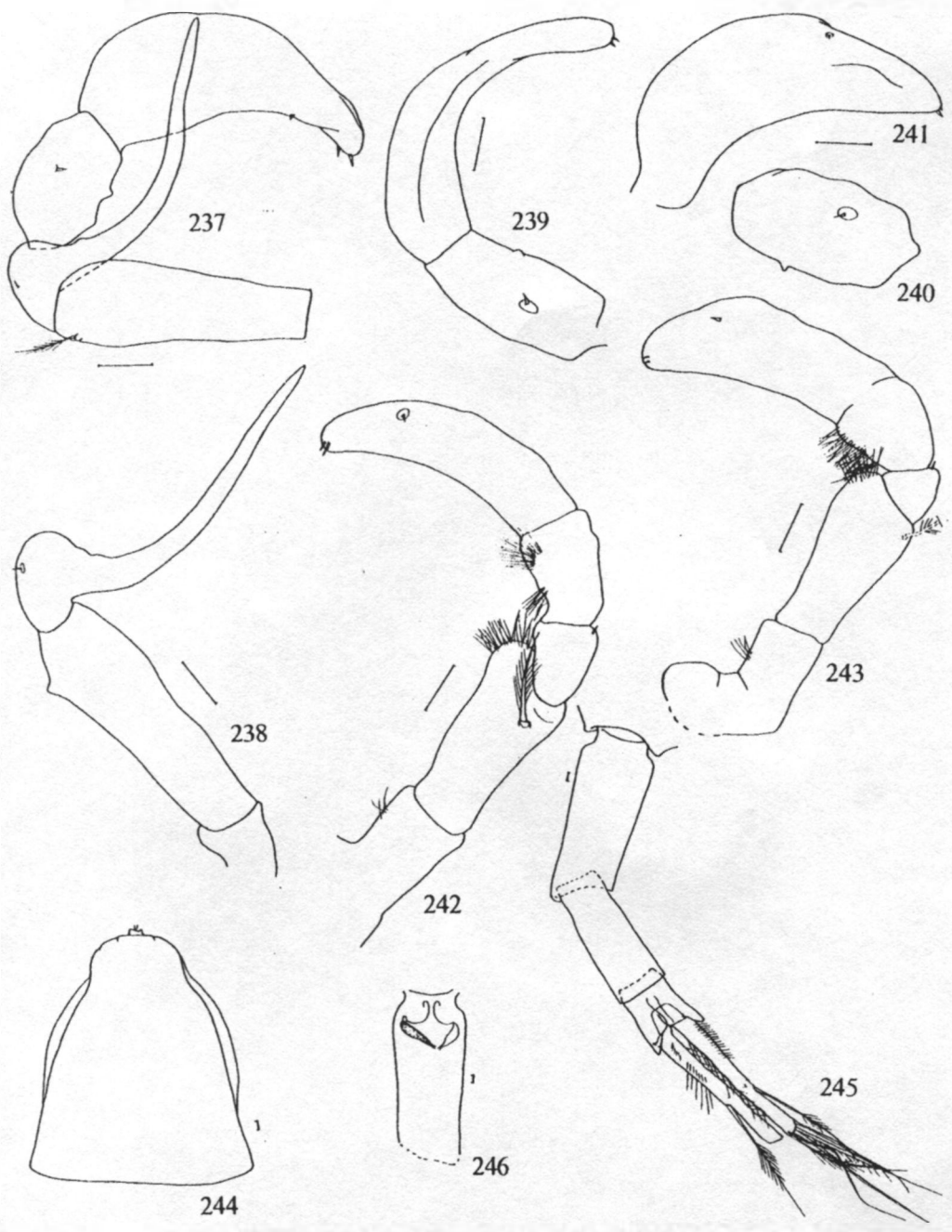
Figs 210-215. *Metridia ornata* Brodsky, female. **210**, P1, coxopod, basipod and Enp; **211**, P1, Exp; **212**, P2; **213**, P2, Enp1 (right); **214**, P2, Enp1 (left); **215**, P3, Exp. Figs 210-214 after specimen No. 90690 (Table 4), Fig. 215 after specimen from Sta. 944 (Table 1).



Figs 216-223. *Metridia ornata* Brodsky, female (216-220) and male (221-223). **216-220,** P5; **221,** general dorsal view; **222,** cephalosome; **223,** cephalosome, anterior view. Fig. 219 after specimen 90690 (Table 4), Fig. 220 after specimen 40765 (Table 4), Fig. 223 after syntype (Table 4), other figures after specimens from Sta. 944 (Table 1).



Figs 224-236. *Metridia ornata* Brodsky, male. 224, urosome; 225, anal segment and caudal rami; 226, P2, basipod, Exp1 and Enp1; 227, P2, Enp1-2; 228, left A1, articulated segments 1-6; 229, left A1, articulated segments 7-12; 230, left A1, articulated segments 13-15; 231, left A1, articulated segments 16-18; 232, left A1, articulated segments 19-21; 233, right A1, articulated segments 1-7; 234, right A1, articulated segments 8-15; 235, right A1, articulated segments 16-19; 236, right A1, articulated segments 20-25. Fig. 225 after syntype (Table 4); other figures after specimens from Sta. 944 (Table 1).



Figs 237-246. 237-243. *Metridia ornata* Brodsky, male. 237, left P5; 238, left P5, coxopod, basipod and Exp1 (other position); 239, left P5, Exp2-3 (other position); 240, left P5, Exp2 (other position); 241, left P5, Exp3 (other position); 242-243, right P5. Figs 237 and 243 after syntype (Table 4); other figures after specimen from Sta. 944 (Table 1). 244-246. *M. macrura* Sars, female. 244, cephalon; 245, posterior prosomal somite and urosome; 246, genital somite. Figures after specimens from the collection of ZISP from 19°09'S, 63°07'E.