Bolm Inst. oceanogr., S Paulo, 23:121-153, 1974

NEW RECORDS AND A NEW SPECIES OF *SEROLIS* (CRUSTACEA, ISOPODA, FLABELLIFERA) FROM SOUTHERN BRAZIL

Received May 20, 1974

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SYNOPSIS

The following species of the isopod genus *Serolis* are recorded from the continental shelf of southern Brazil: *S. exigua* Nordenstam, 1933, *S. polaris* Richardson, 1911, *S. foresti* Bastida & Torti, 1970 and *S. inermis* sp. n. *S. exigua* is for the first time recorded from off Brazil. Both *S. polaris* and *S. foresti* are recorded from new localities. *S. inermis* sp. n., a new species, is detailed described. Remarks are made on the importance and variations of some morphological features. The limit of distribution of both *S. exigua* and *S. foresti* is slightly extended northernwards.

INTRODUCTION

The study of the rich samples bearing isopods (sorting yet in progress) collected by the author through their ISOTAN-DRAGA I Program (MBT serie), has yielded both new records and many new species of the marine isopod genus *Serolis* Leach, 1818 (Moreira 1966, 1971*a*, *b*, 1973, 1974*a*, *b*, *c*). Additional material obtained through the GEDIP Program has contributed to enlarge our knowledge on the southern Brazilian serolid fauna, particularly from off State of Rio Grande do Sul.

The aim of the present paper, based on part of the available material, is to report new records and a new species of *Serolis* from the continental shelf of southern Brazil, from Lat. 21° S southwards.

PUBL. Nº 358 DO INST. OCEAN. DA USP

Serolis exigua Nordenstam, 1933
(Figs 1-8)

Serolis exigua Nordenstam, 1933, p. 70-75, figs 17-18; Sheppard, 1933, p. 304-308, figs 9-10.

HOLOTYPE — Gravid female, 7.0 mm long (Nordenstam, 1933).

MATERIAL EXAMINED — St. GEDIP 1655. Off Albardão, State of Rio Grande do Sul, 33°38' S, 51°04' W; depth 208 m; January 1972; T°C 17.94; S°/oo 35.90; beam-trawl. 1 adult male, 5.5 mm long; 1 ovigerous female, 6.5 mm in length.

PREVIOUS RECORDS — Falkland Islands, St. 49: 51°35' S, 57°56' W, 25-30 m depth; St. 39: 51°40' S, 57°41' W, 40 m depth (Nordenstam, 1933). East Falkland Is., and many stations limited by 46°00'-52°55'45" S, 56°50'-67°16'15" W, from 106 to 504 m depth (Sheppard, 1933). St. Vema and Eltanin, many stations limited by 34°25' - 56°06.5' S, 52°19' - 75°05' W, from 71 to 494 m depth (Moreira, in press).

DIAGNOSIS — Head with a middistal tubercle, which in the male is stout, very prominent and prolonged backwards, while in the female it is much smaller, like a spiniform point. Eyes reniform, composite, blackish, placed on prominent elevations. Antenna 2 with flagellar process. Maxilla 2, 3-lobed. Maxilliped, distal epipod fused to endite; palp with 3 articles. Pereonites and pleonites free, each one with a narrow, middorsal carina prolonging backwards in a short, spiniform point. Coxal plates marked off by dorsal sutures on pereonites II-IV. Pereonite VI, in the male extending rearwardly to a level slightly beyond pleonite 2 but not beyond 3, in the female extending to well anteriorly apex of both pleonites 2 and 3. Pleonite 2 not reaching posteriorly apex of pleonite 3, which is prolonged backwards to a little beyond middle of pleotelson. Pleotelson with a well defined, midlongitudinal carina disrupted about middle level; on either side 2 well marked carinae joining posteriorly in such a manner that confine a pronouncing triangular area; from the apex of these triangular areas arise 1 carina fading posteriorly; another carina is present very laterally, close to and following the outline of the anterolateral margins; apex of pleotelson pointed-rounded, distal margin on either side of apex obliquely truncate, specially in the female. Pleopods 1-3, protopod strongly projected at the inner angle, where are placed thick, plumose coupling setae. Pleopods 4 and 5 with both exo- and endopod entire; apex of exopod of pleopod 5 with 2 long, plumose setae. Uropod biramous; exo- and endopod elongate, distally broad, margins crenulate and fringed by both short and slender, simple setae.

REMARKS — The collected specimens agree very well with the descriptions and illustrations of the species provided by Nordenstam (1933), Sheppard (1933) and Moreira (in press). The species is easily distinguished from the remainder ones of the genus by the characteristic arrangment of the carinae on the dorsum of the pleotelson, and by its peculiar shape.

Both male (Fig. 1) and female (Fig. 2) present a marked frontal carina. The head is broader at the frontal margin. The expanded portions of pereonite I is devoid of carinae. The tubercles on the head and on pereonites and pleonites are well developed in the male, slightly less in the female, but those on the head markedly less developed in the female. The carinae on the dorsum of the pleotelson are pronounced, and their arrangment agree with previous descriptions.

The male pereopod I (Fig. 3) has the basis elongate and strong, bearing distally on the ventral margin a patch of long, fine setae; ischium and merus (which is acutely projected dorsally) with the dorsal margin devoid of setae, ventral margin with few simple setae; carpus, ventral margin and postero-distal angle with many slender, simple setae; distal angle of carpus, in addition, with 2 stout, bifid setae (Fig. 4); propodus oval, strong, broad; dorsal margin distally with a large patch of fine setae; ventral margin bordered by both a row of one single type of composite, bifid setae (Fig. 5), similar to those on carpus but smaller, and a sub-marginal row of slender setae (Figs 3 and 5); propodus stout, acutely pointed, claw indistinct.

The male pereopod II (Fig. 6) has the basis very elongate, with the upper and ventral margins almost paralel and fringed by few short, simple setae; ischium, merus and carpus, ventral margin with a few setae as in the basis; merus, in addition, bearing at the ventrodistal angle 1 moderately elongate, simple seta; propodus elongate, upper margin widely convex, ventral margin almost straight and bearing pairs of stout, composite setae (Fig. 7); dactylus very long, with short, simple setae along margins, when fully flexed exceeding backwards ventro-proximal angle of propodus (Fig. 6); claw distinct, heavily chitinized, tip irregular (Fig. 8).

Adult males and adult females, due to their pronouncing secondary sexual dimorphism, can be at once separated by many distinguishing features, as for instance, by the general shape of body, much broader in the adult male (cp. Figs 1-2), development of the tubercles on the dorsum of body, specially the middistal one on the head, and by the pereopod I setal pattern (both ventral margin of basis and dorsal margin of male propodus bearing dense patches of elongate fine setae, absent in the female).

S. exigua is recorded for the first time from off Brazil. It seems a widely distributed, very common and also very abundant species off Falkland Islands and along the continental shelf of Argentina. The present record extends a little northernwards the geographic distribution of the species, from about Lat. 34° S (previously northernmost record) to Lat. 33° S. The species has a

moderately wide vertical range, from 25 to 504 m depth. It is recorded from southern Brazil from 208 m depth.

Serolis inermis sp. n.
(Figs 9-34)

HOLOTYPE — Adult male, 5.9 mm long. Allotype ovigerous female, 4.8 mm in length.

TYPE LOCALITY — St. GEDIP 451. Off Rio Grande, State of Rio Grande do Sul, 32°14' S, 50°40' W, depth 82-85 m, December 1968.

NAME — The specific name is from the Latin word *inermis*, and alludes to the general aspect of the animal, deprived of large spines or prominent tubercles.

DESCRIPTION — *Body*. *Holotype male* (Fig. 9). Well expanded, lateral margins smooth and with scattered short setae. Color (in alcohol) light yellowish.

Head smooth, with the greatest width across frontal margin. Frontal carina well marked. Eyes composite, reniform, well convex, darkbrownish.

Pereon - Expanded sides of pereonite I smooth, and devoid of carina. Pereonites I-IV, and V-VI, respectively, contiguous laterally one to another. Coxal plates marked off by dorsal sutures on pereonites II-IV. Lateral sides of the first three pereonites broad and only a little prolonged rearwards at the apex, those from pereonites IV to VI narrow and progressively extending backwards. Pereonites I-III with a middistal carina, which is on pereonite I more prominent and prolonged backwards in a point, on remainder pereonites IV-VI only slightly distinct. Pereonite VI free, with coxal plates extending backwards beyond pleonite 2, as well as to about or to slightly beyond apex of pleonite 3.

Pleon with 3 free pleonites. Pleonites 2 and 3 narrow, elongate, and with acutely-pointed apex. Male pleonites each one with a slight middistal carina. Pleonite 2 extending not beyond 3. Pleonite 3 extending backwards to about or to slightly beyond middle of pleotelson. Pleotelson devoid of both posterolateral excavations and spiniform points; anterior margins straight; hind margins smooth, straight and markedly converging mid-posteriorly to a narrow, almost acutely-pointed apex; dorsal surface smooth, nearly flattened, with a narrow, well defined mid-longitudinal carina.

Antenna 1 (Fig. 11). Peduncular articles with few scattered, short setae; article 4 about 2 times shorter than 3rd. Flagellum composed of 9 articles; first 6 articles about equal length, last 3 minute, strikingly smaller than

preceding ones, and devoid of aesthetes, which are present on each of the articles from 2 to 6.

Antenna 2 (Fig. 12). Peduncle, article 2 with a clump of fine, short setae on proximal portion of inner margin; articles from 3 to 5 bearing tufts of moderately elongate setae along ventral surface; article 5 about 1.3 times longer than 4th. Flagellum composed of 10 articles; ventral surface of articles from 2 to 7 bearing an elongate, irregular, serrate flagellar process (Fig. 13); last article short, about half length of penultimate one (Fig. 14).

Maxilla 1 (Figs 15-16). Outer lobe with 11 strong, recurved apical spines (Fig. 15). Inner lobe distally enlarged and bearing an apical seta (Fig. 16).

Maxilla 2 (Fig. 17). Outer 2 lobes shorter, and both together narrower, than inner lobe; each outer lobes with 2 elongate, strongly pectinate apical setae. Inner lobe, internal lateral margin bordered by delicate setae, apex with 13 similar setae, but shorter, than those placed apically on outer lobes.

Maxilliped (Fig. 18). Endite narrowing towards a rounded-pointed apex, which bears 2 stout, short, unequally placed setae. Distal epipod fused to endite, and prominently convex at the outer margin. Palp 4-articulate; article 2 distally as broad as the combined length of articles 3-4, rear margin truncate, inner distal broadly rounded; article 3 about 1.8 times shorter than 2nd; article 4 minute (Fig. 19).

Pereopod I (Fig. 20). Basis and ischium with a characteristic large, dense clump of fine setae on ventral margin. Merus strongly prominent dorsally, lower margin with short setae and 1 elongate simple seta on ventrodistal angle. Carpus, ventral margin bordered by short, simple setae, apex (Fig. 21) with 2 unequal bare setae and 2 stout composite setae. Propodus broadly oval, robust; dorsal margin covered by elongate, fine setae; ventral margin bordered by both 1 row of composite setae (Fig. 22), similar in shape but smaller than the composite setae from apex of carpus, and 1 row of submarginal, elongate setae tapering to a blunt tip. Most of these two types of setae usually are broken at the apex (Fig. 22). Dactylus strong, curved inwards, with simple setae along dorsal margin.

Pereopod II (Fig. 23). Basis narrow, very elongate in relation to remainder pereopodal articles, with a clump of delicate setae posteriorly on dorsal margin. Ischium, merus and carpus characterized by the presence of a dense coverage of elongate, fine setae; in addition, merus with 1 and carpus with 2 slender setae along ventral margin, that on merus located close to the ventrodistal angle. Propodus strong, elongate, with stout, curved, finely setulate composite setae (Fig. 24) placed along ventral margin; short, submarginal bare setae spacely disposed in longitudinal row flanking ventral margin. Dactylus elongate, with few bare setae along dorsal margin, when fully

reflexed reaching posteriorly a level beyond ventrodistal angle of carpus (Fig. 25), tip irregular without defined claw (Fig. 26).

Pereopod VII (Fig. 28). Dorsal margin of basis, ischium and merus with a dense covering of elongate, fine setae. Dorsodistal angle of both basis and ischium devoid of slender setae. Ventral margin of the articles, excepting basis and dactylus, with transverse rows of plumose setae (Fig. 29) and slender, bare or minutely setulate setae. Laterodistal margin of carpus with moderately elongate, strongly pectinate setae (Fig. 30). Dactylus narrowing distally, ending in a stout, pointed-rounded claw (Fig. 31) bearing at both dorsal and ventral base short setae. The general setal pattern of the pereopod VII is shown in Figure 28.

Pleopod 2 (Fig. 32). Protopod, inner angle strongly produced and with 2 strong, plumose coupling setae, dorsal and ventral margins fringed by long, fine setae. Endopod transversely elongate, narrowing towards inner angle where is placed the appendix masculinum; dorsal margin devoid of setae, ventral margin bordered by long, plumose setae; appendix masculinum short, about 1.9 times longer than endopod at its maximum length.

Uropod (Fig. 33). Protopod widening posteriorly, outer-distal angle strongly produced rearwardly, outer margin almost straight with few setae along length, inner margin widely curved, with a longitudinal row of moderately elongate, bare setae. Exo- and endopod elongate, laminar, broad at apex. Exopod longer than endopod, outer margin widely rounded, irregularly crenulate, and with short setae along except distally where 3 elongate, bare setae are placed. Endopod, outer and inner margins nearly paralel and fringed by short simple setae, apex crenulate with 3 moderately elongate, bare setae.

Allotype ovigerous female. Body (Fig. 10). Grossly oval, with the lateral margins bearing scattered short setae.

Head similar to that of male, with a well marked frontal carina. Eyes convex, reniform, dark-brownish.

Pereon similar to the male, but with the dorsal surface of all pereonites evenly smooth, without middistal carina.

Pleon - Dorsal surface of pleonites evenly smooth.

Pereopod I (Fig. 27). Morphologically similar to that of male. Basis and ischium with few short setae spaced in row along ventral margin. Merus strongly prominent dorsally, lower margin with short setae and 1 slender seta on posteroventral angle. Carpus with many setae on rear half of article, which bears on the apex 2 stout, composite setae similar to those found in the male (Fig. 21). Propodus broadly oval, robust; dorsal margin naked; ventral margin with similar setal pattern and types of setae exhibited by the male. Dactylus stout, curved, with short setae in row along dorsal margin.

Pereopod II (Fig. 34). Similar in shape to both male and female pereopods III-VII. Setae bordering female pereopodal articles elongate and mostly of the bipectinate type. Basis, dorsal margin with a posterior coverage of elongate, delicate setae. Ischium with 1 elongate seta on dorsodistal angle. Merus and carpus, ventral margin with transverse rows of elongate, minutely bipectinate setae; upper distal angle of merus with 1 seta and that of carpus bordered by moderately elongate, strongly bipectinate seta. Propodus, lower margin with a posterior, upwardly curved bipectinate seta, rear margin bordered by slender setae, most of which reaching far beyond apex of dactylus. Dactylus narrow, slightly curved downwards, ending in a claw and 2 short setae arising from both dorsal and ventral base of claw.

REMARKS — The new species is closely related to both *S. exigua* Nordenstam, 1933 and *S. uaperta* Moreira, 1971, from which it differs basically in the (a) general structure of body, (b) number and arrangement of the carinae on, and shape of, pleotelson, (c) palp of maxilliped 4-articulate, (d) setal pattern of pereopods I and II, (e) kinds of setae and pattern of ornamentation of pereopod VII, and (f) shape of the endopod of the male pleopod 2, and relative length endopod/ appendix masculinum.

Remarkable in the new species is the slightly calcified, delicate and translucent body (mostly pronouncing in the pleotelson and marginal portions of the pereonites), rendering easier the distinction of *S. inermis* sp. n. from both *S. uaperta* and *S. exigua*.

Striking and very characteristic in the new species are the shape and structure of the pleotelson. It is pronouncedly flattened, specially from middle to apex, and the surface (excepting by the midlongitudinal carina) evenly smooth (in both *S. exigua* and *S. uaperta* the pleotelson is arched along the margins, inclusive rearwardly, and the dorsal surface is irregular due to the carinae). At same time, the pleotelson's shape is very peculiar, with the anterolateral margins nearly paralel, and the posterolateral ones straight and obliquely truncate, converging to an acutely-pointed apex (in both *S. exigua* (Figs 1-2) and *S. uaperta* (Moreira, 1971*a*, Fig. 21) the pleotelson is massive and of a quite different shape).

The maxilliped in *S. inermis* sp. n. is 4-articulate, while in *exigua* and *uaperta* it is 3-articulate. In both *S. uaperta* and *exigua* the 2nd article of the palp is relatively narrow and elongate, projected at the inner-distal angle, and on the distal margin bears a distinct concavity, while that of *S. inermis* sp. n. is comparatively shorter and broader, the distal margin is straight, without concavity, and the inner-distal angle is widely rounded (cp. Moreira, 1971*a*, Fig. 27 and present paper, Fig. 18). However, in all these 3 species the distal epipod is fused to the endite, and the maxilliped general shape is grossly similar.

The number of species of *Serolis* bearing 4-articulate maxillipedal palp is markedly smaller compared to those with 3-articulate palp. In all known species bearing a 4-articulate palp, the 4th article is always minute, and bears apically a tuft of setae (Fig. 19). In a recent paper Bastida & Torti (1970) described from off Argentina *S. foresti*, a serolid species bearing a 2-articulate maxillipedal palp. The species was subsequently recorded from the continental shelf of southern Brazil (Moreira, 1974*b*), and such striking feature was found in both male and female specimens. There are, thus, among the serolid species a variation in the number of articles composing the maxillipedal palp. Presently, such number variation alone has no value as distinctive generic feature.

It is worthy to pointed out in detail, for better knowledge of these closely related species, further features distinguishing *S. inermis* sp. n. from *exigua* and *uaperta*.

The male pereopods I in *S. exigua* and *inermis* sp. n. are morphologically similar, and in both species a patch of fine setae is present on the ventral margin of the basis and on the dorsal margin of the propodus. However, they differ specially in both the ornamentation of the lower margin of the ischium (in *exigua* it is devoid of dense setose covering), and in the pattern of setation of the carpus, whose slender setae in *S. inermis* sp. n. are restricted to the ventral margin.

Important features distinguishing *inermis* sp. n. from *exigua* are exhibited by the male pereopod II (cp. Figs 3 and 20). *S. inermis* sp. n. bears a patch of fine setae distally on the upper margin of basis (lacking in *exigua*); the ischium, merus and carpus bear on the ventral margin a setose coverage (lacking in *exigua*); 2-3 additional slender setae are present on the inferior margin of carpus (lacking in *exigua*), and both the propodus and dactylus are stouter in *S. inermis* sp. n.

The male pereopod VII also differs in *exigua* and *inermis* sp. n. In *S. inermis* sp. n. most of the elongate setae bordering the ventral margin of the ischium through propodus are of the plumose type, and the dorsal margin of the basis, ischium and merus bears a dense setose covering, absent in *exigua* (Moreira, in press).

Further distinguishing features separating *S. inermis* sp. n. from *S. uaperta*, in addition to the already mentioned ones, are found on the male pereopods I and II. Without doubt, both the pereopods I and II of *S. inermis* sp. n. are more closely related to those of *S. uaperta* than to those of *exigua*.

In *S. uaperta* the propodus of the male pereopod I is smaller, broader and less oval, and the carpus exhibit a quite different setal pattern, with most of the slender setae arising from the article distal third (Moreira, 1971*a*, Fig. 28). In relation to the male pereopod II, in *S. uaperta* its basis is devoid of a setose patch distally on dorsal margin, the lower margin of the

carpus is deprived of slender setae, and the upper margin of the propodus is distinctly projected medially (Moreira, 1971*a*, Fig. 29), while in *S. inermis* sp. n. the dorsal margin of the propodus is widely rounded (Figs 23 and 25).

Further characteristics separating *S. uaperta* from *S. inermis* sp. n. can be pointed out, as the setal armature of the male pereopod VII (in *S. uaperta* the distal margin of the basis, ischium and merus is devoid of setose covering), and both the shape of the endopod of the male pleopod 2, and the relative length of appendix masculinum/maximum length of endopod.

S. inermis sp. n., like *exigua* and *uaperta*, exhibit a well developed secondary sexual dimorphism, specially evident on the different setal pattern of both pereopods I (cp. Figs 20 and 27) and II.

Serolis polaris Richardson, 1911
(Figs 35-52)

Serolis polaris Richardson, 1911, p. 396-398, fig. 1; Sheppard, 1933, p. 290-292, fig. 4c-f, pl. 14 (fig. 2); Bastida & Torti, 1967, p. 31-40; 1970, p. 84-86, fig. 11; Moreira, 1971*a*, p. 87-90, pls. 1-4; 1971*b*, p. 390; 1974*a*, p. 1-4, pl. 1 (fig. 1).

Serolis (Serolis) polaris, Nordenstam, 1933, p. 58-59.

HOLOTYPE — Young male, 19.0 mm long (Sheppard, 1933).

TYPE LOCALITY — South Sandwich Islands (Richardson, 1911).

MATERIAL EXAMINED — St. MBT 75. Off Cabo Frio, State of Rio de Janeiro, 23°08' S, 43°09' W, depth 60 m; May 1970; MBT dredge. 1 female bearing hatched young in the marsupium, 18.6 mm long.

PREVIOUS RECORDS — South Sandwich Islands (Richardson, 1911). Off Argentina (Nordenstam, 1933; Bastida & Torti, 1967); Uruguay (Bastida & Torti, 1970); Brazil (Bastida & Torti, 1970; Moreira, 1971*a*, *b*, 1974*a*).

RECORDS ALONG SOUTHERN BRAZIL — *Rio de Janeiro:* St. 100, 22°12.5' S, 40°59' W, 39 m; St. 120, 23°07' S, 44°24' W, 25 m (Bastida & Torti, 1970). St. III, 22°10.5' S, 40°59' W, 30 m (Moreira, 1971*a*). St. MBT 140, 23°02' S, 43°00' W, 43 m (Moreira, 1974*a*). St. MBT 75, 23°08' S, 43°09' W, 60 m (present record).

São Paulo: St. 122, 23°26' S, 44°48' W, 36 m; St. 129, 23°40' S, 45°01' W, 37 m (Bastida & Torti, 1970). Off Ilha Anchieta, 23°32' S, 30 m (Moreira, 1971*a*).

Rio Grande do Sul: St. 406, 34°14' S, 52°53' W, 65 m (Moreira, 1971*a*).

DIAGNOSIS — Head with 2 small, median, anterior tubercles, and 3 posterior prominences, of which the lateral ones are grossly triangular, flattened and slightly prolonged backwards. Eyes large, composite, reniform, strongly convex and prominent, dark-brownish. Antenna 2 with flagellar process. Maxilla 2, 3-lobed. Maxilliped, distal epipod fused to endite; palp 3-articulate. Pereonites and pleonites free, each one with a mid-distal tubercle prolonging backwards, that on pereonite IV the largest, very prominent and spiniform. Coxal plates of pereonites II-V marked off by dorsal sutures. Pereonite VI extending backwards to about apex of pleotelson, and to a level well beyond pleonite 3 but not beyond pleonite 2. Pleonite 2 extending well beyond 3, reaching back to a level beyond apex of pleotelson. Pleonite 3 short, extending backwards to about apex of mid-anterior tubercle of pleotelson. Pleotelson with 1 stout, spiniform mid-anterior tubercle flanked, at each side, by 1 small tubercle; from each of these tubercles arise a diagonal carina delimiting on either side a flattened, triangular area, ending in a rounded point; slightly beyond these points are placed 3 spiniform tubercles interconnected by an arcuate, transverse carina; another carina, fading posteriorly, is placed on either side of the pleotelson, following its anterolateral margins. Pleopods 1-3, protopod not produced, and without plumose coupling setae, at the inner angle. Pleopod 4, endopod uniarticulate, and cleft distally. Pleopod 5 with both exo- and endopod uniarticulate, exopod without apical setae. Uropods biramous; protopod, outer margin with sparse, long plumose setae, inner distal angle acutely produced and devoid of plumose seta; exo- and endopod hind margins crenulate, that of exopod broadly rounded, that of endopod slightly truncate, with both outer and inner angles broadly rounded (from Moreira, 1971*a*, modified).

PARTIAL DESCRIPTION OF THE FEMALE — *Body* circular, morphologically similar to that of male (Fig. 35).

Antenna 1 with flagellum composed of 21 articles. *Antenna* 2 with 15 flagellar articles.

Pereopod II (Fig. 40). Basis elongate, upper margin with short, broom setae placed along length, ventral margin proximally bearing a patch of fine setae. Ischium, dorsal margin distally with slender, plumose setae (Fig. 41), ventro-distal angle with short setae. Merus, dorso-distal angle with plumose setae, ventral margin bearing 1 stout, bare seta (Fig. 42), ventro-distal angle with finely pectinate setae (Fig. 43). Propodus, ventral margin bordered by a longitudinal row of both strongly pectinate setae (Fig. 44) and finely pectinate setae, dorsal angle with plumose and finely pectinate setae. Dactylus laminar, laterally compressed (Fig. 45), slightly curved downwards, devoid of claw; dorsal margin with few setose setae distally; apex pronouncedly scaly, with an elongate setose seta (Fig. 45).

Pereopod III (Fig. 46). Basis and ischium similar to those of pereopod II. Merus, ventral margin and ventro-distal angle bearing unequal, stout bare setae, upper-distal angle with plumose setae. Carpus, dorso-distal angle with both plumose and minutely pectinate setae, ventro-distal angle with bare setae. Propodus, setal pattern similar to that of pereopod II, with the ventral margin bearing plumose setae, minutely pectinate setae and strongly pectinate setae, the former type placed proximally on lower margin. Dactylus laminar, laterally compressed and slightly curved (Fig. 47); claw distinct, stout, ending in a blunt point (Fig. 48); ventral base of claw with 2 unequal setae, 1 of which stronger, densely hairy and longer than claw, dorsal base of claw with 3 short and 1 very elongate setose seta (Fig. 48).

Pereopods IV-VI (Figs 49-51). Very alike one another, differing in minor details. Dorso-distal angle of both ischium and merus bearing plumose setae, that of carpus bearing strongly pectinate, finely pectinate and plumose setae, and that of propodus, in addition, stout glabrous setae. Ventral margin and ventro-distal angle of merus through propodus with both stout glabrous and stout minutely pectinate setae, the former type more numerous on pereopod IV (Fig. 49), the latter type on pereopod VI (Fig. 51). Ventro-distal angle of ischium pereopod VI bearing plumose setae (Fig. 51), absent from ischium pereopods IV and V. Dactylus similar to that of pereopod III, ending in a distinct, blunt claw.

Pereopod VII (Fig. 52). Basis elongate, dorsal and ventral margins slightly curved, almost paralel, ventral margin devoid of setae, dorsal margin proximally with a patch of fine setae, distally with 4 broom setae. Ischium, upper and lower margins without setae, except distally where are placed elongate, plumose setae. Merus, carpus and propodus, dorsal margin devoid of setae, ventral margin bordered by minutely pectinate setae (Fig. 43), those placed on the ventro-distal angles longer and more numerous; dorso-distal angle of merus with plumose setae, that of carpus and propodus with both finely and strongly pectinate setae. Dactylus narrow, curved downwards, with both claw and distal setae as in the dactylus pereopod III (Fig. 48).

Pleonal sternites 1-3 (Fig. 39). Each one laterally depressed, slightly concave; distal margin 3-pointed, median point projected strongly in a large spiniform tubercle gradually decreasing in convexity posteriorly; spiniform point on sternite 3 broader than that on sternites 1 and 2; latero-distal points rounded, depressed, broader on sternites 1 and 2.

REMARKS — The species *S. polaris* and *S. schythei* Lütken, 1858, are very closely related. Both species can be separated easily by the relative length of the pereonite VI to pleonite 2 (in *S. polaris* the pereonite VI extends backwards to a level not beyond pleonite 2), and by the shape of the endopod of the uropods (in *S. polaris* it is slightly truncate distally, with both

outer and inner angles broadly rounded, whereas in *S. schythei* it is distinctly truncate apically, with the outer angle pointed, the inner one broadly rounded). Further differences distinguishing *S. polaris* from *S. schythei* are not so evident as the two ones just pointed out.

The present female carrying hatched young is a very fine specimen. It shows a color pattern similar to that of those specimens figured by Moreira (1974*a*). However, due to the preservative, most of the chromatophores are retracted, forming on the yellowish ground color, dark patches or spots on certain areas of the body.

These patches, irregular spots or narrow bands of light reddish brown chromatophores, are especially evident on the middle of pereon and head (where they exhibit a reticulate pattern), along the articulations of the peduncular articles of both antenna 1 and 2, along the transverse, curved ridge on the expanded lateral sides of pereonite I, along the sutures of the coxal plates, and on the latero-distal margin of pereonites and pleonites. Specially pronouncing are the concentrations of chromatophores on the mid-anterior, spiniform tubercle of the pleotelson, and as a single spot on the middle of the endopod of the uropods. Very striking are the two large reddish brown blotches, one on either side of the pleotelson, placed just on the rounded apex of the diagonal carina arising from the small tubercles flanking the median, spiniform tubercle.

The female illustrated by Bastida & Torti (1970, fig. 11), shows a color pattern almost similar to that of the present female specimen. However, as just remarked, in the present preserved female the spots and blotches on the dorsum of the pleotelson are strikingly pronounced, specially the lateral ones, whereas they are lacking or are not so distinct in the female figured by Bastida & Torti (1970).

The following comments may be made on certain morphological features:

The two small, median tubercles anteriorly on the head are very distinct, and slightly prolonged backwards. The head postero-lateral tubercles are prominent, flattened and prolonged rearwards, ending in a pointed-rounded apex; the mid-distal tubercle is convex, and well defined (Fig. 36).

On the pereonite I are placed, one on either side and just close to both anterior margin of the segment and the acute, antero-lateral angles of the head, two small, slightly flattened finger-like tubercles (Fig. 37) prolonging backwards. These tubercles are found also in the male, as reported by Moreira (1971*a*). The angular projections placed just within the suture of the coxal plates of the pereonites II-V (Fig. 38) are very distinct, diminishing gradually in size posteriorly, those on pereonite VI being only slightly defined. These projections do not represent a secondary sexual feature, once male specimens show similar angular prominences (Sheppard, 1933; Moreira, 1971*a*).

The antenna 2 bears on the ventral surface of the flagellum articles a serrated, flagellar process, similar to that of the male (Moreira, 1971*a*, Fig. 3*a*). Moreira (1974*b*) has recently shown that males and females of *S. foresti* Bastida & Torti, 1970, bear a flagellar process morphologically similar in both sexes, but of a quite different shape from the flagellar process in *S. polaris*. This feature, of unknown function, is neither related to sex (Sheppard, 1933), nor presents generic value, since many species of *Serolis* are deprived of flagellar process (Moreira, 1971*a*, and in press). However, it is undoubtedly valuable as a further specific characteristic (Moreira, in press), in spite of being a character not easily seen and evident, especially in the smallest species.

On the pleotelson, the mid-anterior tubercle is well developed, conical and acutely-pointed. Of the three posterior tubercles interconnected by a transverse carina, the median is conical and acutely-pointed, whereas the lateral ones are flattened, with pointed-rounded apex.

The endopod of the pleopod 4 is cleft distally, a feature also exhibited by some few other species of *Serolis*, as for instance, *S. schythei*, *S. neaera* Beddard, 1884 and *S. kempi* Sheppard, 1933. The importance of this feature as a characteristic closely linking the species bearing it was not yet properly ascertained.

Secondary sexual dimorphism can be seen most strikingly in the setal armament of the ventral margin of carpus pereopod III (lacking in the female), in the setal pattern and types of setae from the ventral margin of merus, carpus and propodus of pereopod VII (cp. Moreira, 1971*a*, Fig. 14, and present paper, Fig. 52), and in the number of articles composing the flagellum of the antenna 1: males 27-28 articles and females, 21-22 articles (Bastida & Torti, 1970; Moreira, 1971*a*, p. 87 and present paper). Actually, the number of articles furnished by Moreira (1971*a*, p. 89) as composing the flagellum of the antenna 1 should be amended as follows: males, 28 articles; females, 21 articles.

BIOLOGICAL NOTES — The present gravid female has a large, very prominent external brood pouch confining hatched young in the last marsupial developmental stage. All young were at the same stage of development, and free within the marsupium, i.e., each hatched young was not surrounded by the embryonic membrane. The oostegites are medially thick and opaque but at the borders are thin, delicate and transparent.

The oostegites forming the brood pouch overlap each other perfecty, excepting the last pair which is reflected outwards, causing the marsupium to gape medially. Two young were partially retained in this gap by the last pair of marsupial plates. These young were retained when being released from the incubatory pouch possibly due to the preservative. This fact seems to show that in serolids the hatched young exit from the marsupium from that posterior opening. Supporting this, Bastida & Torti (1970) have observed in alive *S.*

marplatensis kept in aquaria, young being released from the marsupium from posteriorly.

Serolis foresti Bastida & Torti, 1970

Serolis foresti Bastida & Torti, 1970, p. 70-75, figs 2-4; Moreira, 1974*b*, p. 87-101, figs 1-39.

HOLOTYPE — Ovigerous female, 7.9 mm long (Bastida & Torti, 1970).

MATERIAL EXAMINED — St. MBT 75. Off Cabo Frio, State of Rio de Janeiro, 23°08' S, 43°09' W; depth 60 m; May 1970; MBT dredge. 1 female with empty marsupium, 5.6 mm long.

PREVIOUS RECORDS — Off Argentina (Bastida & Torti, 1970). Off Brazil (Moreira, 1974*b*).

RECORDS ALONG SOUTHERN BRAZIL — *Rio de Janeiro:* St. A, 23°22' S, 44°26' W, 50 m. St. MBT 75 (present record).

Rio Grande do Sul: St. MBT 128, 29°23' S, 49°10' W, 54 m depth (Moreira, 1974*b*).

REMARKS — The specimen closely agree with previous descriptions of the species (Bastida & Torti, 1970; Moreira, 1974*b*).

The head, middle of pereon and pleon are light brownish, while the pereon marginal areas are light yellowish brown. A few small spots of brown chromatophores are placed along posterior margin of pereonites I-IV, frontal margin of head and on middle of antenna 2 peduncular articles 4 and 5; two or three spots are placed on either side on distal half of pleotelson, dorsal and laterally. Pereopod I, oostegites and pleopods 1-4 slightly brownish, pereopods II-VII transparent.

The eyes are deep black. The flagellum of the antenna 1 is composed of 12 articles, that of antenna 2 of 15 articles. The median, arcuate, transverse carina placed anteriorly to the eyes are well defined. The arrangement of the carinae on the dorsum of the pleotelson is similar in male and female.

Secondary sexual dimorphism is found in the antenna 1 flagellum, which in the male is composed of 17 articles (Bastida & Torti, 1970), in the female of 12 articles (Moreira, 1974*b*, and present paper). No dimorphism is found in the antenna 2 flagellum.

ACKNOWLEDGEMENT

The author is thankful to Miss L. Kanno for inking the drawings.

RESUMO

São assinaladas na plataforma continental centro-sul do Brasil as seguintes espécies de isópodes do gênero *Serolis: S. exigua* Nordenstam, 1933, *S. polaris* Richardson, 1911, *S. foresti* Bastida & Torti, 1970 e *S. inermis* sp. n. *S. exigua* é assinalada pela primeira vez ao longo do Brasil. Os registros de *S. polaris* e *S. foresti* representam novas localidades de ocorrência. *S. inermis* sp. n., espécie nova para a ciência, é detalhadamente descrita. São fornecidas informações adicionais sobre as espécies, assim como discute-se a variação e a importância de algumas características morfológicas. O limite Norte de ocorrência das espécies *S. exigua* e *S. foresti* é ampliado ligeiramente.

REFERENCES

BASTIDA, R. & TORTI, M. R. 1967. Nuevas consideraciones sobre *Serolis polaris* Richardson, 1911. Neotrópica, 13 (40): 3-40.

———————————— 1970. Crustaceos isopodos: Serolidae. Résult. scient. Camp. Calypso, nº IX. Annls Inst. océanogr., Monaco, n.s., 47: 61-105.

MOREIRA, P. S. 1966. Sôbre espécies da família Serolidae (Isopoda, Flabellifera) do sublitoral norte do Estado de São Paulo. Ph. D. thesis, University of São Paulo, 175 p., I-XXX pls, 10 tbs.

———————— 1971*a*. Species of *Serolis* (Isopoda, Flabellifera) from southern Brazil. Bolm Inst. oceanogr., S Paulo, 20: 85-144.

———————— 1971*b*. Espécies do gênero criófilo *Serolis* (Isopoda, Flabellifera) na plataforma continental centro-sul do Brasil. Ciênc. Cult., S Paulo, 23, supl.: 390.

———————— 1973. The biology of species of *Serolis* (Crustacea, Isopoda, Flabellifera): reproductive behavior of *Serolis polaris* Richardson, 1911. Bolm Inst. oceanogr., S Paulo, 22:109-122.

———————— 1974*a*. Cryptic protective coloration in *Serolis laevis* and *Serolis polaris* (Isopoda, Flabellifera). Crustaceana, 27 (1): 1-4, pl. 1.

———————— 1974*b*. A new record of species of *Serolis* (Crustacea, Isopoda, Flabellifera) from off southern Brazil. Bolm Inst. oceanogr., S Paulo, 23: 89-101.

———————— 1974*c*. New records of species of *Serolis* (Crustacea, Isopoda, Flabellifera) from southern Brazil. Bolm Inst. oceanogr., S Paulo, 23: 103-119.

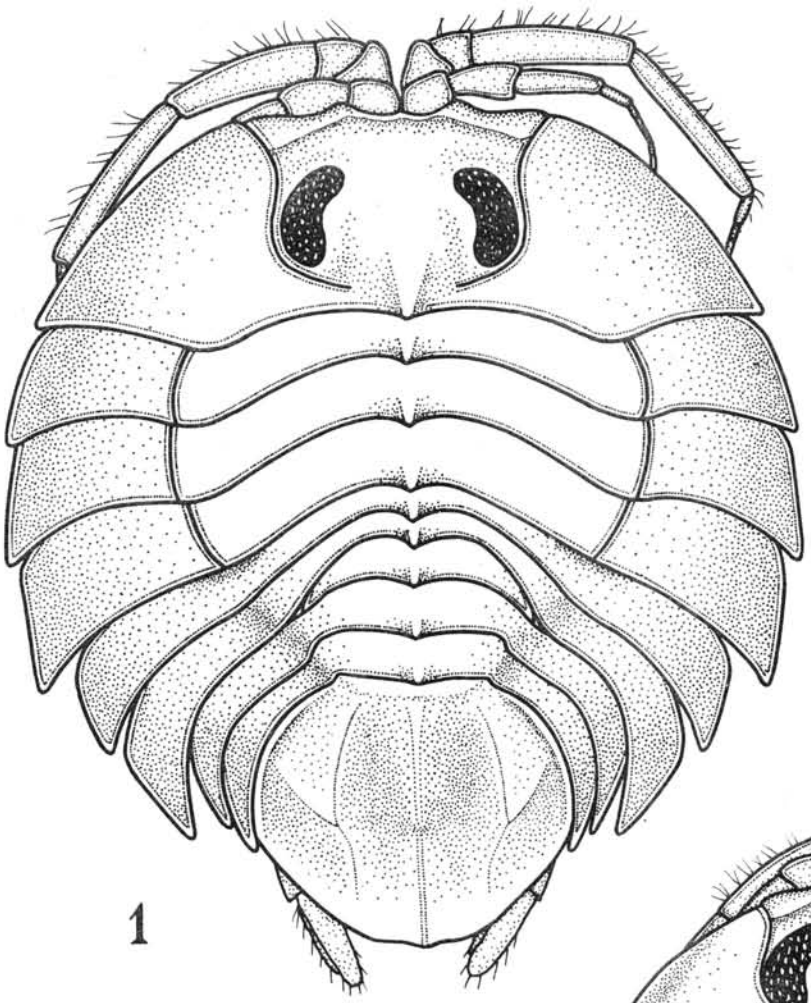
———————————— An account of the Serolidae (Crustacea, Isopoda, Flabellifera) collected by U. S. Antarctic Expeditions. Publção esp. Inst. oceanogr., S Paulo (in press).

NORDENSTAM, A. 1933. Marine Isopoda of the families Serolidae, Idotheidae, Pseudidotheidae, Arcturidae, Parasellidae and Stenetriidae mainly from the South Atlantic. Further zool. Results Swed. Antarct. Exped., 3 (1): 1-284, pls. 1-2.

RICHARDSON, H. 1911. Isopodes du Sandwich du Sud. An. Mus. nac. Hist. nat. B. Aires, ser. 3, 14: 395-400.

SHEPPARD, E. 1933. Isopoda Crustacea. Part I. The family Serolidae. 'Discovery' Rep., 7: 253-362, pl. 14.

Figs 1-2 — Serolis exigua Nordenstam. 1, adult male, 5.5 mm long. 2, ovigerous female, 6.5 mm long.



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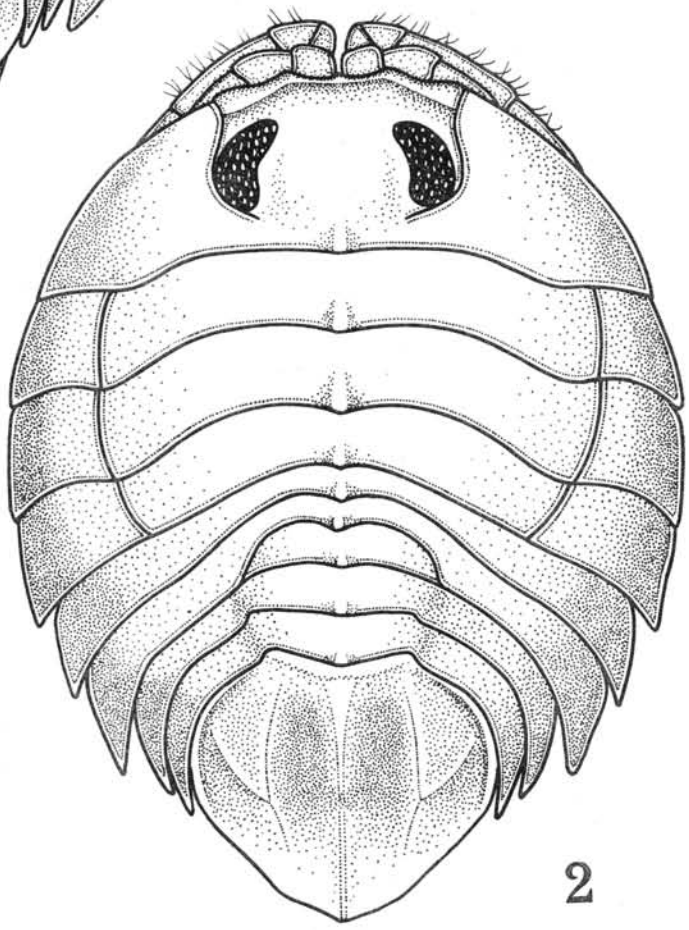

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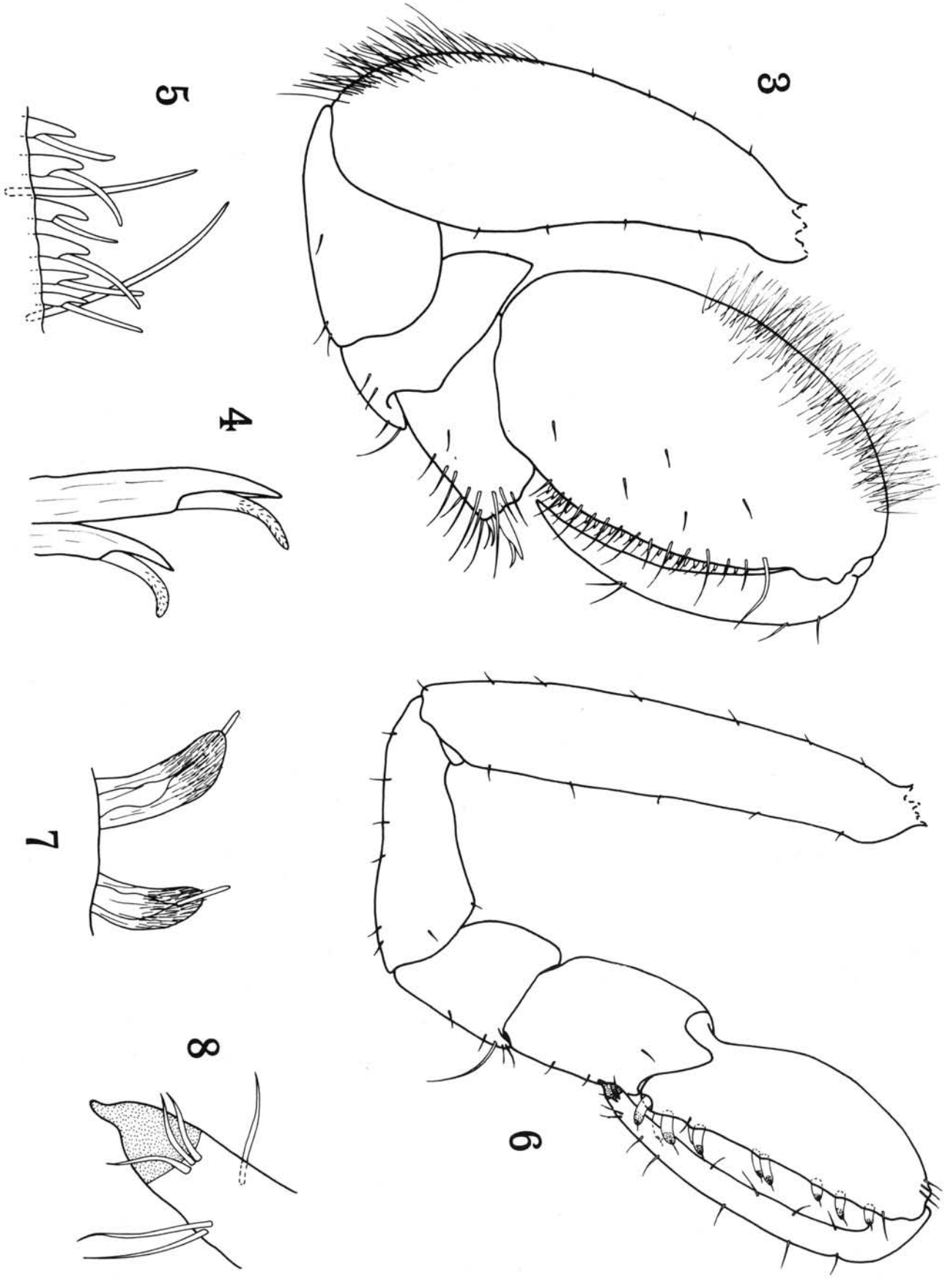
Figs 3-8 — *Serolis exigua* Nordenstam. Adult male, 5.5 mm long. 3, pereopod I. 4, pereopod I, composite setae from carpus. 5, pereopod I, setae from ventral margin of propodus. 6, pereopod II. 7, pereopod II, composite setae from ventral margin of propodus. 8, pereopod II, apex of dactylus.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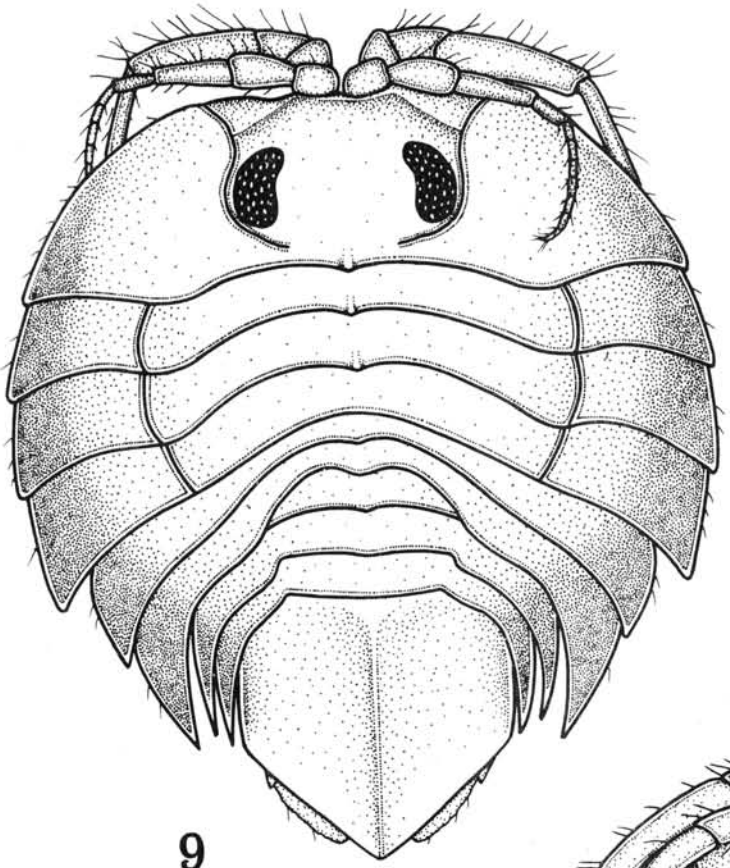
Figs 9-10 — *Serolis inermis* sp. n. 9, holotype adult male, 5.9 mm long. 10, allotype ovigerous female, 4.8 mm long.



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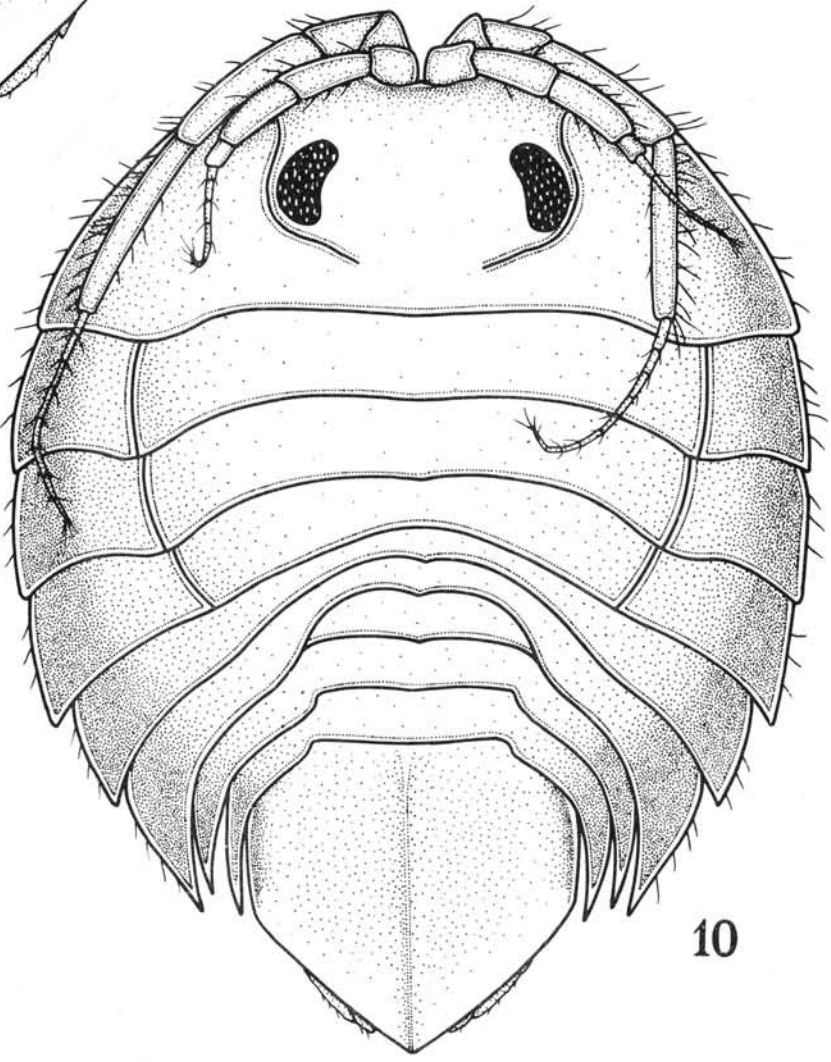

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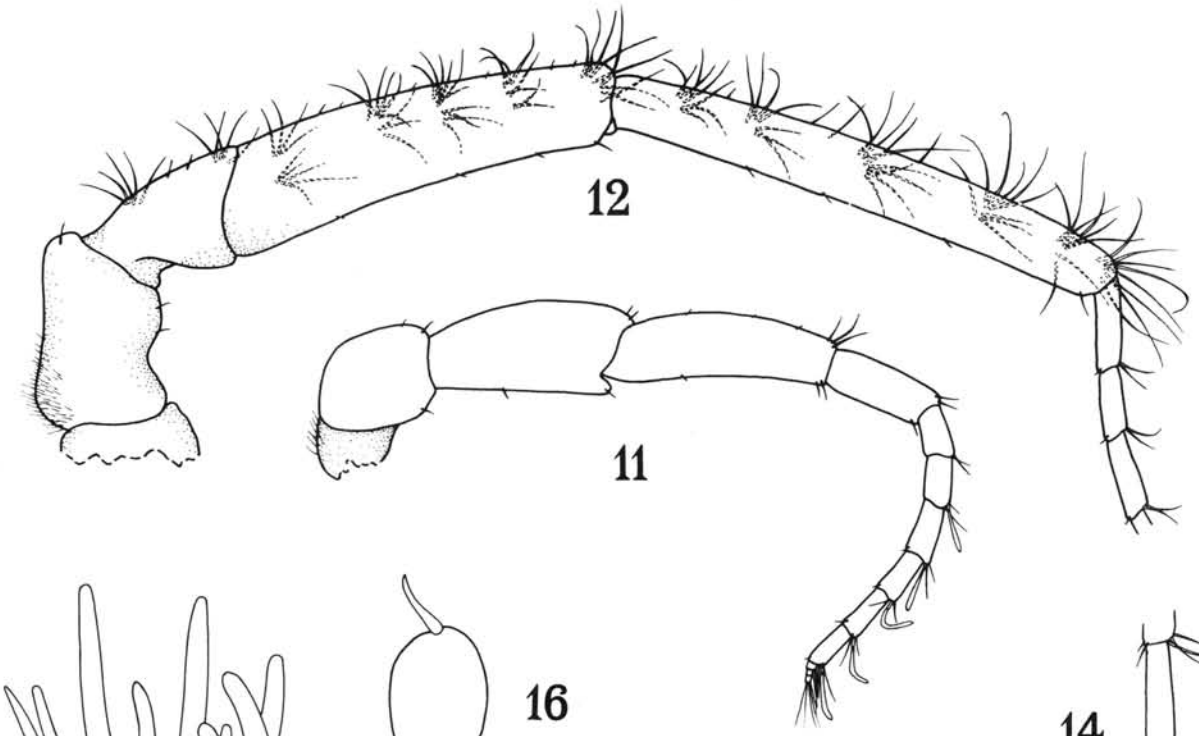
Figs 11-19 — *Serolis inermis* sp. n. Holotype adult male, 5.9 mm long. 11, antenna 1. 12, antenna 2. 13, antenna 2, flagellar process. 14, antenna 2, last articles of flagellum. 15, maxilla 1, apex of outer lobe. 16, maxilla 1, apex of inner lobe. 17, maxilla 2. 18, maxilliped. 19, maxilliped, apex of palp.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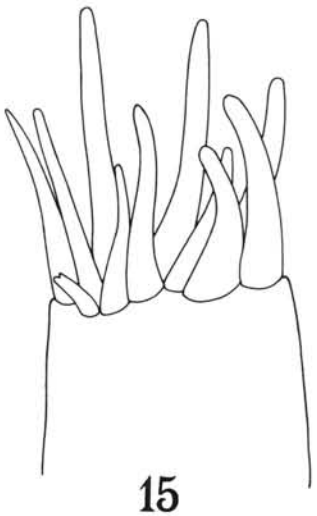
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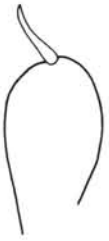
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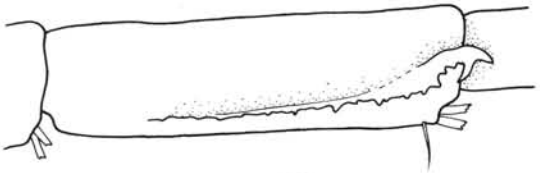
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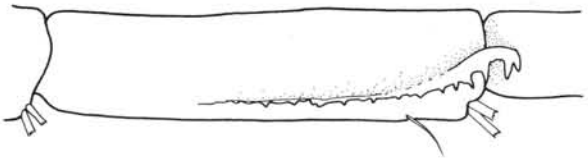

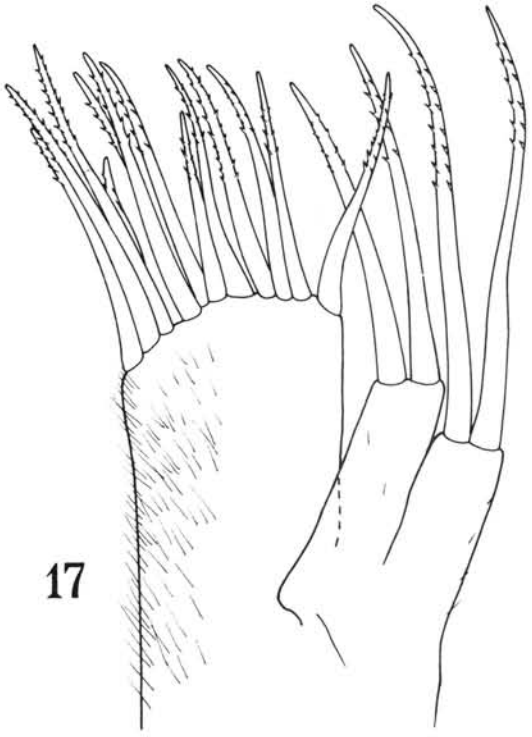
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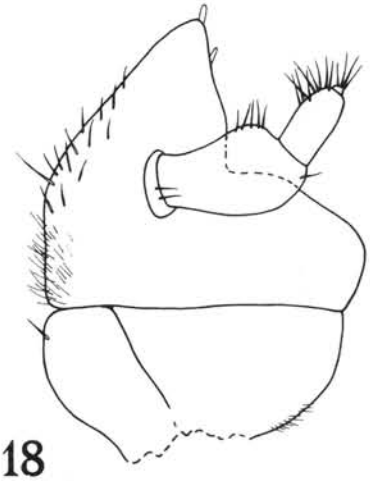
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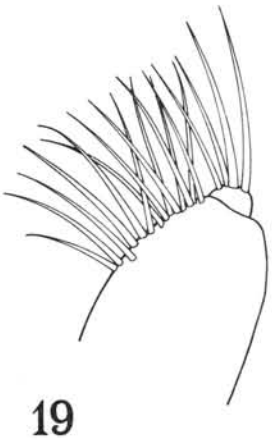
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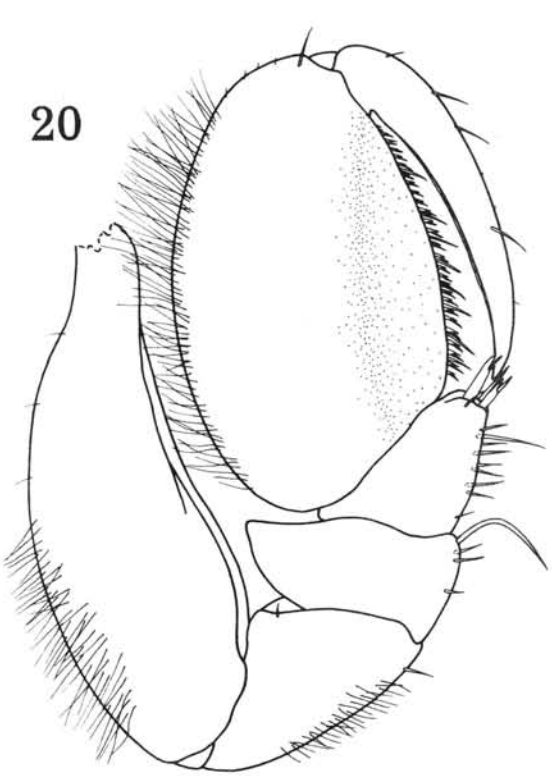
Figs 20-27 — *Serolis inermis* sp. n. Holotype adult male, 5.9 mm long (Figs 20-26). Allotype ovigerous female, 4.8 mm long (Fig. 27). 20, pereopod I. 21, pereopod I, composite setae from carpus. 22, pereopod I, setae from ventral margin of propodus. 23, pereopod II. 24, composite seta from ventral margin of propodus. 25, pereopod II, carpus, propodus and dactylus. 26, pereopod II, apex of dactylus. 27, pereopod I.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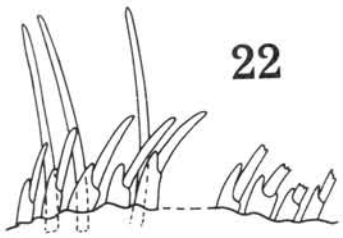
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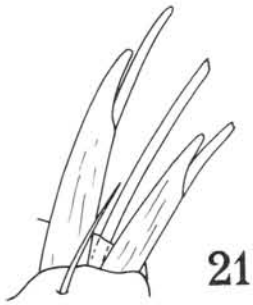
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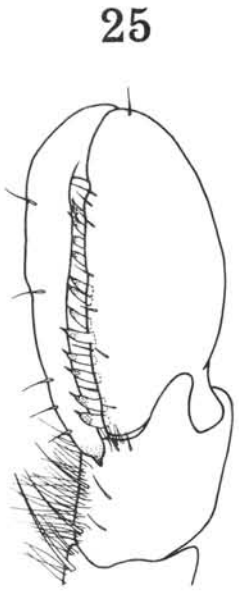
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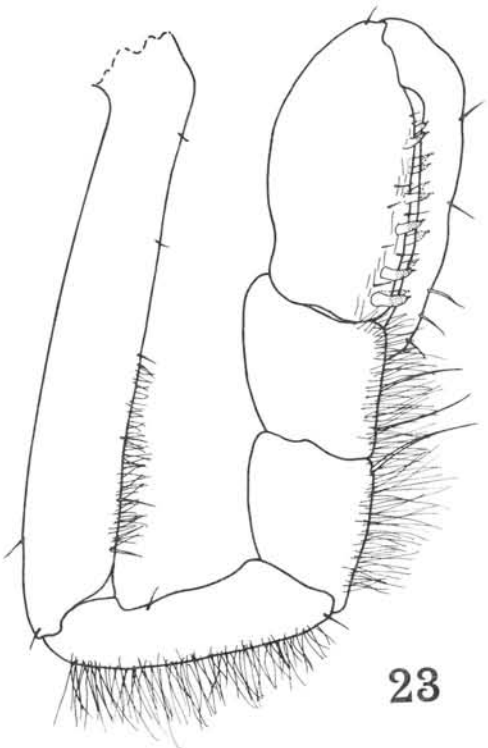
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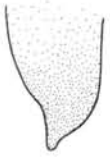
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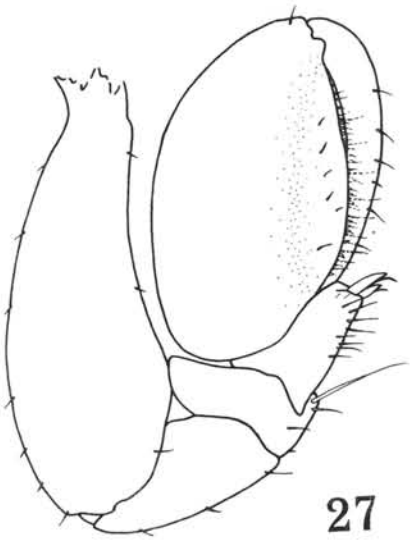
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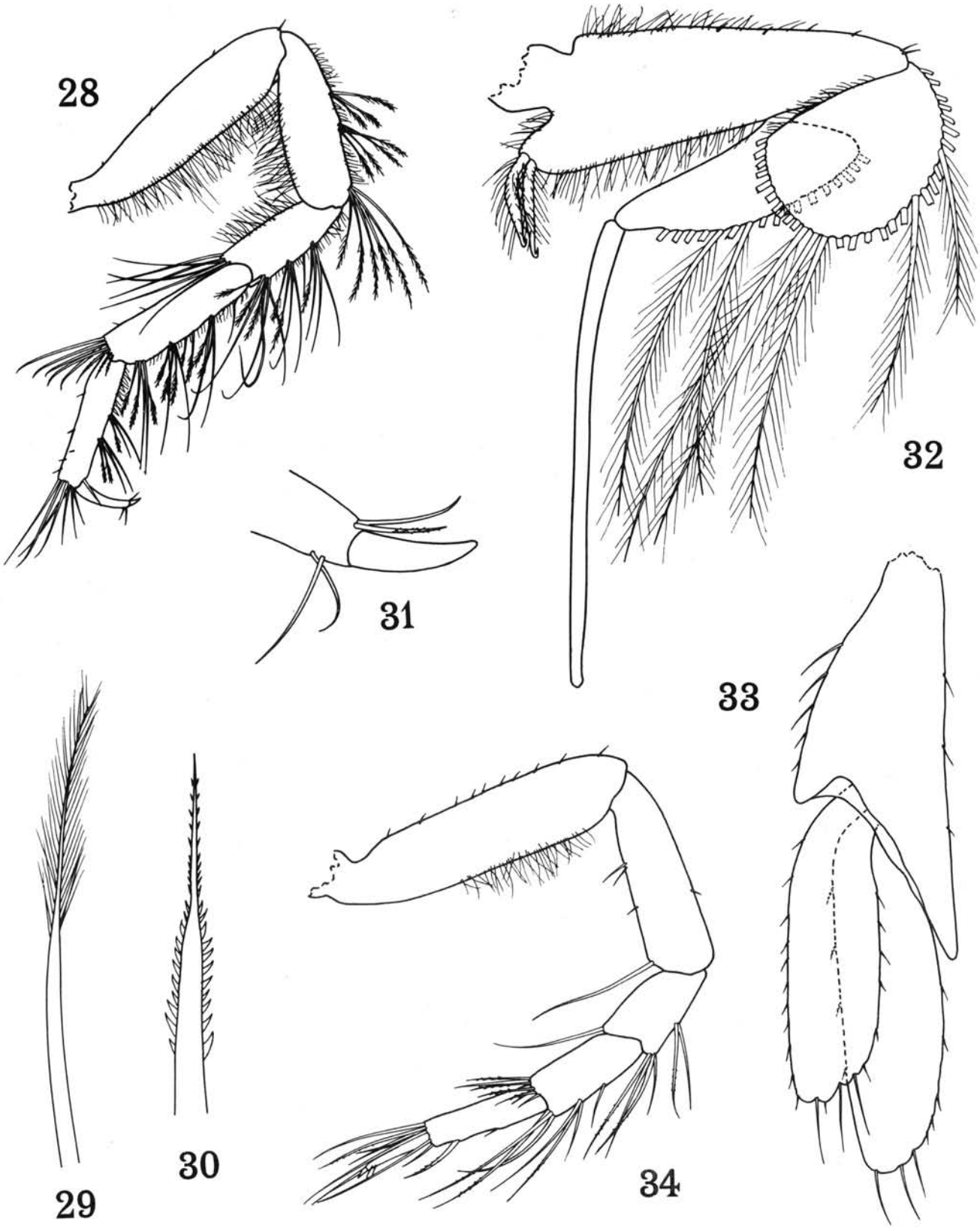
Figs 28-34 — *Serolis inermis* sp. n. Holotype adult male, 5.9 mm long (Figs 28-33). Allotype ovigerous female, 4.8 mm long (Fig. 34). 28, pereopod VII. 29 and 30, pereopod VII, plumose and strongly pectinate setae. 31, pereopod VII, apex of dactylus. 32, pleopod 2. 33, uropod. 34, pereopod II.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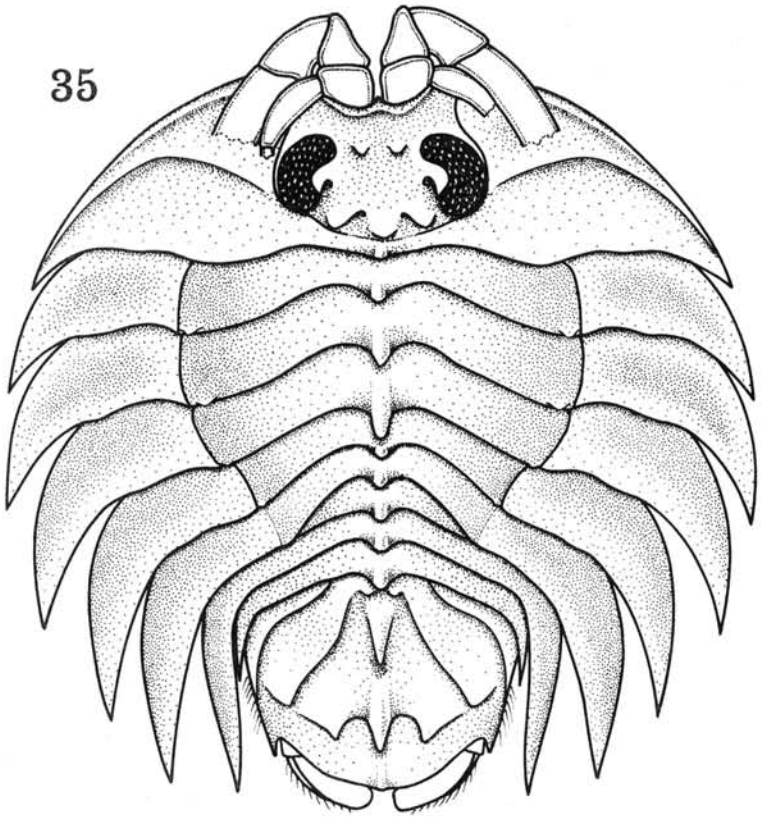
Figs 35-39 — *Serolis polaris* Richardson. Adult male, 16.0 mm long (from Moreira, 1971) (Fig. 35). Female bearing hatched young in the marsupium, 18.6 mm long (Figs 36-39). 35, adult male. 36, head posterior tubercles. 37, frontal area of both head and pereonite I, showing the finger-like tubercle on pereonite I. 38, angular projection placed close to suture of pereonite II coxal plate. 39, pleonal sternites 1-3.



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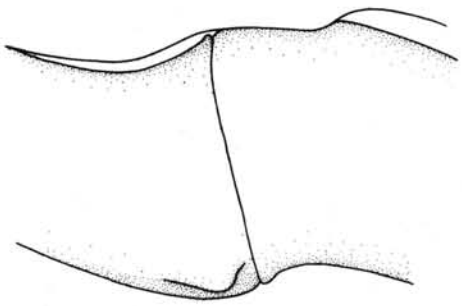

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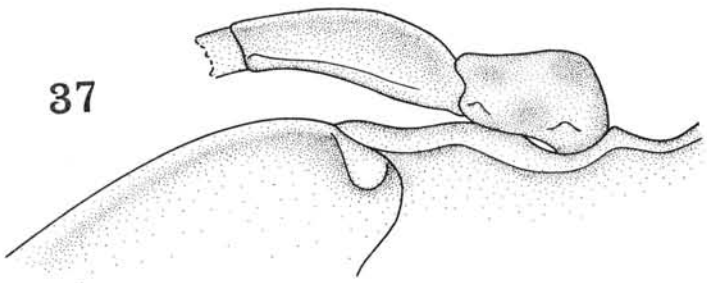

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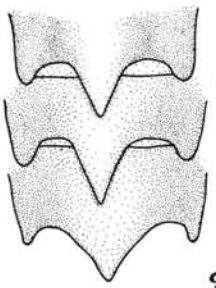

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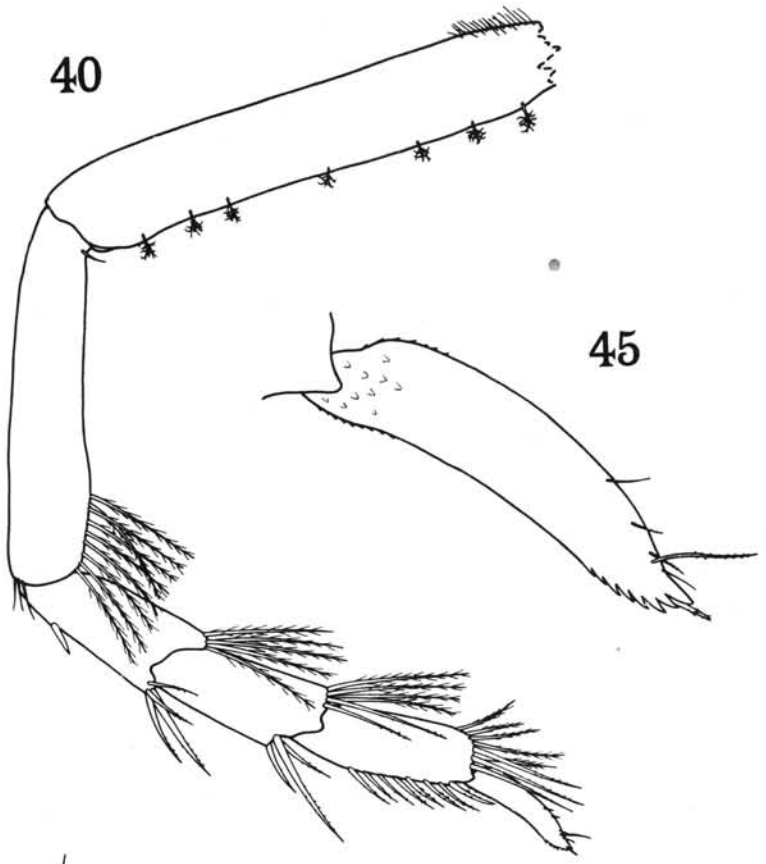
Figs 40-48 — *Serolis polaris* Richardson. Female bearing hatched young in the marsupium, 18.6 mm long. 40, pereopod II. 41-44, types of setae found on pereopod II and remainder pereopods. 45, pereopod II, dactylus. 46, pereopod III. 47, pereopod III, dactylus. 48, pereopod III, apex of dactylus.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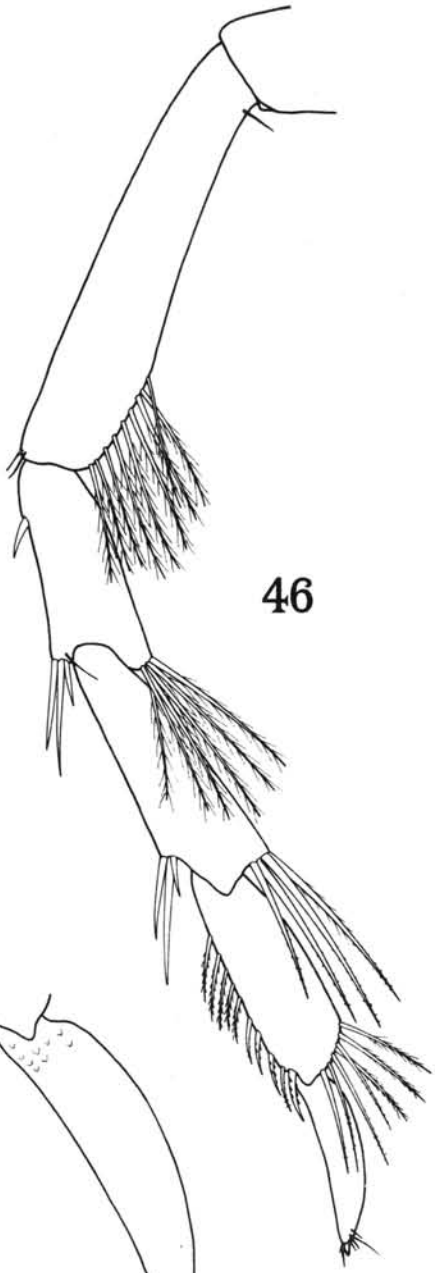
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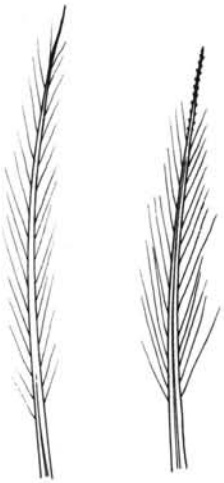
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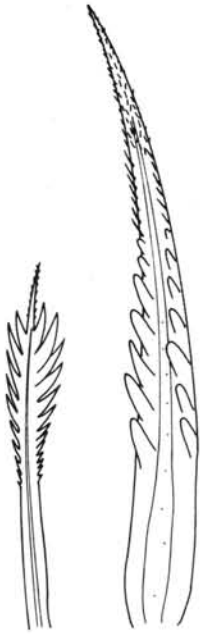
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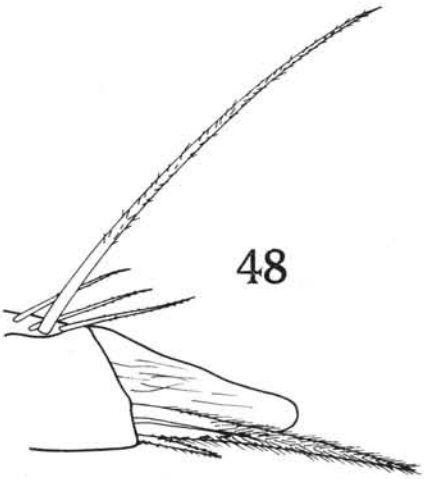
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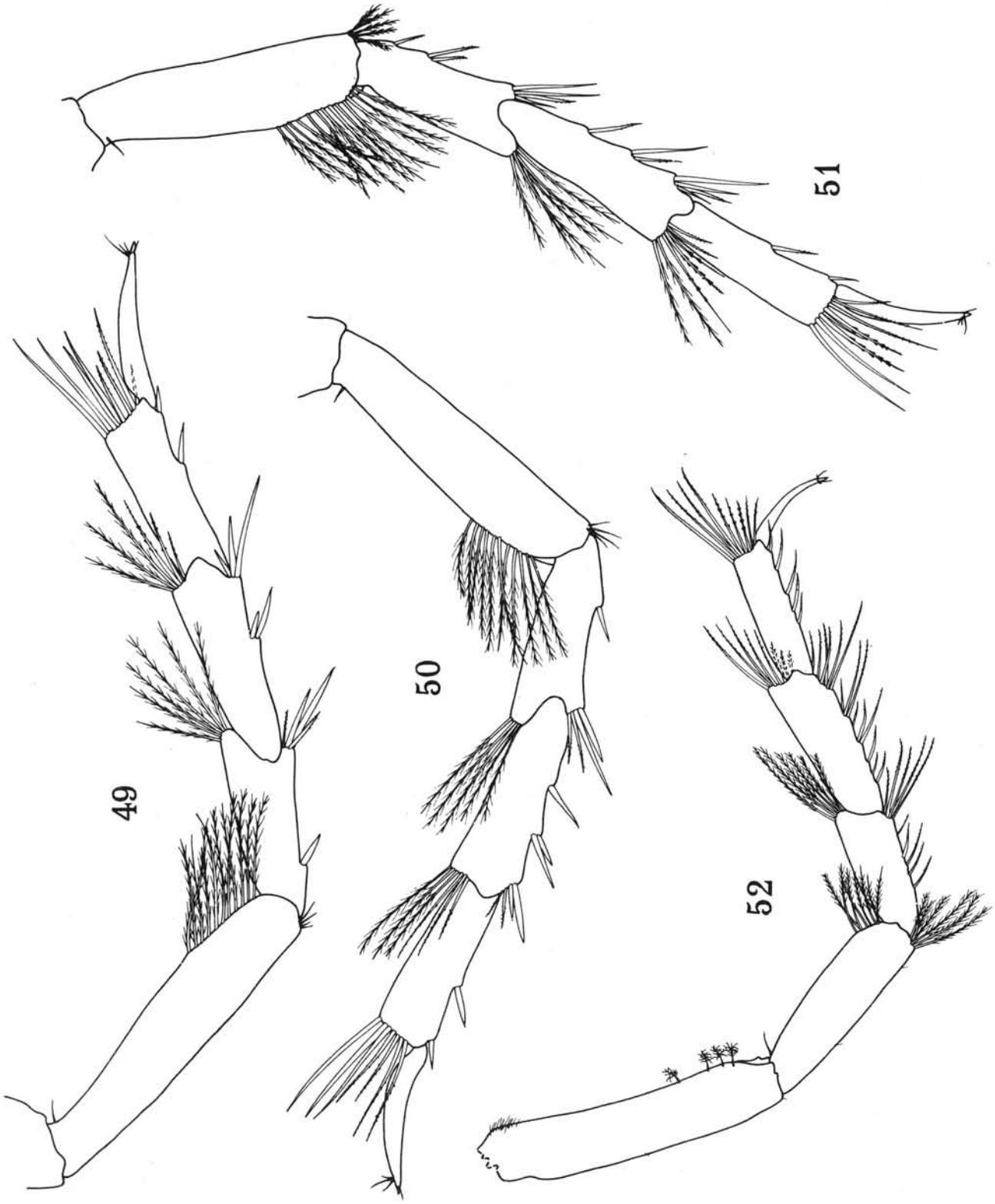
Figs 49-52 – Serolis polaris Richardson. Female bearing hatched young in the marsupium, 18.6 mm long. 49, pereopod IV. 50, pereopod V. 51, pereopod VI. 52, pereopod VII.


51
50
49
52