

granulate near articulation. Pereopods 5–7 robust, all articles bearing dense pile of fine setules, longer than in anterior pereopods; bases with two spinose tubercles on outer surface.

#### *Male*

Body cylindrical, integument densely granulate. Head and pereonite 1 with low, rounded submedian tubercle. Pereonite 4 slightly longer than head plus pereonites 1–3; posterodorsal margin with four posteriorly directed spinose tubercles. Pereonites 5–7 decreasing in length posteriorly, each with strong spinose middorsal and shorter lateral tubercle. Single fused pleonite bearing single middorsal spinose tubercle. Pleotelson relatively narrower than in female. Antenna equal in length to head plus pereon. Pleopod 1, exopod with broad notch at about midlength of outer margin armed with three elongate bristled spines; about ten plumose setae on distal margin. Pleopod 2, copulatory stylet articulating near base of endopod, basally broad, tapering distally, extending by almost half its length beyond ramus, apically bifid, tips slightly broadened; endopod basally narrow, widening to distal margin bearing seven plumose setae.

#### *Etymology*

The specific name refers to the granulate integument of this species.

*Antarcturus* zur Strassen, 1902

*Antarcturus bicornis* sp. nov.

*Litarcturus* Figs 3–4

#### *Material*

Holotype SAM-A15670, SM 232, 32°14'S 29°10'E, 560–620 m, 1 ♂, TL 11,5 mm. Paratypes SAM-A15671, SM 232, 560–620 m, 2 ♂ (both damaged), 2 juvs. SAM-A15672, SM 226, 32°28'S 28°58'E, 710–775 m, 1 juv. Paratype USNM 189067, SM 232, 560–620 m, 1 ♂, TL 11,1 mm.

#### *Description*

##### *Male*

Body cylindrical, integument smooth, with few low, rounded tuberculations. Eyes lateral, well pigmented. Head with anterior pair of dorsal conical spines; anterior margin concave; ventrolateral margins not concealing pereopod 1 and mouth-parts in lateral view. Pereonite 1 fused with head, line of fusion marked by shallow dorsolateral groove, and short ventrolateral slit. Pereonites 2 and 3 similar, short. Pereonite 4 about twice length of preceding segment, cylindrical in dorsal view, with slight posterior flange. Midventral processes lacking on all pereonites. Pereonites 5–7 decreasing in length posteriorly, each with shallow transverse groove. Pleon consisting of three faintly indicated fused pleonites plus broadly convex, posteriorly rounded pleotelson.



Fig. 3. *Antarcturus bicornis* sp. nov. A. Male, lateral view. B. Pleotelson, dorsal view. C. Pereopod 1. D. Pleopod 1 male. E. Pleopod 2 male. Scale = 2 mm.

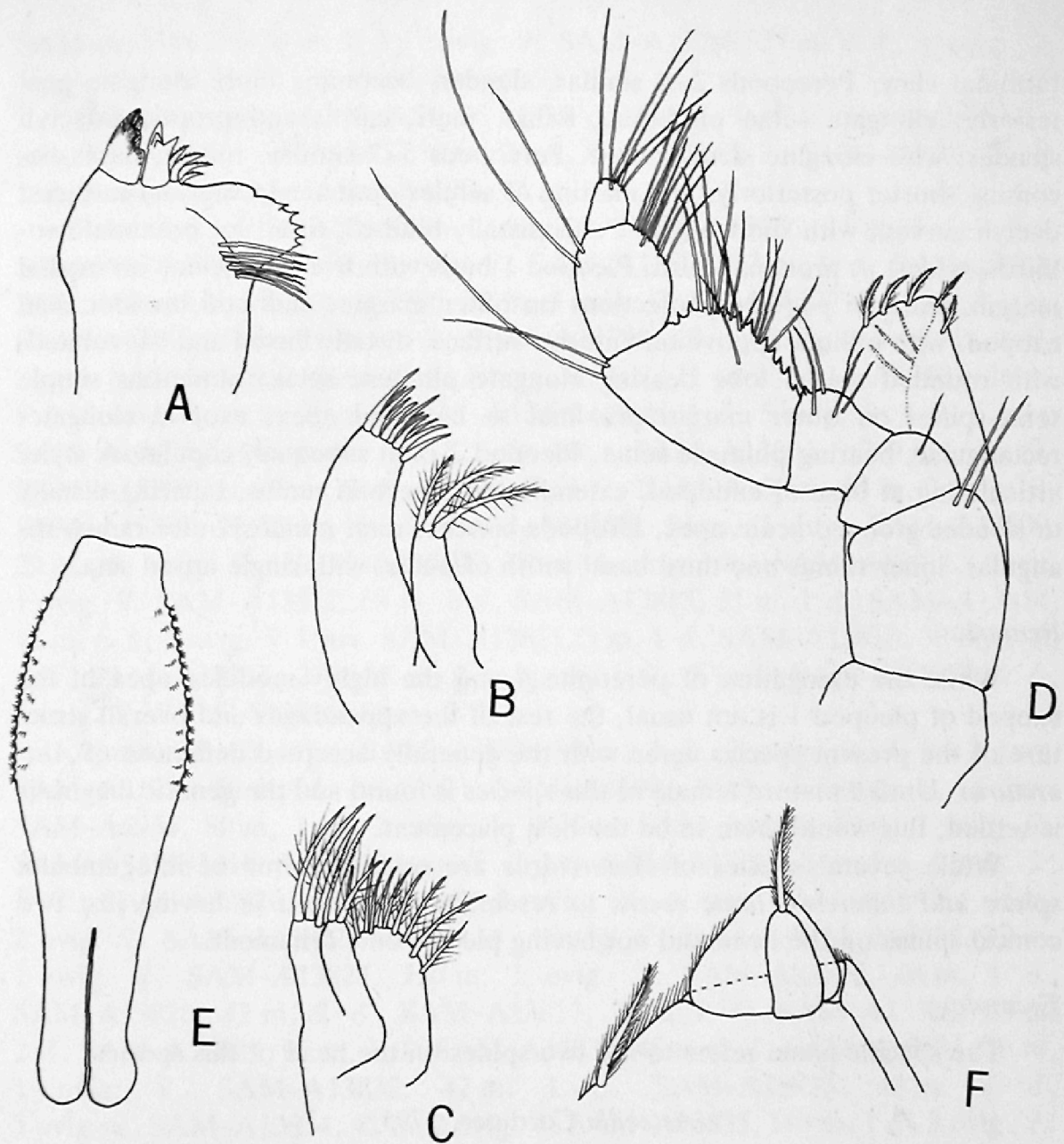


Fig. 4. *Antarcturus bicornis* sp. nov. A. Mandible. B. Maxilla 1. C. Maxilla 2. D. Maxilliped. E. Penis. F. Uropodal rami.

Antennule not reaching distal end of antennal peduncular article 3; flagellum uniarticulate. Antenna almost as long as body, articles 4 and 5 of peduncle slender-elongate; flagellum claw-like, of three articles. Mandible with tricuspid sclerotized incisor; strongly spinose lacinia; molar distally broad, armed with marginal serrations and submarginal spines. Maxilla 1, inner ramus with three stout fringed setae; outer ramus with eleven distal spines. Maxilla 2, inner ramus with nine fringed setae; inner lobe of outer ramus with two setae, outer lobe with three setae. Maxilliped, endite with eight distal fringed setae; palp of five articles, medial margin of articles 2 and 3 spinose; article 3 longest and broadest; exopod elongate-oval. Pereopod 1 armed with numerous finely fringed setae-spines on posterior margin; propodus broadest article; dactylus with strong

terminal claw. Pereopods 2-4 similar, slender, becoming more elongate posteriorly; elongate setae on bases, ischia, meri, carpi, and propodi; dactyli slender, with elongate slender claw. Pereopods 5-7 similar, robust, bases becoming shorter posteriorly; fine matting of setules on inner (posterior) surfaces; dactyli curved, with short ungui. Penis distally bilobed, fused for proximal two-thirds, widest at proximal third. Pleopod 1 basis with five retinaculae on medial margin, thirteen peg-like projections on outer margin; endopod broader than exopod, with oblique groove on anterior surface, distally flexed and convoluted, with rounded mesial lobe bearing elongate plumose setae; numerous simple setae-spines on outer margin proximal to modified apex; exopod elongate-rectangular, bearing plumose setae. Pleopod 2 rami subequal, copulatory stylet articulating at base of endopod, extending just beyond ramus, tapering distally to slender grooved acute apex. Uropoda convex, rami minute, outer ramus triangular, inner ramus one-third basal width of outer, with single apical seta.

#### Remarks

While the elongation of pereonite 4 and the highly modified apex of the exopod of pleopod 1 is not usual, the rest of the appendages and overall structure of the present species agree with the generally accepted definition of *Antarcturus*. Until a mature female of this species is found and the generic diagnosis is settled, this would seem to be the best placement.

While several species of *Antarcturus* are relatively free of integumental spines and tubercles, none seems to resemble *A. bicornis* in having just two conical spines on the head and not having pleotelsonic ornament.

#### Etymology

The specific name refers to the two spines on the head of this species.

*Astacilla* Cordiner, 1795

*Astacilla corniger* (Stebbing, 1873)

Figs 5-6

*Arcturus corniger* Stebbing, 1873: 97, pl. 3 (fig. 2) (recorded from Algoa Bay); 1908: 51.

*Arcturus* (?) *corniger*: Barnard, 1914: 207.

*Arcturella corniger*: Barnard, 1920: 391; 1925: 381; 1940: 493, 509; 1955: 6. Kensley, 1975a: 37; 1978e: 19, fig. 7B-C.

*Antarcturus ornatus* Tattersall, 1913: 889, fig. 5. Vanhöffen, 1914: 526.

*Astacilla setosa* Vanhöffen, 1914: 525, fig. 55.

*Arcturoopsis hirsutus* Barnard, 1914: 207, pl. 19A.

*Arcturoopsis hirsutus* var. *subglaber* Barnard, 1914: 211.

*Astacilla mediterranea* non Kochler, Barnard, 1920: 388; 1940: 493, 509.

*Neastacilla mediterranea*: Kensley, 1978e: 33, fig. 15A-B.

#### Material

Saldanha Bay area. SAM-A52, 160 m, 1 ovig. ♀ (syntype of *Arcturoopsis hirsutus* var. *subglaber*). SAM-A3888, 40 m, 3 ♂, 1 ovig. ♀, 3 ♀, 3 juvs.

SAM-A13784, 50-54 m, 2 ♂, 1 ovig. ♀. SAM-A13785, 37 m, 3 ♂, 10 ovig. ♀, 1 juv. SAM-A13787, 18-33 m, 1 ovig. ♀.

Cape Pont area. SAM-A54, 56 m, 29 ♂, 7 ovig. ♀, 7 ♀ (syntypes of *Arc-turopsis hirsutus*). SAM-A55, 56 m, 24 ♂, 8 ovig. ♀, 5 ♀. SAM-A3829, 48 m, 1 ♂, 3 ovig. ♀, 1 juv. SAM-A4072, 74 m, 1 ♂.

False Bay. SAM-A53, 22 m, 1 ovig. ♀. SAM-A13786, 26 m, 3 ♂, 1 juv. SAM-A13790, 68 m, 1 ♂, 4 ovig. ♀. SAM-A13794, 73 m, 9 ♂. SAM-13795, 29 m, 1 ♂, 2 juvs. SAM-A13796, 33 m, 3 ovig. ♀. SAM-A13797, 13 m, 3 juvs. SAM-A13798, 31 m, 1 ovig. ♀. SAM-A13799, 13 m, 3 ♂, 4 ovig. ♀, 1 ♀, 2 juvs. SAM-A13800, 26 m, 5 ♂, 1 ovig. ♀, 1 ♀, 11 juvs. SAM-A13801, 26 m, 5 ♂, 2 ovig. ♀, 1 ♀, 2 juvs. SAM-A13802, 22 m, 1 ♂, 5 ovig. ♀, 1 ♀, 6 juvs. SAM-A13803, 44-48 m, 1 ♂, 1 juv. SAM-A13804, 7-9 m, 1 ♀. SAM-A13805, 26-29 m, 1 ♂, 2 ovig. ♀, 1 ♀. SAM-A13806, 15 m, 2 ovig. ♀. SAM-A13807 26-29 m, 1 ♂. SAM-A13808, 33 m, 1 juv. SAM-A13809, 29 m, 2 ovig. ♀. SAM-A13810, 31 m, 1 ovig. ♀. SAM-A13811, 29 m, 1 ovig. ♀. SAM-A13812, 68 m, 1 ♂. SAM-A13813, 31 m, 1 ♂. SAM-A13814, 42 m, 6 ♂, 2 ovig. ♀ 1 juv. SAM-A13815, 5 m, 1 ♂. SAM-A13816, 36 m, 1 ♂, 1 ♀. SAM-A13817, 27 m 5 ♂, 4 ovig. ♀, 1 ♀, 3 juvs. SAM-A13818, 1 ♂, 5 ovig. ♀. SAM-A13836, 19 m, 2 ♂.

Agulhas Bank area. SAM-A3861, 94 m, 2 ♂, 2 ovig. ♀, 1 ♀, 7 juvs. SAM-A4175, 56 m, 1 ovig. ♀. SAM-A4190, 1 ♂, 3 ovig. ♀, 1 juv. SAM-A5956, 80 m, 1 ♂, 2 ovig. ♀, 2 juvs. SAM-A6624, 40 m, 1 ovig. ♀. SAM-A13793, 110 m, 8 ♂, 2 ovig. ♀, 2 juvs. SAM-A13819, 84 m 5 ♂, 1 ovig. ♀, 1 ♀. SAM-A13820, 93 m, 1 ♂, 1 ovig. ♀, 1 juv. SAM-A13821, 45 m, 2 ovig. ♀. SAM-A13822, 49 m, 1 ♂, 1 ovig. ♀, 2 juvs. SAM-A13823, 79 m, 1 ovig. ♀. SAM-A13824, 110 m, 1 ovig. ♀. SAM-A13825, 48 m, 1 ♂. SAM-A13826, 42 m, 2 ♂. SAM-A13827, 73 m 1 ♂. SAM-A13828, 93 m, 2 ♂. SAM-A13829, 97 m, 1 ♂. SAM-A13830, 45 m, 1 ♂. SAM-A13831, 36 m, 1 ovig. ♀. SAM-A13832, 42 m, 1 ♂. SAM-A13833, 44 m, 2 ♂, 1 ovig. ♀. SAM-A13834, 42 m, 2 ovig. ♀. SAM-A13835, 110 m, 1 ♂, 3 ovig. ♀.

East London area. USNM 189068, SM 185, 90 m, 1 ♂, 1 ovig. ♀, 1 ♀, 5 juvs.

## Description

### Female

Head and pereonite 1 fused, line of fusion marked by shallow dorsolateral groove and short slit in ventrolateral margin. Head with large rounded-triangular eye; armed with short anterior and longer posterior pair of conical tubercles. Pereonite 1 with strong middorsal conical tubercle. Pereonites 2-3 with median conical tubercles shorter than those of pereonite 1, and with low, rounded, dorsolateral tubercles; coxal plates distinct, subcircular. Pereonite 4 longer than head and three anterior pereonites together; body widest (in dorsal view) at anterior end of pereonite 4; anterior middorsal process consisting of

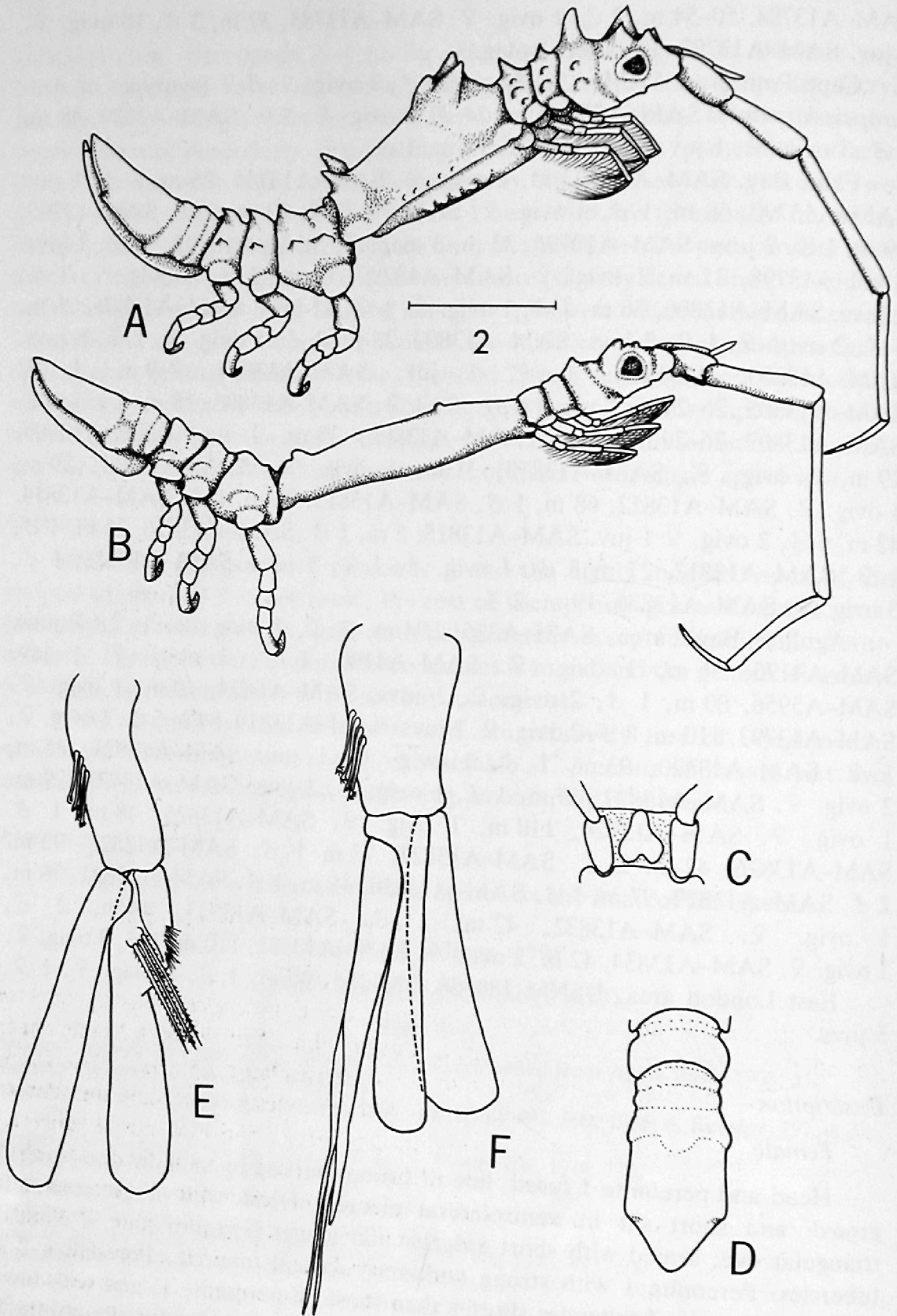


Fig. 5. *Astacilla corniger* (Stebbing) A. Female, lateral view. B. Male, lateral view. C. Pereonite 4, male, ventral view. D. Pleotelson, dorsal view. E. Pleopod 1 male. F. Pleopod 2 male. Scale = 2 mm.

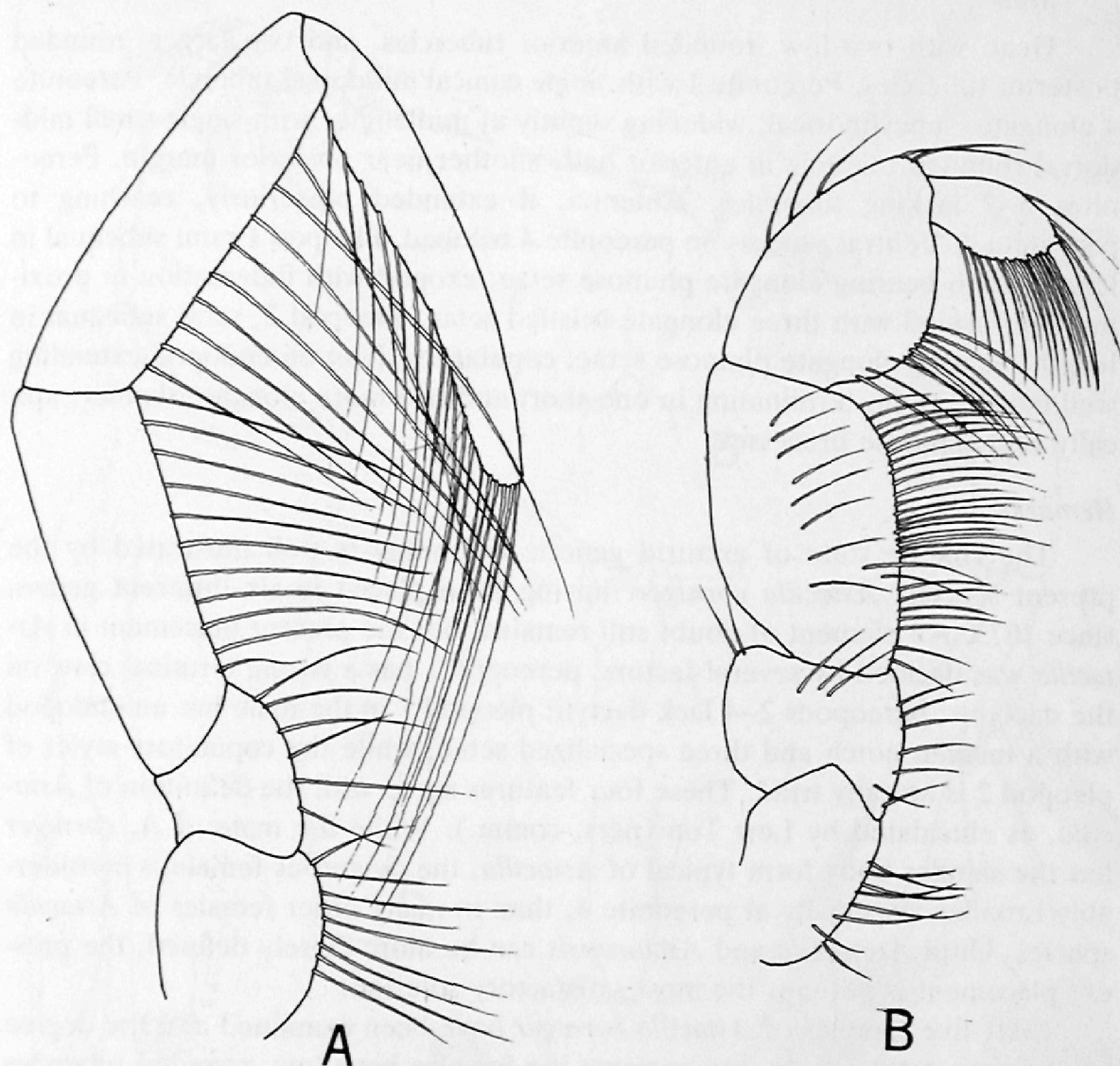


Fig. 6. *Astacilla corniger* (Stebbing) A. Pereopod 2. B. Pereopod 1.

two large lateral slightly flattened apically acute tubercles flanking shorter rounded middorsal tubercle; two large conical submedian dorsal tubercles near posterior margin; four or five low, rounded tubercles laterally; coxal plate forming major part of brood-pouch, with row of low tubercles near articulation. Pereonites 5-7 each with short conical middorsal tubercle, and low lateral tubercle; sideplates rounded. Pleon consisting of three fused segments indicated by shallow dorsolateral grooves, and pentagonal pleotelson, latter dorsally smooth, apically rounded. Antenna, if extended posteriorly, reaching pereonite 7. Mouthparts typical of genus. Pereopod 1 with ventrolateral margins concealed within ventrolateral margins of head and pereonite 1. Pereopods 2-4 increasing in length posteriorly, slender, setose. Pereopods 5-7 robust, decreasing in length posteriorly. Outer uropodal ramus very short, triangular, inner ramus much smaller, bearing single apical seta.

*Male*

Head with two low, rounded anterior tubercles, and two larger, rounded posterior tubercles. Pereonite 1 with single conical middorsal tubercle. Pereonite 4 elongate, subcylindrical, widening slightly at midlength, with single small middorsal rounded tubercle in anterior half, another near posterior margin. Pereonites 5-7 lacking tubercles. Antenna, if extended posteriorly, reaching to pereonite 7. Ventral process on pereonite 4 trilobed. Pleopod 1 rami subequal in length, both bearing elongate plumose setae; exopod with indentation in proximal half armed with three elongate bristled setae. Pleopod 2, rami subequal in length, bearing elongate plumose setae; copulatory stylet on endopod extending well beyond rami, terminating in one short and two more elongate slender, apically acute spinose processes.

*Remarks*

The chaotic state of arcturid generic taxonomy is well illustrated by the present species, *Astacilla corniger*, having been placed in six different genera since 1873. An element of doubt still remains, but the present placement in *Astacilla* was decided by several factors: pereopod 1 has a strong terminal claw on the dactylus; pereopods 2-4 lack dactyli; pleopod 1 in the male has an endopod with a median notch and three specialized setae, while the copulatory stylet of pleopod 2 is apically trifid. These four features agree with the definition of *Astacilla*, as elucidated by Lew Ton (pers. comm.). While the male of *A. corniger* has the slender body form typical of *Astacilla*, the ovigerous female is considerably broader, especially at pereonite 4, than in many other females of *Astacilla* species. Until *Arcturella* and *Arcturoopsis* can be more closely defined, the present placement is perhaps the most satisfactory solution.

Sixty-five samples of *Astacilla corniger* have been examined and the degree of variation assessed. At one extreme the females have low, rounded tubercles with fairly dense pile of golden setae, the males have a low pile of setae and lack tubercles. At the other end of the range the females lack setae and have well-developed and elongate tubercles, sometimes becoming spine-like, while the males lack setae and have rounded to spinose tubercles. Between these extremes almost every variation has been noted, sometimes this variation being considerable within the same sample. There is thus no justification for maintaining Barnard's (1914) variety *subglaber*, either as a subspecies or as a separate species.

Barnard (1920) based his conclusion that his specimen from Natal was the same as the Mediterranean species on Koehler's description and somewhat diagrammatic figure. Barnard did note that the tubercle on pereonite 4 in the female was not symmetrical as in Koehler's figure. In fact, the Natal specimen was an immature specimen. With fresh material from the Mediterranean and mature material from Natal, closer comparison is possible. Pereonite 4 in the female easily separates the two species: *Astacilla mediterranea* has a single conical anterior and posterior middorsal tubercle; *A. corniger* has a trilobed anterior and a bilobed posterior middorsal tubercle. The males of the two species are more



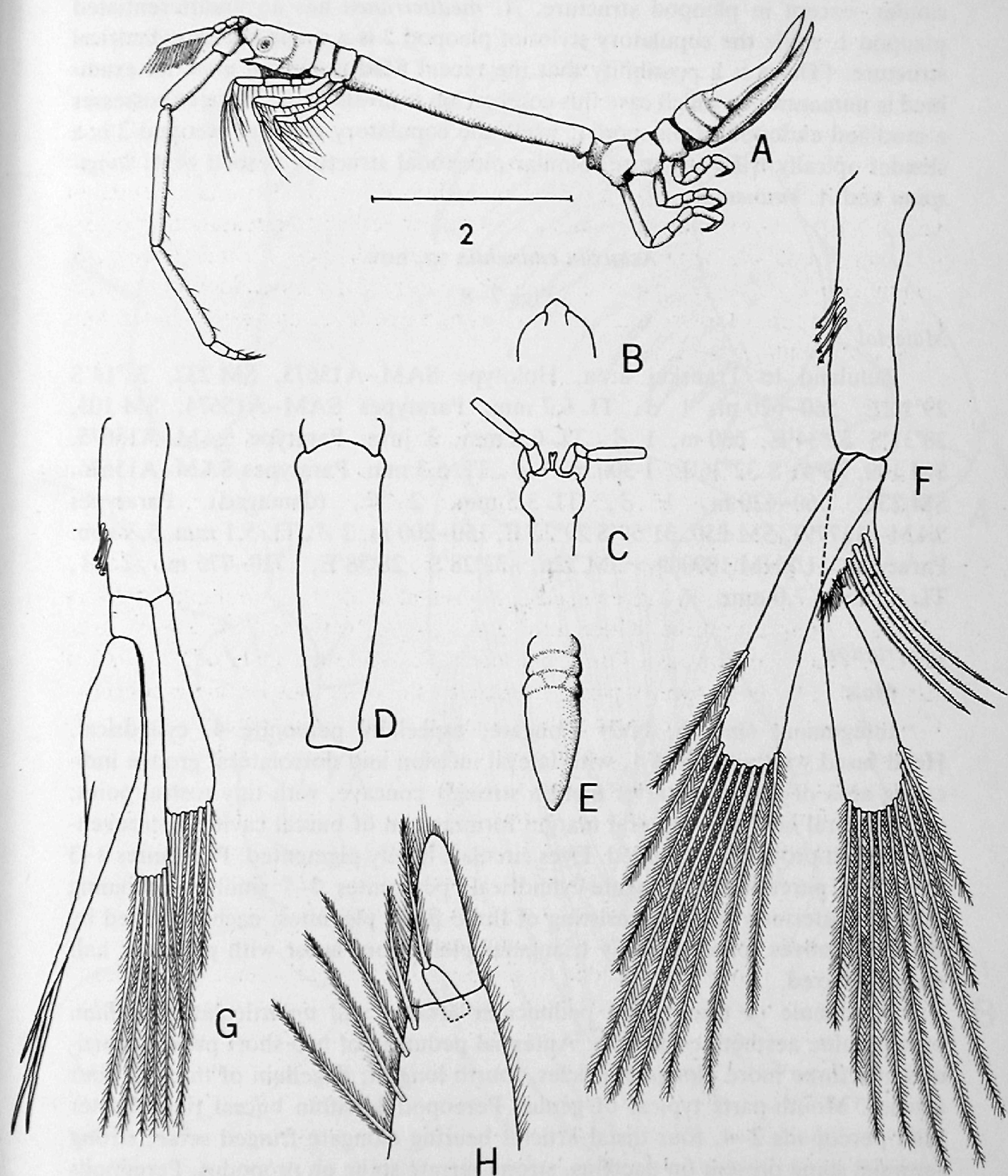


Fig. 7. *Astacilla eminentia* sp. nov. A. Male, lateral view. B. Anterior margin of head. C. Pereonite 4 male, ventral view. D. Pereonite 4 female. E. Pleotelson, dorsal view. F. Pleopod 1 male. G. Pleopod 2 male. H. Uropodal rami. Scale = 2 mm.