

## A Redescription of *Periclimenes aesopius* (Bate, 1863) (Crustacea : Decapoda) with Remarks on Related Species

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### ABSTRACT

The pontoniine shrimp *Periclimenes aesopius* (Bate, 1863) is redescribed in detail. It is considered to be endemic to southern Australia. Other records of this species are referred to *P. indicus* (Kemp) or *P. holthuisi* Bruce, species which may be found in association with actinarians or other coelenterates, and which also occur in Australian waters. It is considered probable that *P. aesopius* is involved in a similar association.

*Periclimenes aesopius* is remarkable for the great enlargement of postero-dorsal lobe of the third abdominal segment. Several closely related species have conspicuous colour markings on this segment and are also involved in fish-cleaning symbioses. It is also considered likely that the development of this process has the result of increasing the effectiveness of this signal and that *P. aesopius* may also be a fish-cleaning species.

*Periclimenes aesopius* is considered to be a member of a widely distributed group of closely related species, generally associates of actinarians, including the Indo-West Pacific species: *P. indicus* (Kemp), *P. tosaensis* Kubo, *P. holthuisi* Bruce; the east Atlantic-Mediterranean *P. scriptus* (Risso), *P. amethysteus* (Risso); and the tropical western Atlantic *P. yucatanicus* (Ives), *P. pedersoni* Chace, *P. magnus* Holthuis and *P. anthophilus* Holthuis & Eibl-Eibesfeldt. The group is not represented in the eastern Pacific region.

### INTRODUCTION

The pontoniine shrimp *Periclimenes aesopius* was first described by C. Spence Bate as *Anchistia aesopia* in 1863. It is of particular interest in that it was the first pontoniine shrimp to be recorded from Australian waters and also that it has not subsequently been reported from any other localities and is still known only from St. Vincent Gulf, South Australia. Other records from the Indo-West Pacific region have proved to be erroneous, and Bate's species appears to be endemic to South Australia.

### DESCRIPTIONS

*Periclimenes aesopius* (Bate) (Figs. 1-6).

*Anchistia aesopia* Bate, 1863, Proc. zool. Soc. Lond., 1863: 502-503, pl. 41, fig. 5.

*Anchistia aepia*—Haswell, 1882, Catal. Aust. Crust.: 194.

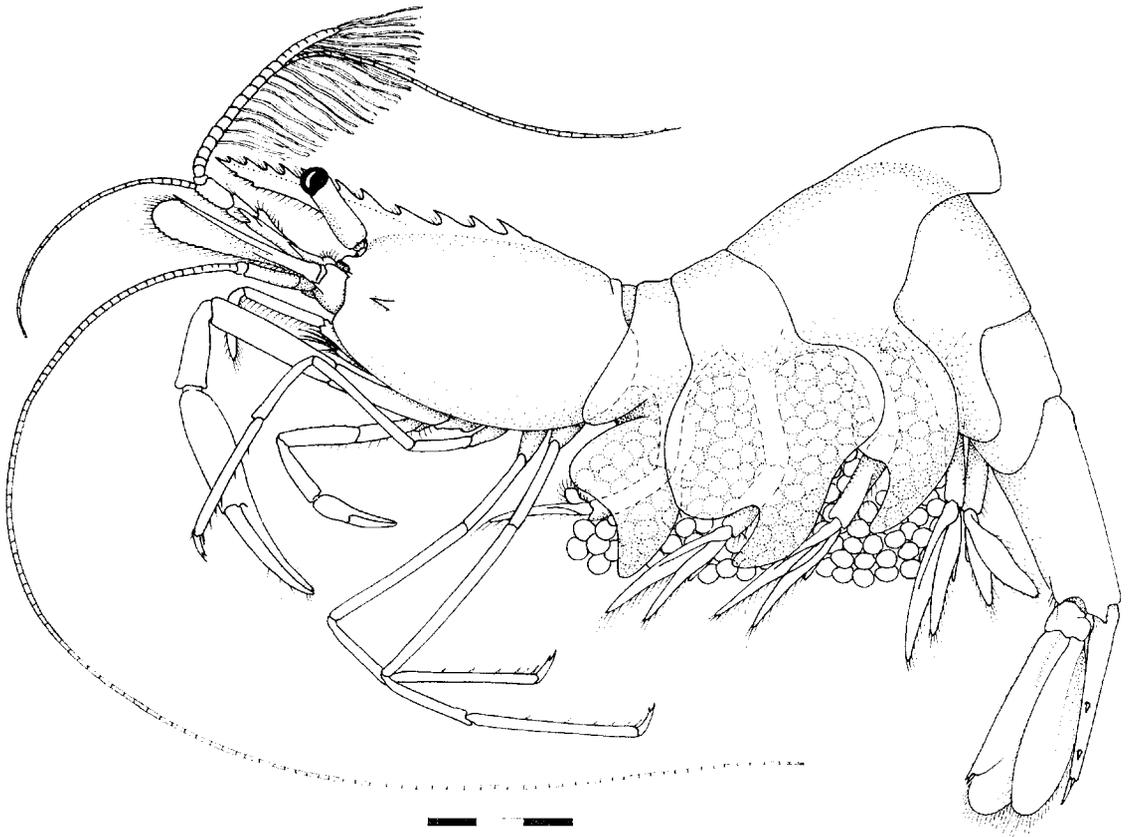


Fig. 1. *Periclimenes aesopius*, ovigerous female. Graduated scale = 3 mm.

*Periclimenes aesopius*— Borradaile, 1898, Ann. Mag. nat. Hist., (7)2:382.

*Urocaris aesopius* —Borradaile, 1917, Trans. Linn. Soc. Lond. Zool., (2) 17:354 (key), 354.

*Periclimenes (Periclimenes) aesopius*— Kemp, 1922, Rec. Indian Mus., 24:140.

*Periclemenes aesopius*— Kemp, 1922, Rec. Indian Mus., 24:142-143, fig. 12 —  
Hale, 1927, Crust. S. Aust., 1, 56, fig. 50; 1928, Rec. S. Aust. Mus., 4:95. —  
Bruce, 1969, Zool. Meded., Leiden, 43(20):258.

nec *Periclimenes (Periclimenes) aesopius* Holthuis, 1952; Siboga Exped. Mon.,  
39 a<sup>u</sup>:34-37, figs. 5-6. — Bruce, 1966, Crustaceana, 10(1): 19, 21, fig. 3b:  
19, 21, fig. 3b, 4ef.

nec *Periclimenes (Periclimenes) aesopius* Johnson, 1961, Bull. Mus. Nat. Singapore,  
30:58, 61, 75, tab. 1.

nec *Periclimenes aesopius* Bruce, 1967, Zool. Verhand., Leiden, 87:51-53.

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### MATERIAL EXAMINED:

(i) 1 ♂, 1 ♀, Gulf of St. Vincent, South Australia, British Museum (Natural History), registration No. 68-81, Types. (ii) 2 ovig. ♀, St. Vincent Gulf, South Australia, South Australian Museum, Cat. Nos. C626, C628. (iii) 1 ovig. ♀, 5 miles off Semaphore Beach, South Australia, South Australian Museum, Cat. No. C1063.

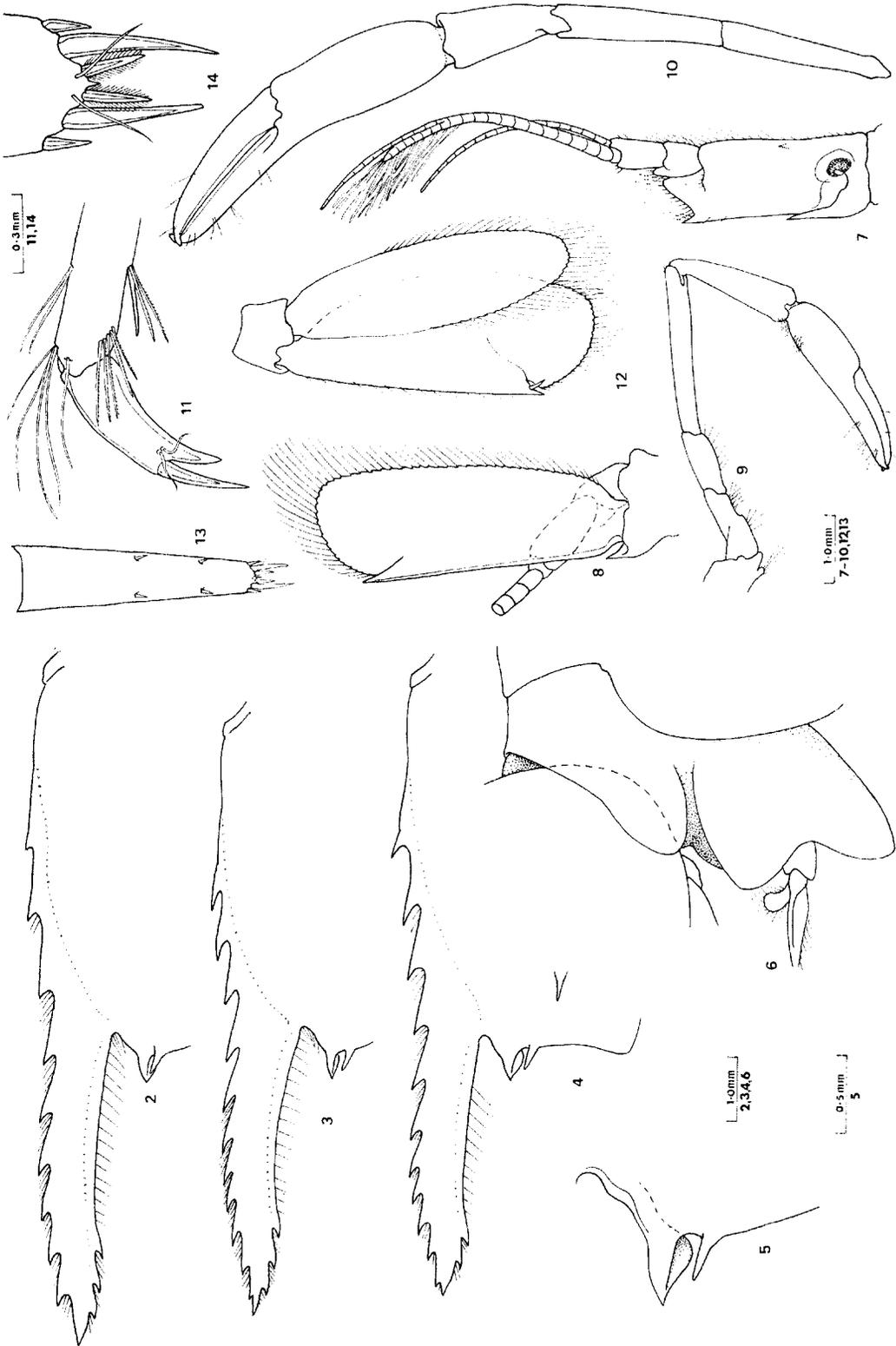
### DESCRIPTION:

A relatively large and slenderly built species of *Periclimenes*, with a smooth carapace and abdomen.

The rostrum reaches almost to the end of the antennular peduncle and is feebly to moderately curved, directed slightly upwards in relation to the longitudinal axis of the carapace (from the posterior orbital notch to the median postero-dorsal point of the carapace, in lateral view). The lamina tapers feebly, with poorly developed lateral carinae, situated nearer to the ventral margin, which is straight or feebly concave, than to the dorsal margin. The dorsal margin is armed with from 9 to 11 acute teeth, of which 3 or 4 are situated on the carapace posterior to the level of the orbital margin. The first tooth is situated at a level of half the post-orbital carapace length or more from the orbital margin. The teeth on the carapace are larger and more widely spaced than those on the dorsal lamina, which gradually decrease in size towards the tip. The ventral border of the lamina bears 2 or 3 teeth on the distal fourth. The orbit is obsolescent and there is no supra-orbital spine. The inferior orbital angle is acutely produced, with a short medial ventral flange, and extends far beyond the tip of the antennal spine. The antennal spine is slender, acute, marginal and situated closely below the inferior orbital angle. The hepatic spine is well developed, larger than the antennal spine and situated more posteriorly at a distinctly lower level. The antero-lateral angle of the carapace is bluntly rounded.

The third abdominal segment is strongly produced postero-dorsally as a compressed rounded lobe projecting backwards, from the posterior half of the segment. The fifth segment is about 0.4 of the length of the sixth, which is 2.3 times longer than wide. The postero-lateral angle is acutely produced and the postero-ventral angle blunt and setose. In the male, the pleura are normal, all broadly rounded posteriorly. In the non-ovigerous female they are similar but larger. In the ovigerous female, the first three are greatly expanded, with the first and third broadly notched and the second deeply notched antero-ventrally. The pleuron of the first abdominal segment is strongly produced antero-ventrally and the lower part separated by a deep notch from the upper part of the pleuron, which is also produced anteriorly.

The telson is about 0.8 of the length of the sixth abdominal segment. It is about 3.5 times longer than the anterior width, tapering with straight sides to half that width posteriorly. The two pairs of dorsal spines are situated at 0.5 and 0.75 of the telson length and are equal to about 0.6 of the telson length. The posterior margin is moderately produced, with a slender acute median point.



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The lateral pair of posterior spines is similar to the dorsal spines. The intermediate spines are long and robust, equal to 0.2 of the telson length. The submedian spines are also robust, equal to 0.4 of the intermediate spines and finely setulose. A pair of simple setae are also present dorsally.

The cornea is globular, of slightly greater diameter than the distal end of the eyestalk, which is subcylindrical, about 2.3 times longer than wide at the base. An accessory pigment spot is distinct. The ophthalmic somite bears an acute median, anteriorly directed hook-like process.

The antennular peduncle slightly exceeds the tip of the rostrum but not the spine of the scaphocerite. The proximal segment is about 2.7 times longer than wide at half its length, with the antero-lateral lobe strongly produced with numerous marginal setae, and medially inclined to reach the level of the proximal end of the distal peduncular segment. The lateral margin is straight, with a strong distal tooth at a level just distal to the proximal end of the intermediate segment and far exceeded by the antero-lateral lobe. The ventro-medial margin bears a short acute tooth. The stylocerite is well developed, slender and acute, reaching to the level of the middle of the medial border. The statocyst is normal with a regular oval statolith. The intermediate and distal segments are together equal to half the length of the medial margin of the proximal segment, with the former segment equal to two thirds of the length of the latter and with a small setose antero-lateral lobe. The lower flagellum is biramous, with the rami fused for the twelve proximal segments. The shorter free ramus, in the dissected female specimen, consists of seven segments. The larger ramus is filiform and has about 20 segments. About 15 groups of aesthetascs are present.

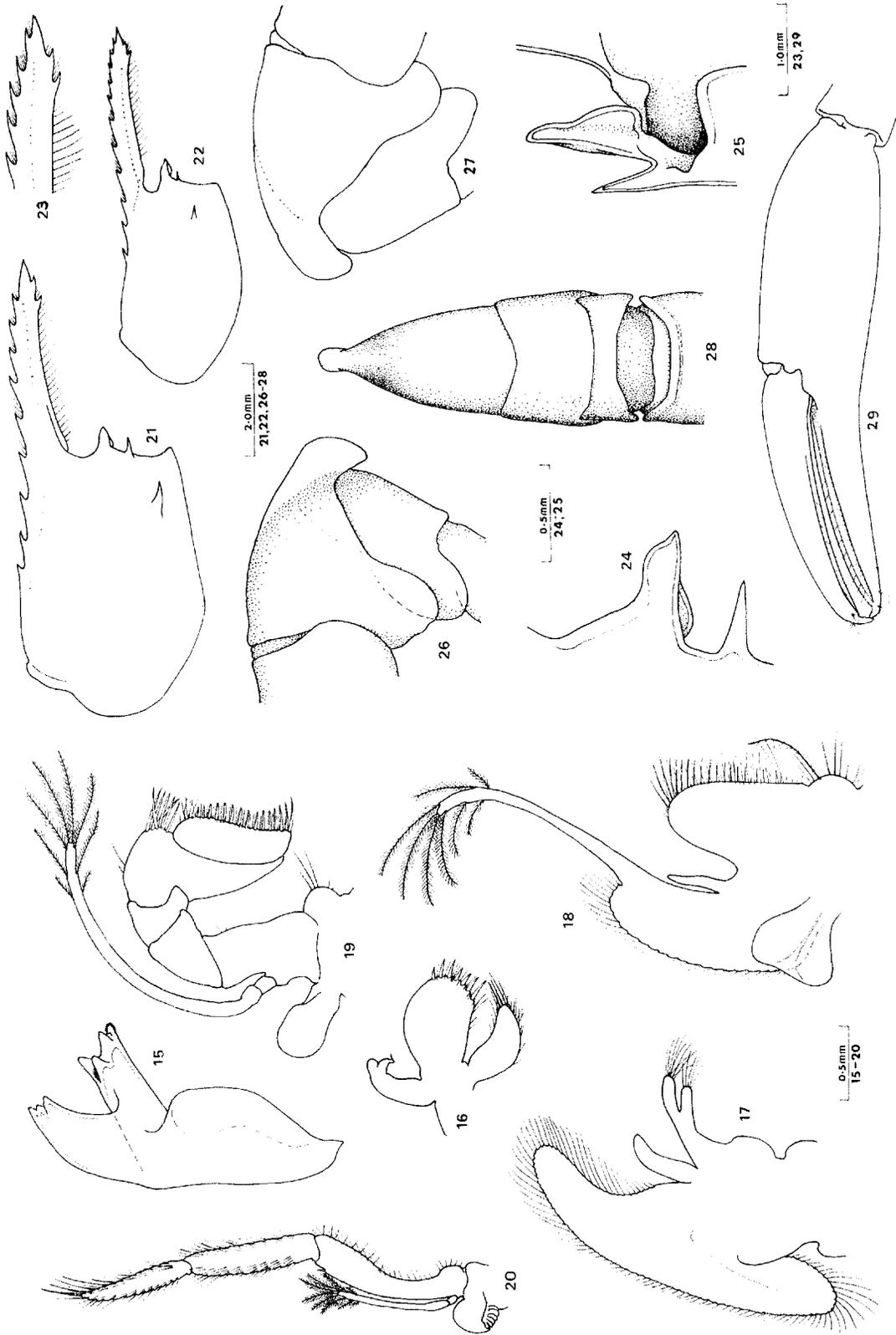
The basicerite of the antenna is robust, with a strong lateral tooth. The carpocerite exceeds the tip of the stylocerite, and is about twice as long as broad and compressed. The scaphocerite is almost three times longer than broad, with the greatest width distally at the level of the disto-lateral spine. The anterior margin of the lamella is broadly rounded, slightly medially orientated and extending far beyond the disto-lateral spine, which is at the end of the straight lateral margin. The flagellum is long and slender.

The mouthparts are typical of the genus *Periclimenes*. The mandible is without a palp. The corpus is stout and the incisor process is robust, tapering distally to three stout terminal teeth. The molar process bears several large blunt teeth distally. The maxillula has a slender bilobed palp, the lower lobe having a simple hook-like seta disto-ventrally. The upper lacinia is broad, with 7-8 finely denticulate spines and numerous setae distally. The lower lacinia is

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Figs. 2-14. *Periclimenes aesopus*. 2-4, rostral variation in ovigerous females. 5, inferior orbital angle. 6, pleuron of first abdominal segment, left lateral. 7, antennule. 8, antenna. 9, first pereopod. 10, second pereopod. 11, dactyl or fifth pereopod. 12, uropod. 13, telson. 14, posterior telson spines.

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slender and setose distally. The maxillula has a slender, non-setiferous palp. The basal endite is slender and tapering, with slender blunt distal lobes. The upper lobe is distinctly longer than the lower and both bear a small group of slender simple terminal setae. The coxal endite is absent and the margin is broadly rounded. The scaphognathite is well developed, long and slender, about 3.3 times longer than broad at the level of the base of the palp. The anterior lobe is slender, with the medial margin strongly concave. The first maxilliped has a small slender palp, non-setiferous, falling far short of the anterior margins of the basal endite or caridean lobe. The basal endite is large, broad, rounded with numerous setae along the antero-medial margins. The coxal endite is distinct, but small and rounded, with a few short, simple setae and a single long plumose seta. The caridean lobe is well developed, elongated and narrow. The epipod is small and feebly bilobed. The endopod of the second maxilliped is typical. The dactylar segment bears numerous stout denticulate spines along its medial margin. Longer spines are present on the disto-medial angle of the propod. The coxa is produced as a rounded medial lobe, with a few simple setae, and a small sub-rectangular epipod, without a podobranch, is present laterally. The third maxilliped is slender and exceeds the carpocerite by the length of the terminal segment. The antepenultimate segment consists of the ischio-merus and basis, which are completely ankylosed, with the medial border of the latter slightly produced, broadly rounded and setose. The segment is strongly bowed, about 5 times longer than broad, with a small spine at the distal end of the lateral margin and the medial border is sparsely setose. The penultimate segment is slightly shorter than the antepenultimate, about 5 times longer than wide, with numerous groups of finely denticulate setae. The terminal segment is about 0.9 of the length of the penultimate, about five times longer than wide, tapering distally, with more numerous groups of denticulate setae. The coxa is not produced medially, but a well developed rounded epipod is present laterally with also a small multilamellar arthrobranch. All three maxillipeds have the flagella of the exopods well developed, with about six large plumose setae distally and several shorter ones.

The fourth thoracic sternite is without a median process.

The first pereopod is moderately stout, exceeding the carpocerite by the length of the fingers. The palm of the chela is about twice as long as wide, slightly compressed and scarcely tapering. The fingers are subequal to the palm length, compressed, with feebly hooked tips and entire cutting edges. The carpus is 0.75 times the length of the chela, 3.5 times longer than the distal width.

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Figs. 15-29. *Periclimenes aesopius*. 15, mandible. 16, maxillula. 17, maxilla. 18, first maxilliped. 19, second maxilliped. 20, third maxilliped. Types 21, 22, carapace and rostrum. 23, tip of rostrum. 24, inferior orbital angle, lateral aspect. 25, inferior orbital angle, ventral aspect. 26, 27, third abdominal segment, lateral aspect. 28, first three abdominal segments, dorsal aspect. 29, chela of second pereopod. 21, 24, 25, 26, 28, 29, allotype. 22, 23, 27, holotype.

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twice as wide distally as proximally. The merus is slender, 7.5 times longer than wide and slightly shorter than the chela. The ischium is short, 0.4 of the length of the merus and feebly setose along the medial border. The basis is 1.1 times the length of the ischium and is also sparsely setose medially. The coxa is more robust, with a small setose ventro-medial process.

The second pereiopods are subequal and similar. The carpopercite is exceeded by the carpus and chela. The palm of the chela is about 2.5 times longer than wide, feebly compressed and slightly tapering distally. The fingers are slightly bowed and a little shorter than the palm length. The tips are hooked and the cutting edges straight and entire. The carpus is short and stout, 0.6 of the palm length, moderately expanded distally and unarmed. The merus and ischium are also unarmed, the merus subequal to the palm length and 5.5 times longer than wide, the ischium more slender, subequal in length to the merus and 6.0 times longer than wide.

The ambulatory pereiopods are slender, the third exceeding the basicerite by dactyl, propod and carpus. The dactylus is slender and curved, about 4.0 times longer than the width at the base. The unguis is slender, equal to 0.6 of the length of the corpus, which bears a stout distal accessory spine. Sensory setae are present disto-laterally. The propod is about 10 times longer than wide, with 5-6 ventral spines. The carpus is 0.6 of the propod length and the merus is subequal; both are without spines. The fourth and fifth pereiopods are similar but longer, the ratios of the segments being, in the dissected female specimen:

|        | P3 | P4 | P5 |
|--------|----|----|----|
| Propod | 35 | 39 | 45 |
| Carpus | 23 | 23 | 25 |
| Merus  | 35 | 43 | 52 |

The pleopods are normal. The appendices internae of the ovigerous female are very well developed. The appendix masculina bears numerous long spiniform setae.

The uropods are normal. The protopodite is without a postero-lateral spine. The exopod is broad, 2.6 times longer than wide, with the lateral margin straight, setose, terminating in an acute tooth distally, with a strong mobile spine medially. The endopod is about 3.4 times longer than broad and falls short of the end of the exopod.

TYPES:

Bate's specimens are preserved in the collections of the British Museum (Natural History). His description and figure 5 are based on the female specimen, with a rostral dentition of 9/2. This specimen is now in a fragmented state. The carapace is detached from the cephalothorax, which is also separated from the abdomen. The mouthparts, except the third right maxilliped, the eyes and the antennae are detached, but all pereiopods are still attached to the cephalothorax.

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The male specimen, with a rostral dentition of 11/2, is almost intact, and lacks only the right third pereopod. The female specimen is now designated as the holotype and the male as allotype.

COLORATION:

Bate has reported that preserved specimens were spotted with red on rostrum, antennae and pereopods. Hale (1927, 1928) has also reported a similar coloration in his specimens and illustrated the colour pattern.

MEASUREMENTS:

Post-orbital carapace length, ♂ (allotype) 3.4 mm; ♀, (holotype), non-ovigerous, 5.0 mm; ovigerous, 4.6-5.6 mm. Length of ovum, 0.5 mm.

*Periclimenes holthuisi* Bruce (Fig. 7).

*Urocaris longicaudata* Pearson, 1905, Rep. Ceylon Pearl Oyster Fish., 4:78, pl. 1 fig. 5.

*Periclimenes (Periclimenes) aesopius*—Holthius, 1952, Siboga Exped. Mon., 39a<sup>10</sup>:34-37, figs. 5-6.

*Periclimenes aesopius*—Bruce, 1966, Crustaceana, 10(1):21, fig. 1b, 2ef.

*Periclimenes holthuisi* Bruce, 1969, Zool. Meded., Leiden, 43(26):258-259. —Monod, 1969, Cahiers Pacifique, 13:216-220, figs. 69-73. —Bruce, 1972, Crustaceana, 23(2):300-302; 1973, Crustaceana, 24(1):99; in press.

MATERIAL EXAMINED:

4 spms., Bowen, Queensland, Coll. E. M. Rainford. British Museum (Natural History) registration no. 1923.8.22.8-10.

DESCRIPTION:

The specimens agree well with the previously available information (Holthius, 1953; Bruce, 1969). The rostral dentition is 8.9/1.2. The dorsal lobe on the third abdominal segment is distinctly smaller than in *P. aesopius*. The inferior orbital angle is particularly long and acutely produced. All specimens are in a good state of preservation.

HOST:

The collector noted that the specimens were obtained from an anemone.

REMARKS:

The type material, from Hong Kong, was also found in association with an anemone. The species has also been found in association with the jellyfish *Cassiopea andromeda* Forsskål in Zanzibar (Bruce, 1972) and with the coral *Fungia actiniiformis* (Quoy & Gaimard). It has also been recorded from Peloris Island, Queensland (Bruce, in press).

DISTRIBUTION:

Type locality. Hong Kong. Also recorded from Zanzibar; Maldives Islands; Ceylon; Indonesia, New Guinea; South China Sea; Japan; New Caledonia and Queensland, Australia.

*Periclimenes indicus* (Kemp) (Fig. 8)

*Urocaris indica* Kemp, 1915, Mem. Indian Mus., 5:275, fig. 26, pl. 13 fig. 9. —Borradaile, 1917, Trans. Linn. Soc. Lond. Zool., (2)71:323.

*Periclimenes (Periclimenes) indicus*— Kemp, 1922, Rec. Indian Mus., 24:104 (key), 144, 145, 146, fig. 13; 1925, Rec. Indian Mus., 27:323. —Holthius, 1952, Siboga Exped. Mon., 39a<sup>10</sup>:9, 32, 33, 39-40, fig. 8.

*Periclimenes indicus*— Kemp, 1922, Rec. Indian Mus., 42:115. —Fujino & Miyake, 1970, J. Fac. Agric., Kyushu Univ., 16(3):255.

*Periclimenes indica*— Panikkar & Aiyar, 1939, Proc. Indian Acad. Sci., 98:253.

*Periclimenes (Periclimenes) aesopius*— Johnson, 1961, Bull. Mus. Nat., Singapore, 30:58, 61, 75 tab. 1.

MATERIAL EXAMINED:

(i) 31 spms., (8 ovig. ♀, 4 juv.) Siglap, Singapore, 6 ins. below L.T., 25 February 1952, coll. D. S. Johnson, British Museum (Natural History) registration no. 1954.11.5.11-15.

(ii) 3 ♀ (2 ovig.), 4 juv., Myora, North Stradbroke Is., Queensland, Australia, 31 January 1968, coll. A.J.B., (no. 836).

(iii) 4 ♂, 14 ♀ (13 ovig.), Myora, North Stradbroke Is., as above) (no. 837).

(iv) 2 ovig. ♀, Peel Island, Moreton Bay, Queensland, Australia, 24 September 1968, coll. A.J.B., (no. 963).

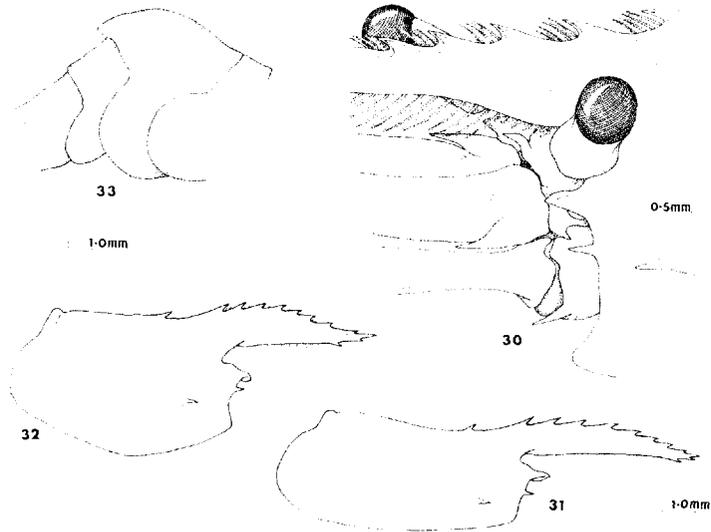
(v) 2 ♂, 2 ovig. ♀, Chilka Lake, no date, Zool. Survey India. (no. 952).

DESCRIPTION:

This species has been well described by Kemp (1922) and the Australian specimens agree closely with his description and with the specimens from the type locality, Chilka Lake, Orissa, India.

The specimens reported by Johnson (1961) as common in the *Enhatius* beds at Singapore, and referred then to *P. aesopius*, have been deposited in the collections of the British Museum (Natural History). These have been re-examined and found to belong to *P. indicus* (Kemp). Of six ovigerous females with undamaged rostra the dentition was 9/2 (4); 9/3 (1) and 10/2 (1), and the proximal part of the dorsal crest is distinctly elevated. The epigastric spine is situated well behind the posterior orbital margin. The inferior orbital angle is produced, but short and distally blunt, with a small ventral flange. The third abdominal segment is only slightly produced in the postero-dorsal midline and is not elevated to form a hump.

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Figs. 30-33. *Periclimenes* spp. 30. *P. aesopius* ophthalmic somite, dorso-lateral view. 31. *P. holthuisi* Bruce, ovigerous female, Bowen, carapace and rostrum. 32. *P. indicus* (Kemp), ovigerous female, Siglap, Singapore, carapace and rostrum. 33. same, third abdominal segment.

COLORATION:

Generally transparent but mottled with red-brown; especially along ventral aspect of body, and dorsally over posterior margins of third and fourth abdominal segments, tip of scaphocariate, ventral eyestalk, coxae of pereopods and tip of caudal fan. Scattered small white dots over branchiostegite and pleura. Ovary and ova bright green.

HOST:

*Macrodactylus aspera* Haddon & Shackleton (Actiniaria). All 18 specimens (no. 837) were obtained from the single host anemone.

REMARKS:

This species has not been previously recorded from Australia and these records represent a considerable extension of the known range of this species. The association of this species with an actinarian host has also not been previously reported and is of interest. It is thought probable that the other Australian specimens, as well as those from Singapore, may have been also associated with anemones but that on disturbance these hosts had withdrawn into the soft substrate leaving the shrimps among the surrounding phanerogams to be caught by the collector's net.

## DISTRIBUTION:

Type locality, Chilka Lake, Orissa, India. Also reported from the Gulf of Manaar; and Madras, India; the Nicobar Islands, and Sumbawa and Celebes, Indonesia. Now also from Singapore and Queensland, Australia.

## DISCUSSION

*Periclimenes aesopius* (Bate) is not known outside the restricted region of South Australia and appears to be an endemic relict species confined to that area. It belongs to a group of widely distributed species that are characterised particularly by the posterior production of the dorsal margin of the third abdominal segment and a produced inferior orbital angle with a ventral flange. Most of the species have a biunguiculate dactylus on the ambulatory pereiopods but this is lacking in some species. In the Indo-West Pacific region this group is represented by *P. aesopius*, *P. holthuisi*, *P. indicus* and also *P. tosaensis* Kubo, which differs from the first three species in the lack of an accessory spine on the dactyls of the ambulatory pereiopods (Kubo, 1951). In the Eastern Atlantic and Mediterranean Seas the group is represented by *P. amethysteus* (Risso) and *P. scriptus* (Risso), while in the Western Atlantic and Caribbean region there are *P. anthophilus* Holthuis & Eibl-Eibesfeldt, *P. pedersoni* Chace, *P. yucatanicus*

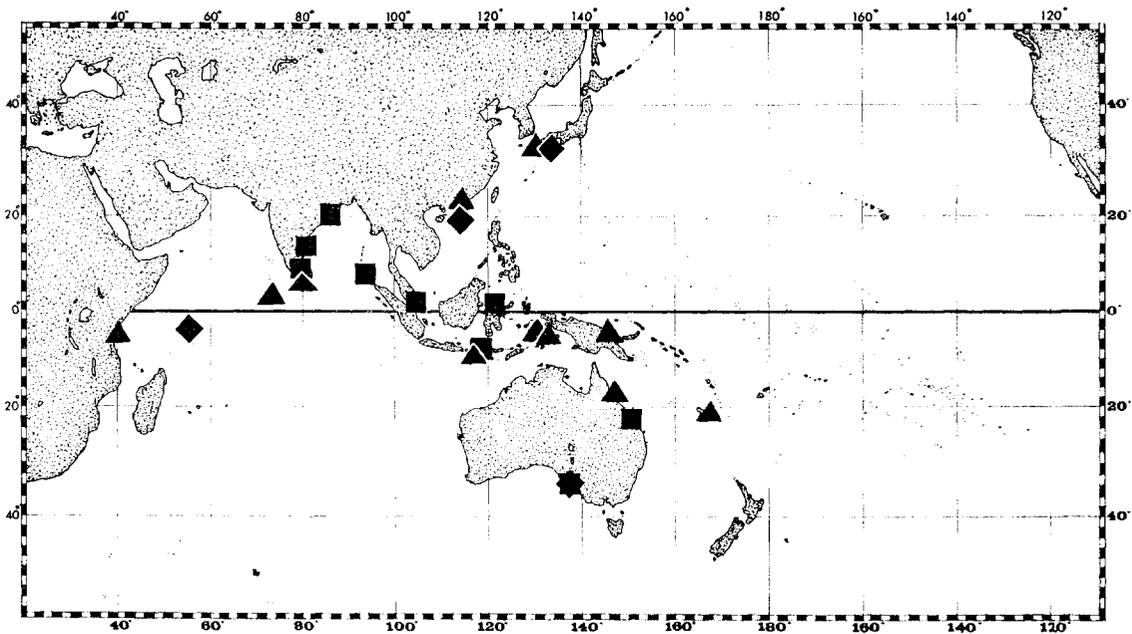


Fig. 34. Distribution of *Periclimenes aesopius* (Bate) ★, and related Indo-West Pacific species: *P. holthuisi* Bruce ▲, *P. indicus* Kemp ■, *P. tosaensis* Kubo ●.

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Ives and *P. magnus* Holthuis, the latter species also differing from the others in the lack of an accessory spine on the dactyls of the ambulatory pereopods (Holthuis, 1952).

In the Pontoniinae there are no established examples of free-living species that have biunguiculate dactyls on the walking legs. Of the species mentioned above *P. holthuisi*, *P. indicus*, *P. anthophilus*, *P. pedersoni* and *P. yucatanicus* are all known associates of sea anemones, (Holthuis & Eibl-Eibesfeldt, 1964; Limbaugh et al, 1961). In the Mediterranean Sea *P. amethysteus* and *P. scriptus* are also associates of actinarians (Svoboda, per. comm.) and other coelenterates. The hosts of *P. aesopius*, *P. tosaensis* and *P. magnus* have not yet been identified but it seems probable that they will also be associates of sea anemones, or other coelenterates.

The four American species all have the maxilla with a simple distal endite. This contrasts with all the other species, East Atlantic and Indo-West Pacific, in which this endite is normally distinctly bifid, although in *P. amethysteus* it may be simple or bifid (Holthuis, 1952), suggesting that the two groups have originated by radiation from different ancestral species. Of the species known at present *P. indicus* is the least morphologically specialized but *P. scriptus* and *P. amethysteus* also show little indication of specialization. In *P. tosaensis* and *P. magnus* the simple dactylus of the ambulatory pereopod is due to the secondary loss of the accessory tooth.

*Periclimenes aesopius* may be distinguished from all the related species by the remarkable hump-like process developed dorsally on the third abdominal segment, and by the presence of three or four post-rostral teeth on the dorsum of the carapace, as well as the biunguiculate dactylus of the ambulatory pereopods. In the other species usually only a single post-rostral tooth is present but in *P. holthuisi* and *P. anthophilus* there may be 1 or 2, and *P. yucatanicus* generally has two. The abdominal hump is less well developed in the other species but is distinct in *P. pedersoni*, *P. yucatanicus* and *P. magnus*, as well as *P. holthuisi*. In *P. scriptus*, *P. amethysteus* and *P. indicus*, it is very feebly developed, but the postero-dorsal margin of the third abdominal segment is produced backwards but not elevated, as it is also in *P. anthophilus*. In *P. tosaensis* a feebly elevated hump is present. The antero-ventral emargination of the pleura of the ovigerous female is also apparently unique in the Pontoniinae. With respect to these features, *P. aesopius* appears to be the most highly specialized species.

The function of the dorsal abdominal hump is obscure but this region is often conspicuously marked with bright colours in related species, (Chace, 1958; Limbaugh, et al 1961), often fish cleaners, and so it is probably to increase the visibility of the displayed signals.

Hale (1927) has described and illustrated the appearance of *P. aesopius* in life. The body of the shrimp is largely transparent but the dorsum of the first three abdominal segments, including the hump of the third segment, is white outlined in red. This must present a conspicuous signal. This region is similarly

conspicuously coloured in the cleaner shrimp *P. pedersoni*. A large tan coloured saddle shaped spot, ringed with white is present on the third abdominal segment in *P. yucatinicus*, another cleaner shrimp. Conspicuous red and white patches are also present on the third abdominal segment dorsally in *Leandrites cyrtorhynchus* Fujino & Miyake. In this palaemonine shrimp the third abdominal segment is posteriorly produced and it is also reported to be a fish cleaning species (Holzberg 1971). The markings in this shrimp are also red and white (Bruce, 1975).

## REFERENCES

- BATE, C.S. (1863). On some new Australian Species of Crustacea. Proc. zool. Soc. Lond., 1863, 498-505, pls. 40-41.
- BORRADAILE, L. A. (1898). A Revision of the Pontoniidae. Ann. Mag. nat. Hist., (7) 2, 376-391.
- ..... (1917). On the Pontiniinae. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner. Trans. Linn. Soc. Lond., (2) 17, 323-396, pls. 52-57.
- BRUCE, A. J. (1966). Notes on some Indo-Pacific Pontoniinae. I. *Periclimenes tosaensis* Kubo. Crustaceana, 10 (1), 15-22, figs. 1-4.
- ..... (1967). Notes on some Indo-Pacific Pontoniinae. III-IX. Descriptions of some new genera and species from the western Indian Ocean and South China Sea. Zool. Verhand., Leiden, 87, 1-73, figs. 1-29.
- ..... (1969). Preliminary descriptions of sixteen new species of the genus *Periclimenes* Costa, 1844, (Crustacea, Decapoda Natantia, Pontoniinae). Zool. Meded., Leiden, 43 (20), 253-278.
- ..... (1972). An association between a pontoniid shrimp and a rhizostomatous scyphozoan. Crustaceana, 23 (3), 300-302.
- ..... (1973). Notes on some Indo-Pacific Pontoniinae. XXII. *Pliopontonia furtiva* gen. nov., sp. nov., a new shrimp associated with a corallimorph zoantharian. Crustaceana, 24 (1), 97-109, figs. 1-5, pl. 1.
- ..... (1975). Coral reef shrimps and their colour patterns. Endeavour, 34, 23-27, figs. 1-16.
- ..... In press. A report on a small collection of pontoniid shrimps from Queensland, Australia. Crustaceana.
- CHACE, F. A. Jr. (1958). A new shrimp of the genus *Periclimenes* from the West Indies. Proc. biol. Soc. Washington, 71, 125-132, figs. 1-17.
- FUJINO, T. & S. MIYAKE (1970). Caridean and Stenopodidean Shrimps from the East China and the Yellow Seas (Crustacea, Decapoda, Natantia). J. Fac. Agric., Kyushu Univ., 16 (3), 237-312, figs. 1-25.
- HALE, H. M. (1927). The Crustacea of South Australia, 1, 1-201, figs. 1-202.
- ..... (1928). Some Australian Decapod Crustacea. Rec. S. Aust. Mus., 4, 91-104, figs. 19-27.
- HASWELL, W. A. (1882). Catalogue of Australian stalk- and sessile-eyed Crustacea, i-xxiv, 1-324, pls. 1-4.
- HOLTHUIS, L. B. (1951). The Subfamilies Euryrhynchinae and Pontoniinae. A general Revision of the Palaemonidae (Crustacea Decapoda Natantia) of the Americas. I. Allen Hancock Found. Publ., Occ. Pap., 11, 1-332, pls. 1-63.
- ..... (1952). The Decapoda of the Siboga Expedition. Part XI. The Palaemonidae collected by the Siboga and Snellius Expeditions, with remarks on other species. II. Subfamily Pontoniinae. Siboga Exped. Mon., 39a<sup>m</sup>, 1-252, figs. 1-110, tab. 1.

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- HOLTHUIS, L. B. & I. EIBL-EIBESFELDT (1964). A new species of the genus *Periclimenes* from Bermuda (Crustacea, Decapoda, Palaemonidae). Senck. biol., 45, 185-192, figs. 1-4.
- HOLZBERG, S. (1971). Beobachtungen einer Putzsymbiose zwischen der Garnele *Leandrites cyrtorhynchus* und Riffbarschen. Helgolander wiss. Meeres unters., 22, 362-.
- JOHNSON, D. S. (1961). A synopsis of the Decapod Caridea and Stenopodidea of Singapore with notes on their distribution and a key to the genera of Caridea occurring in Malayan waters. Bull. nat. Mus. Singapore, 30, 44-79, pl. 1.
- KEMP, S. (1915). Crustacea Decapoda. Fauna of the Chilka Lake. Mem. Indian Mus., 5, 199-325, figs. 1-38, pls. 12-13.
- ..... (1922). Notes on Crustacea Decapoda in the Indian Museum, XV. Pontoniinae. Rec. Indian Mus., 24, 113-288, figs. 1-105, pls. 3-9.
- ..... (1925). Notes on Crustacea Decapoda in the Indian Museum. XVII. On various Caridea. Rec. Indian Mus., 27, 249-343, figs. 1-24.
- KUBO, I. (1951). Some macrurous decapod Crustacea found in Japanese waters, with descriptions of four new species. J. Tokyo Univ. Fish., 38 (2), 259-289, figs. 1-16.
- LIMBAUGH, C., H. PEDERSEN & F. A. CHACE Jr. Shrimps that clean fishes. Bull. mar. Sci. Gulf and Caribbean, 11, 237-257, figs. 1-9.
- MONOD, Th. (1969). Sur quatre crevettes de Noumea (Nouvelle Calédonie). Cahiers Pacific, 13, 191-222, figs. 1-73.
- PANIKKAR, N. K. & R. G. AIYAR (1939). Observations on Breeding in Brackish-water Animals of Madras. Proc. Indian. Acad. Sci., 9B, 343-364.
- PEARSON, J. (1905). Report on the Macrura collected by Professor Herdman, at Ceylon in 1902. In: Herdman, W.A., Report to the Government of Ceylon on the Pearl Oyster Fisheries of the Gulf of Manaar, 4, 65-92, pls. 1-2.
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