

**A NEW SHRIMP OF THE GENUS *RHYNCHOCINETES* FROM THE GREAT AUSTRALIAN BIGHT (CRUSTACEA: DECAPODA: RHYNCHOCINETIDAE)**

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OKUNO, J. 1997. A new shrimp of the genus *Rhynchocinetes* from the Great Australian Bight (Crustacea: Decapoda: Rhynchocinetidae). *Records of the South Australian Museum* **30**(1): 13–18.

A new shrimp of the family Rhynchocinetidae, *Rhynchocinetes enigma*, is described and illustrated on the basis of two males and an ovigerous female from the Great Australian Bight. This species is readily distinguished from the other eleven congeners by the absence of an arthrobranch from the third maxilliped, or lack of an arthrobranch on the pereopods. It represents the fourth rhynchocinetid species from depths exceeding 100 m.

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Caridean shrimps belonging to the family Rhynchocinetidae are distinguished from other carideans in the combination of having a typically movable rostrum, fine transverse striae on the surface of the carapace and abdominal somites, the first two pairs of pereopods robust, with fingers bearing long lateral and terminal spines, and the second pereopod with the carpus entire, not subdivided. To date, this family includes two genera, *Rhynchocinetes* H. Milne-Edwards and *Cinetorhynchus* Holthuis (Okuno 1996b, in press).

Through the courtesy of Ms K. Gowlett-Holmes of the South Australian Museum, Adelaide (SAM), I was able to examine two male and one ovigerous female specimens of an unfamiliar *Rhynchocinetes* species collected by trawling from the Great Australian Bight at depths between 113 and 170 m. These specimens do not possess arthrobranches, although the previously described congeners at least have arthrobranches on the third maxilliped and the first pereopod. Because of these differences, they are described herein as new species.

The postorbital carapace is abbreviated as CL, and the type specimens are deposited in SAM.

***Rhynchocinetes enigma* sp. nov.**  
(Figs. 1–3)

*Material Examined*

Holotype. Male (SAM C5599, 6.8 mm CL), 34°17'S, 132°42'E, Great Australian Bight,

approximately 15 km west-south-west of Pearson Islands, 140–160 m depth, 'F. V. Comet', April 16, 1989.

Paratypes. Ovigerous female (SAM C5598, 9.0 mm CL), 33°12'S, 130°53'E, Great Australian Bight, 250 km south-south-west of Ceduna, 113 m depth, 'F. R. V. Soela', August 5, 1981. Male (SAM C5600, 7.6 mm CL), 33°18'S, 127°38'E, Great Australian Bight, approximately 115 km south-west of Eucla, 170 m depth, 'F. V. Comet', January 17, 1989.

*Diagnosis*

A species of *Rhynchocinetes* without arthrobranches on maxillipeds and pereopods. Dorsal rostral margin armed with three subterminal teeth. Fourth abdominal somite with distinct posteroventral tooth on pleuron. Ambulatory pereopods with meri bearing three spines, and dactyli with four accessory claws posterior to terminal claw. Endopod of male first pleopod with distinct lobe on outer margin.

*Description*

Carapace (Fig. 2A) covered with fine transverse striae, armed with two acute teeth on dorsal median carina, anterior tooth just behind rostral articulation, posterior tooth feebly articulated with carapace; supraorbital spine acute, considerably longer than spines on dorsal median carina, directed anteriorly; antennal spine acute, supported by a feeble carina, directed anteriorly; pterygostomial spine small, distinct. Rostrum (Fig. 2A) articulated with carapace, 1.10 - 1.28x as long as carapace; dorsal margin armed with

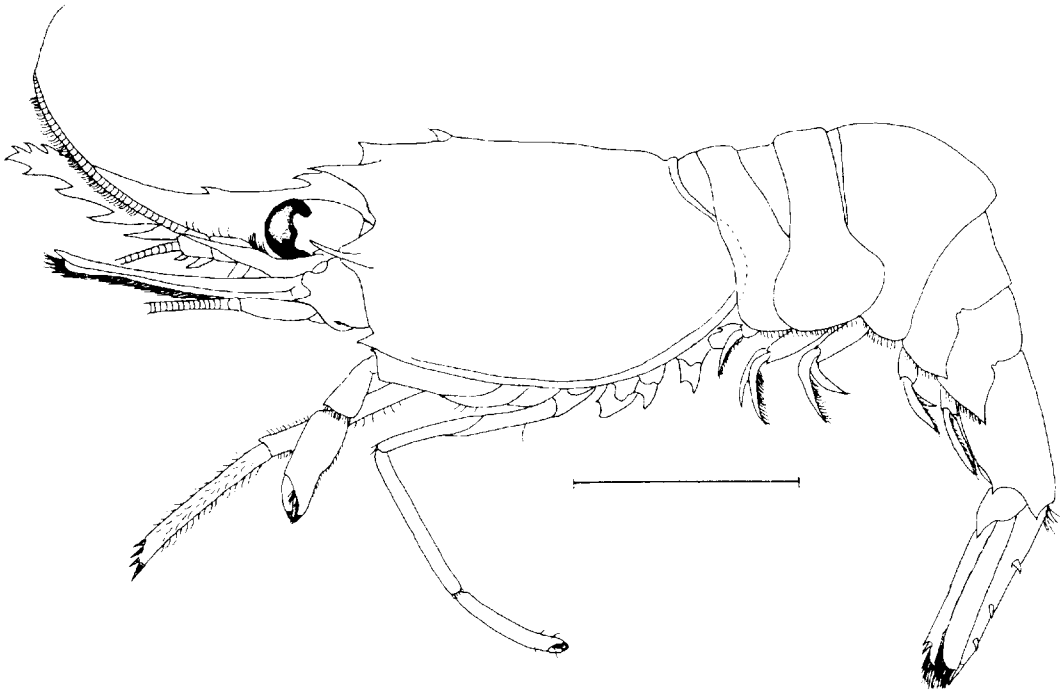


FIGURE 1. *Rhynchocinetes enigma* sp. nov., holotype male (SAM C5599, 6.8 mm CL). Scale bar = 5 mm.

two teeth in the basal half, and with three small teeth subterminally; ventral margin armed with eleven teeth, large proximally, elongate, decreasing distally.

Abdominal somites (Fig. 1) covered with fine striae; first three somites with the pleuron marginally rounded; pleura of fourth and fifth somites with distinct posteroventral tooth; sixth somite  $0.48 - 0.50x$  as long as carapace, with acute posteroventral spine, with strongly hooked anal spine between bases of uropods, directed posteriorly. Telson (Fig. 2B)  $0.57 - 0.63x$  as long as carapace,  $1.16 - 1.30x$  as long as sixth abdominal somite, armed dorsally with three pairs of spines; midpoint of posterior margin triangularly produced, with three pairs of spines, median pair longest.

Eyes well developed, with large, globular cornea; stalk much more slender than cornea.

Antennular peduncle (Fig. 2C) reaching midlength of scaphocerite; stylocerite long, reaching or slightly shorter than level of distal margin of antennular distal segment; proximal segment with distolateral spine reaching distal margin of antennular median segment and small proximal lateral tooth, ventrally with acute spine

at mesial margin; thickened part of upper antennular flagellum slightly overreaching rostral apex.

Antenna (Fig. 2D) with scaphocerite  $0.84 - 0.93x$  as long as carapace,  $4.20x$  as long as maximum width, distolateral spine acute, distinctly overreaching end of lamella; carpocerite reaching proximal quarter length of scaphocerite; basicerite with acute ventrolateral spine and with rounded protrusion just above the spine.

Mandible (Fig. 3A) with robust three-segmented palp, distal segment rounded, with dense setae marginally; incisor process well developed, with six marginal teeth; molar process obliquely truncate distally, with finely ridged distal end.

First maxilla (Fig. 3B) with slender palp armed distally with single long stout spiniform setae; proximal endite distinct, rounded, marginally with numerous setae; distal endite armed with ten stout spines on mesial margin.

Second maxilla (Fig. 3C) with well developed tapering palp; proximal endite slightly truncate; distal endite bilobed, upper lobe rather broader than lower lobe; scaphognathite large, overreaching level of tip of palp, anterior lobe with

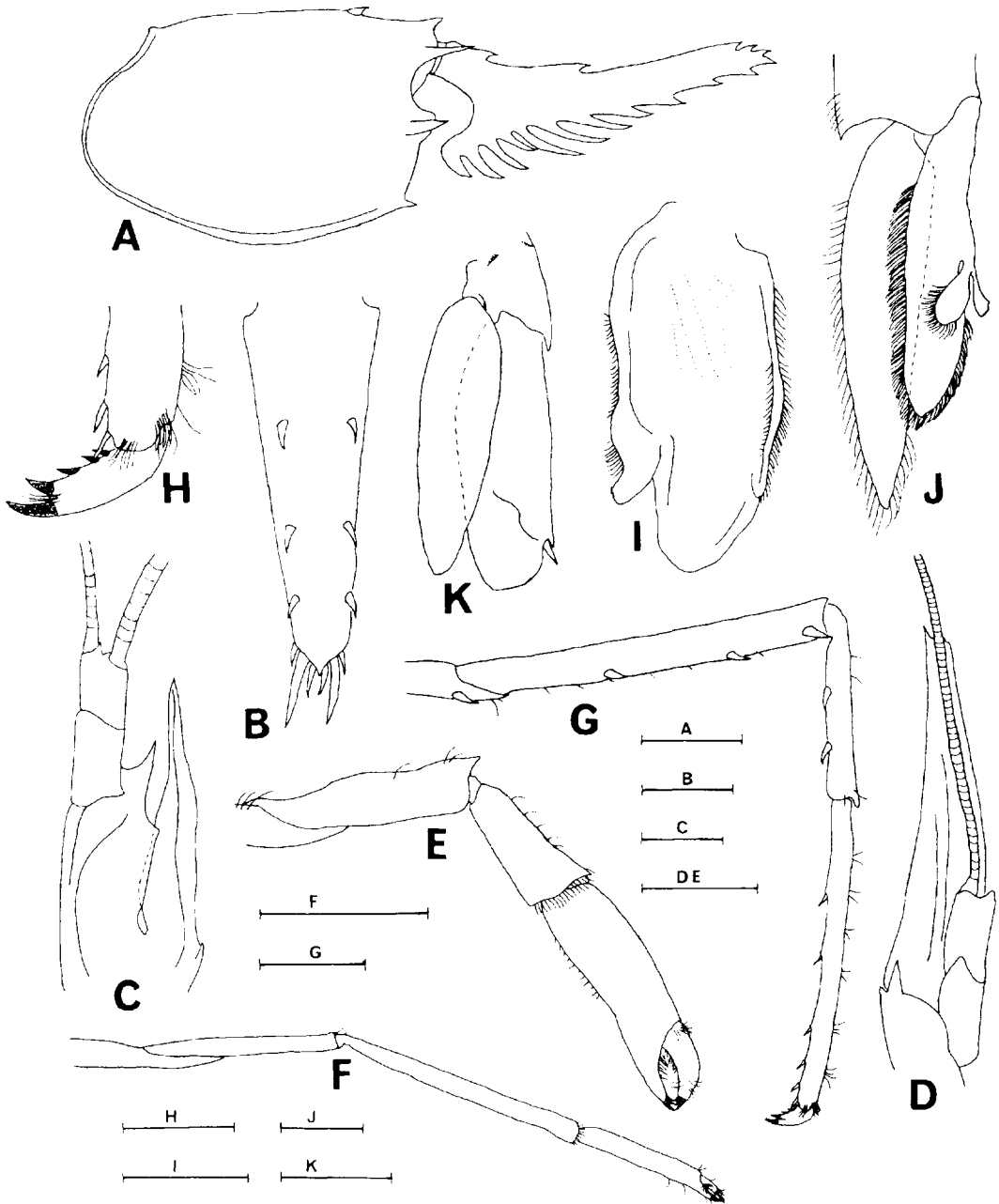


FIGURE 2. *Rhynchocinetes enigma* sp. nov., holotype male (SAM C5599, 6.8 mm CL). **A**, carapace with rostrum; **B**, telson, dorsal aspect; **C**, right antennular peduncle, dorsal aspect; **D**, right antenna, ventral aspect; **E**, right first pereiopod; **F**, right second pereiopod; **G**, right third pereiopod; **H**, same dactylus; **I**, endopod of right first pleopod; **J**, right second pleopod; **K**, right uropod, dorsal aspect. Scale bars: A = 2.5 mm; B, C = 1 mm; D, K = 2 mm; E, G = 1.5 mm; F = 3 mm; H-J = 0.5 mm.

TABLE 1. *Rhynchocinetes enigma*, new species. Branchial formula.

	Maxillipeds			Pereiopods				
	I	II	III	I	II	III	IV	V
Pleurobranchs	-	-	-	1	1	1	1	1
Arthrobranchs	-	-	-	-	-	-	-	-
Podobranchs	-	1	-	-	-	-	-	-
Epipods	1	1	1	1	1	1	1	-
Exopods	1	1	1	-	-	-	-	-

feebly quadrate distal end, posterior lobe tapering, with elongate plumose setae posteriorly, mesial margin convex.

First maxilliped (Fig. 3D) with endites distinctly separated, distal endite concave marginally, distinctly larger than proximal endite with slightly rounded margin; palp long, apparently two-segmented; exopod with long flagellum, caridean lobe distinct.

Second maxilliped (Fig. 3E) with well developed podobranch; epipod slightly pointed distally; exopod well developed, tapering; dactylar segment with truncate distal margin; propodal segment with external margin rounded, mesial margin expanded; ischiomeral segment distinct.

Third maxilliped (Fig. 3F) slightly shorter than tip of scaphocerite; exopod slightly shorter than distal margin of antepenultimate segment, tapering, with dense long setae; ultimate segment with six spines terminally, 0.59 – 0.62x as long as carapace, 2.00 – 2.24x as long as penultimate segment; penultimate segment 0.28 – 0.29x as long as carapace.

Branchial formula as shown in Table 1.

First pereiopod (Fig. 2E) chelate, moderately robust, falling slightly short of midlength of scaphocerite; chela 0.44 – 0.45x as long as carapace, 2.00 – 2.24x as long as carpus, tips of both fingers with dark terminal claws; carpus 0.21 – 0.25x as long as carapace, with acute spine at distal end of dorsal margin; merus dorsodistally acute.

Second pereiopod (Fig. 2F) chelate, much more slender than first pereiopod, reaching distal sixth of length of scaphocerite; chela 0.40x as long as carapace; carpus entire, 0.59 – 0.65x as long as carapace, 1.50 – 2.03x as long as chela.

Third pereiopod (Fig. 2G) reaching distal end of scaphocerite; ischium with single spine; merus 0.74 – 0.81x as long as carapace, 1.50 – 2.03x as long as carpus, with three almost equidistant spines; carpus 0.37 – 0.41x as long as carapace,

with two spines on outer surface; propodus 0.69x as long as carapace, 1.68x as long as carpus, with about six short spinules on flexor margin; dactylus (Fig. 2H) with four accessory claws posterior to terminal largest claw, decreasing in size proximally.

Fourth pereiopod reaching distal fifth of length of scaphocerite, spinulation resembling that of third pereiopod; merus 0.67 – 0.72x as long as carapace, 1.86 – 1.94x as long as carpus; carpus 0.34 – 0.38x as long as carapace; propodus 0.69x as long as carapace, 1.81x as long as carpus.

Fifth pereiopod slightly shorter than midlength of scaphocerite; spinulation resembling those of two anterior ambulatory pereiopods; merus 0.56 – 0.62x as long as carapace, 1.57 – 1.72x as long as carpus; carpus 0.32 – 0.37x as long as carapace; propodus 0.58 – 0.66x as long as carapace, 1.79 – 1.80x as long as carpus.

Endopod of male first pleopod (Fig. 2I) with distal end rounded; well developed appendix interna at midlength of mesial margin, distal end of appendix with dense cincinnuli; distinct lobe at distal third of outer margin of endopod.

Endopod of male second pleopod (Fig. 2J) with appendices masculina and interna at distal two fifths of outer margin; appendix masculina broad, with distal margin rounded, fringed with dense setae; appendix interna considerably more slender and shorter than appendix masculina, with dense cincinnuli at distal end.

Uropodal exopod and endopod (Fig. 2K) slightly overreaching distal end of telson, exopod with a fixed and a movable spine at distal fifth of outer margin, the former considerably shorter than the latter.

#### Coloration

Unknown.

#### Distribution

Known only from the Great Australian Bight.

#### DISCUSSION

Most rhynchocinetid shrimps are found around coral or rocky reefs in shallow waters, although three species, *R. australis* Hale, 1941, *R. balssi* Gordon, 1936 and *R. ikatere* Yaldwyn, 1971 are known from deep waters at depths in excess of 100 m (Hale 1941, Yaldwyn 1971, Holthuis 1972). The present new species represents the fourth rhynchocinetid shrimp obtained from such deep waters. Okuno (1996a) suggested that the

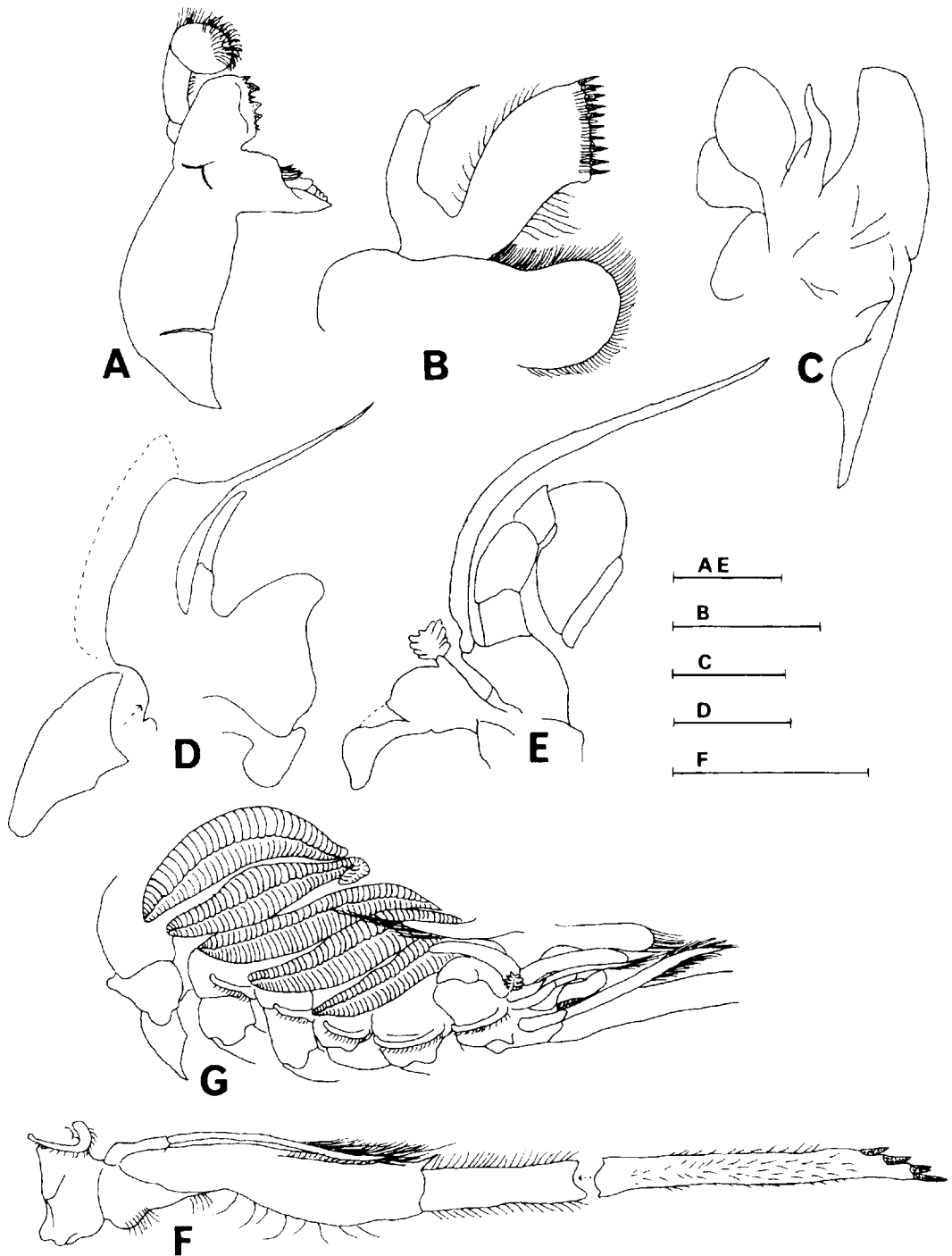


FIGURE 3. *Rhynchocinetes enigma* sp. nov., paratype male (SAM C5600, 7.6 mm CL). A, right mandible; B, right first maxilla; C, right second maxilla; D, right first maxilliped; E, right second maxilliped; F, right third maxilliped; G, right branchial region. Setae omitted on C, D, E. Scale bars: A - E = 1 mm; F = 2 mm; G = 3 mm.

TABLE 2. Specific list of *Rhynchocinetes* accompanied with number of arthrobranch (max. = maxilliped; per. = pereiopod).

	3rd max.	1st per.	2nd per.	3rd per.	4th per.	5th per.
<i>R. australis</i> Hale	2	1	1	-	-	-
<i>R. balssi</i> Gordon	2	1	-	-	-	-
<i>R. brucei</i> Okuno	2	1	1	1	-	-
<i>R. conspicioellus</i> Okuno et Takeda	2	1	1	-	-	-
<i>R. durbanensis</i> Gordon	2	1	1	1	-	-
<i>R. enigma</i> sp. nov.	-	-	-	-	-	-
<i>R. ikatere</i> Yaldwyn	2	1	1	-	-	-
<i>R. kuiteri</i> Tiefenbacher	2	1	1	1	-	-
<i>R. rathbunae</i> Okuno	2	1	1	1	-	-
<i>R. serratus</i> (H. Milne-Edwards)	2	1	1	1	-	-
<i>R. typus</i> H. Milne-Edwards	2	1	1	1	1	-
<i>R. uritai</i> Kubo	2	1	1	-	-	-

temperate and subtropical *Rhynchocinetes* species all have a limited distributional range. Therefore, *R. enigma* probably occurs in southern Australian waters only.

Eleven species belonging to the genus *Rhynchocinetes* were previously known (Okuno 1996a). *Rhynchocinetes enigma* differs distinctly from the other species by the absence of an arthrobranch on all the maxillipeds and pereiopods (Fig. 3G). The other *Rhynchocinetes* species always have two small arthrobranches on the third maxilliped and a developed arthrobranch on at least the first pereiopod (Table 2). In both *Rhynchocinetes* and *Cinetorhynchus*, the number of arthrobranches varies at the species level (see Table 2; Okuno 1996b), and except for the number of arthrobranches, there is no unique morphological

character that distinguishes the new species from other *Rhynchocinetes* species. Therefore, I am inclined to place the new species in *Rhynchocinetes*, rather than establishing a new genus to accommodate it.

#### Etymology

The species name *enigma* refers to the enigmatical status within the genus, because of the absence of all arthrobranches.

#### ACKNOWLEDGMENTS

I am grateful to Ms K. Gowlett-Holmes for sending me the specimens on loan. I also thank Dr L. B. Holthuis for critically reading the manuscript and giving me valuable suggestions.

#### REFERENCES

- GORDON, I. 1936. On the macruran genus *Rhynchocinetes*, with description of a new species. *Proceedings of the Zoological Society of London* 1936: 75-88.
- HALE, H. M. 1941. Decapod Crustacea. *B. A. N. Z. Antarctic Research Expedition 1929-1931. Reports-Series B* (Zoology and Botany) 4(9): 257-286.
- HOLTHUIS, L. B. 1972. The Crustacea Decapoda Macrura (the Alpheidae excepted) of Easter Island. *Zoologische Mededelingen, Leiden* 46: 29-54, 2 pls.
- OKUNO, J. 1996a. *Rhynchocinetes rathbunae*, a new shrimp from the Hawaiian Islands (Crustacea: Decapoda: Rhynchocinetidae). *Pacific Science* 50(3): 309-316.
- OKUNO, J. 1996b. *Cinetorhynchus manningi*, a new shrimp (Crustacea: Decapoda: Caridea: Rhynchocinetidae) from the western Atlantic. *Proceedings of the Biological Society of Washington* 109(4): 725-730.
- OKUNO, J. in press. Review on the genus *Cinetorhynchus* Holthuis, 1995 from the Indo-West Pacific (Caridea: Rhynchocinetidae). in 'Le Benthos des Fonds Meubles des Lagons de Nouvelle-Calédonie'. Études et Thèses, Ed. B. Richer de Forges, ORSTIOM, Paris.
- YALDWYN, J. C. 1971. Preliminary descriptions of a new genus and twelve new species of natant decapod crustacea from New Zealand. *Records of the Dominion Museum* 7: 85-94.