

Distinction between Two Hinge-beak Shrimps, *Rhynchocinetes durbanensis* Gordon and *R. uritai* Kubo (Family Rhynchocinetidae)

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Abstract

Rhynchocinetes durbanensis Gordon reliably known only from South Africa is reported on the basis of specimens from the Philippines. This species has been sometimes recorded under the incorrect identification as *R. uritai* Kubo, to which the general color pattern is strongly similar, but some morphological characters and detailed color pattern are different from those of *R. uritai* from Japanese waters.

Introduction

In the course of study on the rhynchocinetid shrimps, we obtained some specimens of an unidentified species from the Philippines through the aquarium traders in Japan. The general color pattern is very close to that of *Rhynchocinetes uritai* Kubo, 1942, the commonest hinge-beak shrimp in Japanese waters. A close examination of all the specimens at hand revealed that both species in question are distinguished from each other not only by the coloration, but also by some morphological characters. On consultation with literature the Philippine species was tentatively identified with *R. durbanensis* Gordon, 1936, and then this identification was confirmed by direct comparison with the specimens from the type locality, Durban, northeastern coast of South Africa. In some popular publications, *R. durbanensis* has sometimes appeared under the incorrect identification as *R. uritai*. In the following lines, therefore, the differences of the two species are to be described in detail.

All the specimens from the Philippines are preserved in the National Science Museum, Tokyo (NSMT). The comparative materials from South Africa were kindly sent on loan by Ms. **Hoenson** of South African Museum (SAM).

Rhynchocinetes durbanensis Gordon, 1936 (Figs 1, 3-7, and Tab. 1)

Rhynchocinetes typus: Stebbing, 1917, p. 27, pl. 6.

Rhynchocinetes durbanensis Gordon, 1936, p. 83, figs 5 (b.c.), 7 (c.d.); Barnard, 1950, p. 763, fig. 145; Kensley, 1972, p. 34, fig. 15(m).

Rhynchocinetes n.sp.: George & George, 1979, p. 79, pl. 67, fig. 7.

Rhynchocinetes uritai: Debelius, 1983, pp. 71, 77; Debelius, 1984, pp. 71, 77.

Rhynchocinetes rugulosus: Spies, 1983, p. 88/688.

Rhynchocinetes sp.: Takeda, 1986, p. 105.

Rhynchocinetes uritai (sic): Steene, 1990, pp. 77, 314.

Material examined

Philippines. 10 exs. - 2 males (NSMT-Cr 10962, carapace length (cl) 8.3 and 10.0 mm); 1 male (NSMT-Cr 10963, cl 13.0 mm); 1 male, 1 ovig. female (NSMT-Cr 11085, cl 8.8 and 7.9 mm); 1 male, 1 female (NSMT-Cr 11107, cl 12.7 and 9.0 mm); 1 male (NSMT-Cr 11108, cl 12.7 mm); 1 male (NSMT-Cr 11109, cl 10.1 mm); 1 male (NSMT-Cr 11120, cl 8.9 mm).

Durban, South Africa. 2 exs. - 2 males (SAM-A, cl 13.4 and 16.0 mm).



Fig. 1. - *Rhynchocinetes durbanensis* Gordon. Male (8.7 mm cl, NSMT-Cr 11120), in aquarium. **J. Okuno**
Rhynchocinetes durbanensis Gordon. Mâle (8,7 mm cl, NSMT-Cr 11120), en aquarium.



Fig. 2. - *Rhynchocinetes uritai* Kubo. Female (8.6 mm cl, NSMT-Cr 11106), in aquarium. **J. Okuno**
Rhynchocinetes uritai Kubo. Femelle (8,6 mm cl, NSMT-Cr 11106), en aquarium.

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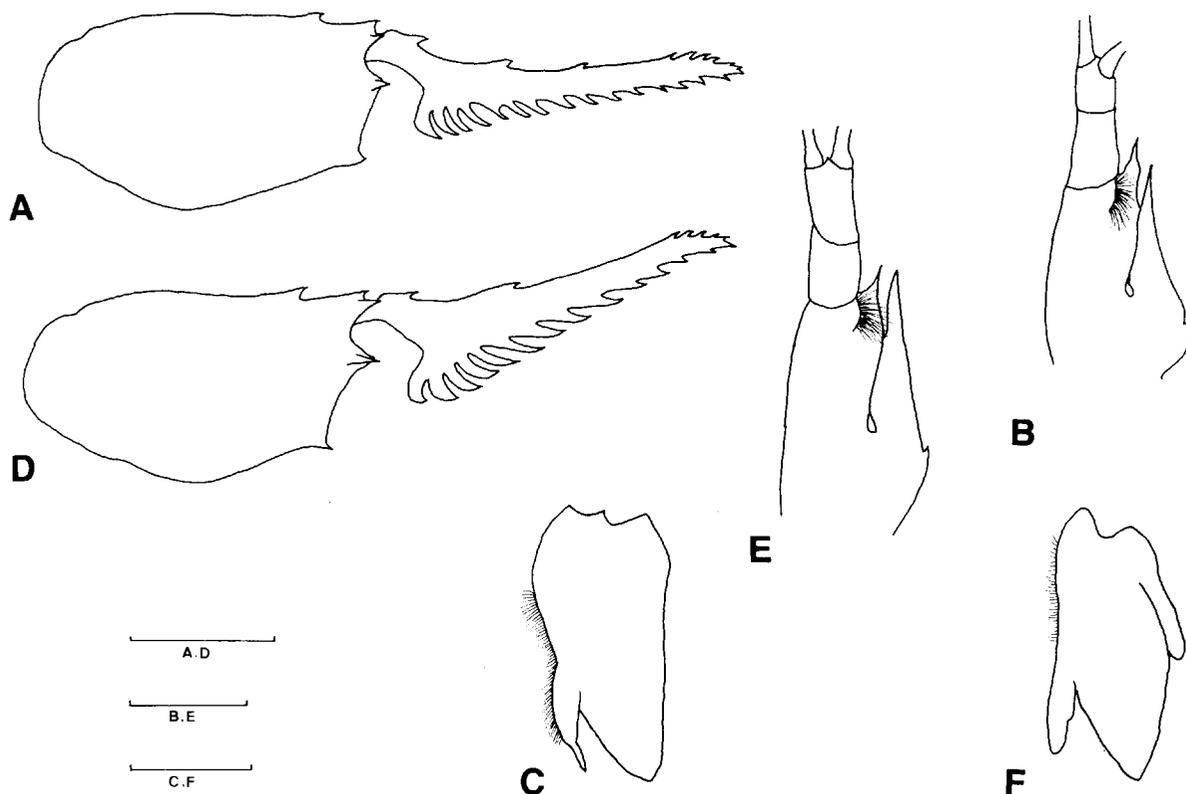


Fig. 3. - *Rhynchocinetes durbanensis* Gordon. Male (8.7 mm cl, NSMT-Cr 11120) (A,B); male (8.8 mm cl, NSMT-Cr 11085) (C). *Rhynchocinetes uritai* Kubo. Male (9.2 mm cl, NSMT-Cr 1505) (D,E); male (6.4 mm cl, NSMT-Cr 10961) (F). Scales for A,D = 5 mm, B,E = 2 mm, and C,F = 1 mm. A,D, carapace with rostrum; B,E, antennular peduncle; C,F, endopod of first pleopod. *Rhynchocinetes durbanensis* Gordon. Mâle (8.7 mm cl, NSMT-Cr 11120) (A,B); mâle (8.8 mm cl, NSMT-Cr 11085) (C). *Rhynchocinetes uritai* Kubo. Mâle (9.2 mm cl, NSMT-Cr 1505) (D,E); mâle (6.4 mm cl, NSMT-Cr 10961) (F). Echelles pour A,D = 5 mm, B,E = 2 mm, et C,F = 1 mm. A,D, carapace avec le rostre ; B,E, pédoncule antennulaire ; C,F, endopodite du premier pléopode.

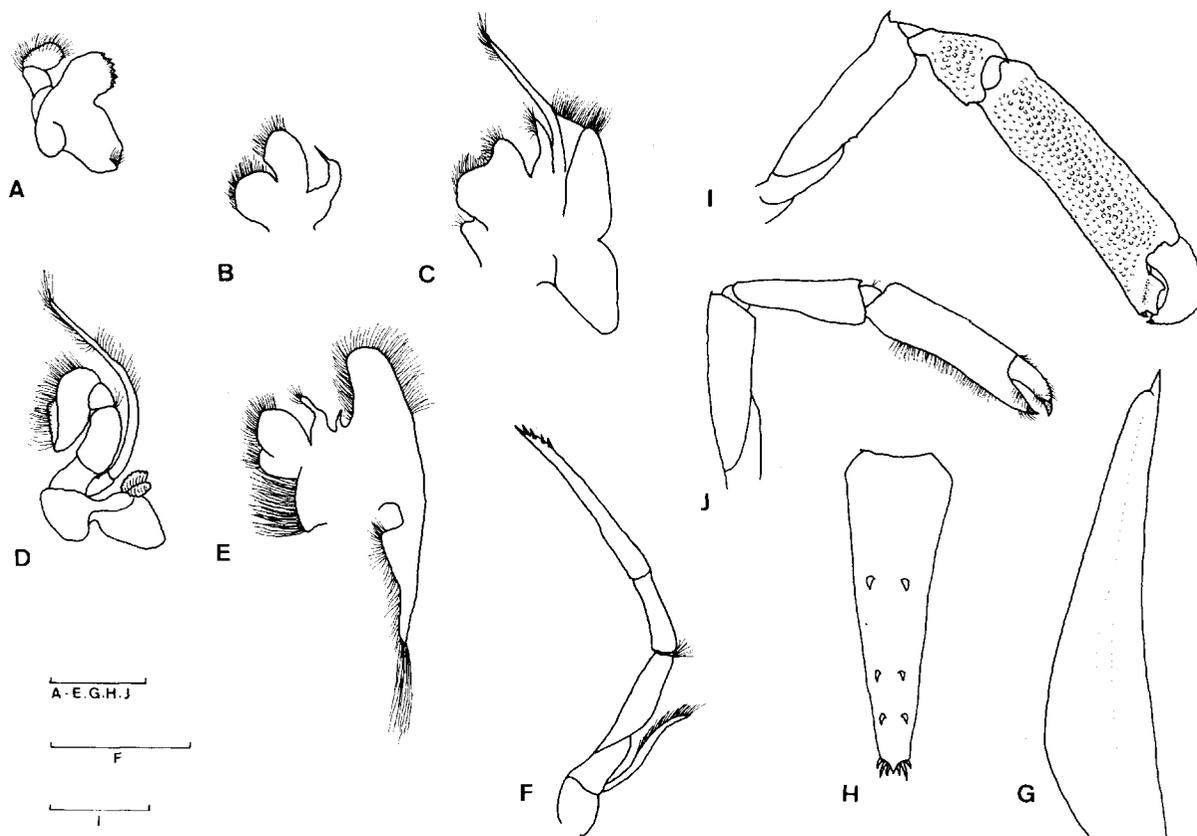


Fig. 4. - *Rhynchocinetes durbanensis* Gordon. Male (8.7 mm cl, NSMT-Cr 11120) (A-H); male (12.7 mm cl, NSMT-Cr 11108 (I); female (8.3 mm cl, NSMT-Cr 10962) (J). Scales for A-E,G,H,J = 2 mm and F,I = 5 mm. A, mandible; B, first maxilla; C, second maxilla; D, first maxilliped; E, second maxilliped; F, third maxilliped; G, antennal scale; H, telson; I, first pereopod of large male; J, first pereopod of female. *Rhynchocinetes durbanensis* Gordon. Mâle (8.7 mm cl, NSMT-Cr 11120) (A-H); mâle (12.7 mm cl, NSMT-Cr 11108 (I); femelle (8.3 mm cl, NSMT-Cr 10962) (J). Echelles pour A-E,G,H,J = 2 mm et F,I = 5 mm. A, mandibule ; B, première maxille ; C, seconde maxille ; D, premier maxillipède ; E, second maxillipède ; F, troisième maxillipède ; G, écaille de l'antenne ; H, telson ; I, premier péréopode d'un grand mâle ; J, premier péréopode d'une femelle.

Description

Carapace (Fig. 3A) with transverse numerous grooves that are fine but distinct and almost parallel to each other. Two sharp teeth just behind rostral articulation; supraorbital and antennal spines strong, sharply pointed; pterygostomial spine indistinct, its apex being more or less rounded. Rostrum (Fig. 3A) laterally compressed, obliquely curved upward at its anterior half, 1.1-1.4 times as long as carapace; three large teeth on upper margin of rostrum with regular intervals between proximal and median parts; distal part of upper margin with 5-7 small teeth; lower margin with 16-18 strong teeth decreasing in size distally.

Abdominal surface also with fine grooves similar to those on carapace. Third segment strongly humped dorsally in lateral view. Posterior margins of fourth and fifth segments shallowly concave at each median part. Telson (Fig. 4H) with three short spines at each side of posterior two thirds of dorsal surface; median part of posterior margin with a sharp process, being armed with three spines at each side, the median of which is the longest of all.

Eye very large, rounded.

Antennular peduncle (Fig. 3B) 0.4-0.5 times as long as carapace, external margin of proximal part strongly convex. Stylocerite sharply pointed at distal end, usually reaching proximal margin of next segment, shorter than external distal spine of antennular basal segment.

Antennal scale (Fig. 4G) 0.8-0.9 times as long as carapace, external distal spine beyond tip of lamella.

Mouthparts normal (Fig. 4A-E), similar to those of *R. uritai* represented by **Kubo** (1942) and of *R. rugulosus* by **McCulloch** (1909).

Third maxilliped (Fig. 4F) reaches beyond rostral tip, having epipod and exopod; exopod extends to median part of merus; ultimate segment usually armed with five dark, small horny spines near its apex.

Gill formula as shown in Table 1.

First pereopod robust, distal end of each upper margin of merus and carpus with a sharp large spine; movable finger strongly curved and sickle-shaped, tip with three dark claws; tip of fixed finger also with three dark claws similar to those of movable one. In large male, chela and carpus uniformly covered with fine granules (Fig. 4I); palm about thrice as long as carpus; inner margin of fixed finger with board-like process. In female, palm as long as carpus, inner margin of palm with sparse short hairs (Fig. 4J).

Second pereopod slenderer than first pereopod, usually extending to median part of antennal scale in female, a little beyond median part of rostrum in male.

Third pereopod usually extends to tip of antennal scale; 3 or 4 sharp spines on outer surface of merus; 3-5 dark small spines just behind terminal claw of dactylus. Fourth and fifth pereopods similar to third one; fourth pereopod usually reaches apex of antennal scale, fifth one elongated to median part of antennal scale.

First male pleopod with a large appendix interna on internal margin of leaf-shaped endopod (Fig. 3C); external margin of endopod entire, and terminal end bluntly pointed.

Endopod of second male pleopod with appendices interna and masculina; appendix interna with dense fringe of hairs, shorter than appendix masculina.

Color in life

Ground color pale pink, rather translucent (Fig. 1); brilliant red labyrinth lines cover whole surface; white ocelli and lines in interspace of red lines; all of white ocelli on body smaller than eye. Dorsal surface of carapace with a white Y-shaped mark, accompanying with a longitudinal white line at each side (Fig. 5); posterior margin of carapace white. Upper margin of rostrum white, lower margin red. Cornea dark, and eyestalk red with longitudinal white line in median part.

A white band runs from fourth abdominal segment to end of telson. An oblique white line down forward from summit of hump of third segment to anterolateral distal margin of first segment.

Proximal part of third maxilliped mottled with red and white; meri, carpi and propodi of third to fifth pereopods red, and their upper margins white. Movable and fixed fingers of first pereopod white.

In large male, red parts of body become more or less blackish (Fig. 6).

Distribution

According to some literatures (**Barnard** 1950; **Debelius** 1983; **Takeda** 1986; **Steene** 1990), *R. durbanensis* is widely distributed in the tropical Indo-West Pacific, although the reliable exact locality is only Durban, South Africa.

Common name

Suzaku-sarasaebi (new Japanese name).

Tab. 1

Branchial formula of *Rhynchocinetes durbanensis*
Formule des branchies de *Rhynchocinetes durbanensis*

	I	II	III	I	II	III	IV	V
Pleurobranches				1	1	1	1	1
Antibio-branches			2	1	1	1		
Podobranche		1						
Epipods	1	1	1	1	1	1	1	
Exopods	1	1	1					

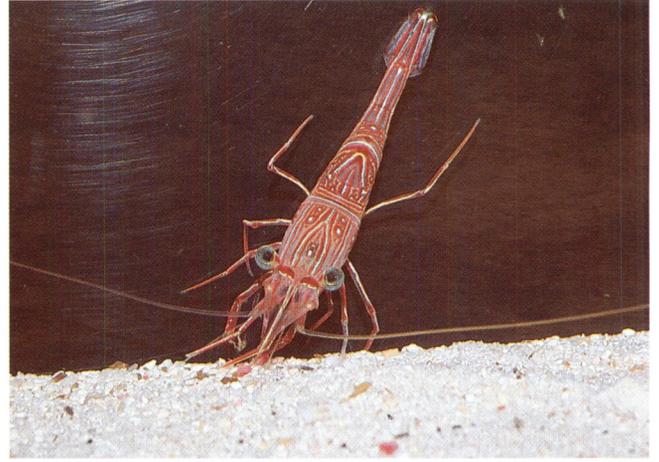


Fig. 5. - Dorsal view of two species of *Rhynchocinetes*. Left, *R. uritai* (specimen was lost); right, *R. durbanensis* (8.7 mm cl, NSMT-Cr 11120).
 Vue dorsale de deux espèces de *Rhynchocinetes*. A gauche, *R. uritai* (spécimen perdu) ; à droite, *R. durbanensis* (8,7 mm cl, NSMT-Cr 11120).

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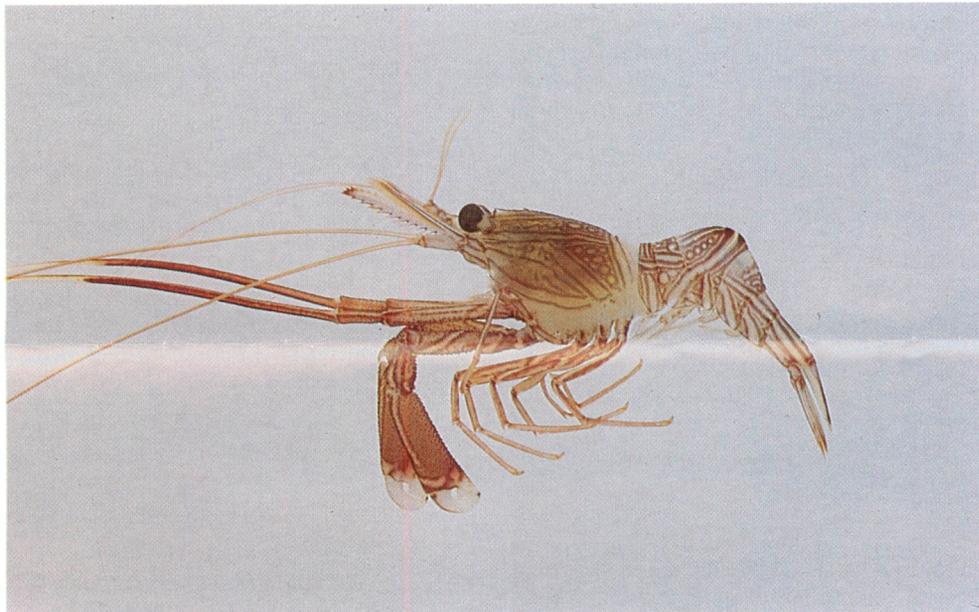


Fig. 6. - *Rhynchocinetes durbanensis* Gordon. Large male (12.7 mm cl, NSMT-Cr 11108). J. Okuno
Rhynchocinetes durbanensis Gordon. Grand mâle (12,7 mm cl, NSMT-Cr 11108).

Discussion

According to **Yaldwyn** (1960), the genus *Rhynchocinetes* is one of three genera of the family Rhynchocinetidae, being readily distinguished from the other genera of the family by having the movable rostrum which is jointed with the carapace by an articulation. The present genus is divided into two species groups (**Kemp** 1925; **Gordon** 1936) : one having two teeth on median carina and a strong supraorbital spine, and another being characterized by the presence of three spines and the absence of the supraorbital spine. *Rhynchocinetes durbanensis* is referred to the former group.

Rhynchocinetes durbanensis was originally recorded by **Stebbing** (1917) as *R. typus* H. Milne Edwards, 1837 on the basis of two specimens from Durban. **Gordon** (1936) had, however, pointed out that one of the two specimens figured by **Stebbing** (op. cit.) and deposited in the British Museum differs from *R. typus*, and described it as a new species under the name of *R. durbanensis*.

Rhynchocinetes durbanensis is readily separated from the other species of the same group by having three equidistant teeth on proximal to median parts of the rostral upper margin. There is no problem in the identification of the species from the type locality of *R. durbanensis* (**Stebbing** 1917; **Gordon** 1936; **Barnard** 1950; **Kensley** 1972), but the other records from several area in the Indo-West Pacific are to be really referred to the different species (**George & George** 1979; **Debelius** 1983; **Debelius** 1984; **Takeda** 1986). These records are accompanied with the beautiful color photographs in life, so that it is possible to identify them with *R. durbanensis*. The color of the type specimen (Fig. 7) has been shown by **Stebbing** (1917), with which they agree well in detail.

Gordon (1936) mentioned that the first pereopods of both sides in *R. durbanensis* are asymmetric in their length, and considered the asymmetric pereopods as one of the specific characters. At present, it is noted, without doubt, that they are on the way to regeneration. Although **Gordon** (1936) also mentioned that there is no hair on the chela of first pereopod, that of female is sparsely covered with the short setae on its lower margin (Fig. 4J).

The third maxilliped is distinctly elongated in large male as in some related species (Fig. 6).

Color pattern of *Rhynchocinetes durbanensis* is the most similar to that of *R. uritai* Kubo, 1942 (Fig. 2). Ground color in both species is more or less hyaline, pale pink; vivid red irregular lines cover whole body; white spots or lines in interspaces of each red line.

The presence of rows of white spots or lines are common in both species, but the detailed pattern is constant and useful for identification of the two species.

Apart from the color in life, some morphological characters of *R. durbanensis* clearly differ from those of *R. uritai*. The differences of the color pattern and morphological characters are summarised in the following key.

A. Rostrum with 9 or 10 teeth on upper margin, 16-18 teeth on lower margin. A short process absent from outer margin of endopod of first male pleopod (Fig. 3C). Arthrobranch present on third pereopod (XII). Outer margin of antennular peduncle strongly rounded (Fig. 3B). In life, there are white ocelli and white lines in interspace between each red line (Fig. 1); a Y-shaped white mark with white bars at each side on dorsal surface of carapace (Fig. 5, right); posterior margin of carapace white; white bar running obliquely from summit of third segment to undermost posterior margin of 1st abdominal segment (Fig. 1)
..... *Rhynchocinetes durbanensis* Gordon, 1936

A. Rostrum with 7 or 8 teeth on upper margin, 13-15 teeth on lower margin. A short process present on outer margin of endopod of first male pleopod (Fig. 3F). Arthrobranch absent from third pereopod (XII). Outer margin of antennular peduncle not strongly rounded (Fig. 3E). In life, there are only white ocelli in interspace between each red line (Fig. 2); neither Y-shaped white mark nor white bars, only white spots scattered in interspace between each red line on dorsal surface of carapace (Fig. 5, left); posterior margin of carapace not white; no white bar running obliquely forward on abdominal segments (Fig. 2)
..... *Rhynchocinetes uritai* Kubo, 1942

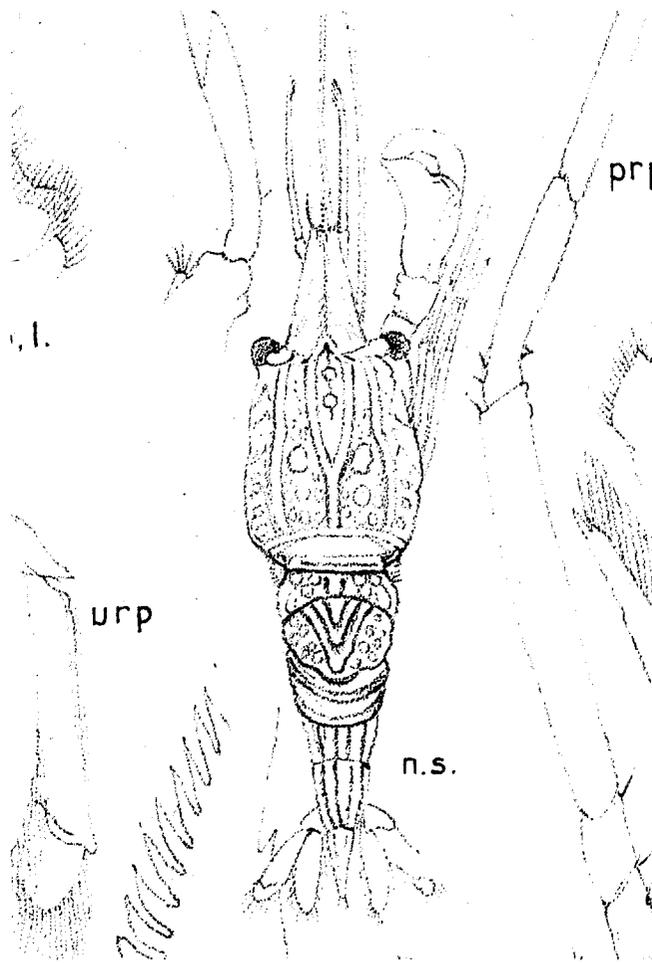
Rhynchocinetes durbanensis is widely distributed in the tropical Indo-West Pacific, whereas *R. uritai* is the antitropical species with restricted distribution in Japan and also in southern Korea (Kim 1977). The both species occur in the Ryukyu Islands (Takeda 1986; Kamesaki et al. 1988).

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We thank Ms. E.J. Hoenson of the South African Museum who kindly sent us the comparative materials on loan and gave us the valuable service for the research. We are also grateful to Mr. Y. Maihara of the Marine Science Museum, Tokai University who kindly gave us a number of the specimens of *Rhynchocinetes uritai* which were collected from Suruga Bay by him.

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Fig. 7. - *Rhynchocinetes durbanensis* Gordon. Male, holotype from Durban, South Africa. (After Stebbing, 1917).
Rhynchocinetes durbanensis Gordon. Mâle, holotype de Durban, Afrique du Sud. (D'après Stebbing, 1917).

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RESUME

Distinction entre deux Crevettes à rostre articulé, *Rhynchocinetes durbanensis* Gordon et *R. uritai* Kubo

Les Crevettes bossues du genre *Rhynchocinetes* sont répandues de longue date dans le commerce aquariophile, souvent importées des Philippines. Outre divers noms vernaculaires (1), elles ont été citées dans la littérature populaire sous *Rhynchocinetes uritai* Kubo, 1942 (Debelius 1983) et parfois sous *Rhynchocinetes rugulosus* Stimpson, 1860 (Spies 1983).

Une étude comparative très détaillée fait apparaître qu'il s'agit en réalité de *R. durbanensis* Gordon, 1936, espèce qui n'était connue avec certitude que d'Afrique du Sud. Il existe une grande ressemblance dans le patron de coloration entre *uritai*, l'espèce la plus commune dans les eaux japonaises, et

durbanensis ; néanmoins, l'absence de bandes blanches, remplacées par des points blancs chez *uritai*, permet une détermination facile des animaux vivants. De nombreux caractères morphologiques dont l'étude nécessite l'usage de la loupe binoculaire ou du microscope permettent de séparer les deux espèces (dents du rostre, premier pléopode du mâle, arthrobranchie du troisième péréipode, bord externe du pédoncule antennulaire).

R. durbanensis est une espèce à large distribution dans l'Indo-Ouest Pacifique, tandis que *R. uritai* est une espèce antitropicale, limitée au Japon et à la Corée du Sud. Les deux espèces sont présentes aux îles Ryukyu.

(1) Tanz- ou Höckergarnelen, Dancing shrimps, Crevettes sexy (G. Favé, Paris), Suzaku-sarasaebi (nouveau nom japonais proposé dans cette note).

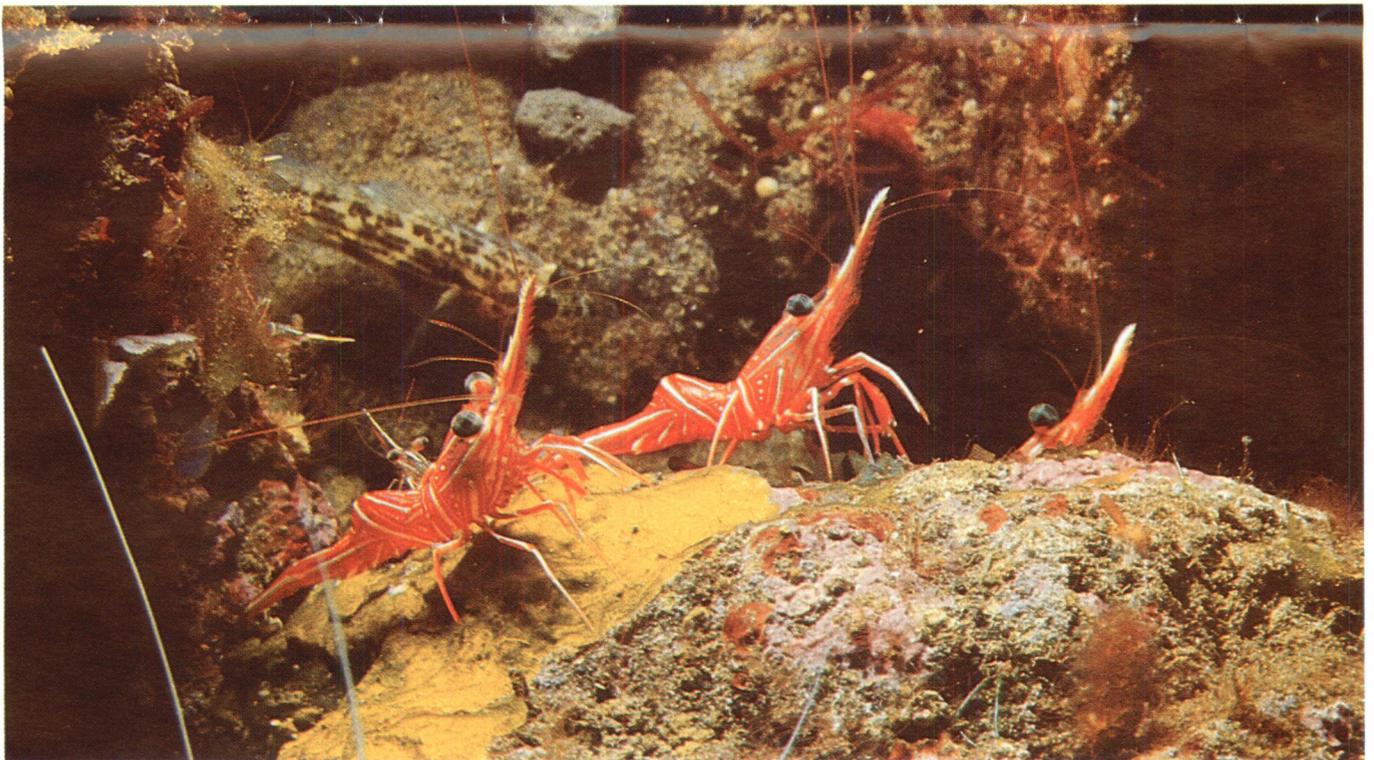


Fig. 8. - *Rhynchocinetes durbanensis* in their natural environment at Bali.
Rhynchocinetes durbanensis dans leur biotope à Bali.

H. Debelius