

Male of *Ctenocheles balssi*
(Crustacea, Decapoda, Callianassidae)
from off Muroto Peninsula, Shikoku, Japan*¹

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Three specimens and 40 larger chelipeds of *Ctenocheles balssi* Kishinouye were collected from None Toyocho, east coast of Muroto Peninsula, Shikoku, at depths of 30-70 m. One specimen is the first male to be obtained in an intact condition. The remaining two are females; one is 61 mm in body length, and of the other only the abdomen is preserved. They do not appear to be sexually dimorphic. The larger cheliped may be on either side (17 right and 23 left). Generically important characters, such as mouthparts, pleopods and gill formula are described and illustrated. A key to all six species of the genus is presented.

1 Introduction

Although three species were reported from the Atlantic Ocean in 1970s¹⁻³⁾, the genus *Ctenocheles* is still poorly known, because typically only detached larger chelipeds are collected⁴⁻⁷⁾. This is also true for the genotype, *C. balssi* Kishinouye, 1926^{4,5,8,9)}. Only two females of this species have been previously found^{10,11)}, the male morphology has been completely unknown, and also the handedness of the larger cheliped has been uncertain.

Recently 40 detached chelipeds, an intact male and two incomplete females of *C. balssi* were collected from the Pacific Ocean off Shikoku. The male was compared with the female specimens and with the description given by Kishinouye¹⁰⁾. Some important characters, including male features, have been clarified, and the asymmetry of the chelipeds was examined in detail.

2 Description of species

Ctenocheles balssi Kishinouye, 1926 (Figs. 1-3)

Ctenocheles balssi Kishinouye, 1926¹⁰⁾, p. 63, fig. 1; Holthuis, 1967⁶⁾, p. 377 (synonymy); Suzuki, 1979⁸⁾, p. 296, fig. 234; Noguchi and Akamine, 1992⁹⁾, p. 25, fig. 1.

Material examined:

None Toyocho, east coast of Muroto Peninsula, Shikoku, 30 m deep, 11 November 1991, coll. K. Matsuzawa — 1 female; 70 m deep, 7 February 1995, — 1 male; depth uncertain, 9 November 1995, — 1 female (abdomen); 70-150 m deep, February 1988-March 1995 — 40 larger chelipeds.

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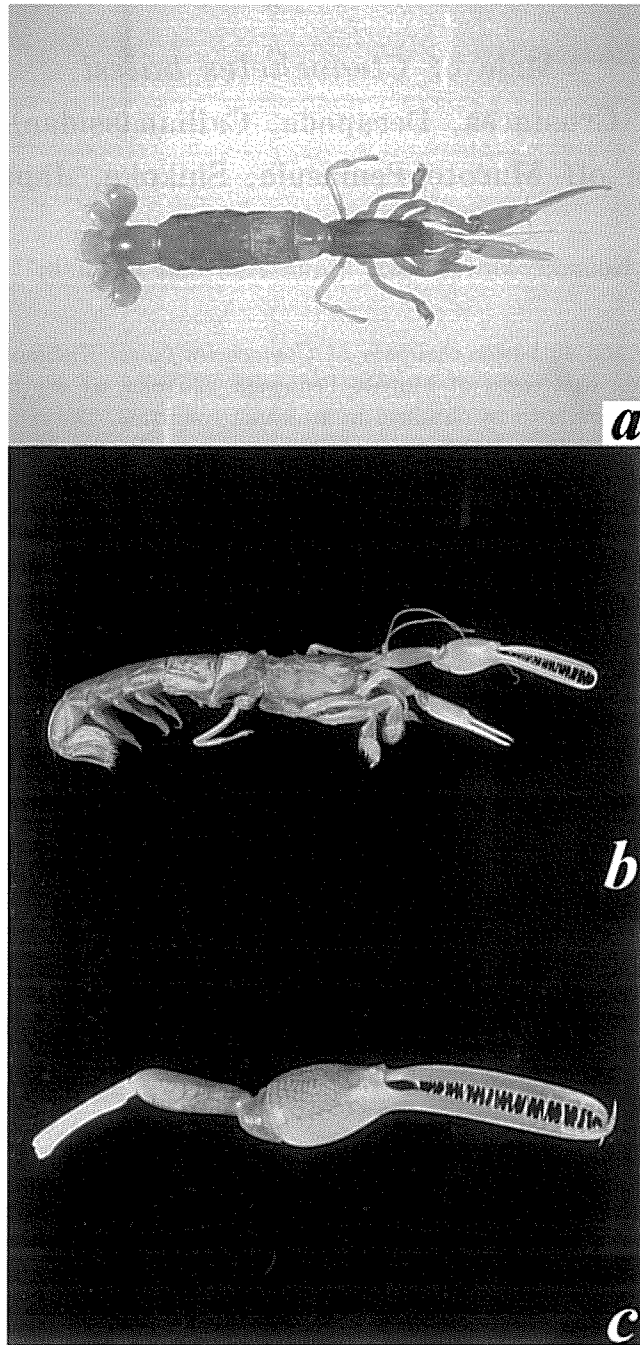


Fig. 1. *Ctenocheles balssi* Kishinouye, 1926, *a*: dorsal view of male 17.2 mm in cl, *b*: lateral view of the same, *c*: detached larger cheliped.

Description:

Description is based mainly on male specimen (Figs. 1a, b and 2). Carapace about one-fourth body length, and part of last thoracic segment dorsally exposed. Two small processes present on dorsal margin, one just behind posterior rostral tooth and one just behind cervical groove (Figs. 2, and 3a, g). Distinct *linea thalassinica* present on lateral surface, and cervical groove indistinct (Fig. 3g, h). Rostrum short, extending only to distal end of eye; dorsally with eight minute teeth, posterior four teeth on low postrostral carina of carapace; lower margin of rostrum unarmed (Fig. 3a). In female, dorsal margin of rostrum with ten minute teeth, posterior six on carapace; unarmed ventrally (Fig. 3g).

Abdomen three times as long as carapace. Ratio of each segment including telson as follows: 1.0, 1.3, 1.2, 1.0, 1.2, 1.6 and 1.4. First two segments rather weakly calcified. Pleura of fourth and fifth somites with tuft of setae on lateral surface (Fig. 3j). Telson rectangular, 1.1 times as long as broad; dorsal surface with two ridges from middle of anterior margin to posterolateral corner; a median longitudinal groove present (Fig. 3b).

Eye small, not pigmented, and not reaching distal margin of first segment of antennular peduncle. Antennular flagella equally biramous and twice as long as antennular peduncle. Antennal flagella about twice as long as carapace; peduncle long and cylindrical, without scale-like process.

Mandible with fused molar and incisor processes, and three-segmented palp (Fig. 3k). First maxilla not specified, with slender palp and two endites (Fig. 3l). Endopod of second maxilla long and tapering; exopod well developed, and inner and outer endites both deeply bilobed (Fig. 3m). First maxilliped provided with large bilobed epipod, endopod slender and not segmented; exopod long and rounded at distal end; distal endite large and oblong (Fig. 3n). Second maxilliped short, pediform, composed of five segments; with neither exopod nor epipod (Fig. 3o). Third maxilliped large and pediform, basally approximated, without exopod; upper and lower margins of distal two segments with long setae; lower margin of ischium, merus and carpus with similar setae; merus with spiniform process on outer distal end; ischium with well-developed *crista dentata*, but no accessory

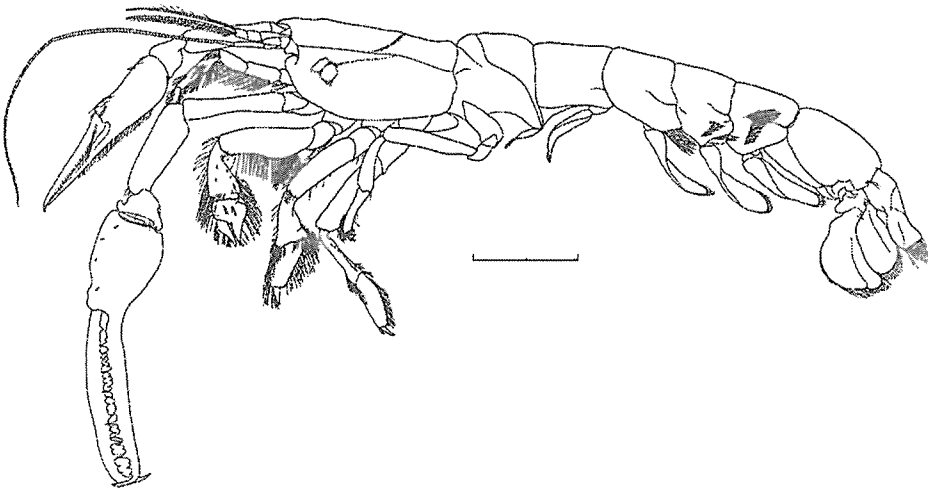


Fig. 2. *Ctenocheles balssi* Kishinouye, 1926. Male, 17.2 mm in cl. (Scale 10 mm)

tooth (Fig. 3p); basis with spine in male (Fig. 3f) but not in female (Fig. 3q).

First pereopods as well-developed chelipeds, unequal in size and form (Fig. 2); left chela larger than right in the specimens described; dactylus twice as long as palm, and armed alternately with several long teeth and some smaller teeth; tips of both fingers tapered and curved, crossing each other when closed; carpus short and cup-shaped; merus nearly as long as ischium. In right chela dactylus 1.2 times as long as palm; cutting edges of both fingers weakly serrated. Second pereopod compressed, ending in short and flat chela; upper and lower margins of carpus and chela and lower margin of merus with long setae. Third pereopod as long as second; dactylus short and small; propodus flattened, surrounded by long setae; distal half of carpus broadened with long setae on lower margin. Fourth and fifth pereopods similar in shape, slender and cylindrical; dactylus in form of short claw; propodus cylindrical and carpus a little swollen in distal part; dense setae present on posterior margin of propodus and distal part of carpus in fourth pereopod, and on distal part of propodus in fifth pereopod. Coxae of fifth pereopods with genital aperture, produced forward.

Thoracic sternum between fourth pereopods pentagonal in outline, surface rather flat, with median narrow groove in both sexes (Fig. 3i).

First pleopod in male short and slender, distal half narrow, indistinctly divided into two parts, with rounded end (Fig. 3c). Second pleopod in male leaf-shaped and bilobed; exopod narrower than endopod; appendix masculina longer than appendix interna, spoon-shaped with many stiff simple setae (Fig. 3d, e). Exopod of uropod broader than endopod, with shallow notch at middle of posterior margin (Fig. 3b).

Size (mm):

	Male	Female
Body	70.0	61.0
Rostrum	1.0	1.0

Carapace (cl)	17.2	14.7
Abdomen	52.8	46.3
Larger cheliped (left)	53.9	—
Chela	29.1	—
Carpus	2.5	—
Merus	10.2	—
Ischium	10.0	—
Immovable finger	19.5	—
Palm	9.6	—
Smaller cheliped (right)	40.2	33.5
Chela	18.2	14.3
Carpus	3.2	2.3
Merus	6.9	6.3
Ischium	8.1	7.4
Immovable finger	10.0	8.3
Palm	8.2	6.0

Detached large chelipeds: Of 40 large chelipeds, 17 are the right side, and 23 are the left side (Fig. 1c). Merus 1.07 (range 1.02-1.09) times as long as the ischium. Dactylus laterally compressed, and 2.0 (range 1.6-2.3) times as long as palm. Immovable finger curved downward toward the tip. Palm 1.5 (range 1.3-1.7) times as high as wide.

Color: Body generally strong yellowish red in live condition; palm of larger cheliped with net marks of pink on background color of yellowish white; both fingers pink (Fig. 1).

Distribution:

This species is only known from the seas around Japan. The present specimens from Tosa Bay, were collected from shallower than previous records.

Sea of Japan: near Kashiwazaki, Niigata Pref.¹⁰⁾, off Igarashihama, Niigata Pref., 60 m⁹⁾, Wakasa Bay, 119 m¹¹⁾, off Nezumigaseki, Yamagata Pref., ca 300 m⁸⁾.

Pacific coast: Okinose Bank, Sagami Bay, 800 m^{4, 5)}, Tosa Bay, Kochi Pref., 30-150 m (present paper).

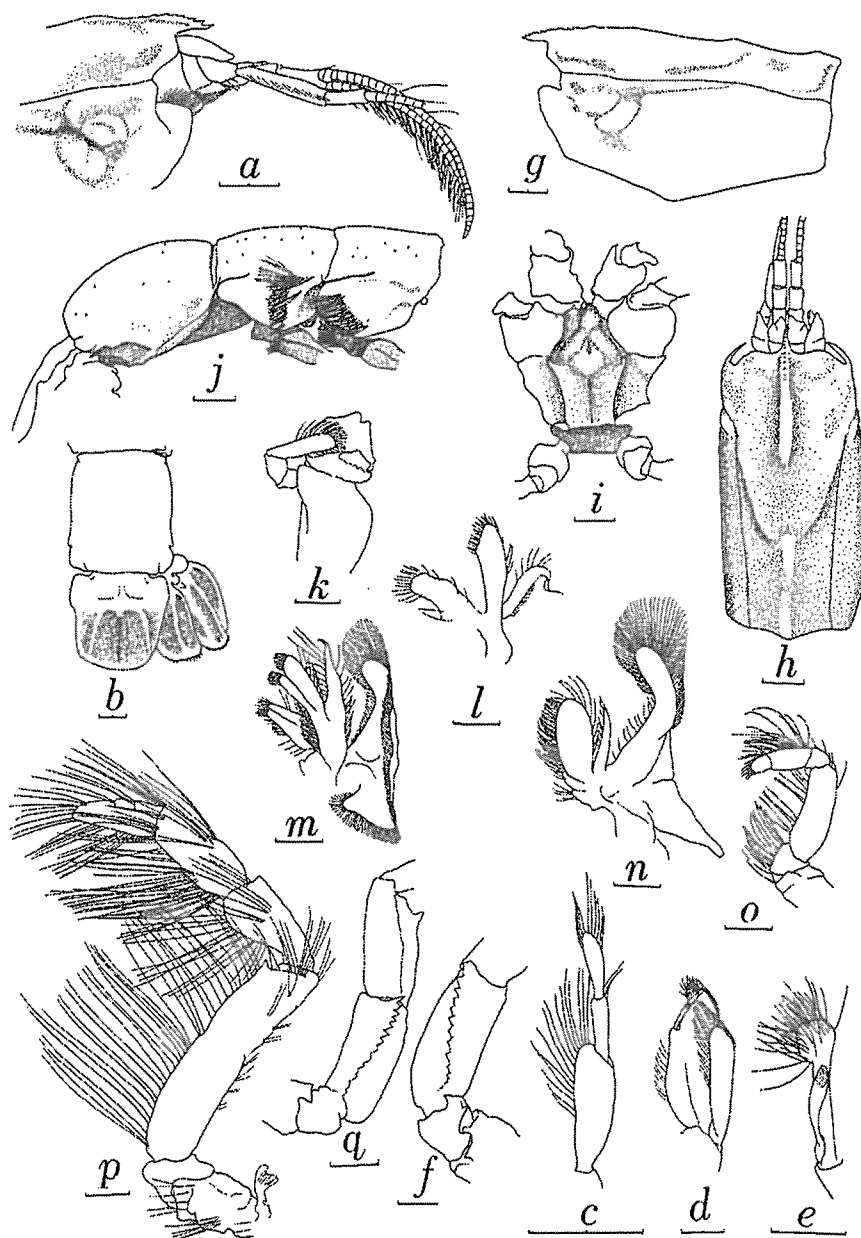


Fig. 3. *Ctenocheles balssi* Kishinouye, 1926. *a-f*: male, 17.2 mm in cl., *g-q*: female, 14.7 mm in cl. *a*: anterior part of body, lateral view, *b*: tail fan, *c*: first pleopod, *d*: second pleopod, *e*: appendices interna and masculina, *f*, *q*: basal part of third maxilliped, mesial view, *g*: carapace, lateral view, *h*: anterior part of body, dorsal view, *i*: thoracic sternum, *j*: posterior part of abdomen, *k*: mandible, *l*: first maxilla, *m*: second maxilla, *n*: first maxilliped, *o*: second maxilliped, *p*: third maxilliped. (Scales for *a-d*, *g-j* 2.0 mm; scales for *e*, *f*, *k-q* 1.0 mm)

3 Discussion

The genus *Ctenocheles* contains six species, *C. balssi* Kishinouye, 1926¹⁰⁾, *C. collini* Ward, 1945^{12,13)} and *C. maorianus* Powell, 1949¹⁴⁾ from the Pacific Ocean, and *C. serrifrons* Loeuff and Intès, 1974¹⁾, *C. holthuisi* Rodrigues, 1978²⁾ and *C. leviceps* Rabalais, 1979³⁾ from the Atlantic Ocean. Males have only been described in *C. serrifrons* and *C. leviceps*^{1,3)}, though the description of the latter species was based on immature males³⁾. The genotype, *C. balssi*, has been only known from two females and detached chelipeds^{4,5,8-11)}. The present specimen is the first intact male of this species.

The present male of *C. balssi* is morphologically similar to the holotype female described by Kishinouye¹⁰⁾ as well as to the females examined. The detached larger chelipeds were all nearly the same in appearance, and none was exceptional in size and shape. In *C. balssi* sexual differences are found in the third maxilliped and the second pleopod. The third maxilliped is provided with a spine on the basis in the male, which is absent in the female. The second pleopod bears the appendices interna and masculina in the male but an appendix interna only in the female. The first pleopod is composed of two narrow segments surrounded by marginal setae, but without any special appendix in both sexes.

Like *C. balssi*, *C. serrifrons* and *C. leviceps*, have the male first pleopod composed of two segments^{1,3)}, however, setation and shape are better developed in *C. balssi* than in the other two species. *C. serrifrons* has a bilobed distal segment with a seta on the inner lobe¹⁾. *C. leviceps* has a simple segment without seta³⁾. In *C. balssi*, the distal segment is not bilobed, and the margin has about 10 plumose setae. The second pleopod is provided with appendices interna and masculina in *C. serrifrons*¹⁾, as in *C. balssi*, but with an appendix interna only in *C. leviceps*³⁾.

The gill formula and mouthparts have not been described for *C. collini* and *C. maorianus*. We,

however, can confirm these characters of the former species by the direct examination of one ovigerous female (Cat. Nos. W 14873, 40.1 mm in cl) and one female (W 5953, 36.0 mm in cl) preserved at the Queensland Museum. As shown by de Saint Laurent¹⁵⁾, there are two types of gill formulae in this genus. A short rod-like exopod is present on the second and third maxillipeds in *C. serrifrons* and *C. leviceps*^{1,3)}, but entirely absent in *C. balssi* and *C. holthuisi*²⁾. In *C. collini* these exopods are rather long and two-segmented. The mouthparts of *C. balssi* show no other obvious differences with the other species.

The first pair of chelipeds are unequal in size and shape in *C. balssi*. The larger cheliped of the present male and female are both on the left side, but Kishinouye's female¹⁰⁾ had the right cheliped larger. Of 40 detached larger chelipeds examined, 17 were right and 23 left. Therefore, the larger cheliped of this species is not fixed to one side.

The species of this genus have all only been rarely collected, and therefore, our knowledge of their distribution is quite limited. They are distinguished from one another by the following characters.

Key to the species of the genus *Ctenocheles*

1. Rostrum armed dorsally with eight to ten minute teeth. 2
1. Rostrum entirely unarmed. 3
2. Second and third maxillipeds without exopod. Known from Japanese waters, at depths of 30-800 m. *Ctenocheles balssi* Kishinouye, 1926
2. Second and third maxillipeds with short exopod. Known from Gulf of Guinea, eastern Atlantic, at a depth of 50 m. *Ctenocheles serrifrons* Loeuff and Intès, 1974
3. Suborbital angle sharply pointed. Merus and ischium of first pair of pereopods with distinct spines on posterior margin. Known from

western Atlantic off central Brazil, at a depth of 75 m. ... *Ctenocheles holthuisi* Rodrigues, 1978

3. Suborbital angle not pointed. 4
4. Large cheliped with fingers twice as long as palm. Known from New Zealand waters, at depths of 35-73 m.
.....*Ctenocheles maorianus* Powell, 1949
4. Large cheliped with fingers less than twice as long as palm. 5
5. Large cheliped with fingers less than 1.5 times as long as palm and with ischium serrated on inner margin. Known from Australian waters, at depths of 15-40 m.
.....*Ctenocheles collini* Ward, 1945
5. Large cheliped with fingers 1.8 times as long as palm and with ischium entirely unarmed. Known from Gulf of Mexico, at depths of 10-49 m.*Ctenocheles leviceps* Rabalais, 1979

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室戸岬沖で採集されたオサテアナジャコの雄個体

松澤圭資・林 健一

オサテアナジャコ (*Ctenocheles balssi* Kishinouye) はスナモグリ科オサテアナジャコ属に属する十脚甲殻類で、1926年に柏崎沖の日本海でとられた雌個体をもとに記載された種類である。その後も雌1個体がとられているが、一般には特異な形態の大きなはさみだけが各地から採集されていた。この属には世界から6種知られている。成体の雄が知られているのはそのうちの1種だけで、ほかの種類においても通常ははさみのみが採集される。このたび、室戸沖の太平洋水深30-150mから成体の雄1個体と雌2個体、さらに、40個の大きなはさみが採集されたので、これまで知見のまったくなかった雄についての特徴とはさみの左右性について調べた。さらに、オーストラリア産の*C. collini*についても直接標本を見る機会があったので、従来不明確であったこの属の鰓式と口器について言及し、6種すべての検索表をつけた。