

## Further Notes on Cirripeds from the Ogasawara Islands

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IN AN EARLIER PAPER (Hiro, 1939) I described three interesting species of cirripeds (*Smilium boninense* Hiro, *Pachylasma ecaudatum* Hiro, and *Balanus krügeri* Pilsbry) which had been collected by the late Dr. Hayato Ikeda in the Ogasawara (Bonin) Islands. The present paper, which deals with new material of his collection from the same locality, received recently through the courtesy of the Honorable Professor H. Ohshima and Dr. S. Miyake, of the University of Kyusyu, may be regarded as a supplement. The material consists of five species, one of which seems to be new to science.

I am greatly indebted to the gentlemen mentioned above for placing the late Dr. Ikeda's collections at my disposal.

*Calantica (Paracalantica) ikedai*  
subgen. et sp. nov.

Figs. 1, 2

Capitulum with 11 valves, much compressed, scalpelliform-triangular and covered with a smooth, yellowish cuticle; occludent margin nearly straight and parallel to long axis of capitulum, carinal margin oblique to the latter. The 11 valves with apical umbones except a pair of scuta, white, wholly calcified, closely fitting, with fine growth lines.

Scutum triangular, nearly as high as broad (ca. 6 mm. long and wide), with umbo slightly incurved at upper one-fifth of occludent margin; occludent and tergal margins nearly straight and basal margin evenly convex.

Tergum elongate, triangular, about three times as long as wide (ca. 12 mm. long and 3.5 mm. wide), oblique to long axis of capitulum,

with nearly straight margins, end not reaching base of capitulum. (Its apex is partially damaged but probably bears the umbo at its pointed end, from which a slight ridge runs to the base.) Occupying the whole space between scutum and carina.

Carina extremely long (ca. 16 mm. long and 2 mm. wide), nearly straight and sharply pointed at end projecting beyond apex of tergum. Dorsal roof strongly arched along medial line, sides rather narrow. Basal end reaching upper level of subcarina.

Rostrum prominently large, pyramidal, about twice as high as broad (ca. 6.5 mm. long and 3.2 mm. wide), and projecting outwards; upper or inner surface slightly hollowed out with a medial, narrow, deep groove and bordered on each side by a low lateral rib. Basal margin strongly concave.

Rostral latus obliquely triangular, very large, about two and one-half times as wide as high, with blunt apex toward rostrum. Basal margin occupying more than half of the basal breadth of capitulum.

Upper latus and inframedian latus absent.

Carinal latus smallest of all valves, obliquely triangular, with apical umbo which curves toward scutum and overlies its baso-lateral margin. Strong broad rib along scutal margin from apex to basal angle, which is overlaid by the rostral latus. Valve thus occupying narrow space between scutum and subcarina below tergum.

Subcarina much stronger than rostrum, horn-like, strongly projecting beyond carinal margin, with incurved apex, from which two small ribs extend along inner margin on each side. Length ca. 8 mm. and breadth ca. 3 mm. Baso-scutal angle attached closely to baso-carinal angle of

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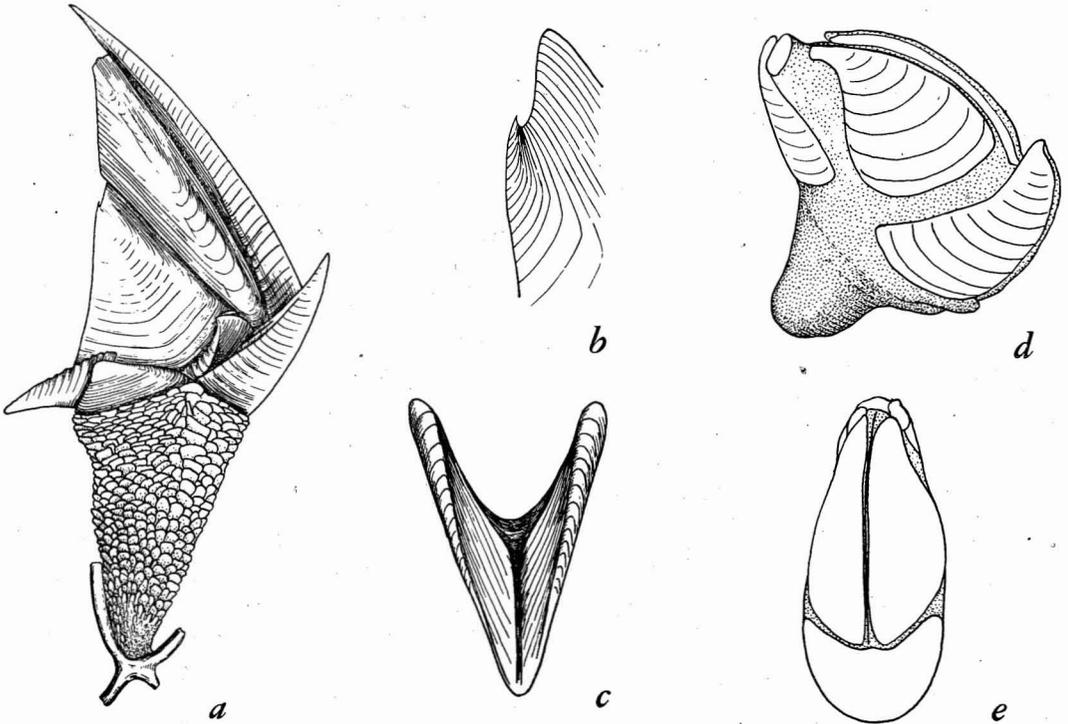


FIG. 1. *Calantica (Paracalantica) ikedai* subgen. et sp. nov.: *a*, specimen in lateral view,  $\times 3$ ; *b*, umbonal portion of scutum,  $\times 6$ ; *c*, rostrum in upper view,  $\times 6$ ; *d*, complementary male in lateral view,  $\times 30$ ; *e*, the same in upper view,  $\times 30$ .

rostral latus just below carinal latus; thus basal margin occupies less than one-half of basal breadth of capitulum.

Peduncle a little shorter than capitulum, tapering downwards and densely covered with somewhat large, strongly imbricating, white, calcified scales. Scales invested by yellowish cuticle except for disintegrated apices, rather broad, becoming club-shaped toward base of peduncle; row extending downwards longitudinally from point of junction between rostral latus and subcarina noticeably larger than elsewhere.

*Mouth parts:* Labrum concave, without teeth. Palpus elongate, with long bristles along somewhat rounded extremity.

Mandible with four teeth, second smallest, and rounded lower angle slightly pectinated.

Maxilla I with spines of three different sizes; two spines on upper angle are largest, those on middle somewhat shorter and slender, shortest ones on the strongly protruded lower angle.

Maxilla II roughly quadrangular, with bristles on entire edge.

Cirri ordinary in segmentation and armature; both rami of each cirrus subequal in length, segments a little longer than wide and bearing five pairs of ventral bristles and one long and two short dorsal bristles at the distal angle. Protopodites robust. The numbers of segments of the cirri are as follows:

I	II	III	IV	V	VI
13 15	14 16	17 16	21 20	20 20	20 21

Caudal appendage uni-articulate, a little longer than one-half the length of lower segment of protopodite of cirrus VI, terminating in a brush of a few short bristles.

Penis extremely short, about as long as protopodite of cirrus VI, very feebly annulated, provided with fine hairs distally.

One complementary male is present in the usual position in front of the adductor scutorum muscle. Although it has the typical appearance of the male of the genera *Calantica* and *Smilium*,

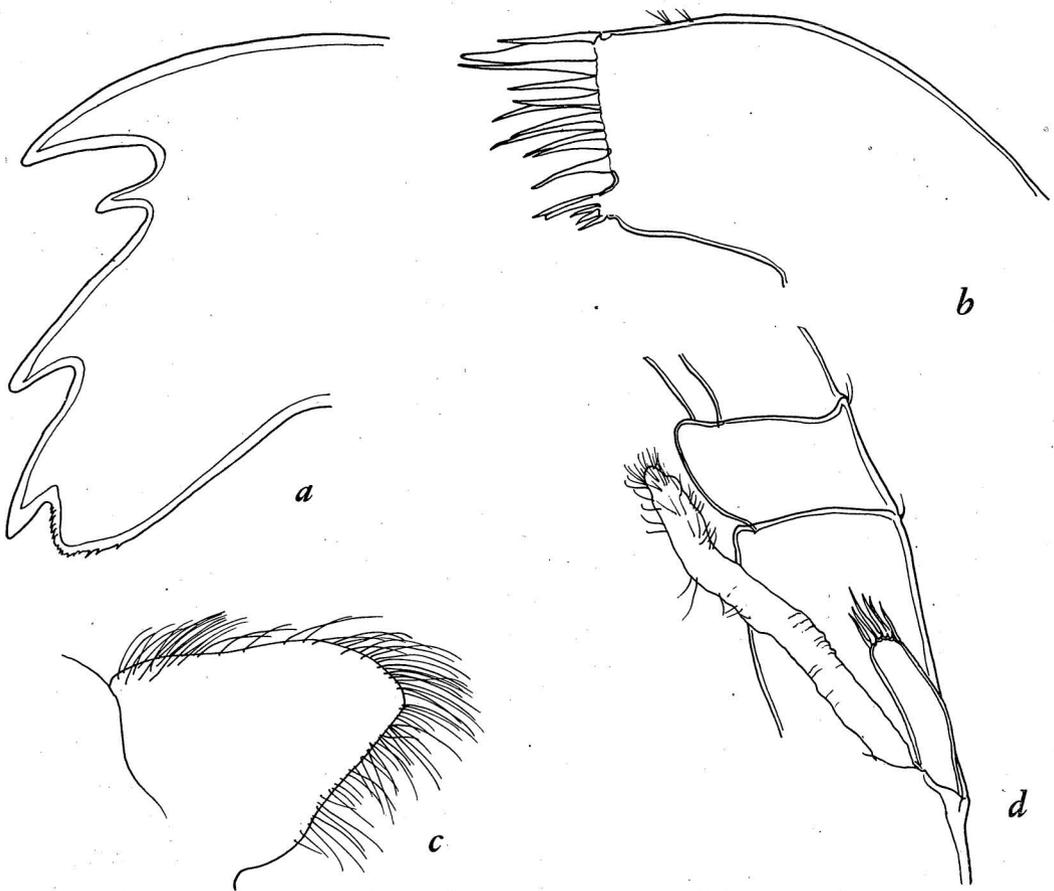


FIG. 2. *Calantica* (*Paracalantica*) *ikedai* subgen. et sp. nov.: a, mandible,  $\times 125$ ; b, maxilla I,  $\times 125$ ; c, maxilla II,  $\times 55$ ; d, lower part of cirrus VI, with penis and caudal appendage,  $\times 30$ .

consisting of a large capitulum with six valves and a short peduncle, it differs somewhat. Of the valves, two scuta, one rostrum, and one carina are extremely large and triangular, while two terga are rather rudimentary and oval in outline. The carina is not visible from outside, *in situ*, being situated basally below the scuta. The peduncle is wholly buried in the cuticle of the hermaphrodite. It is about 1 mm. long and 1.3 mm. wide.

*Measurements in mm.:*

Length of capitulum.....	17
Length of peduncle.....	11
Basal breadth of capitulum.....	8

*Locality:* Ogasawara Islands. Depth unknown. One specimen on a gorgonian stem. Aug. 1, 1938, Ikeda leg.

*Remarks:* The general outline of this cirriped is more like that of the genus *Smilium* than that of *Calantica*, the capitulum being not *Mitella*-like but *Scalpellum*-like in form. However, the upper latus is entirely lacking, a condition not dependent entirely on accidental reduction because of its special environmental location. The upper whorl of valves consists of the paired scuta and terga, and a closely fitting carina, the tergum occupying the whole of the space between the scutum and carina, as in *Calantica*; the lower whorl consists of only two pairs of latera, a rostrum and a subcarina, all being well developed. The scutum is triangular in form as in *Calantica*, but has the subcentral umbo. The subcarina is extraordinarily larger than the rostrum, instead of being somewhat smaller as in *Calantica*. The peduncular scales are wholly

calcified, and compactly imbricate as in *Mitella* and also *Scillaelepas*. The complemental male bears the rudimentary terga, though the general features are somewhat similar to those of *Calantica* as well as of *Smilium*. These peculiarities seem to me to justify the institution of a new subgenus, *Paracalantica*, under the genus *Calantica* Gray, for this cirriped. As I have only a single specimen at present I do not venture to separate it generically from the latter genus. The subgenus *Paracalantica* is diagnosed as follows:

Scalpellidae with a capitulum of 11 valves forming two whorls; upper whorl comprising paired scuta, terga, and a carina, the tergum occupying the space between scutum and carina; lower whorl comprising two pairs of latera, a rostrum, and a subcarina. Subcarina and rostrum very large, high, the former stronger than the latter. Scutum with umbo subcentral; umbo apical in remaining valves. Peduncle with imbricate scales. Male with a capitulum, comprising four large valves and rudimentary paired terga, and a short peduncle.

In the reduction in the number of valves as well as in the peculiar habitat, this cirriped seems to be somewhat allied to *Smilium hypocrites* Barnard (1924). The specimen is completely overgrown by the coenenchym of the gorgonian and by the polyps, which contain abundant spicules, as well. However, this cirriped in no way indicates such reduction in the size of all valves as is shown in *S. hypocrites*, which, according to Barnard, is "a true *Smilium* in process of simplification owing to its protected habitat." It is thus doubtful whether his species is to be placed in the same group as the present species.

#### *Trilasmis (Trilasmis) eburnea* Hinds

This curious cirriped has occasionally been found attached to spines of echinoids from the Malay and Hawaiian Archipelagoes. The specimen examined here measures about 4 mm. in length of capitulum, 2.5 mm. in breadth of capitulum, and 1.3 mm. in length of peduncle.

This is the second record of its occurrence in our territory, since I have recorded it once from off Tonda near Seto (Hiro, 1937).

*Locality:* N. 27°16', E. 140°55', southwest of Titi-zima, 500 fathoms. One specimen on a spine of the sea urchin *Pseudoboletia* sp., Aug. 1, 1938, Ikeda leg.

#### *Balanus (Chirona) krügeri* Pilsbry

This species was recorded from the Ogasawara Islands (Hiro, 1939). The present material consists of two specimens attached to spines of a sea urchin, together with the following two barnacles. One of them measures about 10 mm. in carinorostral diameter and 7 mm. in height.

#### *Balanus (Solidobalanus) hawaiiensis*

Pilsbry

Fig. 3

This species was first described by Pilsbry (1916) on specimens attached to spines of the sea urchin *Phyllacanthus thomasi* Agassiz, taken from the Hawaiian Islands at a depth of 21–222 fathoms. Since then there has been no record of its occurrence whatever. The present specimens agree well with the description and figure of Pilsbry. This cirriped, together with *Balanus pseudauricomus*, found on the sea urchins is adequately shown in the photographs appended to Ikeda's paper on the host sea urchin (1939: pl. 7, 8).

The specimens are very small, conical, white, and tinged with some pink or light reddish-purple transverse stripes. The wall is provided with prominent ribs on each compartment, the carina and latera having two strong ribs, the carinolatera a single one, and the rostrum two. The interval between the ribs is broadest and deepest in the lateral compartments. The radii are wide, transversely striped, and their oblique summits are usually ribbed because of the upturned, prominent growth lines. The alae have straight, smooth, and nearly level summits. The orifice is wide and quadrangular.

The opercular valves differ somewhat from

the original description, but the difference is probably unimportant. The tergum seems to be more narrowly elongate than in the Hawaiian specimens, and nearly akin to that of *Balanus auricomus* Hoek, but there is no doubt that they are specifically distinct in other respects.

The mouth parts agree in all particulars with the description of Pilsbry. The same is also established as regards the cirri.

Measurements in mm.:

	Specimens			
	A	B	C	D
Carinorostral diameter.....	6.0	5.8	5.3	4.9
Height .....	3.4	3.8	2.5	2.6

Locality: N. 26°40', E. 140°55', southwest of

Titi-zima, 70-80 fathoms. Twenty-four specimens on spines of the sea urchin *Compsocidaris pyrsacantha* Ikeda, together with *B. pseudauricomus* and *B. krügeri*.

**Balanus (Solidobalanus) pseudauricomus**  
Broch

Fig. 4

This species has heretofore been recorded by Broch (1931) from the Menado Bay, Celebes, and west of Nagasaki (N. 32°25', E. 128°33') at a depth of 400 to 500 m. The present specimens may be referred to this species, though some slight differences are found to occur.

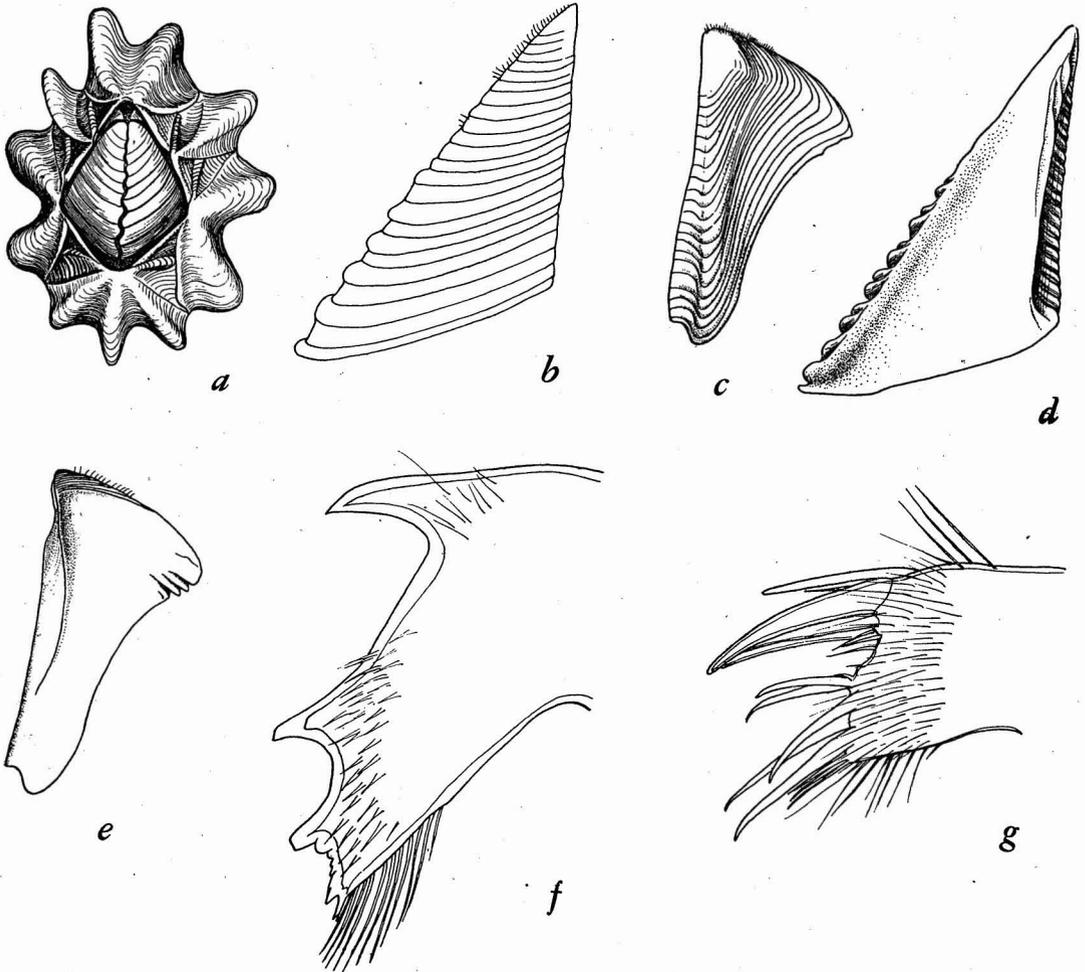


FIG. 3. *Balanus hawaiiensis* Pilsbry: a, specimen in upper view,  $\times 8$ ; b, outer side of scutum,  $\times 24$ ; c, outer side of tergum,  $\times 24$ ; d, inner side of scutum,  $\times 24$ ; e, inner side of tergum,  $\times 24$ ; f, mandible,  $\times 187$ ; g, maxilla I,  $\times 187$ .

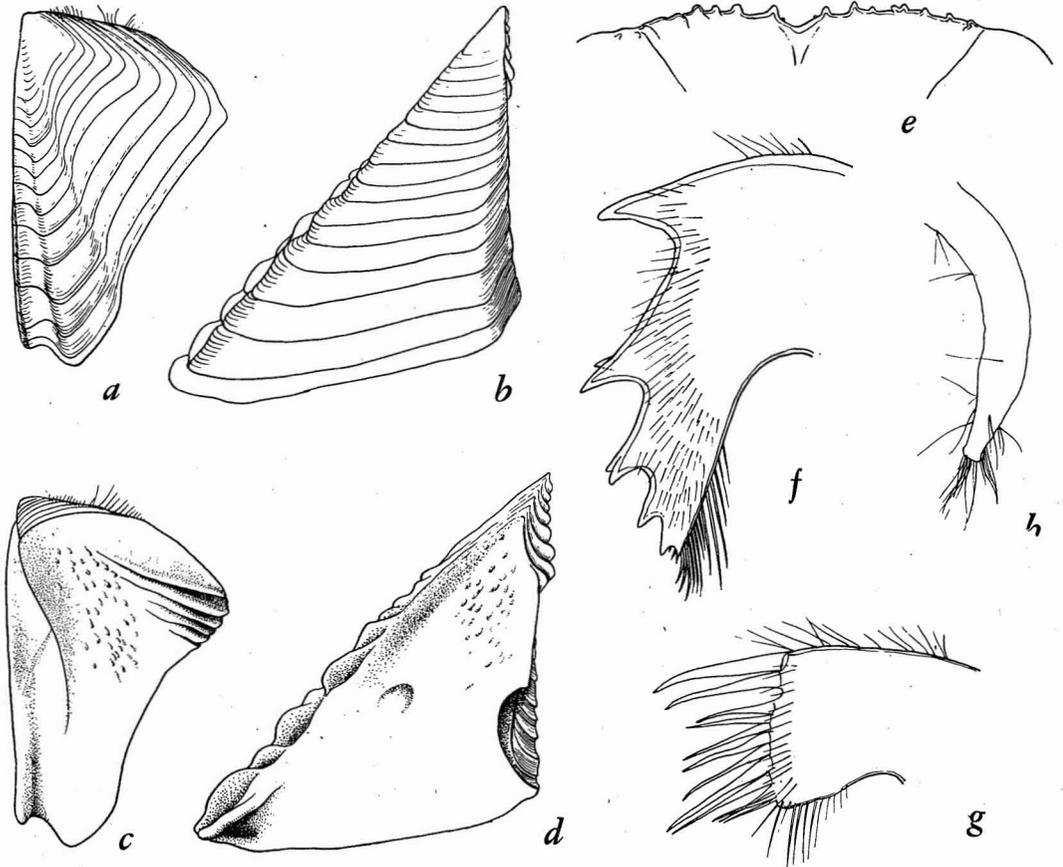


FIG. 4. *Balanus pseudauricomus* Broch: *a*, outer side of tergum,  $\times 15$ ; *b*, outer side of scutum,  $\times 15$ ; *c*, inner side of tergum,  $\times 15$ ; *d*, inner side of scutum,  $\times 15$ ; *e*, labrum,  $\times 62$ ; *f*, mandible,  $\times 50$ ; *g*, maxilla I,  $\times 50$ ; *h*, distal part of penis,  $\times 50$ .

The compartments are smooth, wholly glossy white, without any colored stripes, but in younger specimens tinted with pink color all over. They are thick, solid, and finely ribbed longitudinally on the inner face. The base is radially ribbed, but not porous.

The scutum has plain growth lines, widely separate, and exhibits no longitudinal striation; Broch found delicate, though distinct, longitudinal striation in the median part of the scutum on his specimens. This character is, in my opinion, of little value, as it is often found in other cirripeds. The articular ridge is absent. There is a faint indication of a pit for the adductor muscle, as a small rounded depression, though it is sometimes lacking. There is, however, no distinct pit for the lateral depressor muscle, although Broch recognizes its presence.

The tergum exhibits a shape similar to that of Broch's specimen. It has a shallow and wide furrow running from the apex to the end of the spur; according to Broch, however, "no spur fasciole or furrow but a narrow and distinct furrow runs parallel with the scutal margin limiting the spur area."

In both of the valves, the upper part of the inner face is usually roughened with many tubercles. The occludent margin of the scutum and the carinal margin of the tergum are sometimes colored pale orange.

The mouth parts exhibit all the peculiarities of *B. pseudauricomus*, especially the labrum, which has a very shallow notch and on each side of it seven or eight obtuse teeth (according to Broch, four or five) arranged irregularly. The mandible has five teeth of which the second

and third are bifid, and the fifth is rudimentary. Maxilla I has a distinct but narrow notch.

The cirri have the following numbers of segments in their rami:

I	II	III	IV	V	VI
7 12	12 12	11 11	23 25	27 30	30 30

On the whole the numbers of segments are much larger than those of Broch's specimen, but the other characters agree with his description.

Although some differences, mentioned above, are found between the present specimens and Broch's *pseudauricoma*, these seem to be so small and of such subordinate importance as to be insufficient for a specific separation.

<i>Measurements in mm.:</i>	Specimens			
	A	B	C	D
Carinorostral diameter.....	6.7	6.1	5.9	5.4
Height .....	4.0	4.0	4.8	3.2

*Locality:* The same as given for *B. hawaiiensis*. Ten specimens.

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