

NEW SPECIES OF *MEMBRANOBALANUS* HOEK AND  
*HEXACREUSIA* ZULLO  
(CIRRIPEDIA, BALANIDAE) FROM THE  
GALAPAGOS ARCHIPELAGO<sup>1</sup>

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ABSTRACT: A second eastern Pacific membranobalanid occurs at several localities in the Galapagos Archipelago off Ecuador. It is found in association with a small clionid sponge that burrows in nonliving parts of such hermatypic corals as *Porites* and *Pavona*. *Balanus* (*Membranobalanus*) *nebrias*, new species, is morphologically similar to *B. (M.) orcutti* Pilsbry, known from southern California and the Gulf of California, and to *B. (M.) declivis* Darwin of the tropical western Atlantic. The new species is notable for the presence of conspicuous chitinous laminae in the apices of the opercular valves.

A second species of the coral-inhabiting barnacle *Hexacreusia* Zullo is described on the basis of three specimens living on balanophyllid corals that were dredged from 55 to 90 m. *Hexacreusia straeleni*, new species, differs from the type species, *H. durhami* (Zullo) in its association with ahermatypic rather than hermatypic corals and in its conic rather than depressed shape.

The two new species described herein are part of a broader study of the cirriped fauna of the Galapagos Archipelago and of the adjacent areas of the tropical eastern Pacific. The overall study is based on collections made by Zullo during the 1964 Galapagos International Scientific Project, on previously unstudied collections in various museums, and on collections recently made by various individuals. This preliminary report is presented to draw attention to two cryptic barnacles in the hope that knowledge of their existence will bring to light additional information on their distribution.

The subgenus *Membranobalanus* Hoek (of the genus *Balanus* Da Costa) is comprised of a small number of species inhabiting sponges in tropical and warm temperate waters. Heretofore, only a single species, *Balanus orcutti* Pilsbry, was known from the eastern Pacific. Its known range includes southern California, Cape San Lucas, Baja California, and the Gulf of California,

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but *B. orcutti* probably will be found to occur throughout the tropical Panamic province. *Balanus orcutti* is related to *B. declivis* Darwin, which is found at scattered localities throughout the tropical western Atlantic, and is the only other membranobalanid known previously from the New World. These two species, together with the new Galapagan species, form a close knit group that is morphologically distinct from membranobalanids in other parts of the world.

Unlike *B. orcutti* and *B. declivis* which are found in a variety of sponges, the new species appears to be restricted to a single species of boring clionid sponge. The sponge usually occurs in nonliving, generally basal parts of such hermatypic corals as *Porites* and *Pavona*, but in one instance it was discovered burrowed in weathered vesicular basaltic cobbles. Corals from several other tropical eastern Pacific localities have been examined, but to date this new species has been found only in the Galapagos Archipelago, where it is widespread and abundant.

The six plated, coral-inhabiting barnacle *Hexacreusia* Zullo, heretofore known only by its type species, *H. durhami* (Zullo), is a common symbiont of *Porites californica* Verrill in the Gulf of California and the Tres Marias Islands, and of *P. californica* and possibly *P. lobata* (Dana) on the Pacific coast of Panama (Zullo, 1961; Zullo, Beach and Carlton, 1972). Corals from the Galapagos, Cocos Island off Costa Rica, and Clipperton Island off Mexico have been examined with some care, yet none has yielded symbiotic barnacles.

The new Galapagan species was obtained under unexpected circumstances. The three known specimens were found attached to two ahermatypic balanophyllid corals dredged from 55 to 90 m off Beagle Island. Although this habitat is similar to that of the northeastern Atlantic coral barnacle *Pyrgomina anglica* (Sowerby), the possibility of this type of association had been overlooked by us in searching for additional occurrences of *Hexacreusia*. It is, thus, likely that other eastern Pacific localities will yield *Hexacreusia* upon re-examination.

#### SYSTEMATIC DESCRIPTIONS

Suborder BALANOMORPHA Pilsbry, 1916

Family BALANIDAE Leach, 1817

Genus *BALANUS* Da Costa, 1778

Subgenus *MEMBRANOBALANUS* Hoek, 1913

***Balanus (Membranobalanus) nebrias*, new species**

Figures 1-17

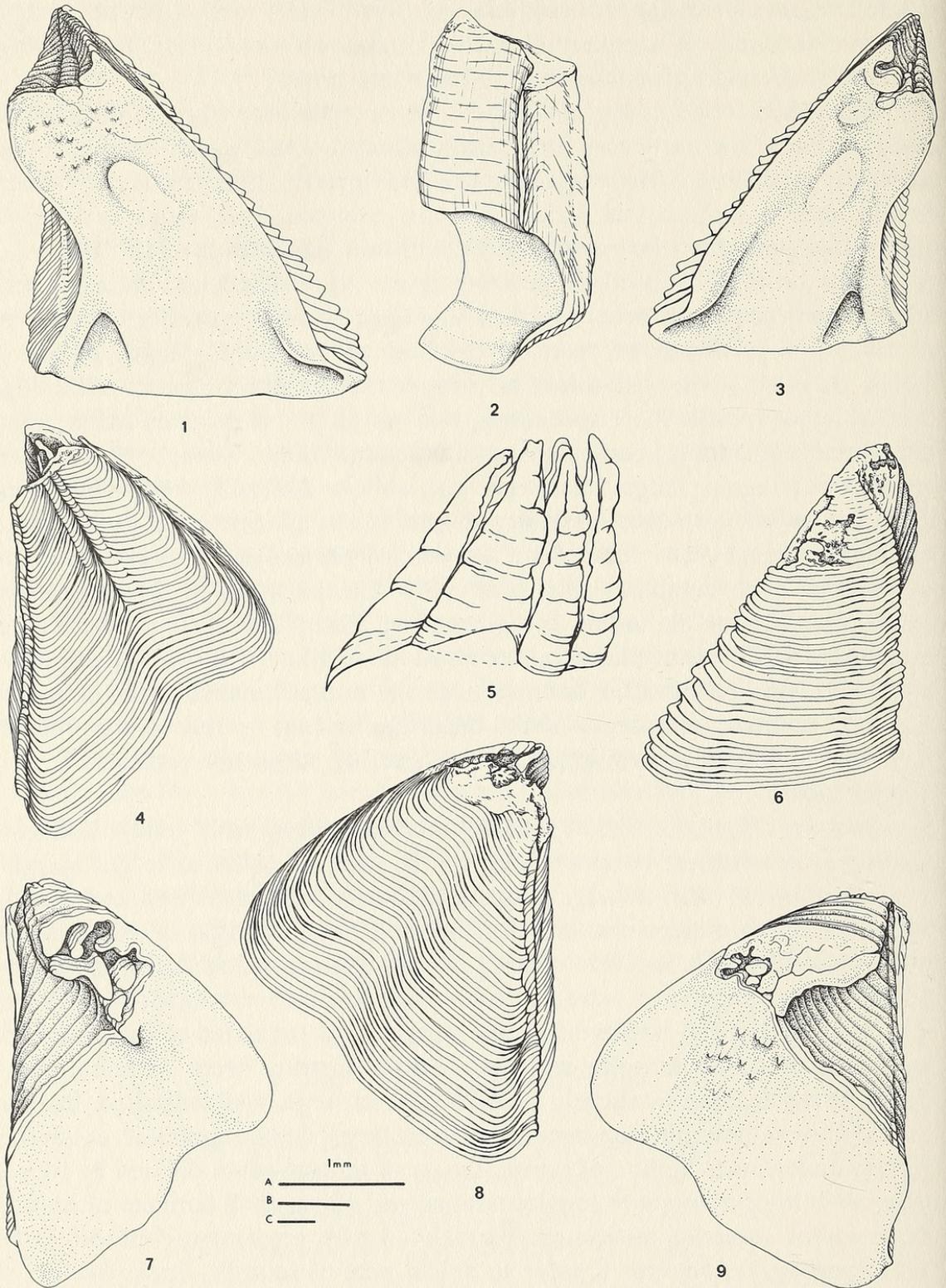
*Diagnosis.* Conspicuous chitinous laminae intercalated with shelly laminae in apices of opercular valves; adductor ridge of scutum absent; scutal articular ridge short, but prominent; tergal spur short and broad; labrum narrow,

pointed, triangular in shape; mandible with five distinct teeth on cutting edge; armature of Cirrus IV simple; five pairs of spines on medial articles of Cirrus VI; reddish purple ciri marked with large white spots.

*Description.* Shell (Fig. 5) high conic or cylindric, white, with toothed orifice; compartmental plates solid, easily disarticulated; parietes ornamented externally with fine, closely spaced, irregular growth lines crossed by finer, closely spaced longitudinal striae; rostrum elongate, half again as long as other plates, roughly diamond-shaped with lower half broader and basal margin either broadly rounded or pointed; apices of rostrum and carina in unbroken specimens with deeply incised V-shaped notches (probably caused by cirral rasping); sheath of rostrum one-half to two-thirds length of plate; sheath on other plates two-thirds to three-fourths length of plate; basal edge of sheath not free in most specimens, but merging into parietes below; interior of parietes smooth, basal edge not denticulate; radii absent, or represented by narrow, irregular ledges; alae wide with oblique summits, and without denticulation on sutural edges; basis membranous; a single specimen possesses an incomplete 'basal plate' formed by the inward projection of secondary basal ledges from each compartmental plate (Fig. 2); the width of the basal ledge varies, with that of the carina being broadest, that of the rostrum narrowest, and those of the other plates intermediate in width; the ledge apparently is laid down secondarily after formation of the compartmental wall, and consists only of the continuation of the inner lamina(e) of the compartmental plate in a different growth plane, and, therefore, does not represent a true balanid basis.

Scutum (Figs. 1, 3, 6, 8) thick, convex, white, with yellow adherent epidermis on exterior; basal margin shorter than or equal to tergal margin; tergal margin reflexed; exterior ornamented with sharp, closely spaced growth ridges, every other ridge carrying over onto occludent margin as an occludent tooth; growth ridges incised by fine, closely spaced radial striae, especially evident in median part of valve; articular ridge prominent, triangular, reflexed, extending far beyond border of scutal margin, and restricted to upper half or two-thirds of scutal margin; articular furrow narrow, deep; adductor ridge absent or represented by slightly raised border of large, well delimited, lenticular adductor muscle pit; depressor muscle pit large, deep, triangular, extending well up under inner lamina of scutum; apex of scutum often divided by two or three radiating furrows into longitudinal ridges; apical shell laminae of scutum above top of adductor muscle pit intercalated with prominent chitinous laminae imparting yellow-brown color to apical part of scutum; upper margin of articular ridge often chitinous also.

Tergum (Figs. 4, 7, 9) heavy, broad, convex, white, with basal margin shorter than scutal margin; exterior ornamented by fine, closely spaced growth ridges, often with an adherent yellow-brown epidermis bearing golden hairs; spur fasciole broad, open, well delimited by an abrupt change in elevation on either side; carinal side of exterior often crossed by one or two incised longi-



FIGURES 1-9. Shell and opercular valves of *Balanus (Membranobalanus) nebrias*, n. sp. (1) scutum interior, paratype no. 4; (2) carina interior, paratype no. 5, showing inflected basal margin; (3) scutum interior, holotype; (4) tergum exterior, holotype; (5) shell profile, paratype no. 6; (6) scutum exterior, holotype; (7) tergum interior, holotype; (8) scutum exterior, paratype no. 4; (9) tergum interior, paratype no. 4. Scale A: Figs. 1, 3, 4, 6-9; Scale B: Fig. 2; Scale C: Fig. 5.

tudinal furrows near and parallel to fasciole border; tergal spur short, truncate, not parallel to basal margin, close to but distinct from basiscutal angle; depressor muscle crests absent; articular ridge short, straight, restricted to center of apical third of valve, with chitinous laminae intercalated with calcareous laminae as in scutum; chitinous laminae especially conspicuous as lining of articular furrow.

Labrum (Figs. 14, 15) sharply triangular, divided at apex by deep notch; two or three teeth usually on either side of notch; sides of notch lined with fine hairs; Paratype no. 2 with two teeth at either edge of notch and a third along outer slope on either side.

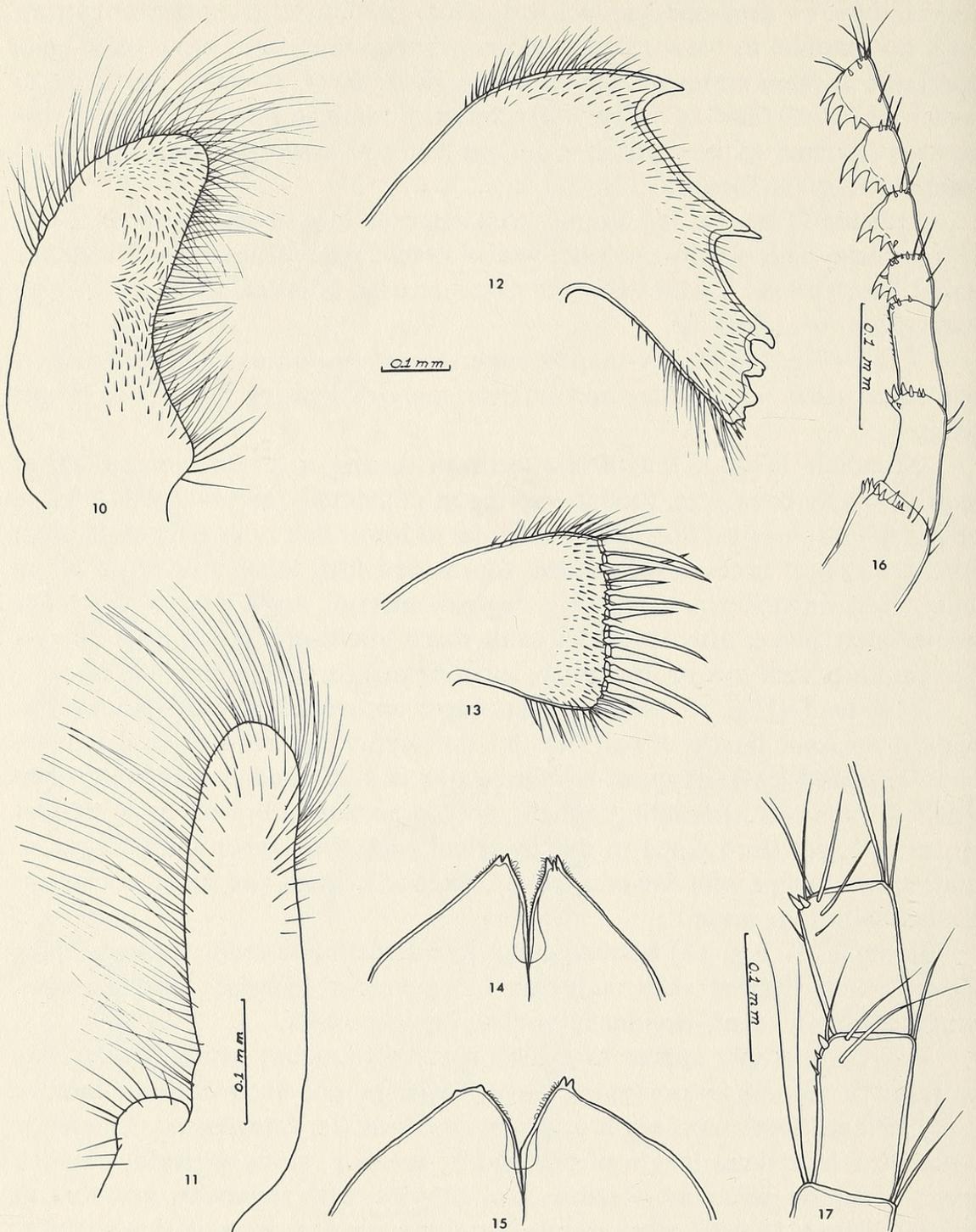
Palps (Fig. 10) kidney-shaped; superior margin concave, lined by numerous equal sized setae; inner and inferior margins bearing fewer, but longer setae.

Mandible (Fig. 12) with five teeth on cutting edge; first three teeth of approximately equal size, though varying in individuals; second tooth bifid, in center of cutting edge; third tooth in center of lower half of cutting edge, often bifid with blunt accessory denticles; fourth and fifth teeth smaller, of about equal size, molariform to varying degrees; inferior angle and cutting edge immediately above often provided with sharp, multi-pronged spines; inferior margin lined with row of long setae; superior margin with a few long setae.

Maxilla I (Fig. 13) with straight edge; uppermost pair of spines large, with upper spine largest of pair; notch below upper pair reduced to slit, sometimes occupied by small spine; middle section of cutting edge with five to eight smaller, right-left alternating spines; middle section followed by a pair of spines in lower third equal in size to apical pair, with upper spine largest of pair; inferior angle with five to six short spinules; inferior and superior margins clothed with long setae.

Maxilla II (Fig. 11) bilobed; outer lobe tipped with reddish purple, long, narrow, with parallel sides, superior and posterior margins densely setose; inner lobe protrudent, circular in outline, densely setose.

Cirri and trophi appear to exhibit some asymmetry, which in cirri may be result of nipping by predators; Cirrus I with grossly unequal rami; anterior ramus about three times length of posterior ramus (in Paratype no. 3, anterior more than four times length of posterior); anterior ramus reversed, antenniform; posterior ramus more setose than anterior, with somewhat protuberant articles; Cirrus II with outer ramus one-third again as long as inner ramus; articles of both rami slightly protuberant, covered with setae somewhat longer than those of Cirrus I; Cirrus III (Fig. 7) with outer ramus longer than inner; similar in size and structure to Cirrus II; proximal articles fused or partially fused; Cirrus IV (Fig. 16) with inner ramus half again as long as outer; pedicel nearly as long as outer ramus, imparting whiplike appearance to cirrus; outer ramus bearing large, recurved teeth, usually three in number, on anterior surfaces of proximal and medial articles; distal articles and pedicel bearing numerous, small, upright teeth along distal margins of anterior surfaces; inner ramus



FIGURES 10-17. Trophi and cirral detail of *Balanus (Membranobalanus) nebias*, n. sp. (10) palp, paratype no. 4; (11) second maxilla, holotype; (12) mandible, paratype no. 4; (13) first maxilla, paratype no. 4; (14) labrum, holotype; (15) labrum, paratype no. 4; (16) detail of armature of Cirrus IV, paratype no. 1; (17) detail of armature of Cirrus III, paratype no. 4.

also with small upright teeth at distal anterior margins of articles; Cirrus V with subequal to equal, long, slender rami; outer ramus bearing small erect teeth on distal margins of medial articles; Cirrus VI with long, slender, equal rami, medial articles bearing four large pairs and a fifth minute pair of spines on the anterior surfaces; cirri reddish purple in color, and marked by large, white, circular spots; penis without basidorsal point, bearing four longitudinal rows of setae.

The number of articles on individual cirri are tabulated for the following specimens (those in parentheses indicate broken rami):

Holotype:

Cirrus	I	II	III	IV	V	VI
outer (ant.) ramus	28	—	14	13	20	22
inner (post.) ramus	8-9	—	12	17	18	22
Paratype no. 1:						
outer (ant.) ramus	24	11	14	13	19	21
inner (post.) ramus	8	9	11	18	20	22
Paratype no. 4:						
outer (ant.) ramus	27	11	13-15	(10-17)	16	16
inner (post.) ramus	9	9-10	11-13	(10-11)	16	17

*Dimensions.* Paratype no. 2: height of rostrum, 8.9 mm; carinorostral diameter of base, 6.4 mm; lateral diameter of base, 4.9 mm; greatest diameter of orifice, 1.8 mm.

*Disposition of Type Material.* The holotype and all paratypes are deposited in the Natural History Museum of Los Angeles County. Referred specimens have been deposited in the California Academy of Sciences, San Francisco, the University of California Museum of Paleontology, Berkeley, and the United States National Museum, Washington, D. C. Holotype: South Channel (channel between Baltra and Santa Cruz Islands), Baltra Island, Galapagos; in red clionid sponge burrowed in basaltic rock at 2 m depth; Feb. 12, 1964, V. Zullo collector. Paratype no. 1: Sullivan Bay, James Island, Galapagos; in red clionid sponge burrowed in *Leptoseris* at 2 m depth; Feb. 16, 1964, V. Zullo collector. Venedig, north of Conway Bay, northwestern Santa Cruz Island, Galapagos; in red clionid sponge burrowed in *Porites* at 2-3 m depth; Feb. 19, 1964, V. Zullo collector. Paratype no. 3: Academy Bay, Santa Cruz Island, Galapagos; in red clionid burrowed in *Pavona*; Feb. 25, 1964, J. W. Durham collector. Paratype nos. 4 and 5: locality same as for holotype.

*Discussion.* The following species are presently included in the subgenus *Membranobalanus*:

*Balanus basicupula* Suhaimi (1966: 65), Singapore.

*Balanus cuneiformis* Hiro (1936: 627), Port Darwin, Australia; Seto, Japan (Hiro, 1939).

*Balanus declivis* Darwin (1854: 275), West Indies, Jamaica; Cape Sable, Florida, Bermudas (Pilsbry, 1916: 230); includes "var. *cuspidatus*" of Verrill (1902: 22), Bermudas.

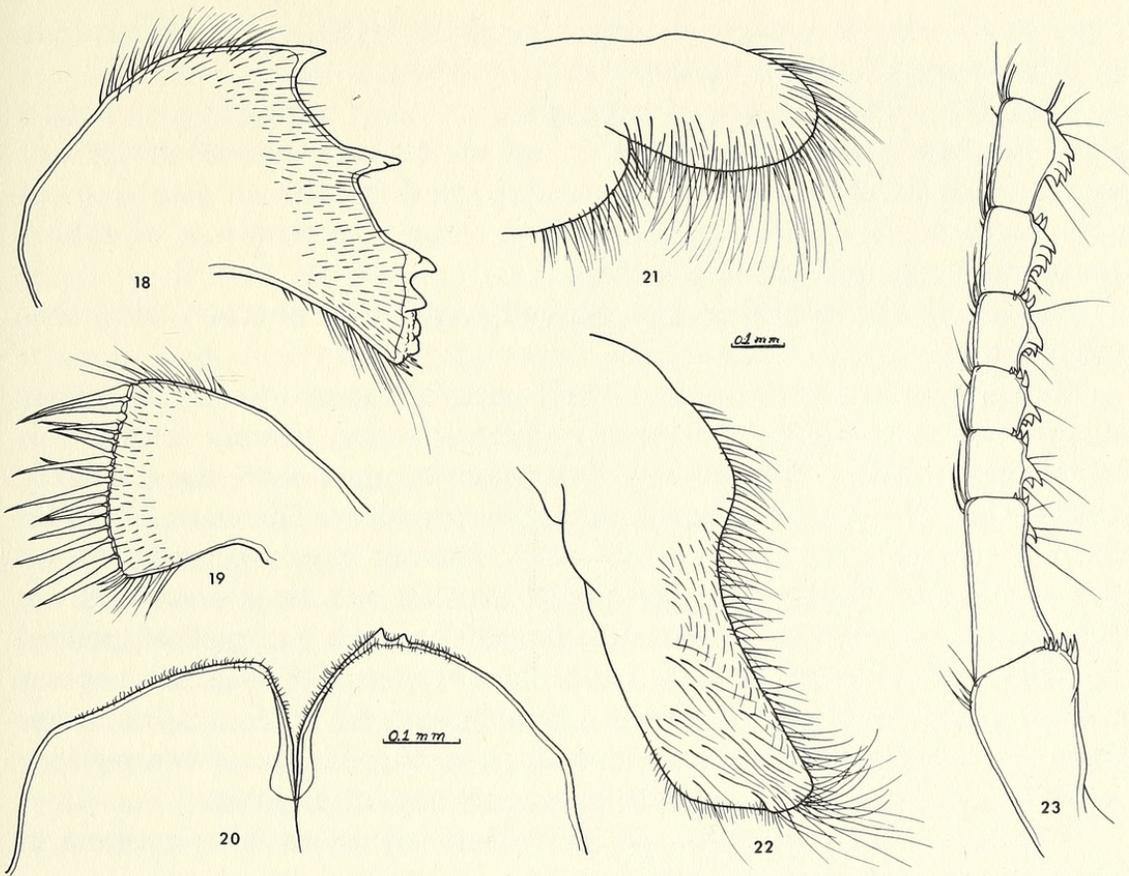
*Balanus longirostrum* Hoek (1913: 205), Celebes: west coast of Sumatra (Nilsson-Cantell, 1921: 340); Sunda Strait (Broch, 1931: 85) Gulf of Manaar, Pamban (Nilsson-Cantell, 1938: 54); includes "var. *krusadaiensis*" of Daniel (1956: 26), Bay of Bengal.

*Balanus orcutti* Pilsbry (1907: 361; 1916: 233), Gulf of California. Barnard (1924: 74) recorded this species from Algoa Bay, South Africa, but comparison of the cirri and trophi of *B. orcutti* from southern California (see below) with Barnard's description suggests that the South African specimens represent a species similar to *B. longirostrum*.

*Balanus nebrias* most closely resembles the New World species *B. declivis* and *B. orcutti*, but differs from both in the presence of large white spots on the reddish purple cirri and of chitinous lamellae in the apices of the opercular valves. The concentration of chitinous material in the apex of the opercular pyramid is apparently a device to inhibit the decalcification of the exposed parts of the opercular valves by the boring sponge inhabited by the barnacle. The erosive effects of this sponge on the calcareous lamellae is quite evident (Figs. 4, 6), especially on the exterior surfaces of the valves. It also appears that the chitinous lamellae are not secondary deposits, but are laid down alternately with the calcareous lamellae and retain the form and structure of the valve. The shell wall of the barnacle does not require protection against dissolution by the sponge, as those sponge cells involved in boring are concentrated on the sponge's exterior. The opercular valves would require protection primarily against damage by newly settled, actively boring sponges. Damage that might occur at the apices of the compartmental plates would be compensated by continued growth at their basal margins. However, such damage to the opercular pyramid would be irreparable.

Specifically, *B. nebrias* differs from *B. declivis* in the shorter articular ridge of the scutum, the more nearly equilateral tergum with a shorter, broader spur, a more pointed, triangular labrum, a less complex armature on the anterior surface of the outer ramus of Cirrus IV, and five rather than four pairs of spines on the median articles of Cirrus VI.

The new species differs from *B. orcutti* in the much shorter rostrum which is not ribbed below the sheath, the absence of an adductor ridge on the scutum, and the shape of the articular ridge of the tergum. The trophi and cirri of *B. orcutti* have not been described. Based on specimens in the Allan Hancock Foundation collection from southern California (described below), *B. nebrias* is seen to have a more angular and narrower labrum, a less angular palp, a mandible with five rather than four distinct teeth, a simpler armament of Cirrus IV, and five rather than four pairs of spines on the median articles of Cirrus VI.



FIGURES 18-23. Trophi and Cirrus IV of *Balanus (Membranobalanus) orcutti* Pilsbry. (18) mandible; (19) first maxilla; (20) labrum; (21) second maxilla; (22) palp; (23) detail of armature of Cirrus IV. (Figs. 18, 19, 21, hypotype no. 1, AHF loc. 1153; Figs. 20, 22, 23, hypotype no. 2, AHF loc. 1170; southern California).

*Balanus nebrias* differs markedly from *B. basicupula*, *B. longirostrum*, and *B. cuneiformis* in the presence of prominent recurved teeth on Cirrus IV, and in the form of the tergal articular ridge. In addition, *B. longirostrum* lacks a scutal depressor muscle pit, and the second and third cirri bear small, erect teeth along the distal margin of the articles. The shell of *B. basicupula* differs in being essentially membranous and flexible.

*Supplementary Description:* mouth parts and cirri of *Balanus orcutti* Pilsbry (Figs. 18-23).

Labrum (Fig. 20) with deep central notch lined with fine setae; labral crest rounded, with sloping sides, but not acutely triangular; two teeth on one side of notch only.

Palps rectangular; superior margin concave, lined by short setae; inner and inferior margins bearing slightly longer setae.

Mandible with four teeth and molariform area above inferior angle; first three teeth approximately equal in size, with second tooth in center of cutting edge and third tooth in center of lower half of cutting edge; second and third teeth bifid; fourth tooth small, often merging with molariform area

below; small spinules present at inferior angle in Hypotype no. 1; superior and inferior margins lined by short, straight spines.

Maxilla I with single pair of large spines at top of cutting edge, followed by well-developed notch bearing one or two small spines; central area of cutting edge with six to ten right-left alternating spines; lowermost pair of spines in Hypotype no. 1 not distinguishable from those of central part of cutting edge; cutting edge of maxilla straight.

Maxilla II bilobed; outer lobe ellipsoid, inner lobe circular; both lobes densely setose.

Cirrus I with grossly unequal rami; anterior ramus three times longer than posterior, antenniform, reversed; posterior ramus densely setose, with protuberant articles; Cirrus II with outer ramus longer than inner, densely setose; Cirrus III subequal to equal, similar in structure to Cirrus II; Cirrus IV with outer ramus shorter than inner ramus, bearing large recurved teeth on anterior surfaces of proximal and medial articles, and large erect teeth on distal anterior surfaces of proximal and medial articles and pedicel; pedicel long, over half the length of outer ramus; inner ramus with small erect spines on distal anterior surfaces of medial articles; Cirrus VI with equal rami; anterior surfaces of medial articles with four pairs of spines; penis bearing four longitudinal rows of setae, and with prominent basidorsal point.

The number of articles for the individual cirri are as follows (those in parentheses indicate broken rami):

Hypotype AHF no. 1:

Cirrus	I	II	III	IV	V	VI
outer (ant.) ramus	30	15	14	20-21	(28)-31	(24-30)
inner (post.) ramus	10	12	15	30-24	35-31	37-34

Hypotype AHF no. 2:

outer (ant.) ramus	27-28	11-14	13-14	22-19	(23)-32	(30)-36
inner (post.) ramus	9	10-11	14	23-25	(30-31)	(33-32)

*Material Examined.* Two hypotypes are deposited in the Allan Hancock Foundation (AHF) collection. Hypotype no. 1: AHF locality 1153-40, 35-46 fathoms on mud bottom, east of Long Point, Santa Catalina Id., Los Angeles County, California. (33° 24' 10" N., 118° 21' 25" W.). July 5, 1940. Hypotype no. 2: AHF locality 1170-40, 80-100 fathoms on sand and gravel. Isthmus Cove, Santa Catalina Id., Los Angeles County, California. (33° 26' 24" N., 118° 27' 35" W.). August 19, 1940.

On the basis of the specimens of *B. orcutti* and *B. nebrias* described herein, it would appear that certain characters that have been judged significant in the differentiation of species of *Membranobalanus* are quite variable. The specific characters implied are the form and length of the rostrum and the width and development of the tergal spur. In *B. orcutti* the rostrum is usually twice the height of the other compartmental plates and tongue- or fingernail-

shaped, but a number of specimens examined have a short rostrum which may be either broadly rounded or narrow and pointed. The terga of specimens from the Allan Hancock Foundation localities have spurs much more like that figured for *B. declivis* (Pilsbry, 1916, pl. 55, figs. 1c, d) than that of the type of *B. orcutti* (Pilsbry, 1916, pl. 55, figs. 2a, c). The width of the spur in relation to the total width of the basal margin is also misleading, and depends particularly on the point of measurement: whether at the root of the spur or at its extremity. In the former case the tergum of *B. orcutti* figured by Pilsbry equals two-thirds of the width of the basal margin, but that of *B. declivis* is larger, occupying nearly three-fourths of the basal margin. When measured at the extremity, the same tergal spur is 55 percent of the margin in *B. orcutti* and 53 percent, or smaller in *B. declivis*. It is probable that the form both of the rostrum and the opercular valves is governed by age and individual habitat of the specimen.

The identification of *B. orcutti* from Algoa Bay, South Africa has always appeared doubtful because of the known distribution of membranobalanid species. Although Barnard (1924) did not illustrate his material, comparison of his description of the mandible and second maxilla of the South African specimens with those described herein from southern California indicate significant differences. Barnard's specimens appear to be more closely related to *B. longirostrum* with which they also have closer geographic affinity.

*Etymology.* The specific name "nebias" is from the Greek for "spotted like a fawn," referring to the color pattern of the cirri.

Genus *HEXACREUSIA* Zullo, 1961

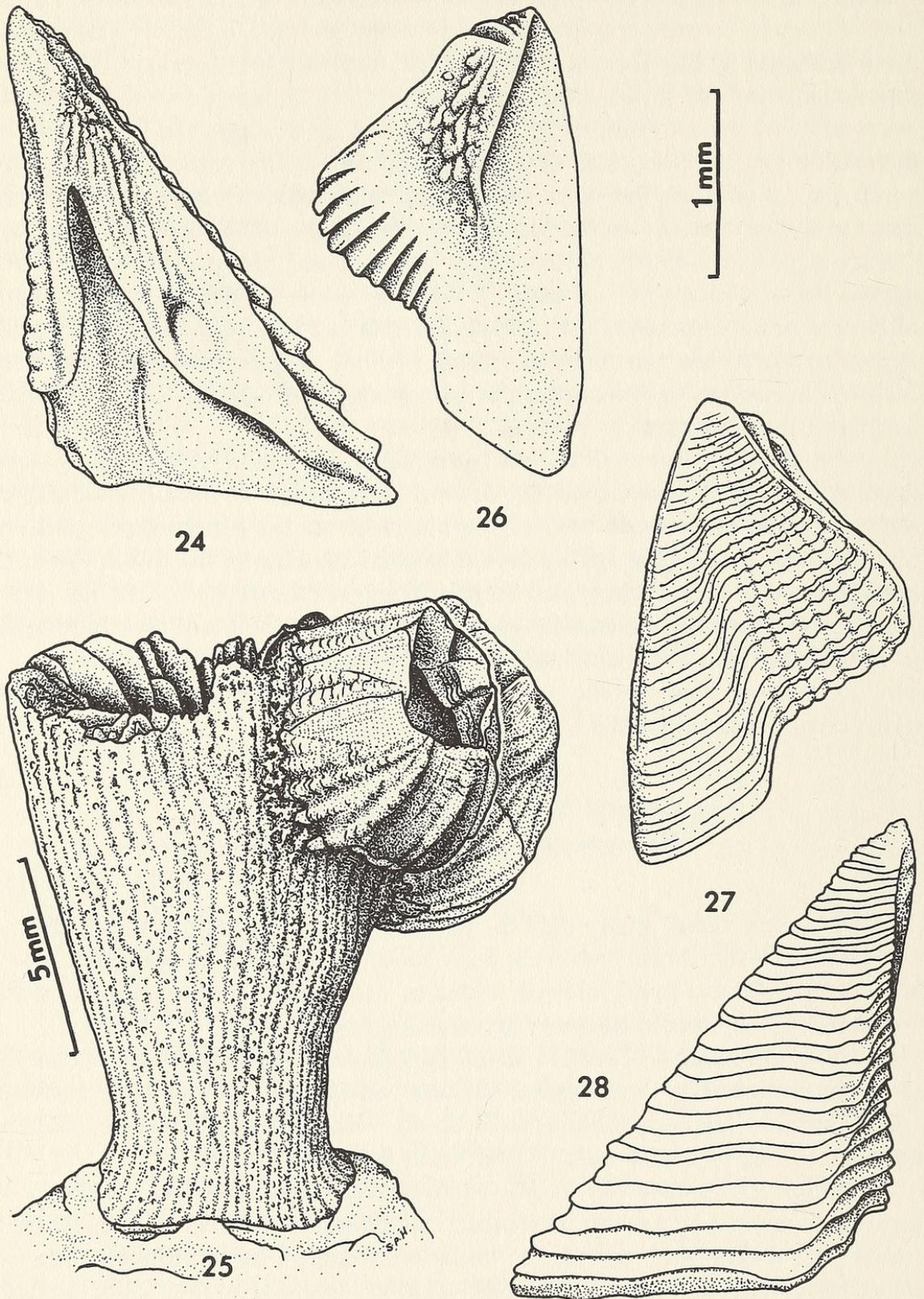
*Hexacreusia straeleni*, new species

Figures 24-34

*Diagnosis.* Solid, high conic to globular shell with large, untoothed orifice and regularly ribbed shell wall; basis solid, cup-shaped; scutum thick, narrow, with well-developed internal adductor shelf; tergum thin, narrow, with truncate tergal spur continuous with basiscutal angle.

*Description.* Shell (Fig. 25) small, light pink to light purple, high conic to globular; orifice large, subtrigonal to diamond-shaped, not toothed; parietes solid, exteriors regularly ribbed; radii broad, with horizontal summits; sheath long, extending nearly to base of shell wall; basis cup-shaped.

Scutum (Figs. 24, 28) thick, narrow, with reflexed tergal margin; exterior ornamented by growth increments only; basal margin short, about three-fourths the length of tergal margin; occludent margin straight, toothed; articular ridge low, long; articular furrow narrow, shallow; a low, thin, arched ridge extends vertically across lower third of valve on tergal side of center; an "adductor shelf" continuous with occludent margin and occludent side of articular ridge projects out over the inner surface of the scutum, leaving a deep pocket beneath it; shelf bears deep, narrow, V-shaped notch centrally;



FIGURES 24-28. Shell and opercular valves of *Hexacreusia straeleni*, n. sp., paratype no. 1. (24) interior of scutum; (25) shell (holotype in background) attached to balanophyllid coral; (26) interior of tergum; (27) exterior of tergum; (28) exterior of scutum.

small, deep, oval adductor muscle pit on lower half of "adductor shelf"; depressor muscle pit small, shallow, situated on basal margin at basitergal angle.

Tergum (Figs. 26, 27) thin, narrow; carinal side of exterior radially ribbed; articular ridge low, thin; articular furrow broad, shallow; depressor muscle crests numerous, well developed; scutal and carinal margins straight; tergal spur broad, nearly one-half width of basal margin, situated at and not differentiated from basiscutal angle; spur furrow open, differentiated only by change in direction of growth lines.

Labrum (Fig. 30) deeply notched, with three teeth on the left and two teeth on the right side of notch.

Palps rectangular, with short, stout, curved, coarsely pectinate setae on the superior margin, and long, slender, nonpectinate setae on the inner margin.

Mandibles (Fig. 29) with five distinct teeth, not including inferior angle; first three teeth of equal size; bifid second tooth at middle of cutting edge; third tooth trifid; fourth tooth with accessory denticles; inferior and superior margins of mandible setose.

Maxilla I (Fig. 31) with straight cutting edge and with small notch below uppermost two large spines; center of cutting edge bears four smaller spines followed by a large pair of spines; base of cutting edge bears tuft of spinules; inferior and superior margins setose.

Maxilla II (Fig. 32) bilobed, anterior lobe small, rounded, posterior lobe large, attenuated; both lobes densely clothed with pectinate setae.

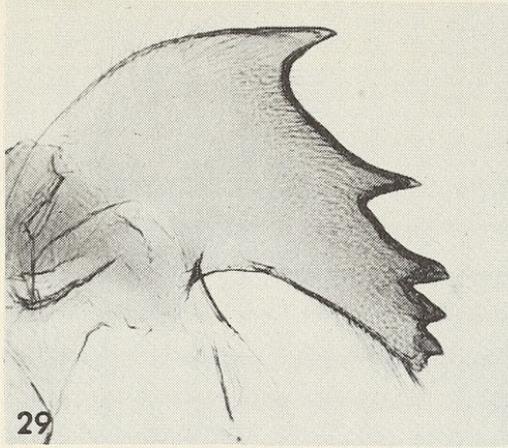
Outer ramus of Cirrus I antenniform, twice as long as stout inner ramus; rami densely setose, with pectinate distal setae; rami of Cirrus II short, stout; outer ramus one-fourth again as long as inner; rami densely setose with pectinate distal setae; rami of Cirrus III (Fig. 33) short, stout; inner ramus one-third again as long as outer; both rami bearing prominent sharp teeth along anterior margins of articles; Cirri IV-VI unarmed, except for occasional tufts of minute spinules near distal edges of articles; long, slender, subequal; a maximum of one small proximal pair and three large distal pairs of setae per article on Cirrus VI (Fig. 34).

The number of articles per cirrus of the holotype is as follows:

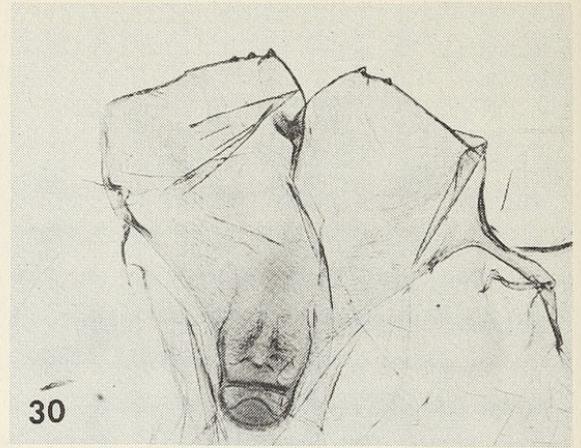
Cirrus	I	II	III	IV	V	VI
outer ramus	13-14	8-9	12	18	21	24
inner ramus	7	7-8	9-10	21	21	24

*Occurrence and Type Disposition.* Holotype and paratype nos. 1 and 2 are deposited in the Natural History Museum of Los Angeles County. The specimens were dredged by Fritz and Carmen Angermeyer off Beagle Island, Galapagos at depths between 55 and 90 m (date of collection unknown).

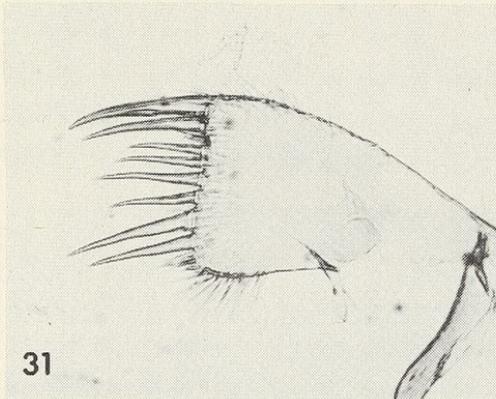
*Discussion.* *Hexacreusia straeleni* can be distinguished from *H. durhami*



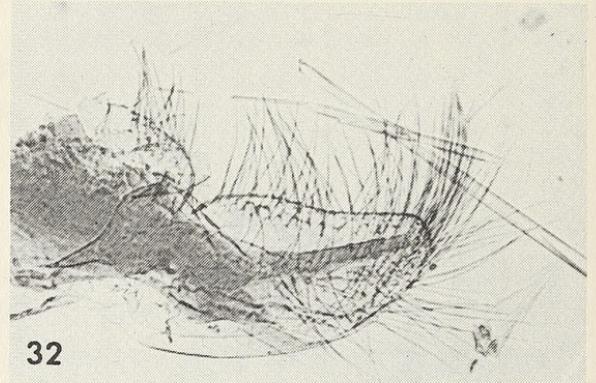
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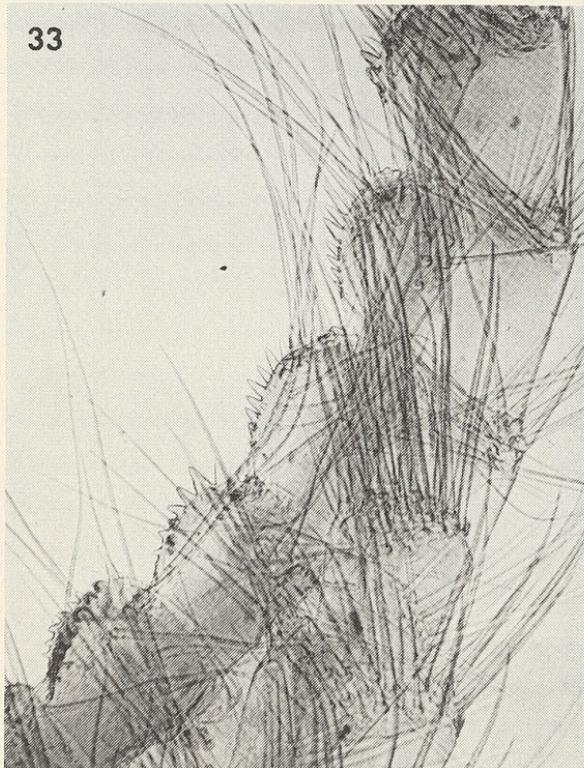
30



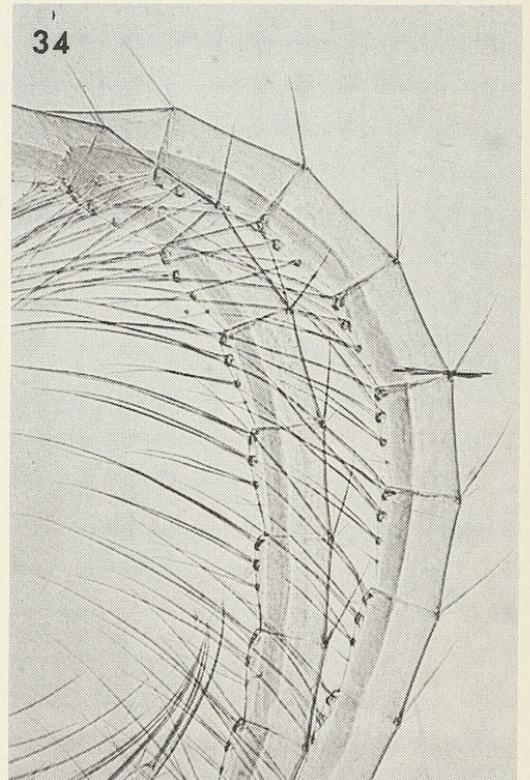
31

0.1 mm

32

0.1 mm

33



34

FIGURES 29-34. Trophi and cirri of *Hexacreusia straeleni*, n. sp., paratype no. 1. (29) mandible; (30) labrum; (31) first maxilla; (32) second maxilla; (33) detail of armature of Cirrus III; (34) setation of median articles of Cirrus VI.

by its choice of coral host, by shell shape, and by opercular valve morphology. Shell shape can be attributed in part to partial embedment in the balanophyllid coral. However, the high conic to globular shell wall of *H. straeleni* would appear to be independent of habitat and differs, therefore, from the patelliform wall of *H. durhami*. The opercular valves of *H. straeleni* are both thicker and narrower than those of *H. durhami*. The scutum of *H. straeleni* has a narrower "adductor shelf," a shorter central internal ridge that is restricted to the basal part of the valve, and smaller adductor and depressor muscle pits. The tergum of *H. straeleni* is notable for its truncate tergal spur that is confluent with the basiscutal angle.

*Etymology.* This species is named for the late Dr. Victor van Straelen, first president of the Charles Darwin Foundation for the Galapagos Islands.

#### ACKNOWLEDGMENTS

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#### RESUMEN

Dos especies nuevas de Cirripedia Thoracica de las Isles Galapagos son descritas. *Balanus (Membranobalanus) nebrias*, especie nueva, se halla en las esponjas amadrigadas en las bases de corales. La especie nueva se parece a *B. declivis* Darwin y *B. orcutti* Pilsbry de la América tropical. *Hexacreusia straeleni*, especie nueva, fue encontrada a los fondos de 55 m a 90 m en los corales balanophyllides, y es la segunda especie conocida de *Hexacreusia*.

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