

AN ANNOTATED CHECKLIST OF HAWAIIAN BARNACLES  
(CLASS CRUSTACEA; SUBCLASS CIRRIPIEDIA)  
WITH NOTES ON THEIR NOMENCLATURE, HABITATS  
AND HAWAIIAN LOCALITIES

by

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Technical Report No. 19

August 1970

#### ACKNOWLEDGMENTS

I wish to thank Drs. Keith Chave, Ernst Reese, Dennis J. Crisp and Ralph Bowers for their encouragement and suggestions in compiling this report.

I also wish to thank Mrs. Bronwen Solyom, of the Bernice P. Bishop Museum, for her help in compiling the bibliography. Together we have tried to expand Darwin's references so that it would be easier for others to find the correct papers.

The work was done with financial assistance from National Science Foundation Sea Grant GH-62.

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## Introduction

This work brings together a great deal of scattered literature regarding barnacles or cirripeds (Class Crustacea; Subclass Cirripedia) found in Hawaii. It is by no means a survey of the present cirriped fauna in the Hawaiian Islands, but rather, an annotated checklist of the species which have been reported from the Islands.

There have been 37 species representing 19 genera and 4 families reported from Hawaiian waters to this date. Two species were dredged on the Tanager Expedition 1923-24; 11 species were dredged on the Albatross Expedition 1902; and the remaining 24 species were found in the intertidal zone around the Islands. Like all workers in the field of Cirripedology, I have relied on Darwin for most of the background information regarding classification and original description. Darwin published two works, one on the family Lepadidae in 1851 and another on the families Balanidae and Verrucidae in 1854. Both works were published by the Ray Society of London. Darwin was the first person to extensively describe the subclass Cirripedia and to lay the ground rules for their systematics.

Very little has been done since his time. Gruvel wrote a similar but less extensive monograph in 1905, in French, which was re-printed in 1965 by A. Asher and Co., Amsterdam, in a very handsome volume. Henry A. Pilsbry wrote two papers on Hawaiian barnacles (1907A and 1927) which form the basic source of information for Hawaiian cirripedilogs. In 1916, Pilsbry wrote an extensive work covering all the barnacles in the collection of the U. S. National Museum, including a monograph of the American species. Hawaii was not part of the United States at that time and so very little attention was given to the Hawaiian Islands.

Since 1927, nothing has been done to bring the Hawaiian barnacle fauna up to date. Edmondson (1933 and 1946), Newman (1960 and 1961), Jones

(1968), Bowers (1965) and Tomlinson (1963 and 1969) have made isolated observations. It is hoped that this work will provide the framework for a later island-wide cirriped survey.

### Classification

Leach proposed the first cirriped classification in 1825: (contents of families in brackets)

#### Class Cirripedes

##### Order 1. Campylosomata

##### Family Clytidae (Conchoderma)

##### Pollicipedidae (Lepas, Scapellum)

##### Ibladae (Ibla)

##### Order 2. Acamptosomata

##### Family Coronulidae (Coronula, Chelonibia)

##### Balanidae (Balanus, Tetraclita, Chthamalus)

##### Clistidae (Verruca)

Darwin revised this scheme in 1852-1854. He demonstrated the important morphological differences between the whale barnacles (Coronula) and the turtle barnacles (Chelonibia). He also separated the Chthamalidae from the Balanidae on morphological differences. These changes together with a classification based on definite morphological characteristics have made Darwin's works a chief source of reference, even today. Darwin recognized three orders in the subclass Cirripedia

##### Order 1. Apoda

##### Order 2. Abdominalia

##### Order 3. Thoracica

##### Family Lepdaidae (Lepas, Scapellum)

Balanidae

Subfamily Balaninae (Balanus, Tetraclita)

Chthamalinae (Chthamalus, Catophragmus)

Verrucidae (Verruca)

In this work, I have followed Darwin's classification with regard to the order Thoracica. However, when Darwin established the order Abdominalia, he erroneously assumed that the cirri on the terminal segments of the body were abdominal rather than thoracic. This error was noted by Gruvel in 1905 who changed the name to Acrothoracica. With this change, the systematics in this paper follow this plan:

Class Crustacea

Subclass Cirripedia

Order Apoda

Order Acrothoracica

Family Lithoglypidae

Order Thoracica

Family Lepadidae

Family Balanidae

Subfamily Balaninae

Subfamily Chthamalinae

Family Verrucidae

Nomenclature

When Darwin wrote his two-volume monograph on the Cirripedia, he found it necessary to name the various parts of the cirriped before he could describe and compare the species coherently. In doing so, he reduced the confusion which prevailed in all the writings before his time.

The Lepadidae or goose-neck barnacles have a 'neck' or peduncle which may be naked or squamiferous, and a 'head' or capitulum. The capitulum may also be naked but more often it is covered with valves (Fig. 1). The scutum is one of the more persistent valves. It is recognized by an internal hollow to which the adductor scutorum muscle attaches. The name, scutum, is taken from the resemblance to which the two valves together bear to a shield and from their anterior position. The two terga lie on the dorsal-lateral surface of the animal. Other valves include the carina, the rostrum, sub-carina, sub-rostrum and the latera. The margins of the valves are named from the adjoining valves.

These names of the valves are also applicable to the valves of the sessile cirripeds, the Balanidae and the Verrucidae. These cirripeds have a shell, or testa, and an operculum, or opercular valves. The opercular valves are seated within the orifice of the shell; the cirri protrude through the valves to gather food from the surrounding water. The shell consists of a basis which can be either membranous or calcified and of compartments which vary from eight to four in number and which occasionally may be calcified together. These compartments are individually named: the carina is at that end of the shell where the cirri are extended through the opercular valves; the rostrum is the opposite compartment; on the sides are the lateral compartments, that nearest the carina being the carino-lateral, that nearest the rostrum, the rostro-lateral, and the middle one, the lateral compartment. These compartments may or may not be present all together in one species.

Each compartment is formed of a wall or parietal portion which grows downward forming the basal margin and of two wing pieces, the alae or the radii, or an ala on one side and a radius on the other - the distinction

# Capitulum

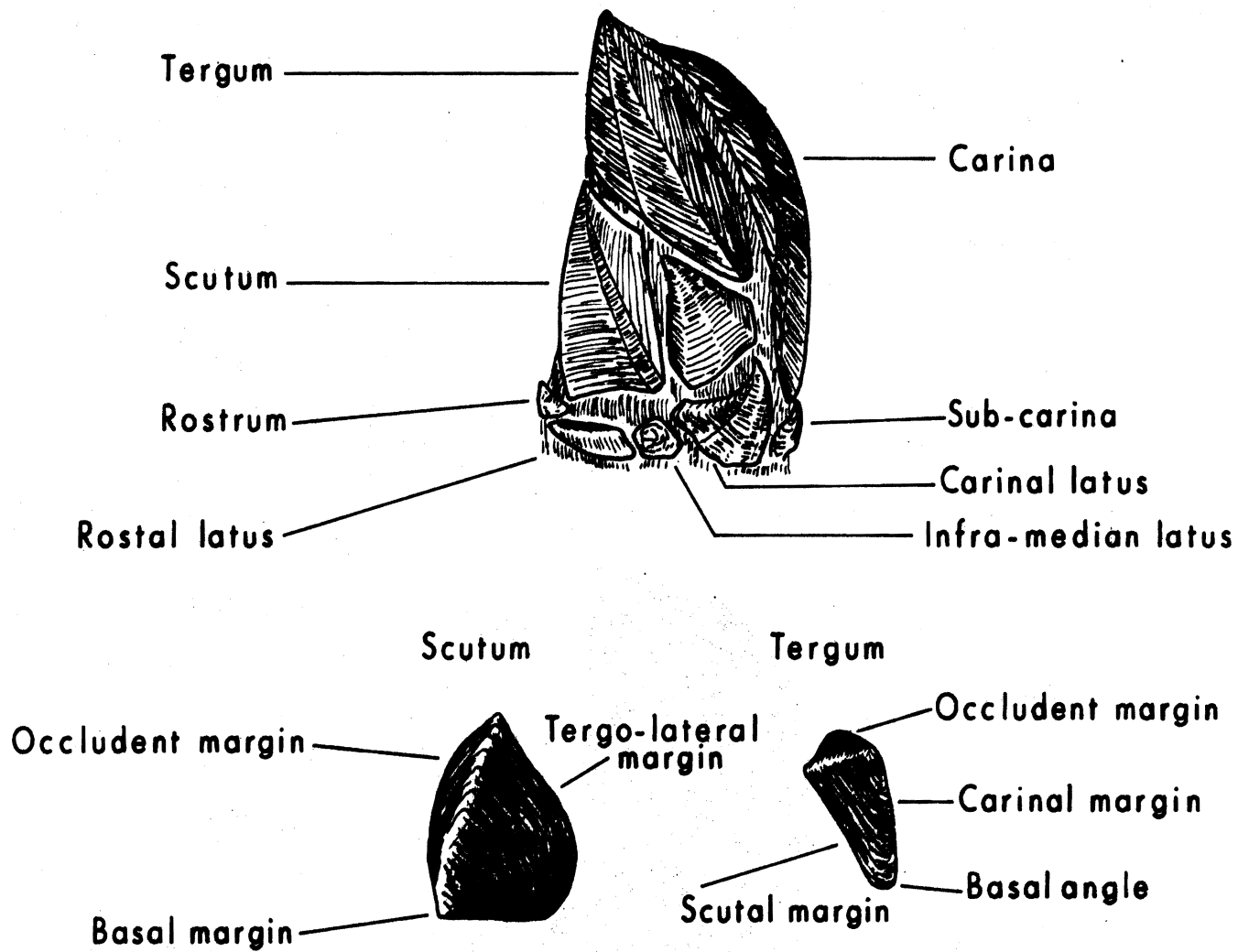


Fig. 1

Capitulum and opercular valves of a pedunculate cirriped. Drawn from Darwin, 1851.



being based on the lines of growth. The opercular valves in the sessile cirripeds consists of a pair of scuta and a pair of terga (Fig. 2). These valves are connected to the sheath of the shell by the opercular membrane. These valves are the main identification tool of the cirripedologist. The shape of the valves and the position of the various ridges and furrows are constant for each species. The scutum is triangular in shape. The margins are the basal; the tergal, articulating with the tergum; and the occludent, which opens and shuts against the opposing valve. The angles of the scutum are named from the adjoining margins, the basi-tergal angle, etc. The scutum is articulated to the tergum by the articular ridge which runs up to the apex of the valve and by the articular furrow, which receives the scutal margin of the tergum. Another furrow is the adductor pit or cavity for the attachment of the adductor scutorum muscle. This pit is bounded on its tergal and basal sides by the adductor ridge which is sometimes continuous with the articular ridge. In the basi-tergal corner of the valve, is often found the lateral depressor pit where the same named muscle attaches. The tergum is also three-margined: the scutal, the basal, and the carinal margins. The upper end of the tergum is the apex and projecting from the lower or basal margin, is the spur. The outer surface is often depressed or longitudinally furrowed in the line of the spur. The angles are named from the adjoining margins as in the scutum. In the apex, internally, is the articular ridge, and on the scutal margin, is the articular furrow, which receives the articular ridge of the scutum. In the basi-carinal corner of the valve, there are crests where the tergal depressor muscle attaches. These are very well developed in some terga and not present in others.

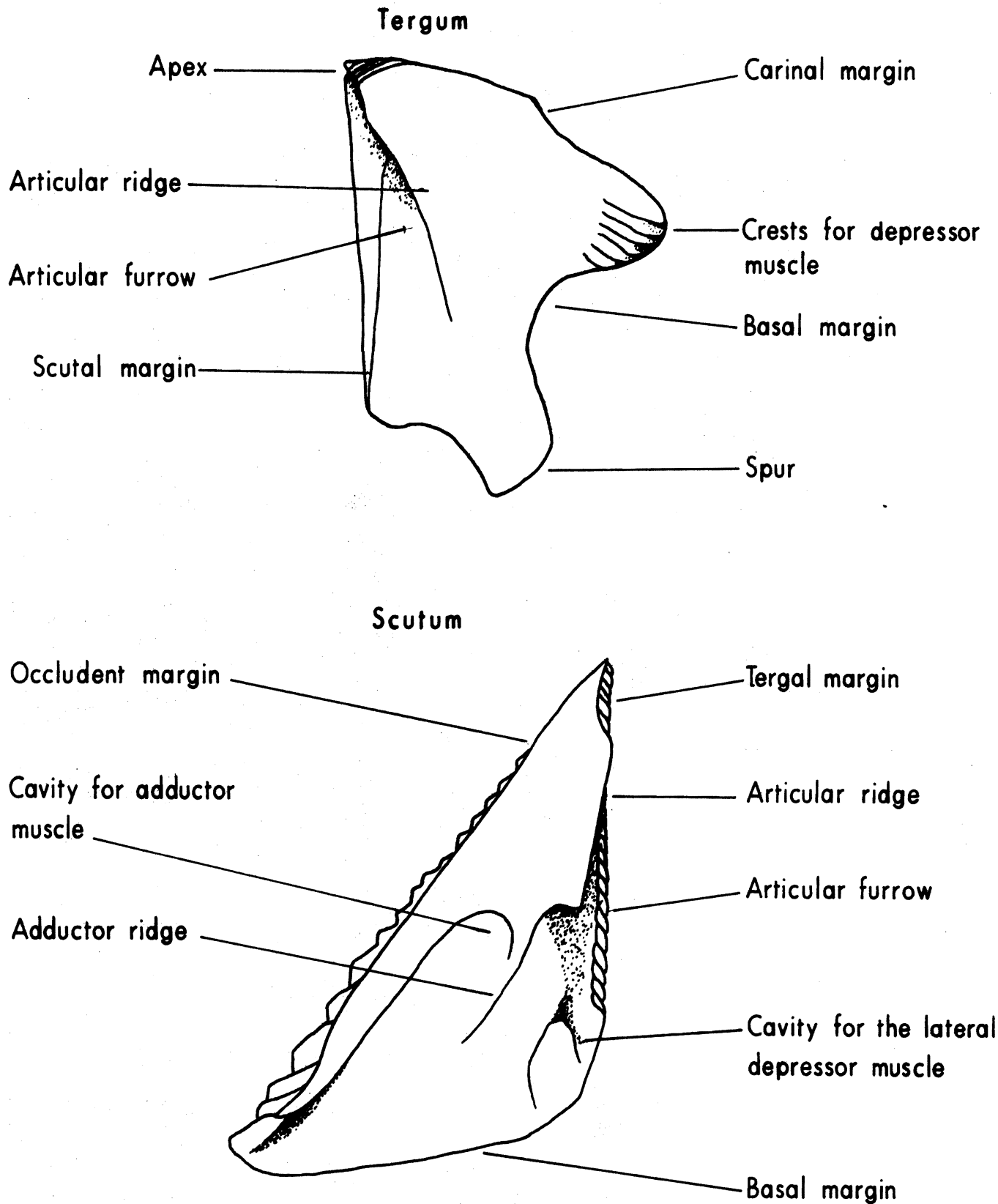


Fig.2

Opercular valves of a sessile cirriped, Balanus eburneus. Drawn from a specimen collected in Kaneohe Bay, Oahu.

These features are used for the general identification of cirripeds and they are illustrated in this paper. For finer identification, i.e., subspecies, the tools of identification are the maxillae, the mandibles and the cirri of the body. These are lengthy to describe, they can be found in Darwin (1851 and 1854) for members of the families Lepadidae, Balanidae and Verrucidae and in Tomlinson (1969) for the Acrothoracicans.

### Hawaiian Reports

#### Class Crustacea

##### Subclass Cirripedia

Order Apoda      no Hawaiian species recorded

##### Order Acrothoracica

Family Lithoglyptidae      Cryptophialus unguinulus Tomlinson

Lithoglyptes mitis Tomlinson

Weltneria hirsuta (Tomlinson)

##### Order Thoracica

Family Lepadidae      Conchoderma virgatum hunteri (R. Owen)  
Heteralepas (Paralepas) percarinata Pilsbry  
Heteralepas rex (Pilsbry)  
Lepas anatifera Linnaeus  
Lepas anserifera Linnaeus  
Lepas australis Darwin  
Lepas fascicularis Ellis and Solander  
Megalasma (Megalasma) minus Annandale  
Mitella mitella Broch  
Octolasmis hawaiiense Pilsbry  
Octolasmis (Octolasmis) indubia Newman

Octolasmis lowei (Darwin)

Paralepas palinuri urae Newman

Poecilasma kaempferi Darwin

Scapellum hawaiiense Pilsbry

Scapellum pacificum Pilsbry

Trilasmis eburneum Hinds

Trilasmis fissum hawaiiense Pilsbry

## Family Balanidae

### Sub-Family Balaninae

Balanus amphitrite Darwin

Balanus amphitrite hawaiiensis Broch

Balanus eburneus Gould

Balanus hawaiiensis Pilsbry

Balanus tintinnabulum tanagrae Pilsbry

Balanus trigonus Darwin

Chelonobia patula (Ranzani)

Chelonobia testudinaria (Linnaeus)

Tetraclita costata Darwin

Tetraclita purpurascens (Wood)

Tetraclita wireni pacifica Pilsbry

### Sub-Family Chthamalinae

Catophragmus darwini Pilsbry

Chthamalus hembeli (Conrad)

Chthamalus intertextus Darwin

## Family Verrucidae

Verruca cookei Pilsbry

Verruca halotheca Pilsbry

Order Acrothoracica Gruvel, 1905

Acrothoracicans lack the protective valves found in other cirripeds. They are found in burrows made in dead shelly material, limestone or in live barnacles, coral, chitin, gastropod and pelecypod shells. According to Tomlinson (1969), they do little, if any harm to the host; they collect food without taking from or giving anything to the host.

The exact shape of the burrow varies according to its position within the burrowed material and to the other encrusting animals. The burrow aperture is a tapered slit a few millimeters long and less than a millimeter wide.

Fossil forms have been found in limestone, coral, echinoids and mollusc shells from the Carboniferous to Recent times.

The body is little more than a sack containing the much reduced digestive, excretory, muscular, circulatory, respiratory and reproductive systems. There are five pairs of cirri and three pairs of appendages. There is no abdomen in the adult forms. Males are usually dwarf forms.

All acrothoracicans found in Hawaii belong to the same family, Lithoglyptidae Aurvillus 1892, which is characterized by having a well developed mouth appendages and an alimentary canal without teeth.

Cryptophialus unquinculus Tomlinson

1969. Cryptophialus unquinculus. Tomlinson, U. S. Nat. Mus. Bull. 296, 1969,  
p. 112, fig. 29.

Habitat

C. unquinculus has been reported in Thais aperta, the type shell, from Necker Island; in Turbo marmoratus L. from Nitendi or Santa Cruz Island; in Turbo lajonkairi from Wake Island; and in Turbo aperta Balinv. from Mokolea Rock and Manana, Oahu, Hawaii and from Necker Island.

The holotype of this species was found on Necker Island in Thais aperta shell. The specimen may be found in the Bishop Museum, number B 461.

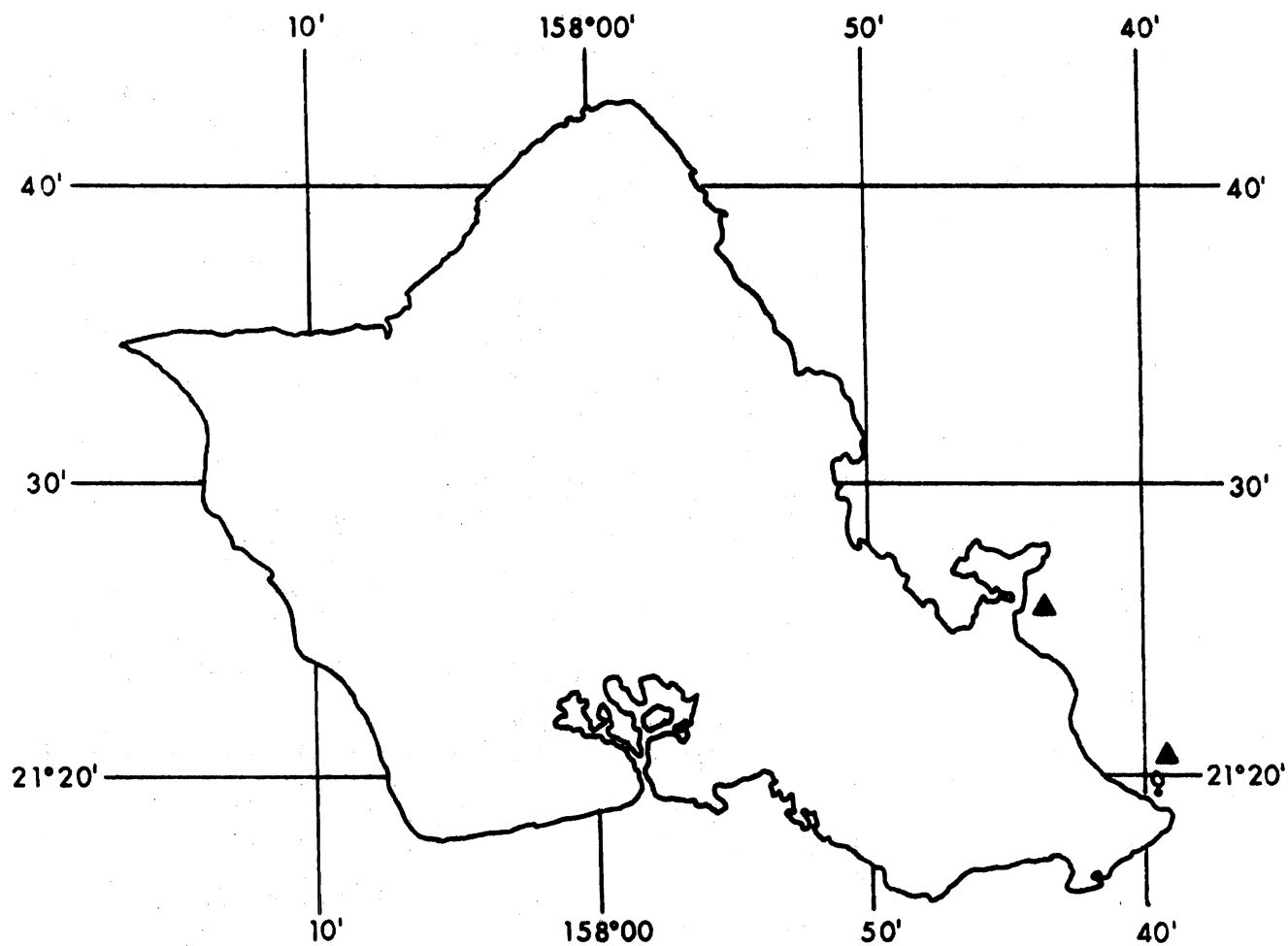
Hawaiian Records

Wake Island. Tomlinson, 1969.

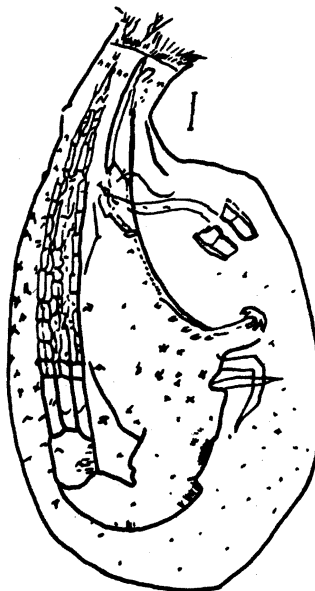
Mokolea Rock, Oahu. Tomlinson, 1969.

Manana, Oahu. Tomlinson, 1969.

Necker Island, Hawaiian Islands. Tomlinson, 1969.



Distribution of Cryptophialus unguinculus Tomlinson on Oahu.



**Fig.3**

Cryptophialus unguiculus Tomlinson. Side view of a female from Thais aperta from Necker Island, Hawaii. Drawn from Tomlinson, 1969. Scale is 0.1 mm.



Lithoglyptes mitis Tomlinson

1969. Lithoglyptes mitis. Tomlinson, U. S. Nat. Mus. Bull. 296, 1969,  
p. 52, fig. 9.

Habitat

This new species has been reported from various parts of the Pacific by Tomlinson (1969): Nadi Bay, Veti Levu, Fiji; Tutuila, Nuuuli, Samoa; Ponape, Caroline Islands; Kwajalein, Marshall Islands; and from Necker Island, and from Mokolea Rock and Manana, Oahu. In most areas, they were found in burrows in gastropod shells, and in two cases, they were found in coral. These gastropods included Bursa bubo L. and Ricinula rubicunda from Fiji; Trochus obeliscus Gmelin from Samoa; Trochus incrassatus and Spondylus from Ponape; Thais tuberosa Roding (= Purpurea pica L.) from Kwajalein; and Thais aperta Balinv. from Necker Island and Oahu.

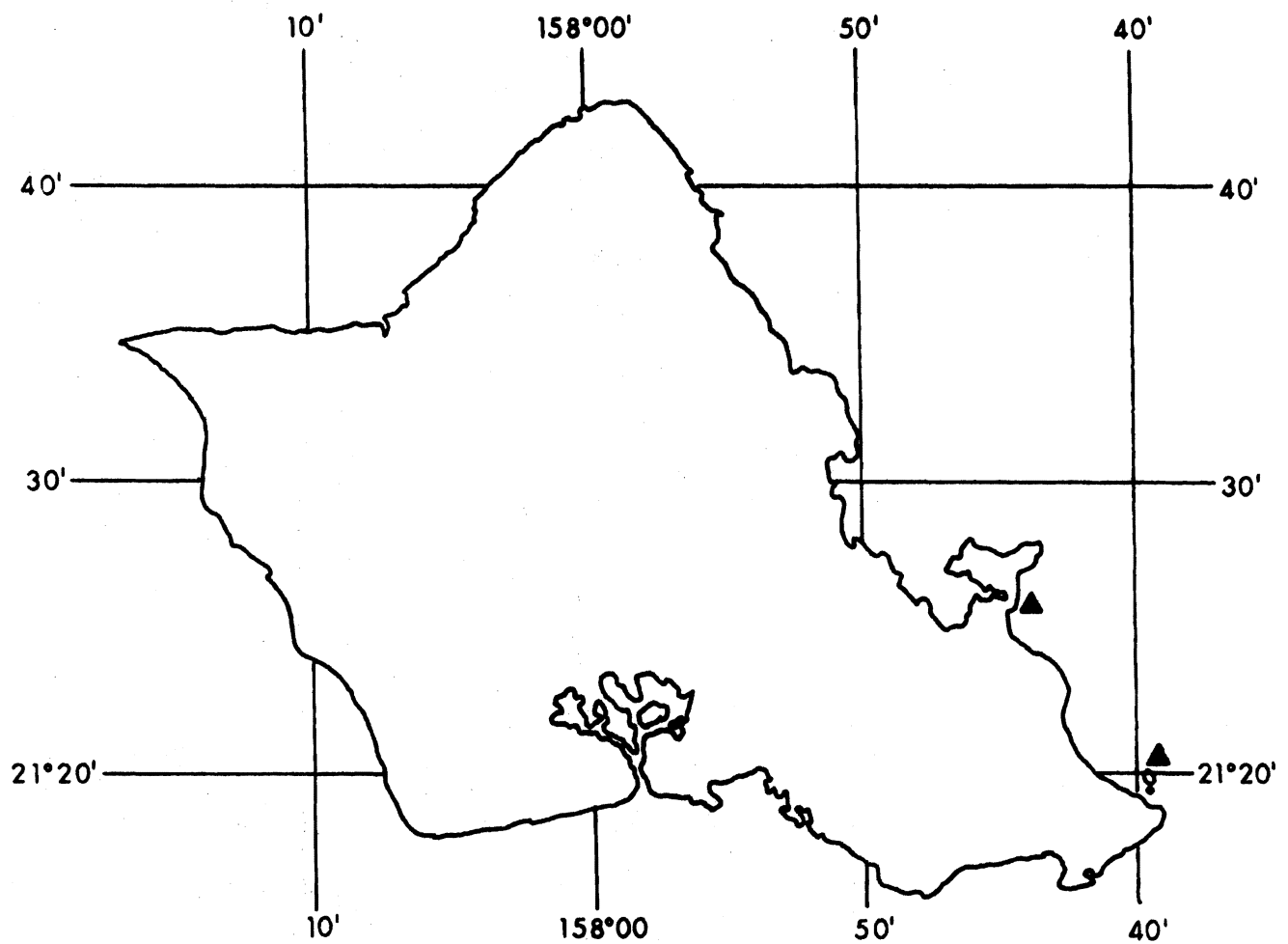
The Hawaiian specimens were found in association with another acrothoracican, Cryptophialus unguinulus Tomlinson, 1969.

Hawaiian Records

Necker Island. Tomlinson, 1969.

Mokolea Rock, Oahu. Tomlinson, 1969.

Manana, Oahu. Tomlinson, 1969.



Distribution of Lithoglyptes mitis Tomlinson on Oahu.



**Fig.4**

Lithoglyptes mitis Tomlinson. Side view of a female found in coral in Kwajalein, Marshall Islands. Drawn from Tomlinson, 1969.

Weltneria hirsuta (Tomlinson)

1892. Lithoglyptes hirsutus. Aurvillus, 1892.

1963. Lithoglyptes hirsutus. Tomlinson, Pacific Science 17(3), 1963,  
p. 299-301, figs. 1-7.

1963. Utinomia newmani. Tomlinson, Publ. Seto Mar. Biol. Lab., vol. 11,  
no. 2, 1963, p. 263-280.

1969. Weltneria hirsuta. Tomlinson, U. S. Nat. Mus. Bull. 296, 1969, p. 36,  
fig. 2.

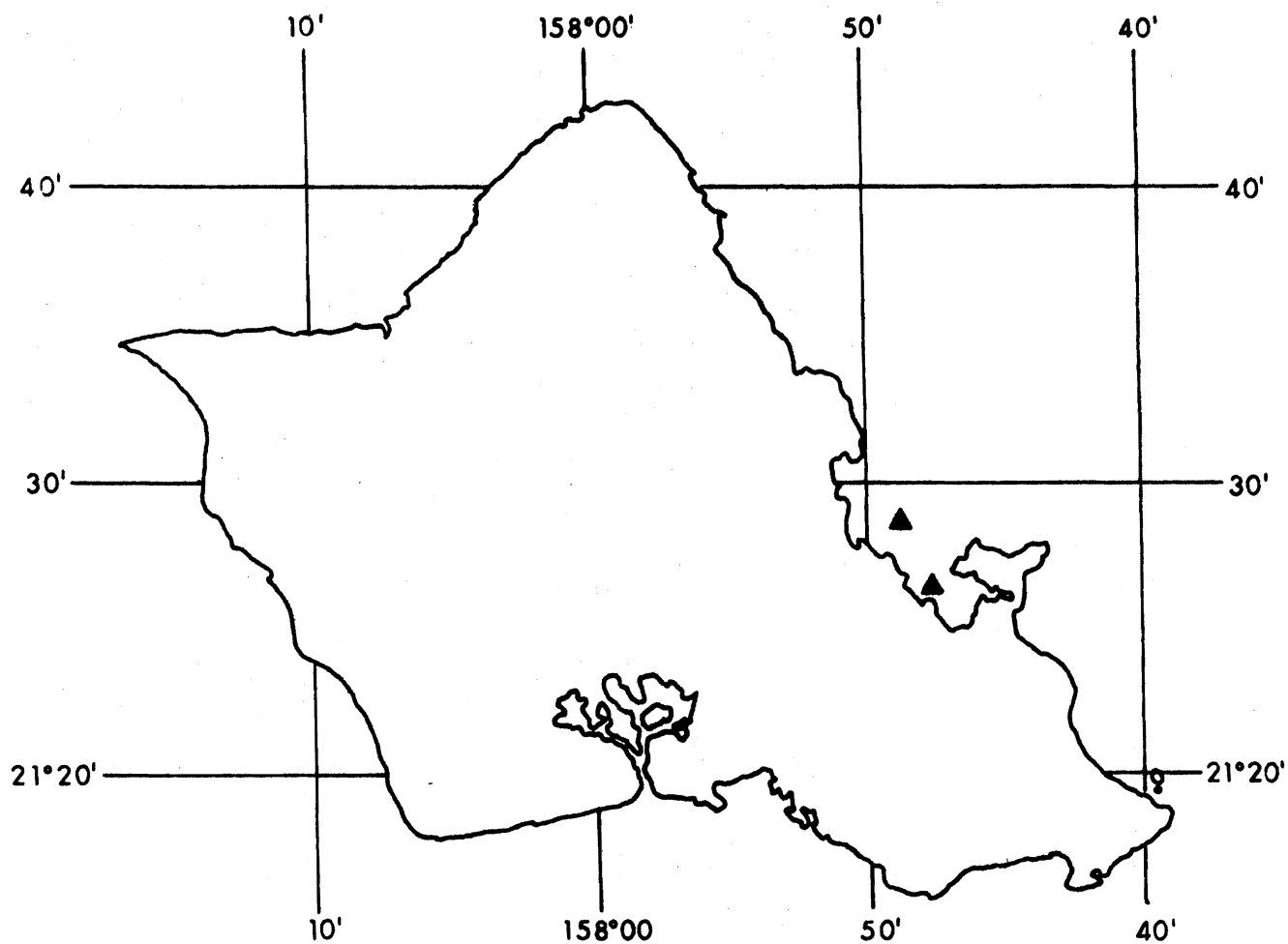
Habitat

Specimens of Weltneria hirsuta reported from Hawaii have all been found in coral: in Psammocora verrilli Vaughan at a depth of 3-6 feet on Sand Bar Reef and in Porites compressa Dana from the northeast side of Checker Reef in Kaneohe Bay, Oahu. The cirriped burrow is attached to the coral by means of a mantle attachment disc which can be readily dislodged when the coral is decalcified. The aperture length is about 0.97 mm. W. hirsutus has also been reported from Bursa bufo (Roding) from Seto, Wakayama-Ken, Japan.

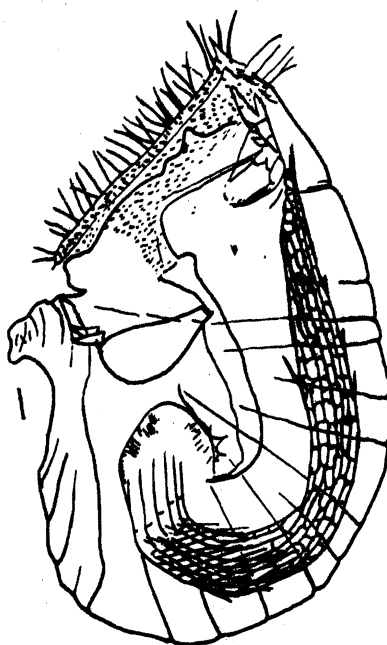
Hawaiian Records

Sand Bar Reef, Kaneohe Bay, Oahu. Tomlinson, 1969.

NE Checker Reef, Kaneohe Bay, Oahu. Tomlinson, 1969.



Distribution of Weltneria hirsuta (Tomlinson) on Oahu.



**Fig.5**

Weltneria hirsuta (Tomlinson). Side view of a female with a male from Coconut Island, Kaneohe Bay, Oahu. Drawn from Tomlinson, 1969. Scale is 0.1 mm.

### Order Thoracica

This order includes all the common cirripeds. They are permanently attached to the substrate, before their final metamorphosis, with cement from glands opening through the second pair of antennae. This single character is common to all cirripeds. The eyes are rudimentary in the adult, the mouth is prominent being surrounded by a labrum, palps, mandibles and two pairs of maxillae. The thorax bears six pairs of captorial, biramous and multi-articulated appendages and the abdomen is rudimentary. They are generally bisexual, however, when unisexual, the males are epizoic on the females. Metamorphosis is complex, with six free-swimming naupliar stages and a settling cyprid stage.

There are three families within this order-

Family Lepadidae

Balanidae

Verrucidae

### Family Lepadidae

These cirripeds have a flexible muscular peduncle. The scuta have the adductor muscle but no lateral depressor muscle. The other valves, when present, are not united into an immovable ring as in the other thoracicans.

Conchoderma virgatum hunteri

Edmondson (1946) has the only report of this barnacle from Hawaii. I can find no mention of this particular subspecies in any of the cirriped monographs. According to Darwin (1851), Pilsbry (1907B, 1916) and Gruvel (1905), there is a Conchoderma virgatum Spengler, 1790 and a Conchoderma hunteri R. Owen, 1830, but they make no reference to a Conchoderma virgatum hunteri (R. Owen).

Habitat

Darwin (1851) reported that this genus was found throughout the equatorial, temperate and cold sea; attached to floating objects.

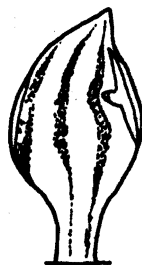
Annandale (1906) stated that the species was probably confined to the tropical parts of the Indian and Pacific Ocean, the only known localities at that time were the Maldives or Laccadives and New Britain. He noted that it was often found on Hydrus platurus and once on a telegraph cable. It is a rare cirriped.

Edmondson (1946) reported that this species was found living on a submerged buoy in 15 feet of water off the coast of Oahu.

Hawaiian Records

Oahu. Edmondson, 1946.





**Fig.6**

Conchoderma virgatum hunteri (R. Owen). Drawn from Edmondson, 1946.

Heteralepas (Paralepas) percarinata Pilsbry

1907. Alepas percarinata. Pilsbry, Bull. Bur. Fisheries 26, 1907, p. 185,  
pl. 4, fig. 8.

1907. Heteralepas (Paralepas) percarinata. Pilsbry, U. S. Nat. Mus. Bull.  
60, 1907, p. 103.

Habitat

This genus comprises all the species referred to as Alepas by Darwin, Hoek, Gruvel, Annandale and other authors with the exception of A. parasita Rang, the type specimen of Alepas. (Pilsbry, 1907B).

Members of this genus are known as the nude barnacles in that the muscular layer of the peduncle is continuous with the integument of the capitulum; the scuta are absent, or minute and chiefly chitinous; and no other plates have developed.

All the specimens found by Pilsbry were attached to the bottom of the ocean. Pilsbry (1907A) originally described this species under the name of Alepas percarinata. It was recorded from various Albatross station around the Hawaiian Islands: in 283 f. on a bottom of grey mud and fine sand in the Pailolo Channel; in 241-282 f. on a bottom of coral sand and foraminifera on the northwest coast of Oahu; and in 259-261 f. on a bottom of light brown mud and sand and on Cnidarius (sea urchin) spines off the south coast of Molokai. It would appear that this species is commonly to be found on fine grain substrates.

Hawaiian Records

Albatross station 3866, in the Pailolo Channel between Maui and Molokai in 283 f. Pilsbry, 1907A.

Albatross station 4116 and 4117 off the northwest coast of Oahu in 241-282 f. *ibid.*

Albatross station 3839 off the south coast of Molokai in 259-266 f. *ibid.*

Albatross stations 4081, 4082, 4083, and 4084 off the north coast of Maui  
in 202-267 f. Pilsbry, 1907B.

Albatross station 3835 off the south coast of Molokai in 169-182 f. *ibid.*

Albatross station 3912 off the north coast of Molokai in 334 f. *ibid.*

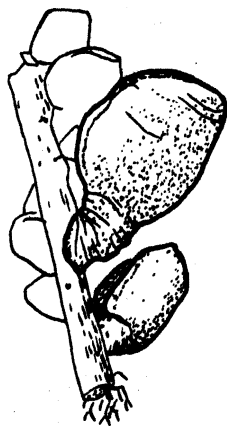


Fig.7

Heteralepas (Paralepas) percarinata Pilsbry. Drawn from Pilsbry, 1907A.

Heteralepas rex (Pilsbry)

1907. Alepas rex. Pilsbry, Bull. Bur. Fisheries 26, 1907, p. 186, pl. 4,  
fig. 7.

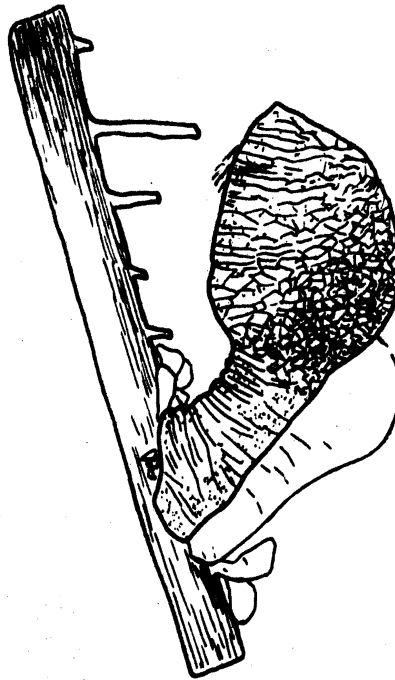
1907. Heteralepas rex. Pilsbry, U. S. Nat. Mus. Bull. 60, 1907, p. 100,  
fig. 34b.

Habitat

Heteralepas rex (Pilsbry) is the type specimen for the genus Heteralepas. This species was originally described as Alepas rex by Pilsbry in 1907 (1907A). Specimens were dredged on Albatross Expedition near Kauai in 228 to 235 fathoms. The bottom habitat was coarse broken coral, sand and shells. The cirripeds were found living on dead stems of gorgonians.

Hawaiian Records

Albatross station 3998, vicinity of Kauai in 228-235 f. Pilsbry, 1907A.



**Fig.8**

Heteralepas rex (Pilsbry). Drawn from Pilsbry, 1907A.

Lepas anatifera Linnaeus

1767. Lepas anatifera. Linnaeus, Systema Naturae, 1767.

Anatifera vel Anatifera vel Pentalasmis laevis, pleurumque auctorum

1789. Anatifera dentata (var.). Brugiere, Encyclop. Meth. (des Vers), 1789.

1837. Anatifera engonata. Conrad, Journal Acad. Nat. Sci. Philadelphia,  
vol. 7, 1837, p. 262, pl. 20, fig. 15.

1835. Anatifera dentatus (var.). Martin St. Ange, Mem. sur l'organisation  
des Cirripeds, 1835.

1844. Pentalasmis dentatus (var.). Brown, Illust. Conch., 1844, pl. lii,  
fig. 5.

1851. Lepas anatifera. Darwin, Ray Society, London, 1851, p. 73.

1907. Lepas anatifera. Pilsbry, U. S. Nat. Mus. Bull. 60, 1907, p. 79, pl. 9,  
figs. 3, 4, 5.

Habitat

At the time of Darwin, Lepas anatifera was common throughout the world. He reported (1851) that the species was frequently found attached to floating timber, vessels, bottles, seaweed, etc., in the Atlantic Ocean, the Mediterranean, the West Indies, the Indian Ocean, the Philippine Archipelago, the Sandwich Islands, Bass's Straits and Van Diemens Land.

Although Pilsbry (1907B) noted that L. anatifera was common in all seas on floating objects, he gave no records from the Hawaiian Islands. In 1927, Pilsbry reported that the species was found at Malaekahana, Oahu by Chas. M. Cooke III; and at Kupehu on Molokai on a log on the shoreline by W. A. Bryan.

Edmondson (1933) describes L. anatifera as a common species in Hawaii, often found attached to drift logs washed ashore.

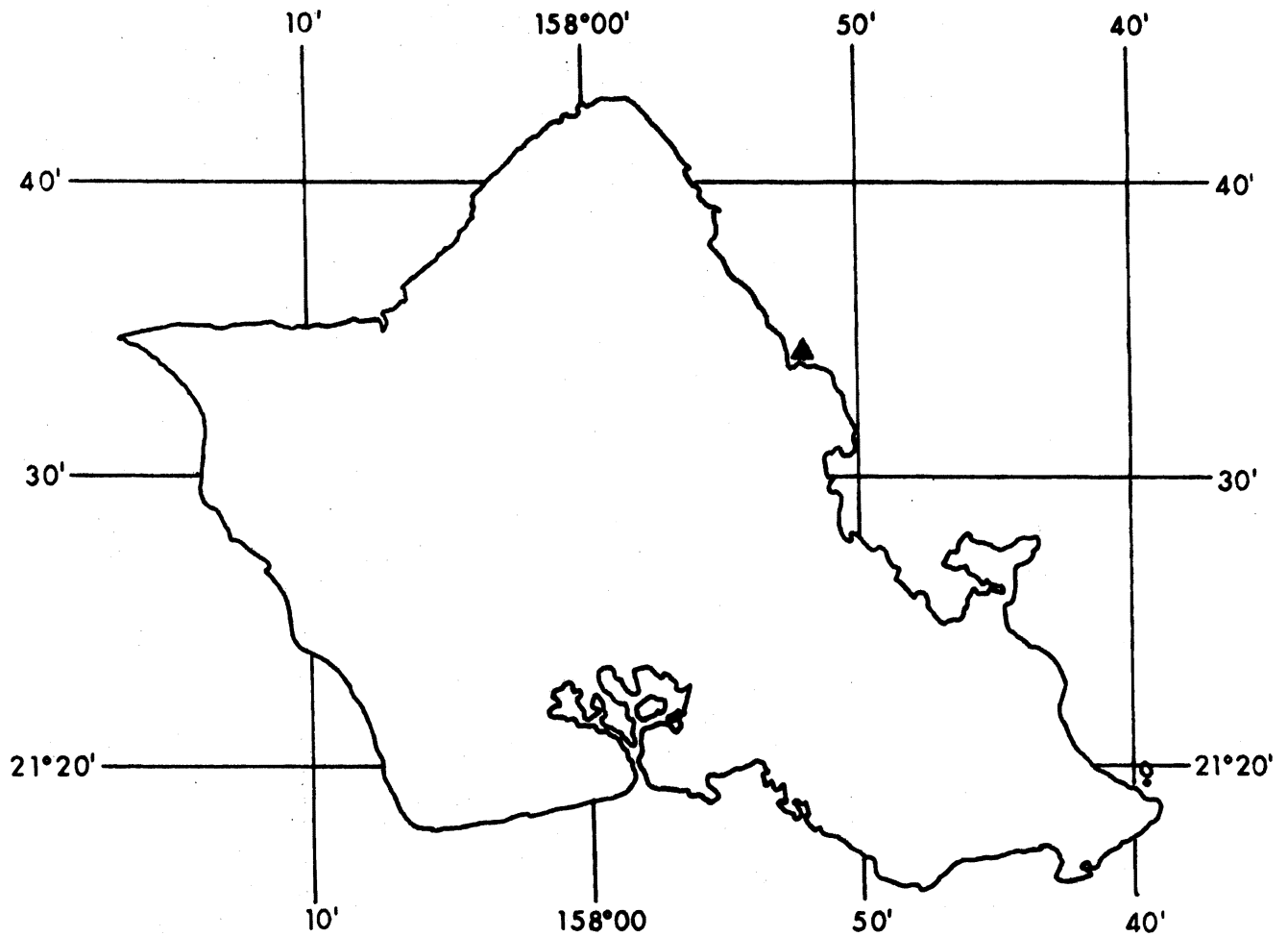
Hawaiian Records

Malaekahana, Oahu. Pilsbry, 1927.

Kupehu, Molokai. Pilsbry, 1927.

Hawaiian Islands. Edmondson, 1933.





Distribution of Lepas anatifera Linnaeus on Oahu.



**Fig.9**

Lepas anatifera Linnaeus, natural size. Drawn from Darwin, 1851.

Lepas anserifera Linnaeus

1767. Lepas anserifera. Linnaeus, Systema Naturae, 1767.

Anatifera striata. Brugiere, Encyclop. Meth. (des Vers), pl. clxvi,  
fig. 3.

1818. Pentalasmis dilatata. Leach, Tuckey's Congo Exped., 1818, p. 413.

Anatifera sessilis (?). Quoy and Gaimard, Voyage de l'Astrolabe,  
pl. xciii, fig. 11.

Lepas nauta. Macgillivray, Edin. New Phil. Journ., 38, p. 300.

1844. Pentalasmis anseriferus. Brown, Illust. Conch., 1844, pl. li, fig. 1.

1851. Lepas anserifera. Darwin, Ray Society, London, 1851, p. 81, pl. 1,  
fig. 4.

1907. Lepas anserifera. Pilsbry, U. S. Nat. Mus. Bull. 60, 1907, p. 80,  
pl. 8, figs. 1, 3.

Habitat

Darwin (1851) reported that L. anserifera was a common cirriped found on ship's bottoms around the world - Mediterranean, West Indies, South America, Mauritius, Africa, East Indian Archipelago, Central Pacific Ocean, China Sea, Chusan and Sydney. He noted that it was often found attached to pumice, various species of fuci (Janthine and Spriulae) or in association with other cirripeds such as L. anatifera, and L. hilli and with the younger stages of L. fascicularis.

Pilsbry (1907B) confirmed this worldwide distribution and added a few more reported localities including Honolulu, Hawaii. He noted that the species was commonly found on driftwood and floating seaweeds or in association with other pedunculate cirripeds such as L. pectinata. In 1927, Pilsbry reported that this species was found attached to a log at Mokapu Lighthouse on Oahu by W. A. Bryan. He also reported that the species has been found on Laysan Island by the Tanager Expedition.

Edmondson (1933) described L. anserifera as a common barnacles being found on logs washed up on shore.

Jones (1968) found this species living on the snail, Ianthina, at Kailua, Oahu.

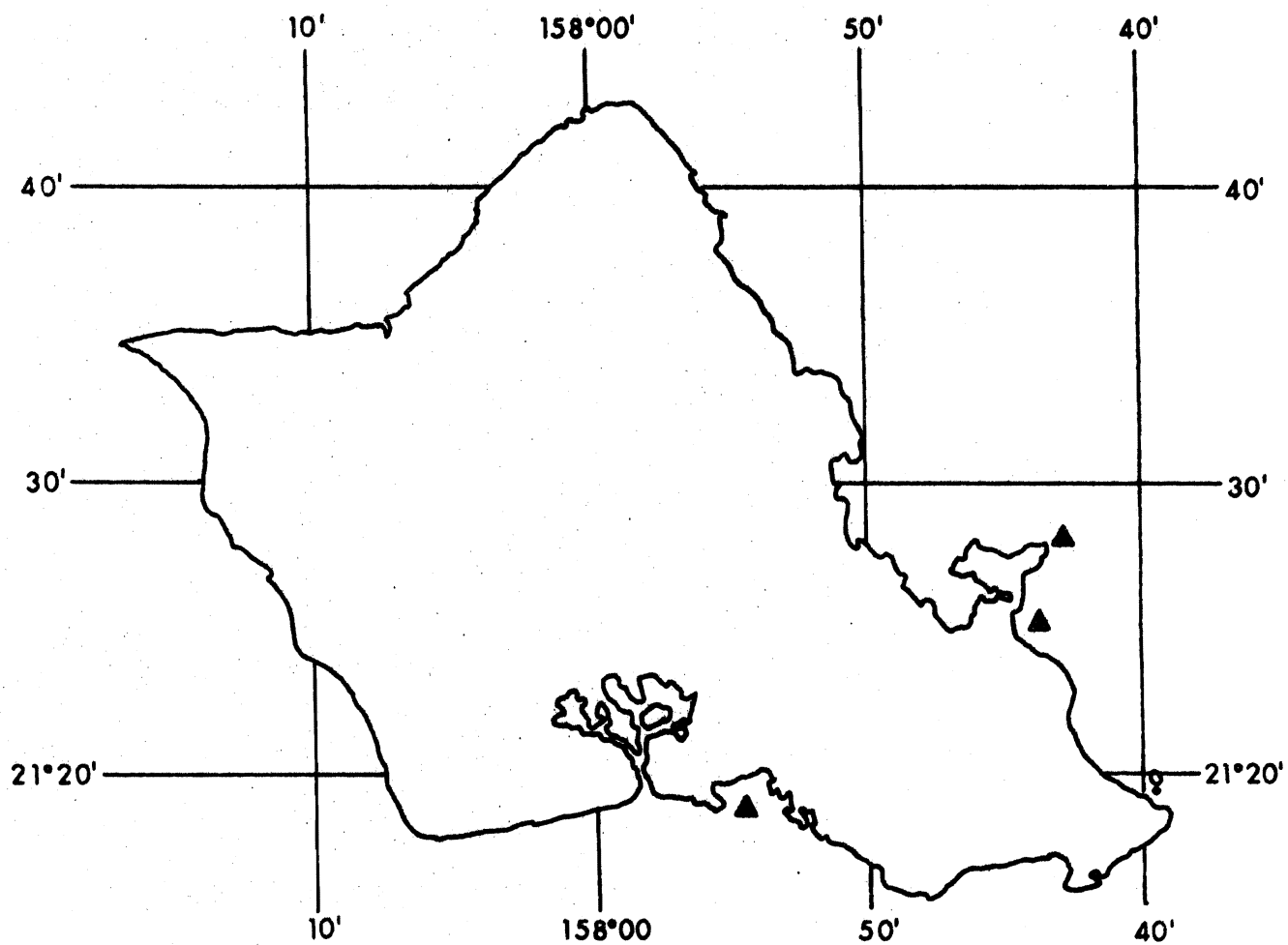
#### Hawaiian Records

Honolulu, Oahu. Pilsbry 1907B.

Mokapu Lighthouse, Oahu. Pilsbry 1927.

Hawaiian Islands. Edmondson, 1933.

Kailua Bay, Oahu. Jones, 1968.



Distribution of Lepas anserifera Linnaeus on Oahu.



Fig.10

Lepas anserifera Linnaeus, natural size. Drawn from Darwin, 1851.

Lepas australis Darwin

1851. Lepas australis. Darwin, Ray Society, London, 1851, p. 89, pl. 1,  
fig. 5.

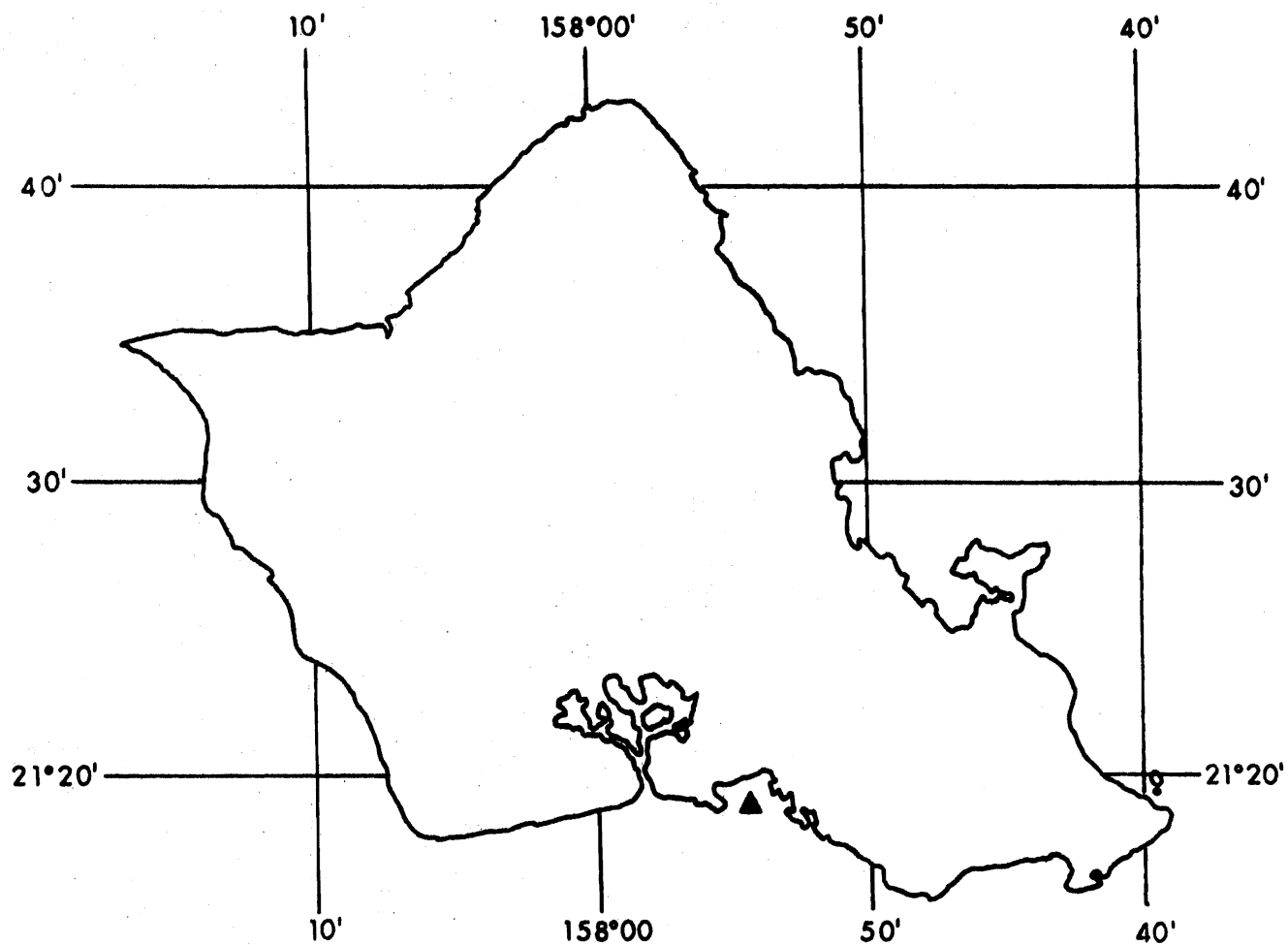
Habitat

Darwin (1851) reported Lepas australis as being common on Laminariae in the Antarctic Ocean, Bass's Straits, Van Diemen's Land, Bay of Islands in New Zealand, and in Patagonia. They were found attached to the bottom of the vessel, H. M. S. Beagle and to a Nullipora. The only record from Hawaii is Pilsbry (1927) who notes that the species was found in Honolulu by Weltner (Archiv. f. Natururg., Jarg. 1897, 1, p. 245.). He makes no reference to the habitat.

Edmondson (1933) makes no reference of the species being found in the Hawaiian Islands.

Hawaiian Records

Honolulu, 1897. Pilsbry, 1927.



Distribution of Lepas australis Darwin on Oahu.





**Fig.11**

Lepas australis Darwin, natural size. Drawn from Darwin, 1851.

Lepas fascicularis Ellis and Solander

1786. Lepas fascicularis. Ellis and Solander, Zoophytes, 1786, Tab. xv,  
fig. 5.
1790. Lepas cygnea. Spengler, Skrifter Naturhist. Selbskabet, Bd. 1, 1790,  
Tab. vi, fig. 8.
1804. Lepas dilata. Donovan, British Shells, 1804.
1808. Lepas fascicularis. Montagu, Test. Brit. Suppl., 1808, pp. 5, 164.
1818. Pentalasmis spirulicola et Donovani. Leach, Tuckey's Congo Exped.,  
1818, p. 413.

Anatifera vitrea. Lamarck, Animaux sans vertebres.

1825. Dosima fascularis. J. E. Gray, Annals of Philosophy, 1825, 10.
1830. Pentalasmis vitrea. Lesson, Voyage de la Coqville. Mollusca, 1830,  
pl. xvi, fig. 7.
- Anatifera oceanica. Quoy and Gaimard, Voyage de l'Astrolabe, pl. xciii.
1844. Pentalasmis fascicularis. Brown, Illust. Conch., 1844, pl. li, fig. 2.
1851. Lepas fascicularis. Darwin, Ray Society, London, 1851, p. 92, pl. 1,  
fig. 6.

Habitat

Darwin (1851) reported that Lepas fascicularis was worldwide in its distribution being found in Great Britain and France; in the Baltic Sea (acc. to Montagu); southern United States (from Agassiz); tropical Atlantic Ocean, East Indian Archipelago, off Borneo and Celebes; in the Pacific Ocean between the Marianna Islands and the Sandwich Islands; and in New Zealand. Darwin noted that it was frequently found attached to fuci (*Spirulae*, *Janthinae* and *Velellas*), to feathers and cork. It was also found associated with the younger stages of L. anserifera and L. pectinata.

Edmondson (1933) mentioned that this cirriped was found in Hawaii attached to the shell of the floating mollusk Ianthina fragilis Lamarck. The largest Hawaiian species which Edmondson examined has a shell and stalk, each about 12 mm long.

#### Hawaiian Records

Hawaiian Islands. Edmondson, 1933.



**Fig.12**

Lepas fascicularis Ellis and Solander, natural size. Drawn from Darwin, 1851.

Megalasma (Megalasma) minus Annandale

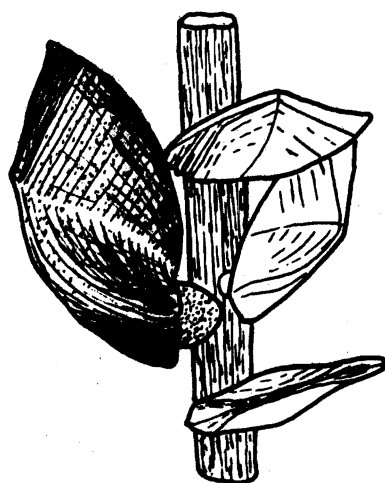
1906. Megalasma striatum minus. Annandale, Ann. Mag. Nat. Hist. 17, 7th series, 1906, p. 399.
1907. Poecilasma bellum. Pilsbry, Bull. Bur. Fisheries 26, 1907, p. 183, pl. 4, fig. 6.
1907. Megalasma bellum. Pilsbry, U. S. Nat. Mus. Bull. 60, 1907, p. 93.
1907. Megalasma lineatum. Hoek, Siboga Expeditie, Monogr. 31a, 1907, Leiden.
1922. Megalasma minus. Broch, Papers from Dr. Th Mortensen's Pacific Expedition, 1914-1916, 1922, 10. Studies of Pacific Cirripedes:215-358.
1961. Megalasma (Megalasma) minus. Newman, Veliger, 1961, 4(2), p. 104.

Habitat

In most collection areas, these cirripeds were found growing on the substrates of coral sand, mud and foraminifera and globigerina ooze. At one Albatross station, 4117, they were noted to be aggregated on large sea urchin spines.

Hawaiian Records

- Albatross station 4117, northeast coast of Oahu in 241-282 f. Pilsbry 1907A.
- Albatross station 3998, vicinity of Kauai in 228-304 f. *ibid*.
- Albatross station 4090, 4097, 3883, and 3866 in the Pailolo Channel between Molokai and Maui in 277-302 f. *ibid*.
- Albatross station 3839 south coast of Molokai in 259-266 f. *ibid*.
- Albatross station 4081 and 4084 off the north coast of Maui in 202-267 f. Pilsbry, 1907B.
- Albatross station 4088 between Maui and Molokai. *ibid*.
- Albatross station 3893 in the Kaiwi Channel between Molokai and Oahu in 220 f. *ibid*.



**Fig.13**

Megalasma (Megalasma) minus Annandale. Drawn from Pilbry 1907A,  
under the name Poecilasma bellum.

Mitella mitella Linnaeus

1767. Lepas mitella. Linnaeus, Systema Naturae, 1767.

Pollicipes mitella. G. B. Sowerby, Genera of Shells, fig. 2.

1824. Polylepas mitella. De Blainville, Dict. Sc. Nat., 1824, fig. 5.

1825. Capitulum mitella. J. E. Gray, Annals of Philosophy, new series,  
1825, 10.

1851. Pollicipes mitella. Darwin, Ray Society, London, 1851, p. 316, pl. 7,  
fig. 3.

1931. Mitella mitella. Broch, Vidensk Medd. Dansk. Naturh. Foren. Kbh.  
91, p. 1-146.

There is some disagreement over the correct generic name of this species. According to Reese (personal communication), it is thought by several cirripedologists that the correct generic name for this species is Pollicipes mitella Linnaeus. This change in nomenclature has not as yet been published to my knowledge.

Habitat

Darwin (1851) stated that members of this genus that occur in the warmer and tropical seas are usually found attached to fixed objects and less commonly to floating ones. He noted that P. mitella (= M. mitella) was recorded from the Phillipine Archipelago, China Sea, Amboyna and the East Indian Archipelago as well as from Madagascar.

Broch (1922) found this species living "on the shoreline" in Hawaii. He gave no further information on its habitat.

Hawaiian Records

Hawaii. Broch, 1922.



**Fig.14**

Mitella mitella Linnaeus, natural size. Drawn from Darwin, 1851, under the name Pollicipes mitella. View of whole animal and internal views of the scutum and tertum, showing the articular fold of the tergum.



Octolasmis hawaiiense (Pilsbry)

1907. Dichelaspis hawaiiensis. Pilsbry, Bull. Bus. Fisheries 26, 1907,  
p. 184, pl. 4, fig. 5.

1907. Octolasmis hawaiiense. Pilsbry, U. S. Nat. Mus. Bull. 60, 1907, p. 97.

Habitat

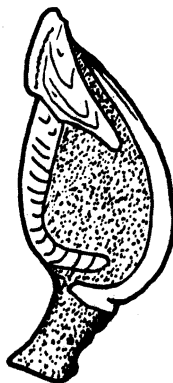
Members of this genus are found on large crustacea in all warm seas and in the depths of the ocean. In those species living on crustacea, Newman (1961) hypothesized that there has been a reduction in the external armament in response to the protection afforded by the host. This cirriped is one of the free living members and like other free living species, it has the valves better developed than those species living on the gills of crabs. This species was first reported from Hawaii by Pilsbry (1907A) who called the species Dichelaspis hawaiiensis. The Albatross station number was not preserved and so the exact location can not be given. The cirriped was living on a slender gorgonian. Later that year, Pilsbry (1907B) renamed the species Octolasmis hawaiiense. Further specimens were found off the south coast of Oahu, Albatross station 3810, and off Puniawa Point on Maui, Albatross station 4081. There was no information given on the habitat of the species found in Hawaii.

Hawaiian Records

Albatross station unknown. Pilsbry, 1907A.

Albatross station 3810 off the south coast of Oahu in 211-253 f. Pilsbry  
1907B.

Albatross station 4081 off Puniawa Point, Maui in 202-220 f. *ibid*.



**Fig.15**

Octolasmis hawaiiense (Pilsbry). Drawn from Pilsbry 1907A,  
under the name Dichelaspis hawaiiensis.

Octolasmis (Octolasmis) indubia Newman

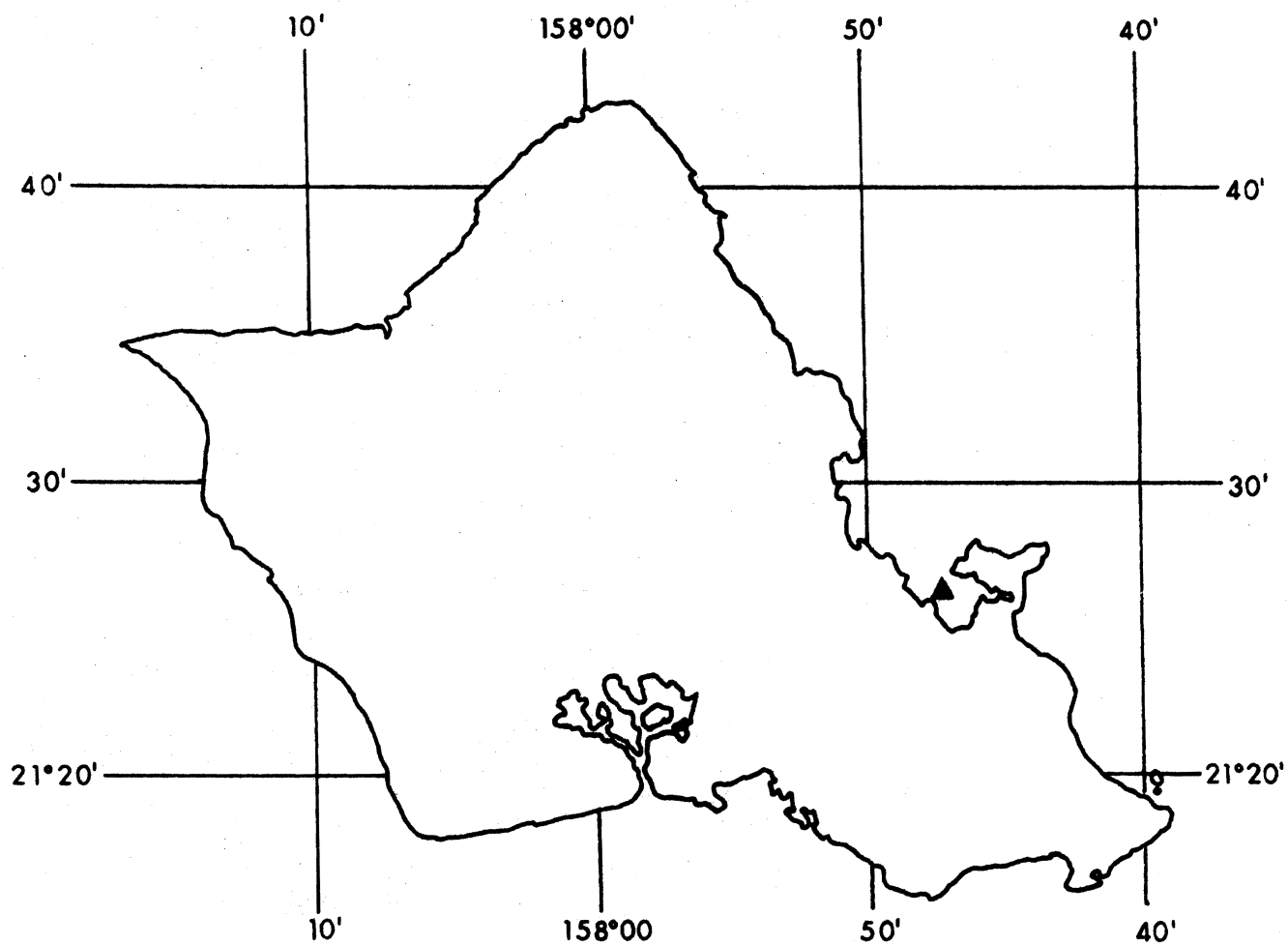
1961. Octolasmis (Octolasmis) indubia. Newman. Veliger 4(2), 1961, p. 102,  
pl. 22.

Habitat

In contrast to O. hawaiiense which is a free living species, Octolasmis (Octolasmis) indubia has been found living on the slipper lobster. Numerous specimens were found living on the mouth parts of a single specimen of Scyllarides squamosus (Milne-Edwards). On the gills of the same specimen, specimens of Octolasmis lowei (Darwin) were living. The five valves are incompletely calcified and they often appear as seven valves. The holotype is U. S. N. M. cat no. 107'310; paratypes are U. S. N. M. cat no. 107'311 and 107'312.

Hawaiian Records

Coconut Island, Kaneohe Bay, Oahu. Collected by Stephen Wainwright.  
Newman, 1961.



Distribution of Octolasmis (Octolasmis) indubia Newman on Oahu.

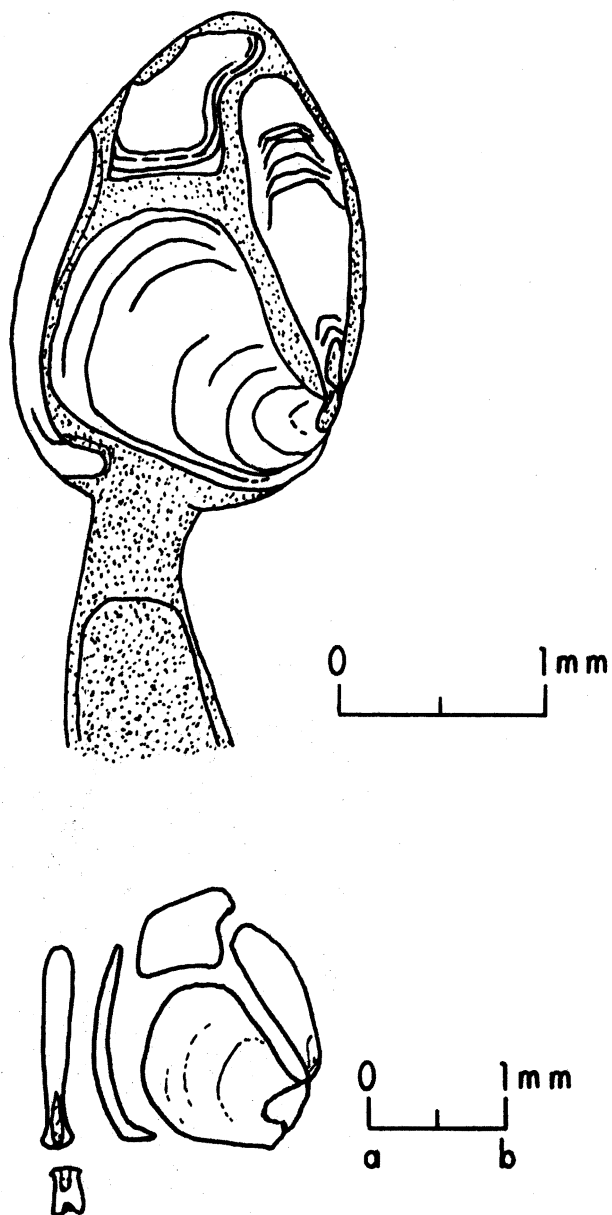


Fig.16

Octolasmis (Octolasmis) indubia Newman. Drawn from Newman, 1961. Lateral view of whole animal with (a) an anterior and dorsal view of the carina, and (b) lateral views of the disarticulated valves, the carina, scutum and tergum.

Octolasmis lowei (Darwin)

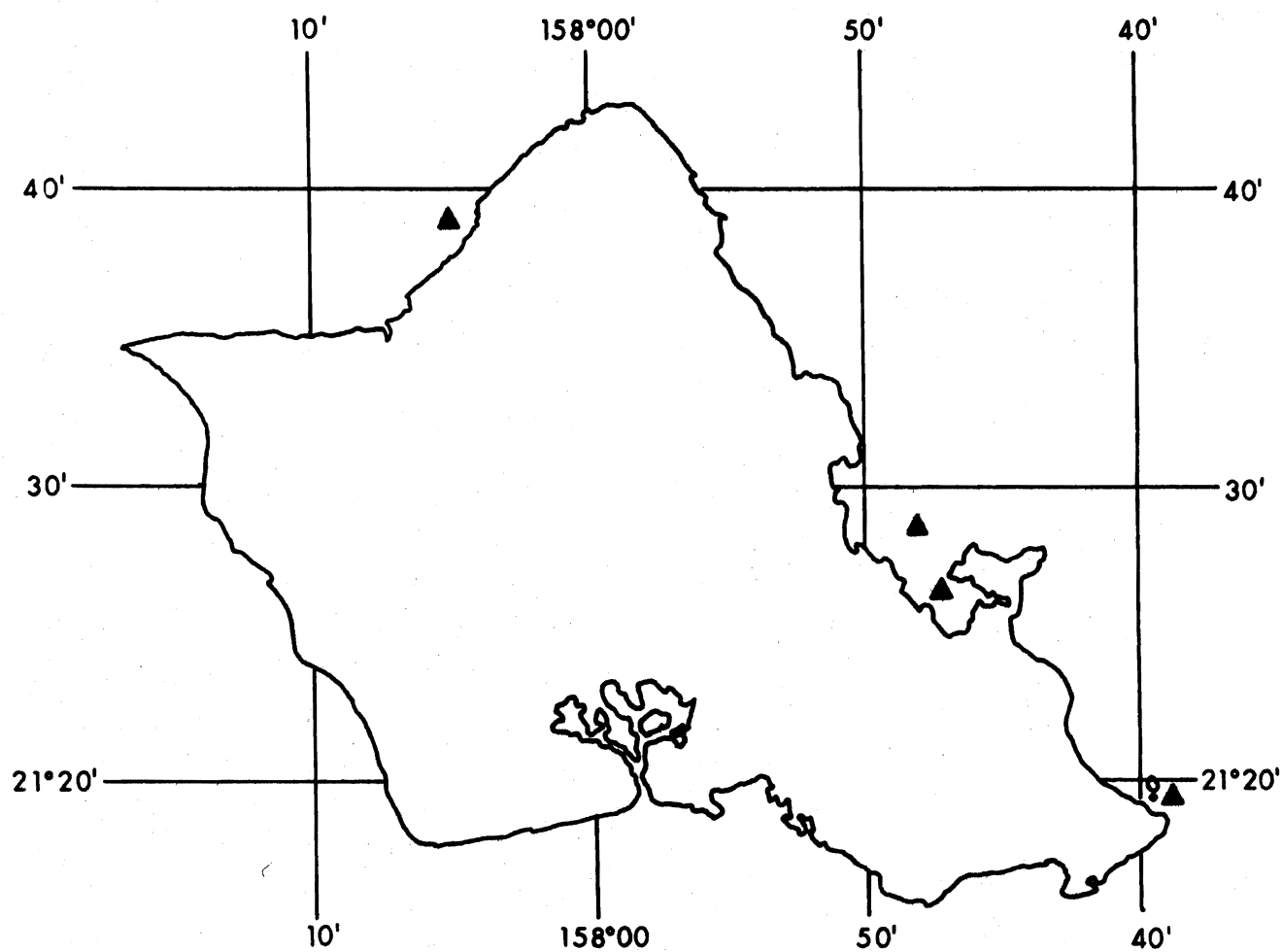
1851. Dichelaspis lowei. Darwin, Ray Society, London, 1851, p. 128, pl. 2.
1894. Octolasmis trigona. Aurivillius, Studien uber Cirripeden. Kongl. Sv. Vet. Ak. Handl., 1894, 26(7), p. 4-107.
1938. Octolasmis lowei. Nilsson-Cantell, Cirripedes from the Indian Ocean. Mem. Ind. Mus. 13, 1938, p. 1-81.
1951. Octolasmis uncus. Pearse, Proc. U. S. Nat. Mus. 101, 1951, p. 369, fig. 77k.
1951. Octolasmis brevis. Pearse, Proc. U. S. Nat. Mus. 101, 1951, p. 370, fig. 77j.
1960. Octolasmis lowei. Newman, Crustaceana 1, 1960, p. 106, fig. 4.

Habitat

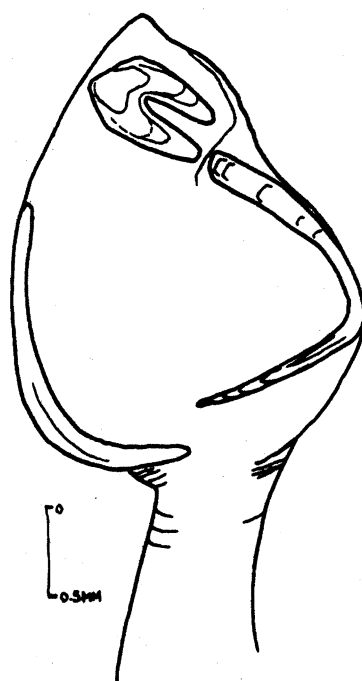
Another epizoic member of the Octolasmis genus is O. lowei which has been found in Hawaii living on the gills of the slipper lobster, Scyllarides squamosus (Milne-Edwards) (Newman, 1961). Bowers also found this species living on the gills of Panulirus marginatus Quoy and Gaimard and on Panulirus penicillatus (Oliver), two spiny lobsters. It is interesting to note that Darwin (1851) mentioned that this was a very rare cirriped found only in Madiera attached to a rare Brachyurous crab.

Hawaiian Records

- Coconut Island, Kaneohe Bay, Oahu. Newman, 1961.
- Kaneohe Bay, Oahu. Bowers, 1965, on P. marginatus and P. penicillatus.
- Waimea Bay, Oahu. Bowers, 1965, on P. marginatus only.
- Black Island, Makapuu, Oahu. Bowers, 1965, on P. penicillatus only.



Distribution of Octolasmis lowei (Darwin) on Oahu.



**Fig.17**

Octolasmis lowei (Darwin), mature form. Drawn from Newman, 1960.



Paralepas palinuri urae Newman

1960. Paralepas palinuri urae. Newman, Crustaceana 1, p. 112, fig. 6.

Habitat

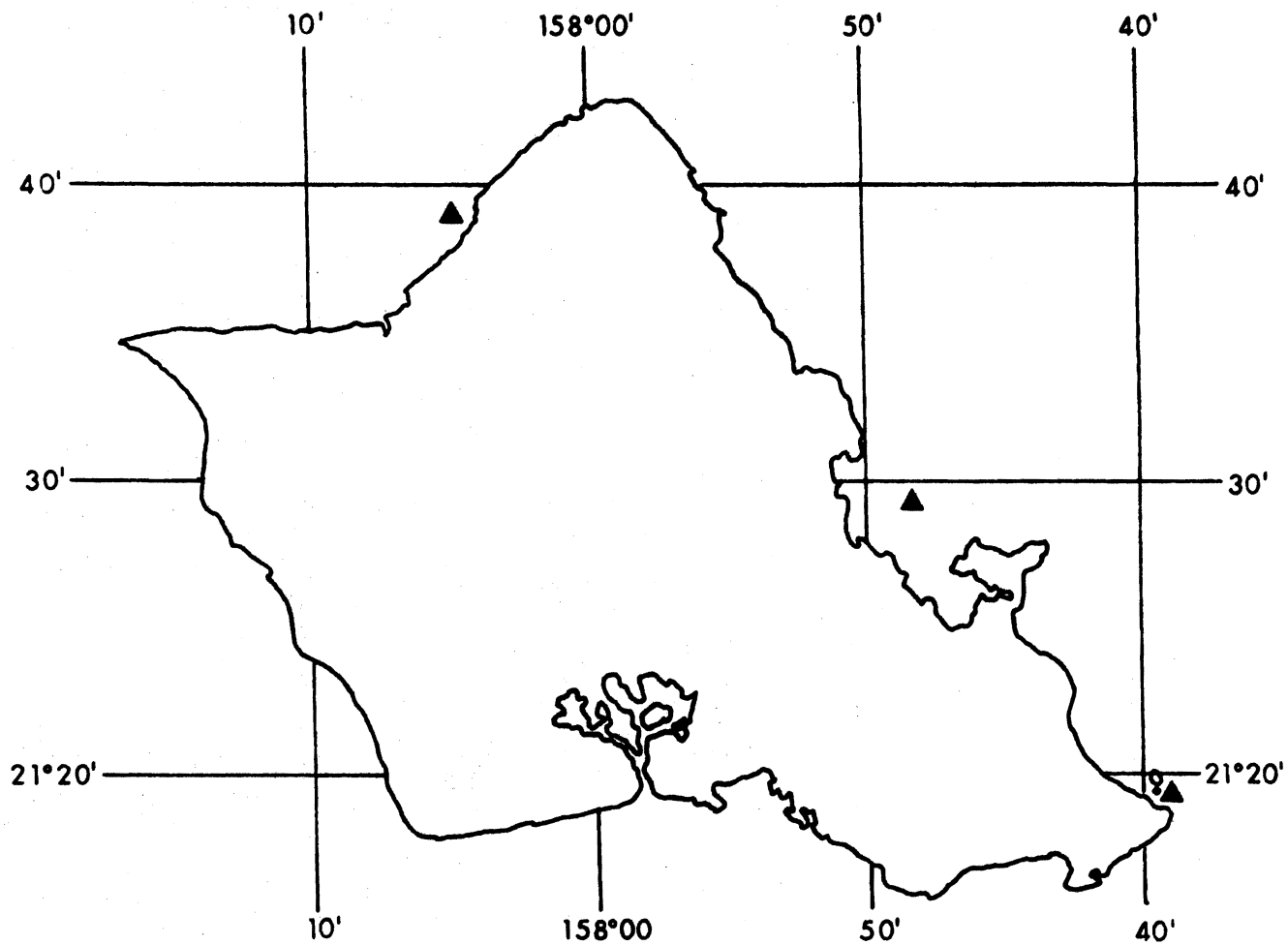
Newman (1960) first described this species from Kapingamarangi Atoll in the intertidal region attached to the maxillipeds of the Spiny Lobster. Bowers (1965) reported the species living epizoically on Panulirus marginatus Quoy and Gaimard and Panulirus penicillatus (Oliver) in the Hawaiian Islands. He noted that they were most often found in the cavities near the bases of the walking legs and occasionally on the maxillipeds and near the genital openings. One specimen of P. marginatus found in Waimea Bay had the barnacles attached to the ventral surface of the muscular abdomen.

Hawaiian Records

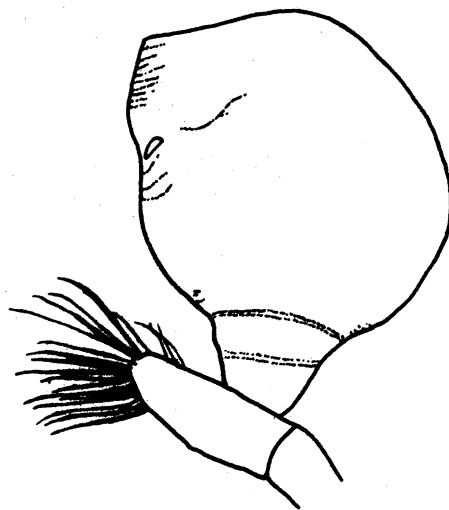
Kaneohe Bay, Oahu. Bowers, 1965.

Waimea Bay, Oahu. Bowers, 1965.

Black Island, Makapuu, Oahu. Bowers, 1965, on P. penicillatus only.



Distribution of Paralepas palinuri urae Newman on Oahu.



**Fig.18**

Paralepas palinuri urae Newman, mature form, attached to maxilliped of the spiny lobster. Drawn from Newman, 1960.

Poecilasma kaempferi Darwin

1851. Poecilasma kaempferi. Darwin, Ray Society, London, 1851, p. 102,  
pl. 2, fig. 1.

1907. Poecilasma kaempferi. Pilsbry, U. S. Nat. Mus. Bull. 60, 1907, p. 84,  
pl. 5, fig. 10, 11; pl. 6, fig. 3, 4, 5.

Habitat

Darwin described this genus in 1851, having not accepted the earlier name of Hinds, Trilasmis. He felt that such a name was "glaringly incorrect" for a five-valved species. Darwin noted that the genus was found attached to crustacea. He found that this particular species was attached in great numbers to the upper and lateral sides of the carapace of the brachyuran crab, Inachus kaempferi De Haan, from Japan. He also noted that this species was a deep water form.

In his report on the Hawaiian cirripedia, Pilsbry (1907A) reported that this species was new to the Hawaiian fauna. Several specimens were dredged during the Albatross Expedition, stations 4117 and 4045, but only two were attached to crabs, Cyrtomaia smithi Rathbun and Lambrus (Platylambrus) stellatus Rathbun.

Hawaiian Records

Albatross station 3984 between Honolulu and Kauai, 164-237 f. Pilsbry 1907A.

Albatross station 3839 off the south coast of Molokai, 259-266 f. *ibid.*

Albatross station 3884 in the Pailolo Channel, 284-290 f. *ibid.*

Albatross station 4117 off the northwest coast of Oahu, 282 f. *ibid.*

Albatross station 3811 off the south coast of Oahu, 338 f. *ibid.*

Albatross station 4045 off the west coast of Hawaii, 198 f. *ibid.*



**Fig.19**

Peocilasma kaempferi Darwin magnified two and a half times.  
Drawn from Darwin, 1851.

Scapellum hawaiiense Pilsbry

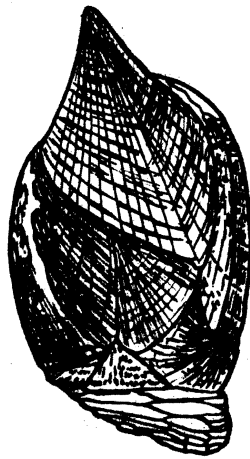
1907. Scapellum hawaiiense. Pilsbry, Bull. Bur. Fisheries 26, 1907, p. 181,  
pl. 4, fig. 1, 2.

Habitat

A deep living genus which appears to be distributed over the whole world but it is most common in the warmer temperate regions. They are usually found attached to horny corallines (Darwin, 1851). Pilsbry (1907A) in his report of S. hawaiiense from Hawaii, made no reference to an attachment to corallines but he noted that it was found in 811 fathoms of water on a bottom of manganese sand and globigerina ooze.

Hawaiian Records

Albatross station 4181 near Kauai in 811 fathoms. Pilsbry, 1907A.



**Fig.20**

Scapellum hawaiiense Pilsbry, side view. Drawn from Pilsbry, 1907A.

Scapellum pacificum Pilsbry

1907. Scapellum pacificum. Pilsbry, Bull. Bur. Fisheries 26, 1907, p. 182,  
pl. 4, fig. 3, 4.

Habitat

Another new species of Scapellum described by Pilsbry (1907A) from the Albatross Expedition. Specimens of S. pacificum was found on two bottom types - on fine white sand and mud and on coral rock and broken shell. In each area they were attached to a coralline object - in the first area, to a spine of a cidaroid sea urchin and in the second area, to Hyalonema. The cirriped was found in association with Poecilasma sp. in the first area.

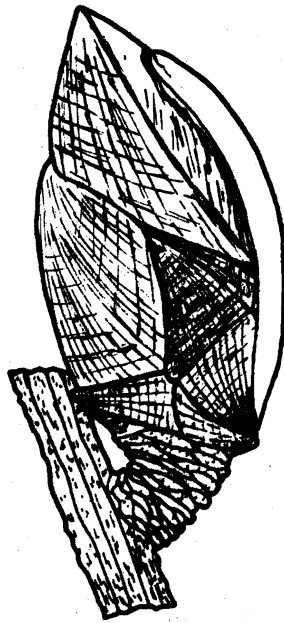
Hawaiian Records

Albatross station 3907, south of Oahu in 315 f. Pilsbry, 1907A.

Albatross station 3824, south coast of Molokai in 222-498 f. *ibid.*

Hawaii. Broch, 1922.





**Fig.21**

Scapellum pacificum Pilsbry, side view. Drawn from Pilsbry, 1907A.

Trilasmis eburneum Hinds

1844. Trilasmis eburnea. Hinds, Voyage of "Sulphur", 1844, 1, Mollusca,  
p. 72, pl. 21, fig. 5.

1851. Poecilasma eburnea. Darwin, Ray Society, London, 1851, p. 112, pl. 2,  
fig. 5.

1907. Trilasmis eburneum. Pilsbry, Bull. Bur. Fisheries 26, 1907, p. 183,  
fig. 11.

Habitat

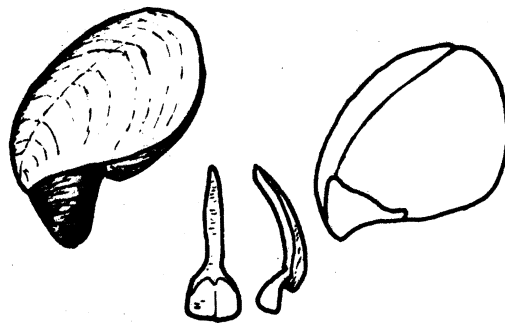
Pilsbry (1907A) notes that Trilasmis eburneum is a rare species which was previously known only from the coast of New Guinea. It was found on the "Sulphur" Expedition to New Guinea living in the spines of Echinus.

This species was found in the Hawaiian Islands in 60-64 f. off the south coast of Molokai living on a Cidaris-like sea urchin spine. Pilsbry (1907A) remarked that the Hawaiian species looked larger than the New Guinean species.

Hawaiian Records

Albatross station 3845 off the south coast of Molokai in 60-64 f. Pilsbry, 1907A.

Hawaii. Broch, 1922.



**Fig.22**

Trilasmis eburneum Hinds. Drawn from Darwin, 1851, under the name of Poecilasma eburnea. Lateral view of the whole animal magnified five times; external and lateral views of the carina; and a lateral view of the scutum.

Trilasmis fissum hawaiiense Pilsbry

1927. Trilasmis fissum hawaiiense. Pilsbry, Proc. Acad. Nat. Sci. Philadelphia 79, 1927, p. 306, pl. 24, figs. 1-8.

Habitat

Members of this genus have been found epizoic on crustaceans in warm temperate and tropical waters. The first record of this species in Hawaii was in 1927 by Pilsbry who found the cirripeds growing on the mouth parts of the sponge crab Dromia dromia (type no. 528 in the Bishop Museum, Honolulu).

Edmondson also noted this report in 1933.

Bowers (1965) found that this species was epizoic on the mouth parts of the spiny lobsters, on Panulirus marginatus Quoy and Gaimard and on Panulirus penicillatus (Oliver).

Hawaiian Records

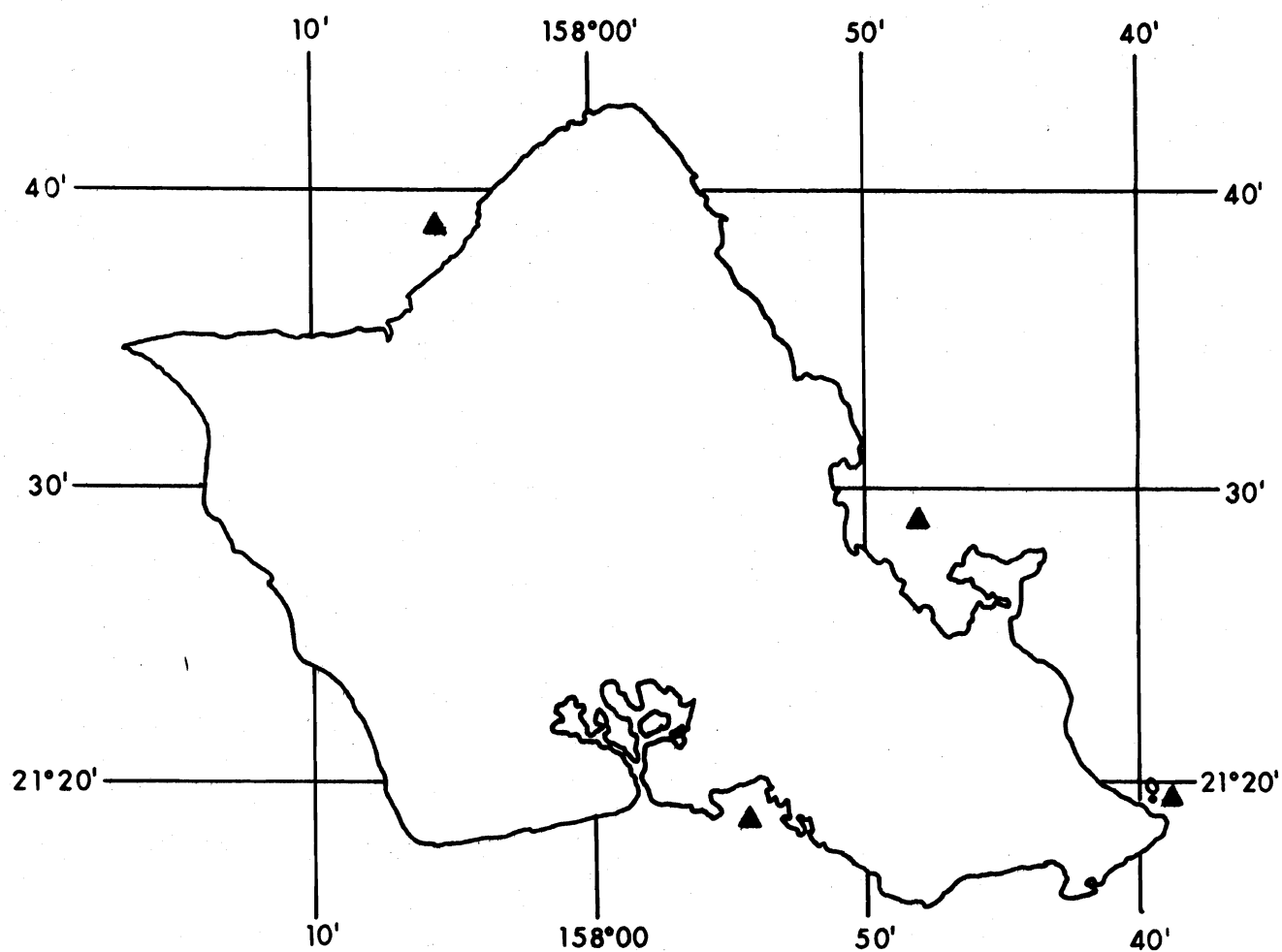
Honolulu, Oahu. Pilsbry, 1927.

Hawaiian Islands. Edmondson, 1933.

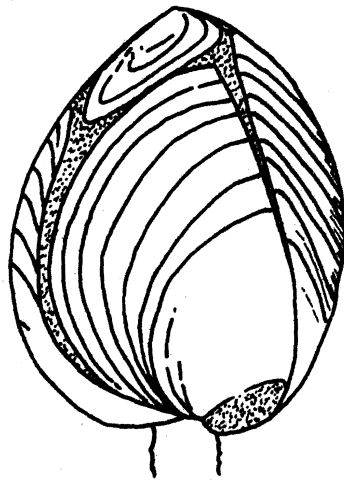
Kaneohe Bay, Oahu. Bowers, 1965, on P. marginatus Quoy and Gaimard and on P. penicillatus Oliver.

Waimea Bay, Oahu. Bowers, 1965, on P. marginatus Quoy and Gaimard.

Black Island, Makapuu, Oahu. Bowers, 1965, on P. penicillatus Oliver.



Distribution of Trilasmis fissum hawaiiense Pilsbry on Oahu.



**Fig.23**

Trilasmis fissum hawaiense Pilsbry, lateral and carinal views of the type specimen, No. 528 B.P.B.M. Drawn from Pilsbry, 1927.

### Family Balanidae

Cirripedia of the family Balanidae are without a peduncle. The compartments are immovably united in a fixed whorl. The opercular valves are opened and closed by the depressor muscles.

Darwin has split this family into two sub-families, the Balaninae and the Chthamalinae.

#### Sub-family Balaninae

Members of this subfamily have eight valves composing the shell, these valves are either solid or porous (i.e., Tetraclita). The basis is either membranous or calcareous.

#### Sub-family Chthamalinae

The Chthamalinae have four, six or eight valves and in the genus Catophragmus, there are whorls of compartments or scales much like those on the lower part of the capitulum of some Lepadidae (i.e., Pollicipes). The basis is always membranous except in Catophragmus where at times, it is calcareous. The walls are never porous. The scuta and terga are articulated together more deeply than in the Balaninae and the tergum never has the long spur.

Balanus amphitrite Darwin

1789. Balanus radiatus. Brugiere, Encyclopedie methodique, 1789, p. 168.
1790. Lepas purpurea. Spengler, Skrivter f. Naturhistorie Selskabet, 1790, 1, p. 172.
1795. Lepas balanoides. Poli, Testacea utriusque Sicilae, 1795, Table 5.
1815. Lepas radiata. Wood's General Conchology, 1815, pl. 7, fig. 7.
1815. Lepas minor (?). Wood's General Conchology, 1815, pl. 7, fig. 6.
1826. Balanus balanoides. Risso, Hist. Nat. de l'Europe Medit., tom iv, 1826.
1854. Balanus amphitrite. Darwin, Ray Society, London, 1954, p. 240, pl. 5, fig. 2a-2o.
1897. Balanus amphitrite. Weltner, Verzeichnis, 1897, p. 264.
1904. Balanus carenatus. Gruvel, Mem. Asiatic Soc. of Bengal, 1904, 2(1), p. 6.
1913. Balanus amphitrite. Hoek, "Siboga" Expedition, Monographie 31b, 1913, p. 167.
1916. Balanus amphitrite. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 89.

Habitat

Darwin (1854) reported Balanus amphitrite to be extremely common in warm and temperate tropical seas: the Mediterranean, Smyrna, Sicily, Portugal, Africa, West Indies, Madagascar, Demerara, Natal, Ceylon, Philippine Archipelago, East Indian Archipelago, east coast of Australia and New Zealand. It has been found attached to floating timber and ship's bottoms; in association with Balanus tintinnabulum; and attached to pebbles and mollusc shells.

Pilsbry (1927) noted that it was growing on volcanic rocks in Kualoa, Kaneohe Bay, Oahu.



Edmondson (1933) reported that the species was widely distributed in the Hawaiian Islands where it is found on rocks, shells, reeds, pilings etc.

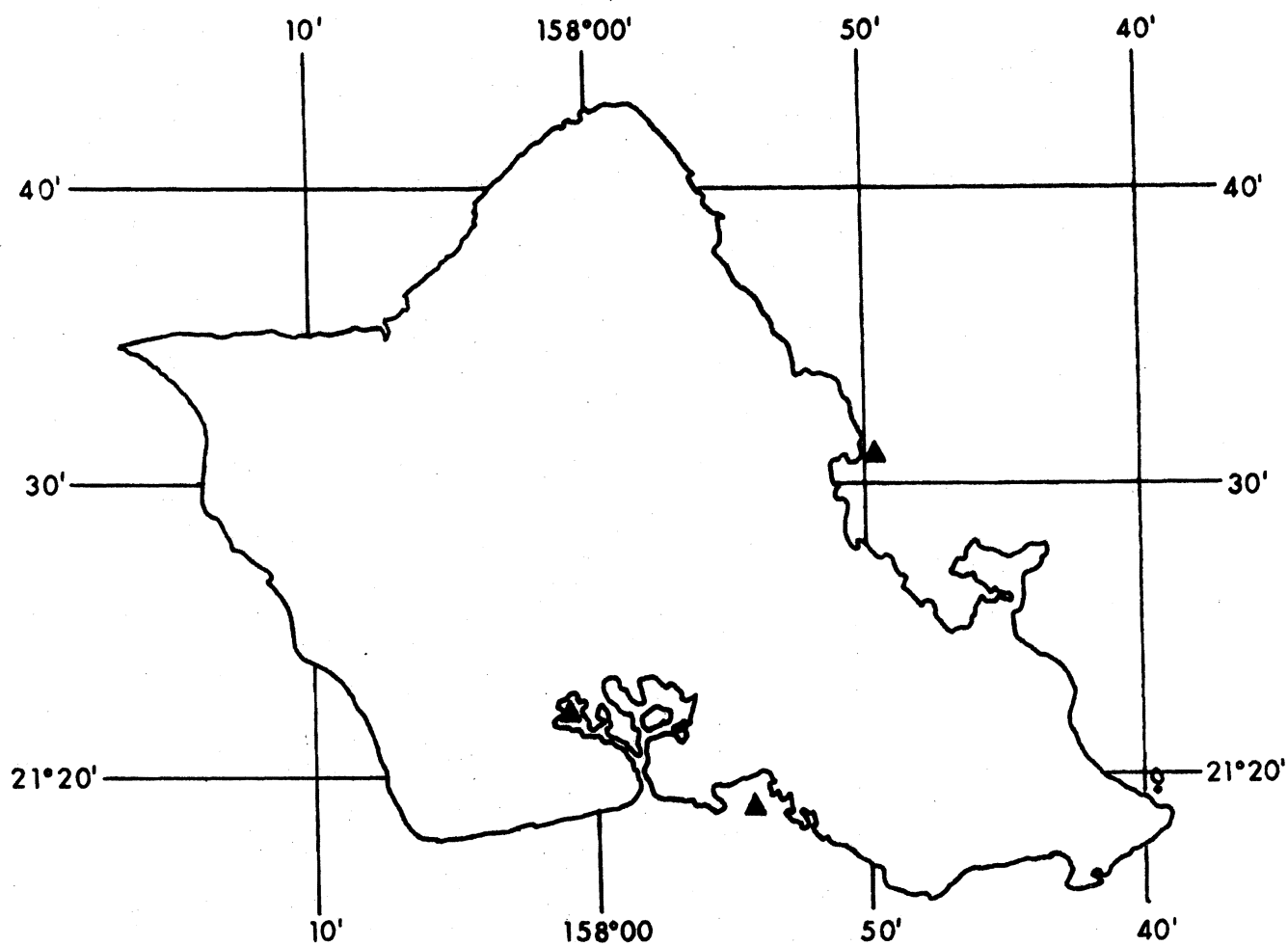
Hawaiian Records

Honolulu Harbor, Oahu. Pilsbry, 1927.

Pearl Harbor, West Loch between Waipahu and Hoaeae, 1913. Pilsbry, 1927.

Kualoa, Kaneohe Bay, Oahu. Pilsbry, 1927.

Hawaii. Edmondson, 1933.



Distribution of Balanus amphitrite Darwin on Oahu.



**Fig.24**

Balanus amphitrite Darwin. Drawn from species found on wooden floats on Coconut Island, Kaneohe Bay, Oahu. Scale 0.1 mm.

Balanus amphitrite hawaiiensis Broch

1922. Balanus amphitrite hawaiiensis. Broch, Vidensk. Medd. Dansk. Naturh. Forenkbh., Bd. 73, 1922, p. 314, fig. 56, 57.

1960. Balanus amphitrite hawaiiensis. Utinomi, Pacific Science 14(1), 1960, p. 43, fig. 1, 2.

Habitat

In recent publications (Utinomi, 1960; Costlow and Bookout, 1958) this subspecies of Balanus amphitrite has been claimed synonymous with B. amphitrite denticulata. The native habitat of B. amphitrite hawaiiensis (= denticulata) is thought to be the Hawaiian Islands (Utinomi, 1960). In Hawaii, the species is found living abundantly in the intertidal zone of sheltered coastlines, usually below mean sea level; in clusters on wharf pilings, coastal rocks, mangrove roots and on the leeward, more sheltered sides of coral reefs.

The first report of this species from Hawaii was made by Broch in 1922, who found the cirriped growing on a piece of broken china in Pearl Harbor.

From the Hawaiian Islands, the subspecies spread around the world possibly on the bottoms of ships. (Utinomi, 1960). It has been reported in Kaladis Point, Mindanao by Broch (1922); Saebo, Kure, Maizuru, Seto and Misaki, Japan by Hiro, 1937, 1938; in the Persian Gulf by Nilsson-Cantell, 1938; Suo, Kiirun, Tansui, Takao and Mako, Formosa by Hiro, 1939; Aio, Seto, Inland Sea, Japan by Hudinaga and Kasahara, 1942; and in Misaki, Japan by Hiroana and Okushi in 1952.

Utinomi (1960) claims that the recordings of B. amphitrite denticulata were, in fact, B. amphitrite hawaiiensis. The former has been reported

from the Suez Canal (Broch, 1927; Ciurea, Monod and Dinulesco, 1933; Monod, 1937); from the southern coasts of Britain (Bishop, 1950; Norris, Jones, Lovegrove and Crisp, 1951; Crisp and Molesworth, 1951); from the Atlantic coasts of France (Bishop, Crisp, Fischer-Piette and Prenant, 1957); from the Knysha Estuary, South Africa (Millard, 1950); from Queensland and Torres Strait, Australia (Allen, 1953); and from Durban Bay, South Africa (Day and Morgan, 1956).

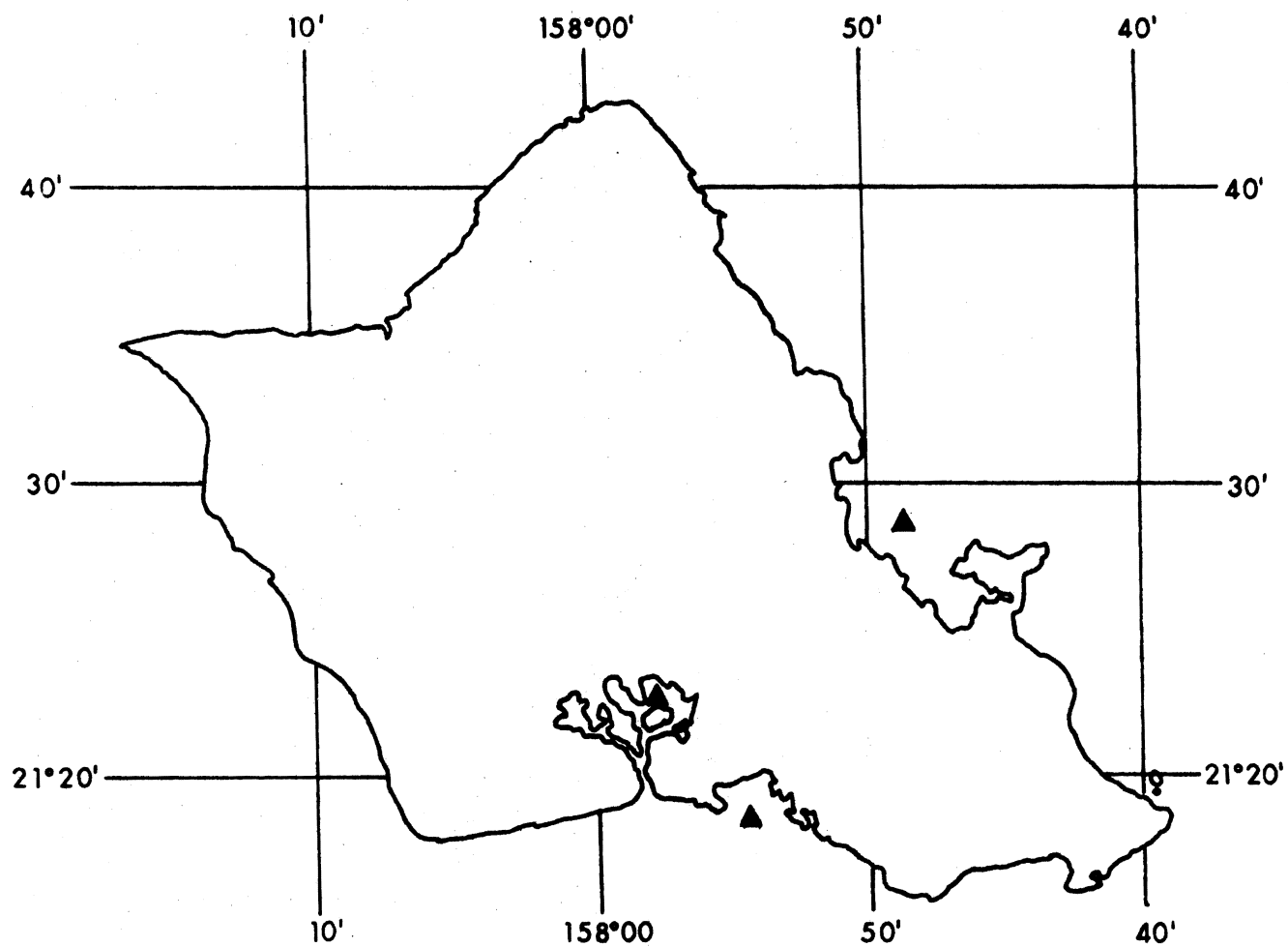
#### Hawaiian Records

Pearl Harbor, Oahu. Broch, 1922.

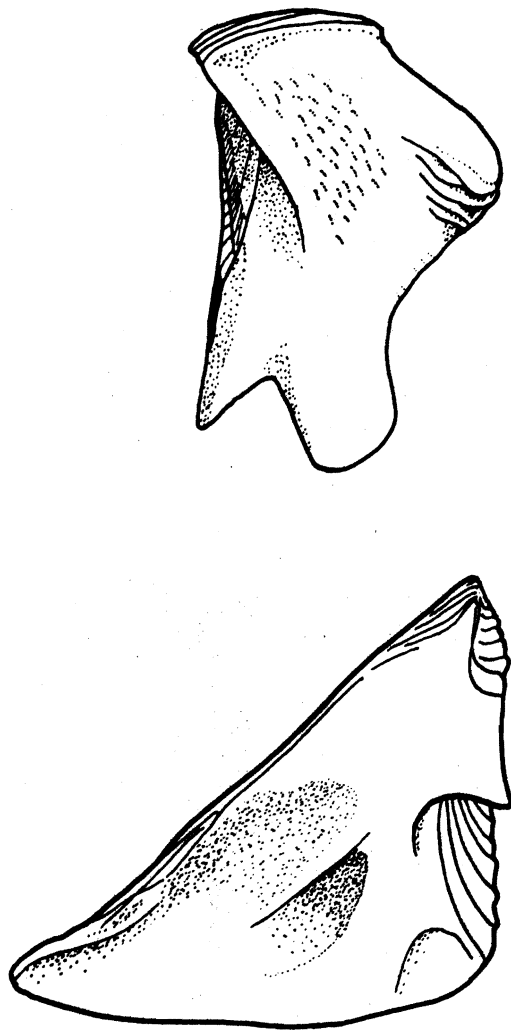
Honolulu Harbor, Oahu. Pilsbry, 1927.

Pearl Harbor, Oahu. Edmondson, 1933.

Pearl Harbor and Kaneohe Bay, Oahu. Edmondson, 1946.



Distribution of Balanus amphitrite hawaiiensis Broch on Oahu.



**Fig.25**

Balanus amphitrite hawaiiensis Broch. Drawn from Utinomi, 1960.

Balanus eburneus Gould

1841. Balanus eburneus. Gould, Report on the Invertebrata of Massachusetts, 1841, p. 15, pl. 1, fig. 6.
1854. Balanus eburneus. Darwin, Ray Society, London, 1854, p. 248, pl. 5, fig. 4a-4d.
1874. Balanus eburneus. Verrill, Invertebrate Animals of Vineyard Sound. p. 285, in Report to Commissioner of Fish and Fisheries, 1874, p. 579.
1897. Balanus eburneus. Weltner, Verzeichnis recenter Cirripeden arten, 1897, p. 266.
1911. Balanus eburneus. Sumner, Bull. Bur. Fisheries 31, 1911, p. 129, 302, 645, chart 84.
1916. Balanus eburneus. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 80, pl. 24, fig. 1-1c, 2.

Habitat

Balanus eburneus Gould was first reported by Gould in 1841 from the eastern coast of America ranging from Massachusetts south to the Caribbean. It was observed from low water to about 20 fathoms (Darwin, 1854; Pilsbry, 1916). As it is a fouling cirriped, it was transported around the world by ships (Matsui, Shane and Newman, 1964). The first record of B. eburneus in the Pacific according to Matsui et al (1964) was by Edmondson (1946) when he observed a barnacle closely related to B. eburneus in Pearl Harbor, Oahu. However, in an earlier paper, 1933, Edmondson mentions finding Balanus eburneus in Pearl Harbor attached to buoys, floats and oyster shells.

Darwin (1854) noted that the species is often found attached to shells and floating timber at sea; on the bottoms of ships in the United States south of latitude 42°N, in the West Indies, Honduras, Venezuela etc; and



often in association with B. tintinnabulum, B. amphitrite and B. improvisus. (Matsui et al, 1964). It is a brackish water species and can live in fresh water. (Darwin, 1954; Edmondson, 1933).

#### Hawaiian Records

Pearl Harbor, Oahu. Edmondson, 1933.

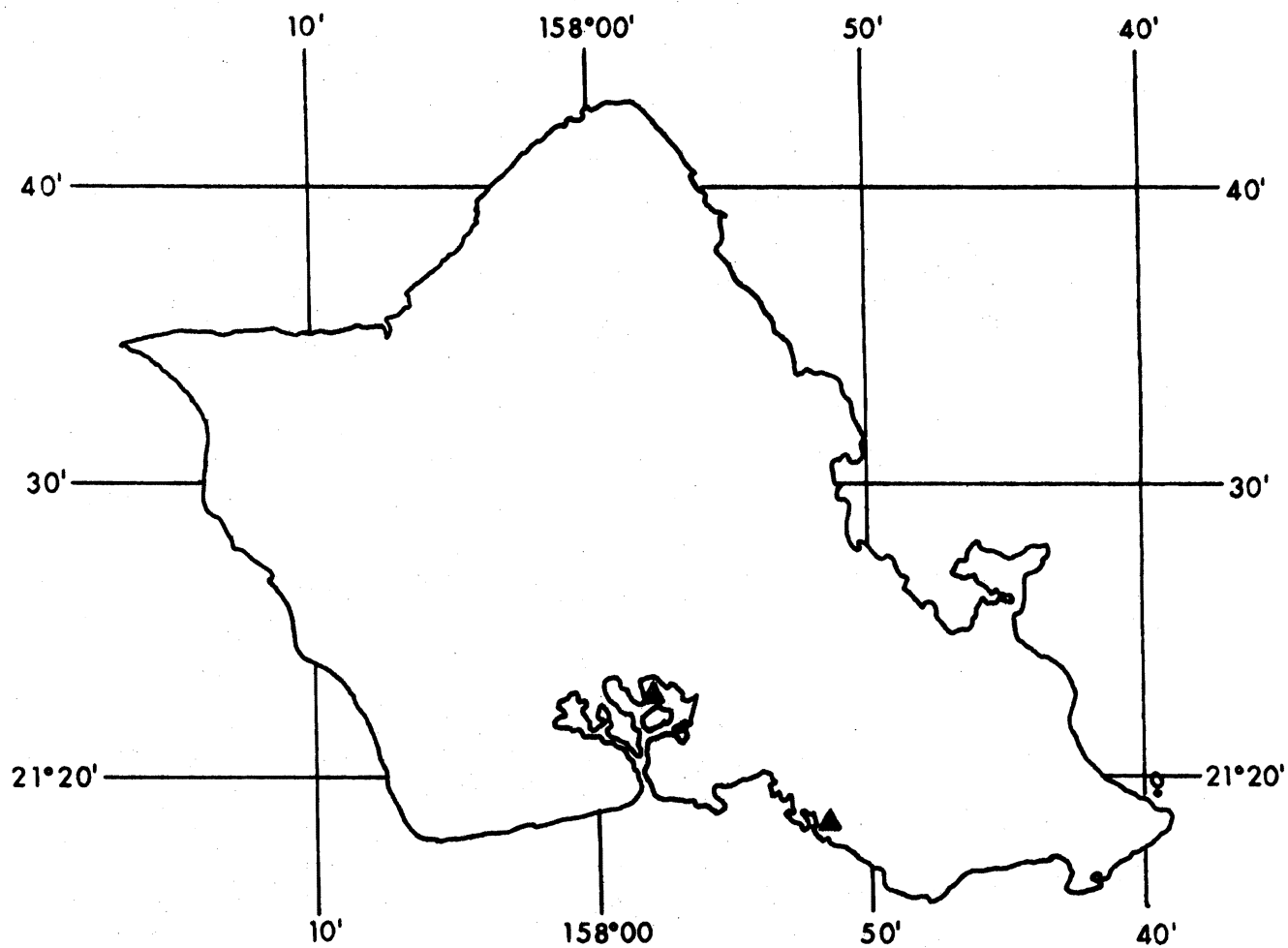
Pearl Harbor, Oahu. Edmondson, 1946.

Pearl Harbor, Oahu. Matsui, Shane and Newman, 1964.

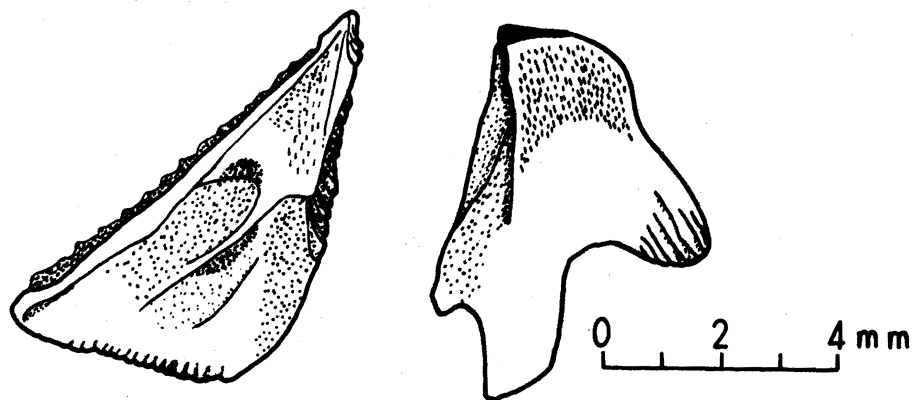
Hawaii, 1950. Matsui et al, 1964.

McCully Bridge, Honolulu, Oahu. Matsui et al, 1964.

Maalea, Maui, 1962. Matsui et al, 1964.



Distribution of Balanus eburneus Gould on Oahu.



**Fig.26**

Balanus eburneus Gould. Drawn from Matsui et al, 1964.

Balanus hawaiiensis Pilsbry

1916. Balanus hawaiiensis. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 222,  
pl. 48, fig. 1-1g.

Habitat

Specimens of Balanus hawaiiensis were found in six localities in the Hawaiian Islands. (Pilsbry, 1916). This indicated to Pilsbry (1916) that this species inhabits the entire Hawaiian Ridge in the warmer waters (60°-69°F) and at moderate depths, down to 212 fathoms. It was usually found seated lengthwise on the rough spines of the sea urchin Phyllacanthus thomasi. Pilsbry (1916) noted that the cirripeds remained very uniform in the size attained by the adult and in other characters throughout its range of about 1,700 miles. At times it was very abundant; one sea urchin spine, 6 cm long from Albatross station 4046, had 108 cirripeds living on it.

Hawaiian Records

Albatross station 4062 off the northeast coast of Hawaii in 88-113 f.

Pilsbry, 1916.

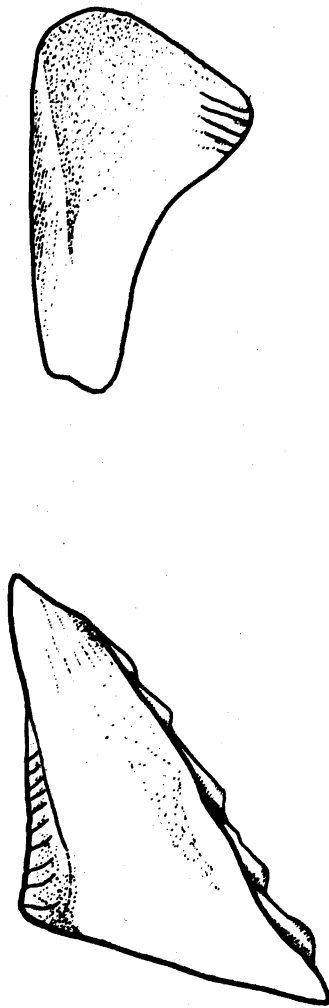
Albatross station 4064 off the northeast coast of Hawaii in 63-107 f. *ibid.*

Albatross station 3863 in the Pailolo Channel between Maui and Molokai in  
127-154 f. *ibid.*

Albatross station 3838 off the south coast of Molokai in 92-212 f. *ibid.*

Albatross station 3823 off the south coast of Molokai in 78-222 f. *ibid.*

Albatross station 4162 off Bird Island (Modu Manu now Moku Manu) in 21-24  
f. *ibid.*



**Fig.27**

Balanus hawaiiensis Pilsbry. Drawn from Pilsbry, 1916.

Balanus tintinnabulum tanagrae Pilsbry

1927. Balanus tintinnabulum tanagrae. Pilsbry, Proc. Acad. Nat. Sci. Philadelphia 79, 1927, p. 311, pl. 25, fig. 5-8.

Habitat

Pilsbry (1927) mentions nothing in his original description of this new subspecies about the preferred substrate of this cirriped. The species was collected by the Tanager Expedition on Necker Island, Gardner Island, French Frigate Shoal, Laysan Island and Pearl and Hermes Reef.

Edmondson (1933) notes that this species grows tall and straight and may attain 1.5 inches in diameter but he says nothing of the substrate.

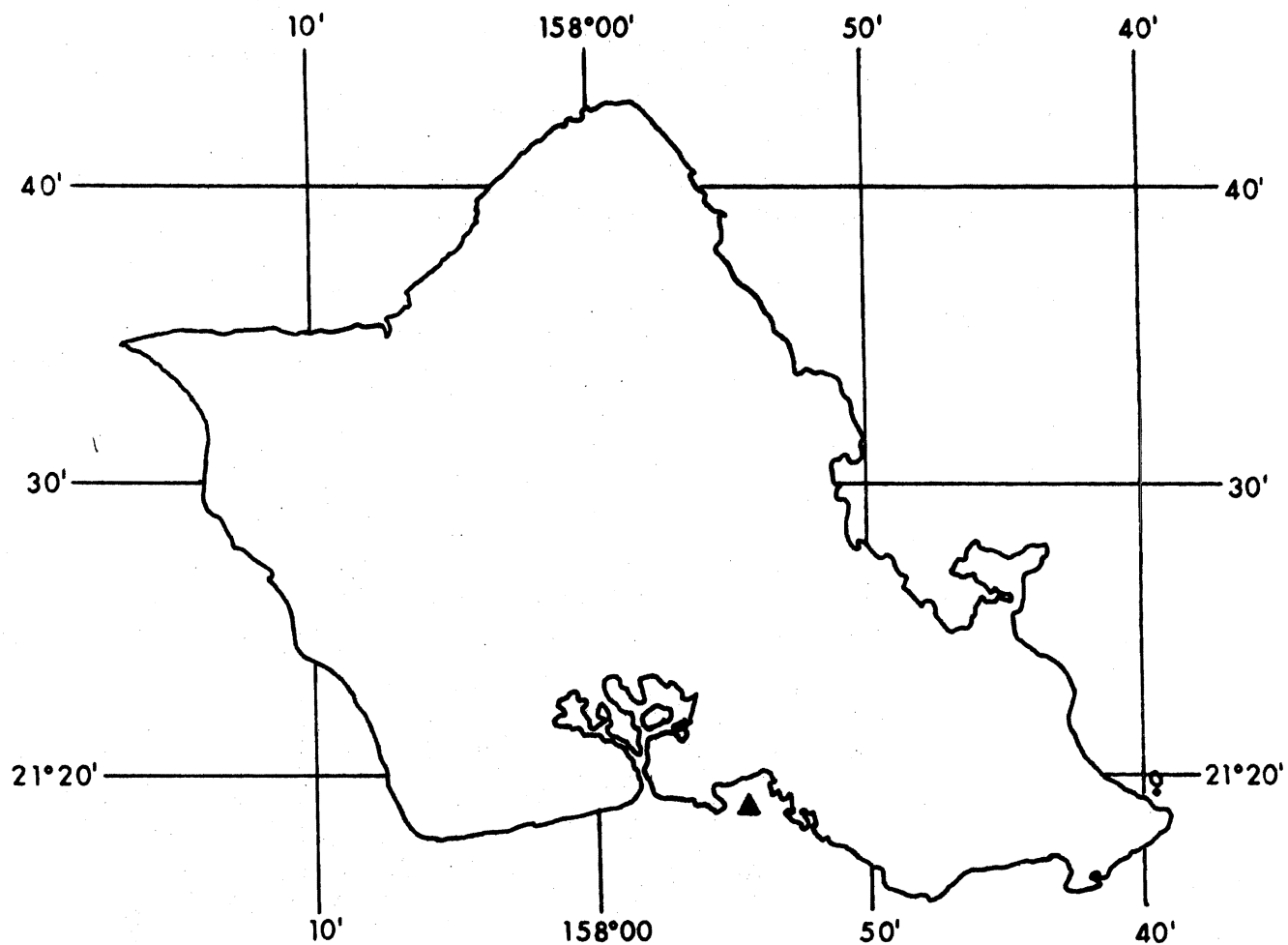
The type species, B. tintinnabulum, has not been observed in Hawaii although it is widely distributed in warm seas on the bottom of ships. (Darwin, 1854).

Hawaiian Records

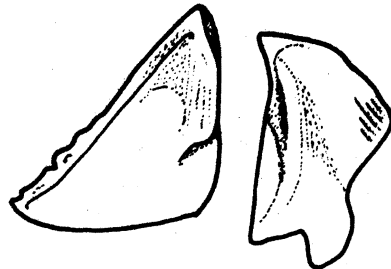
Necker Island, collected by the Tanager Expedition. Type no. 500, Bishop Museum, Honolulu. Pilsbry, 1927.

Gardner Island, French Frigate Shoal, Laysan Island and Pearl and Hermes Reef. *ibid.*

Hawaiian Islands, leeward areas, collected by the Tanager Expedition. Edmondson, 1933.



Distribution of Balanus tintinnabulum tanagrae Pilsbry on Oahu.



**Fig.28**

Balanus tintinnabulum tanagrae Pilsbry. Drawn from Pilsbry, 1927.



Balanus trigonus Darwin

1854. Balanus trigonus. Darwin, Ray Society, London, 1854, p. 223, pl. 3, fig. 7a-f.
1867. Balanus armatus. Muller, Archiv fur Naturgeschichte, Jah. 1867, 1, p. 329-356, fig. 1-21, 23-28; pl. 8, fig. 44, 46-48; pl. 9, fig. 56.
1868. Balanus armatus. Muller, Ann. Mag. Nat. Hist. 1, 1868, p. 392.
1897. Balanus trigonus. Weltner, Verzeichnis, 1897, p. 262.
1911. Balanus trigonus. Kruger, Beitrage zur Cirripeden fauna Ostasiens in Abh. Math-Phys. Klasse der K. Bayer. Akad. Wissensch. 2, suppl. 1, 1911, p. 49, fig. 98-100; pl. 1, fig. 6; pl. 3, fig. 33.
1916. Balanus trigonus. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 111, pl. 26, fig. 1-13e.

Habitat

When Darwin first described this species in 1854, it was reported from Java, the Indian Archipelago, Peru, West Columbia, California, Sydney, and New Zealand.

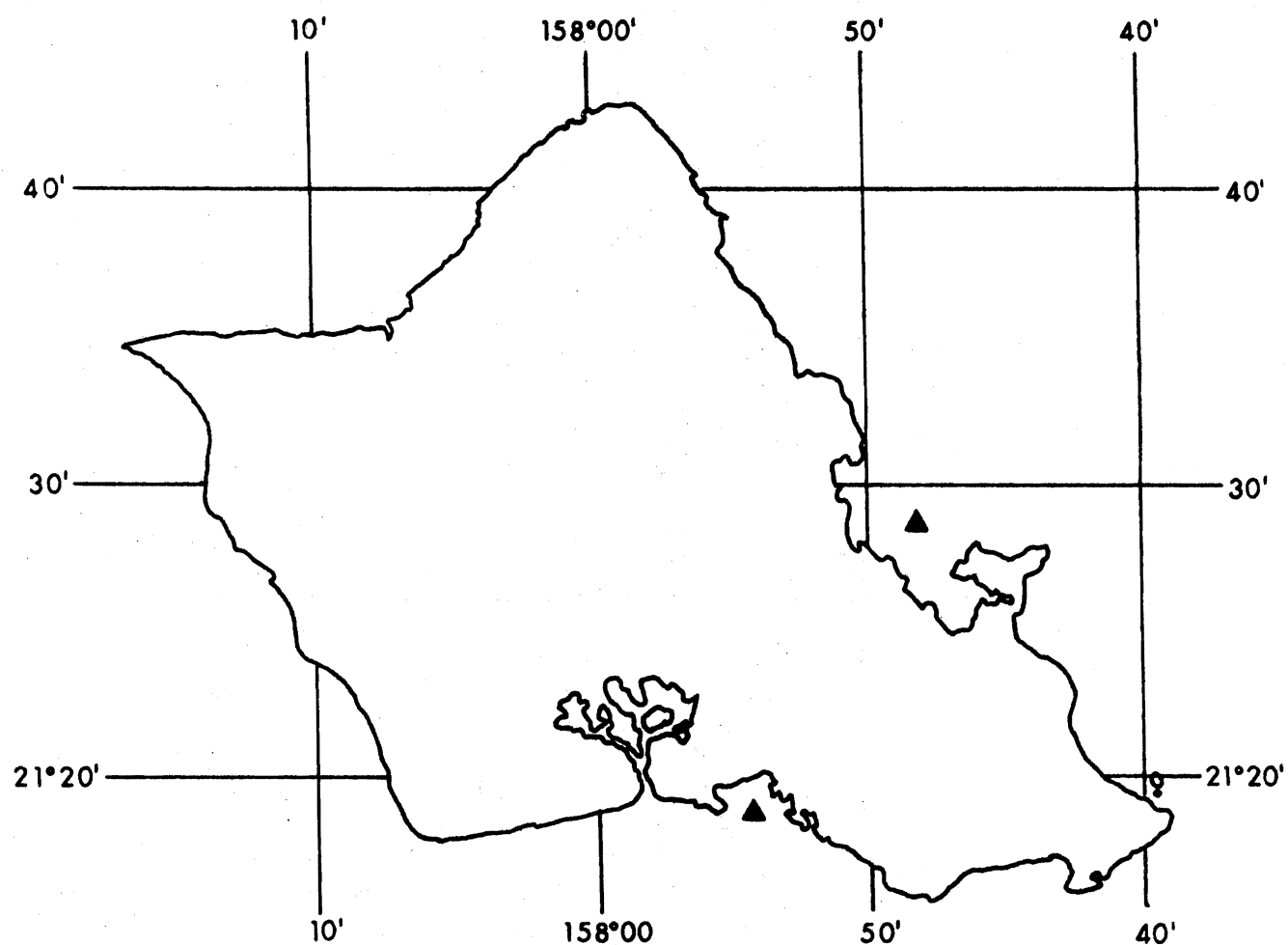
Broch first reported the cirriped from Hawaii when he found several specimens growing on shells of living and dead lamellibranchs on a coral reef in Honolulu. (Broch, 1922).

Bowers (1965) reported finding the cirriped on both Panulirus marginatus Quoy and Gaimard and Panulirus penicillatus (Oliver) living on the dorsal and lateral surfaces of the carapace in both species. They were rarely observed on the appendages and on the ventral surface of the carapace.

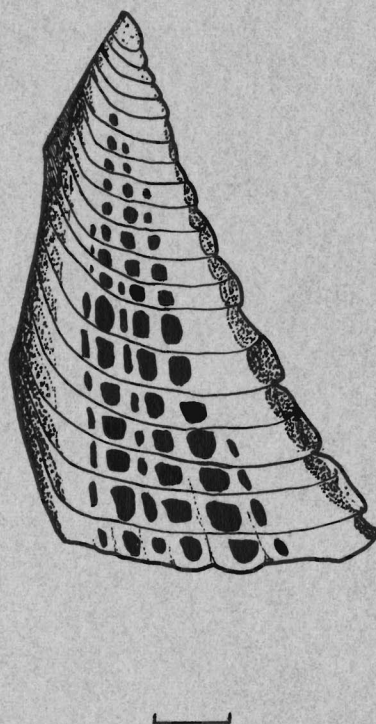
Hawaiian Records

~~Hawaiian Records~~  
Honolulu. Broch, 1922.

Kaneohe Bay, Oahu. Bowers, 1965.



Distribution of Balanus trigonus Darwin on Oahu.



**Fig.29**

Balanus trigonus Darwin. Drawn from specimens collected on Coconut Island, Kaneohe Bay, Oahu. External view of scutum, scale 0.1 mm.

**Fig.30**

Balanus trigonus Darwin. Drawn from specimens collected on Coconut Island, Kaneohe Bay, Oahu. Internal views of tergum and scutum, scale 0.1 mm.

Chelonobia patula (Ranzani)

1758. Verruca cancri. Ellis, Phil. Trans. 50, 1758, pl. 34, fig. 13.

1818. Coronula patula. Ranzani, Opuscoli Scientifici 2, 1818, pl. 3,  
fig. 25-28.

1820. Coronula patula. Ranzani, Memoire di Storia Naturale, 1820, Tabele 3,  
fig. 25-28.

1822. Coronula dentulata. Say, Journal of the Academy of Natural Sciences  
of Philadelphia 2, 1822, p. 325.

1825. Coronula denticula. Gray, Annals of Philosophy, new ser. 10, 1825,  
p. 105.

1825. Astrolepas laevis. Gray, Annals of Philosophy, new ser. 10, 1825.

1854. Chelonobia patula. Darwin, Ray Society, London, 1854, p. 396, pl. 14,  
fig. 3a-b, 4.

1916. Chelonobia patula. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 268,  
pl. 63, fig. 4, 4a.

Habitat

Members of this genus, Chelonobia, are widely distributed throughout the world in the tropical and warmer temperate seas, attached to turtles, crustacea and smooth gastropod molluscs. (Darwin, 1854).

The species, C. patula has been observed attached to crustacea, smooth bivalve shells and at times, to ships' bottoms. (Darwin, 1854; Pilsbry, 1927). Edmondson (1933) noted that the species was frequently seen on the backs and appendages of the swimming crabs, Podophthalmus vigil and Portunus sanguinolentus. On one specimen of P. sanguinolentus, there were eleven cirripeds on the carapace and two on the chelipeds. The largest of these was 15 mm across. Bowers (1965) observed this cirriped on the carapace and maxillipedes as well as the appendages of the lobster, Panulirus marginatus Quoy and Gaimard.

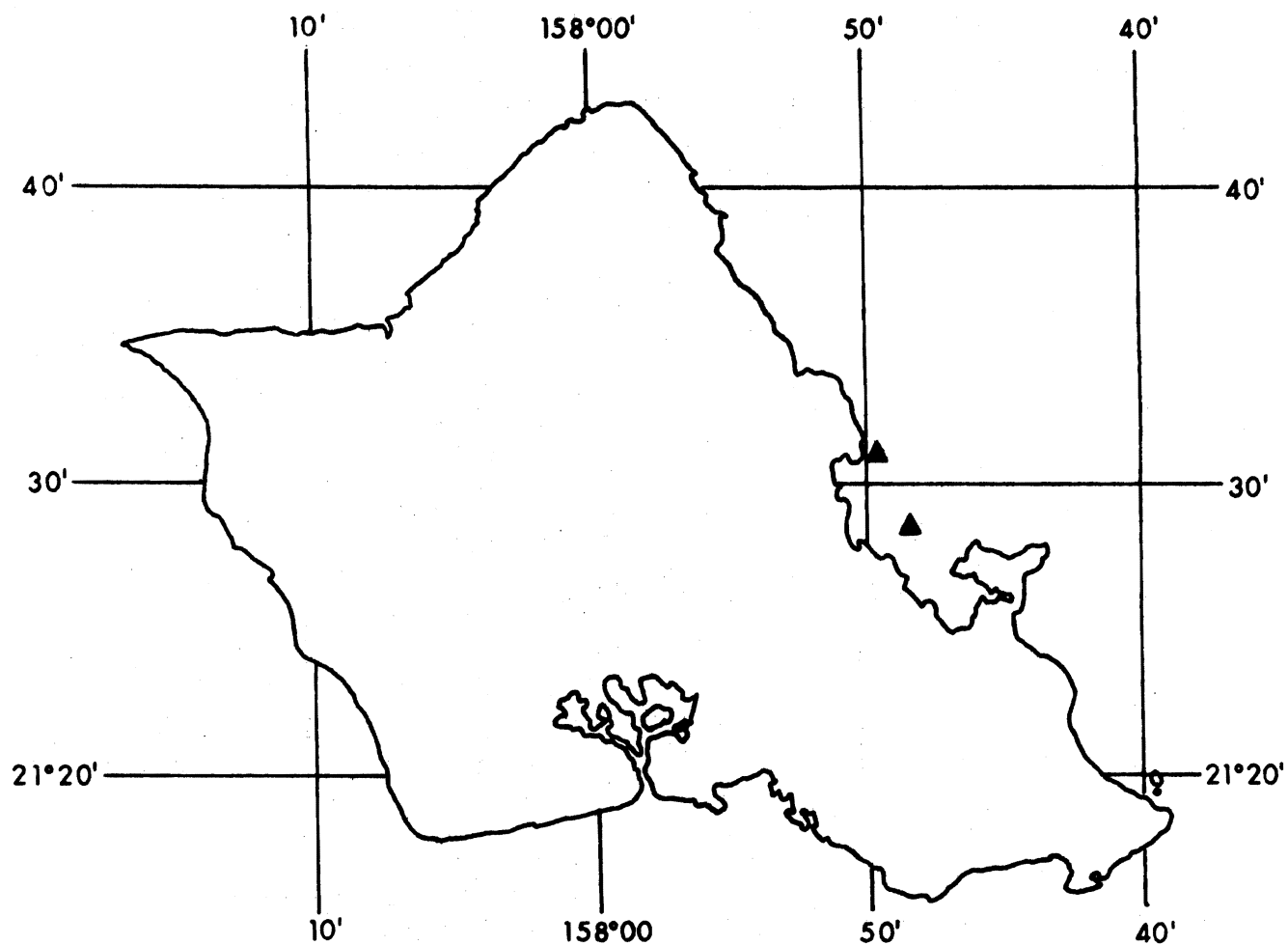
Hawaiian Records

Hawaiian Islands. Gruvel, 1905.

Kualoa, Kaneohe Bay, Oahu, 1920. Pilsbry, 1927.

Hawaiian Islands. Edmondson, 1933.

Kaneohe Bay, Oahu. Bowers, 1965.



Distribution of Chelonobia patula (Ranzani) on Oahu.



**Fig.31**

Chelonobia patula (Ranzani), opercular valves. Drawn from Pilsbry, 1916.



Chelonobia testudinaria Linnaeus

1758. Lepas testudinaria. Linnaeus, Systema Naturae ed. 10, 1758, p. 668.
1758. Verruca testudinaria. Ellis, Phil. Trans. 50, 1758. pl. 34, fig. 12.
1778. Balanus polythalamus. Bock, Naturforscher Stuch. 12, 1778, fig. 9.
1795. Lepas testudinaria. Poli, Testacea Utriusque Siciliae, 1795, Tab. 5, fig. 9-11.
1820. Coronula testudinaria. Ranzani, Memoire di Storia Naturale, Decade 1, 1820.
1824. Coronula testudinaria. De Blainville, Dict. des Sciences Nat., 1824, Tab. 117, fig. 2.
1824. Chelonobia savignii. Leach, Encyclop. Brit. Suppl., 3, 1824.
1825. Astrolepas rotundarius. Gray, J. E., Ann. Philosoph. (new ser.) 10, 1825.
1854. Chelonobia testudinaria. Darwin, Ray Society, London, 1854, p. 392, pl. 14, fig. 1a-1d, fig. 5; pl. 15, fig. 1.
1911. Chelonobia testudinaria. Kruger, Abh.-Phys. Klasse der K. Bayer, Akad. Wissensch., 1911, p. 57, fig. 121-125.
1916. Chelonobia testudinaria. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 264, pl. 62, fig. 1-4.

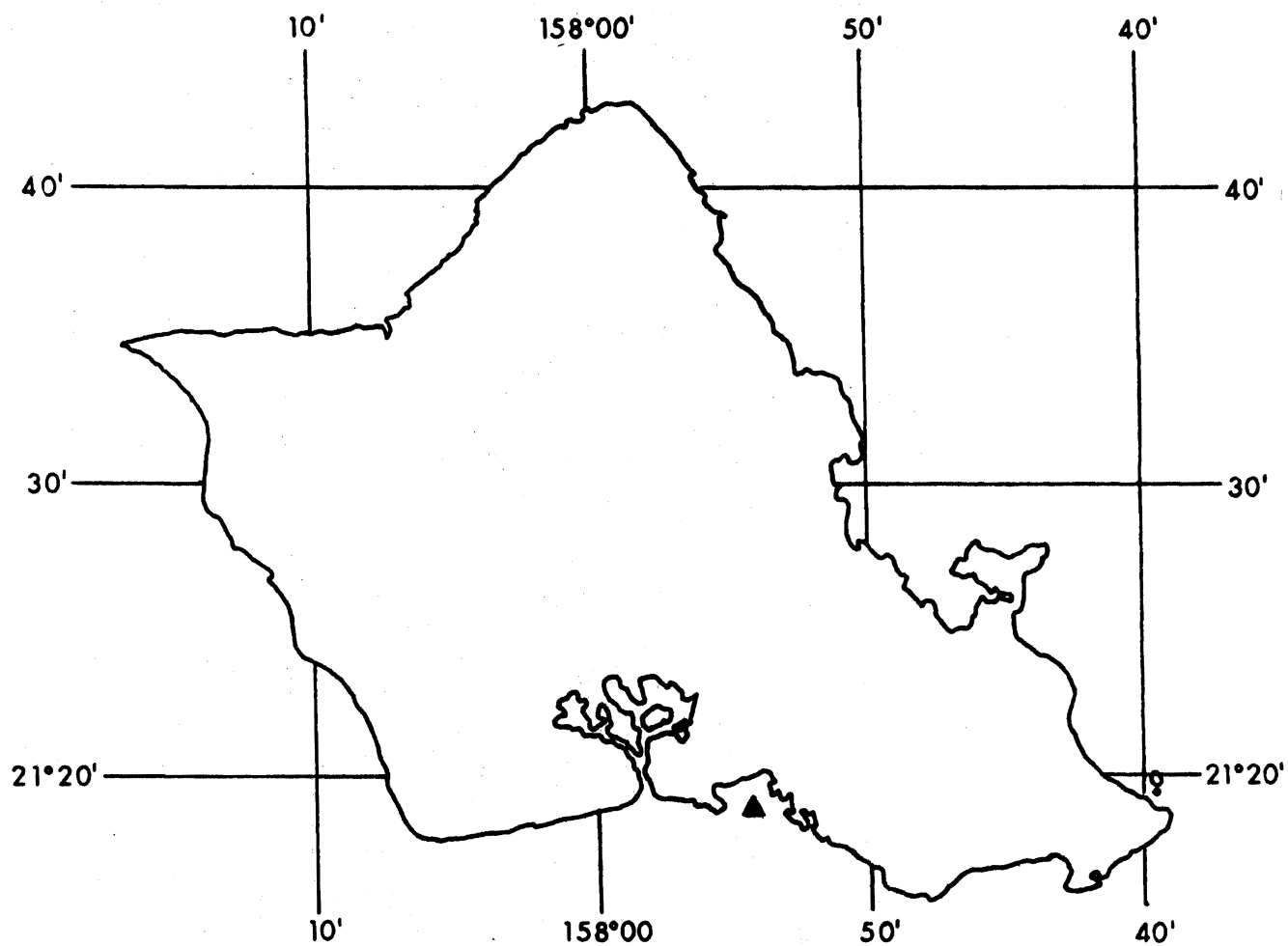
Habitat

Chelonobia testudinaria has only been reported to be found attached to turtles (Darwin, 1854; Pilsbry, 1927; Edmondson, 1933). The cirriped is widely distributed around the world. It has been recorded in the Mediterranean, west coast of Africa, northeast Australia, low archipelago, Pacific Ocean and on the west coast of Mexico (Darwin, 1854). Edmondson (1933) reports that numerous specimens were found on the carapace of the green turtle here in the Hawaiian Islands.

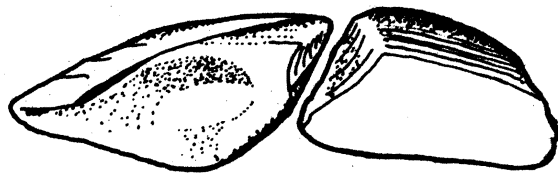
Hawaiian Records

Honolulu Harbor by W. A. Bryan. Pilsbry, 1927.

Hawaiian Islands. Edmondson, 1933.



Distribution of Chelonobia testudinaria Linnaeus on Oahu.



**Fig.32**

Chelonobia testudinaria Linnaeus. Drawn from Pilsbry, 1916.

Tetraclita costata Darwin

1854. Tetraclita costata. Darwin, Ray Society, London, 1854, p. 339, pl. 11,  
fig. 2a-2c.

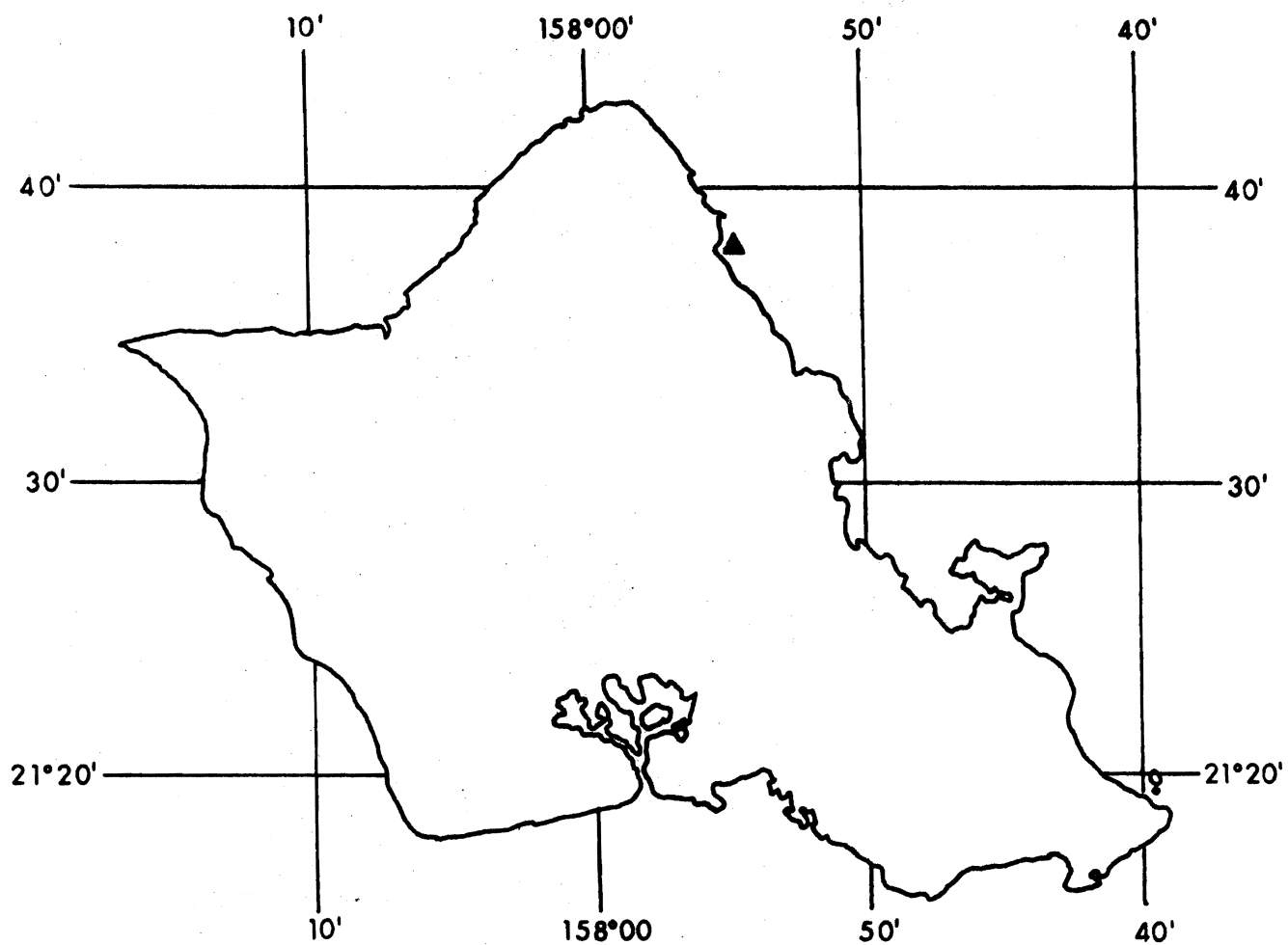
1916. Tetraclita costata. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 259.

Habitat

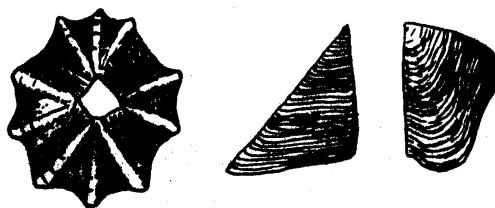
Darwin, 1854, reported that this genus was found throughout the tropical and warmer temperate seas. He described this particular species from the Philippine Archipelago where it was attached to various shells within the tidal range. Pilsbry (1927) reported one large (7mm diameter) and several smaller specimens from Laniloa Point, Laie, Oahu. These cirripeds were attached to Chthmalus hembeli and were collected by Chas. M. Cooke III.

Hawaiian Records

Laniloa Point, Laie, Oahu. Pilsbry, 1927.



Distribution of Tetraclita costata Darwin on Oahu.



**Fig.33**

Tetracrita costata Darwin. Drawn from Darwin, 1854.

Tetraclita purpurascens (Wood)

1815. Lepas purpurascens. Wood, Wood's General Conchology, 1815, p. 55,  
pl. 9, fig. 42.

1818. Balanus plicatus. Lamarck, Animaux sans Vertebres et Puncturatus.  
Chenu. Illust. Conch., 1818, Tab. 4, fig. 3, 12.

1843. Conia depressa. Gray, J. E., Appendix, Dieffenbach's Travels in New  
Zealand, 1843.

1854. Tetraclita purpurascens. Darwin, Ray Society, London, 1854, p. 337,  
pl. 11, fig. 1a-1d.

Habitat

Darwin (1854) reported this cirriped to be very common being found at that time in Sydney, New South Wales; Flinders Lagoon, Barrier Reef; King Georges Sound, Western Australia; Van Dieman's Land, New Zealand. It was attached to tidal rocks and sometimes to shells. Darwin noted that it had been found on two occasions in association with Pollicipes spinosus and Pollicipes mitella.

Edmondson (1933) found T. purpurascens to be very abundant on the lava rocks on the western shore of Maalae Bay in Maui. Some specimens reached 12 mm in diameter. He observed that some specimens were attached to the large cirriped Chthamalus hembeli.

Hawaiian Records

Maalae Bay, Maui. Edmondson, 1933.





**Fig. 34**

Tetraclita purpurascens (Wood). Drawn from Darwin, 1854.

Tetraclita wireni pacifica Pilsbry

1927. Tetraclita wireni pacifica. Pilsbry, Proc. Acad. Nat. Sci. Phil.

79, 1927, p. 312, pl. 26, fig. 1-5.

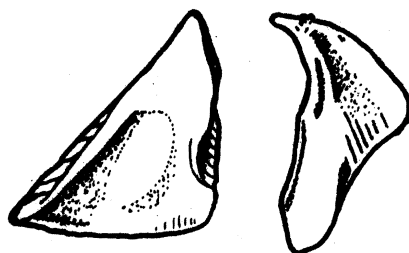
Habitat

This new species was collected from Wake Island by the Tanager Expedition and identified by H. A. Pilsbry in 1927. The original specimen is in the Bishop Museum, type number 512. The cirriped was also found living on Balanus tintinnabulum tanagrae on Necker Island. (Edmondson, 1933).

Hawaiian Records

Wake Island. Pilsbry, 1927.

Necker Island. Edmondson, 1933.



**Fig.35**

Tetraclita wireni pacifica Pilsbry, enlarged 2.85 times.  
Drawn from Pilsbry, 1927.

Sub-Family Chthamalinae

Catophragmus darwini Pilsbry

1907. Catophragmus darwini. Pilsbry, Bull. Bur. Fish. 26, 1907, p. 188,  
fig. 4; pl. 5, fig. 1-8.

1911. Catophragmus (Chionelasmus) darwini. Pilsbry, Bull. Bur. Fish. 29,  
1911, p. 82.

1916. Catophragmus darwini. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 335.

Habitat

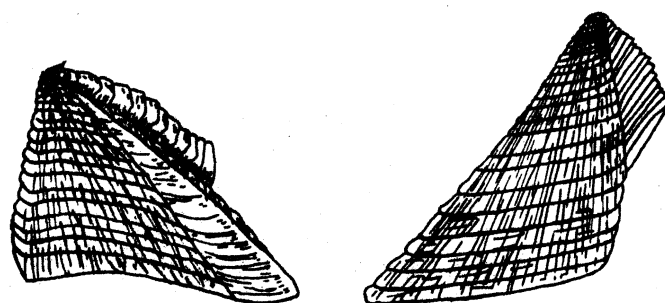
Darwin (1854) noted that this genus was remarkable among the sessile cirripeds in that the eight normal compartments of the shell are surrounded by several whorls of supplemental compartments or scales. These scales are arranged symmetrically and decrease in size but increase in number toward the basal margin of the adult. The adult specimen looks very much like a composite flower.

Specimens of this species were first collected on the Albatross Expedition near Kauai. They were found in 228 to 235 fathoms of water on a bottom of coarse broken coral, sand, shells and rock. Other barnacle species collected in this area were Poecilasma bellum, Alepas percarinata and a few small valves of Verruca halothea. (Pilsbry, 1907A, 1916).

Hawaiian Records

Albatross station 3998 near Kauai in 228-235 fathoms. Pilsbry, 1907A.

Albatross station 3998 near Kauai in 228-235 fathoms. Pilsbry, 1916.



**Fig.36**

Catophragmus darwini Pilsbry. Drawn from Pilsbry, 1907A.

Chthamalus hembeli Conrad

1834. Euraphia hembeli. Conrad, Journal Acad. Nat. Sci. Phil. 7, 1834,  
pl. 20, fig. 6.

1854. Chthamalus hembeli. Darwin, Ray Society, London, 1854, p. 465, Tab.  
18, fig. 5a-5e.

1897. Chthamalus hembeli. Weltner, Verzeichnis, 1897, p. 272.

1905. Chthamalus hembeli. Gruvel, Monographie des Cirripedes, 1905, p. 205.

1916. Chthamalus hembeli. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 324,  
pl. 76.

Habitat

Darwin (1854) reported that Conrad, who first described this species, noted that it was found near San Diego in California.

Pilsbry (1927) describes a specimen which was collected by C. M. Cooke III, at Laniloa Point, Laie, northwestern Oahu. The cirriped was found on rocks between the tide levels; none were found below the low tide mark. Cooke learned from native fishermen that the species was very abundant on the small islets about a mile outside Laie. Cooke himself has seen the cirriped on Molokai, growing on lava in the intertidal zone at the western end of the island.

Edmondson (1933) reported that C. hembeli was the largest known Hawaiian barnacle. He notes that it has been found on Maui, Molokai and Oahu with very fine specimens growing at Laie Point, Oahu.

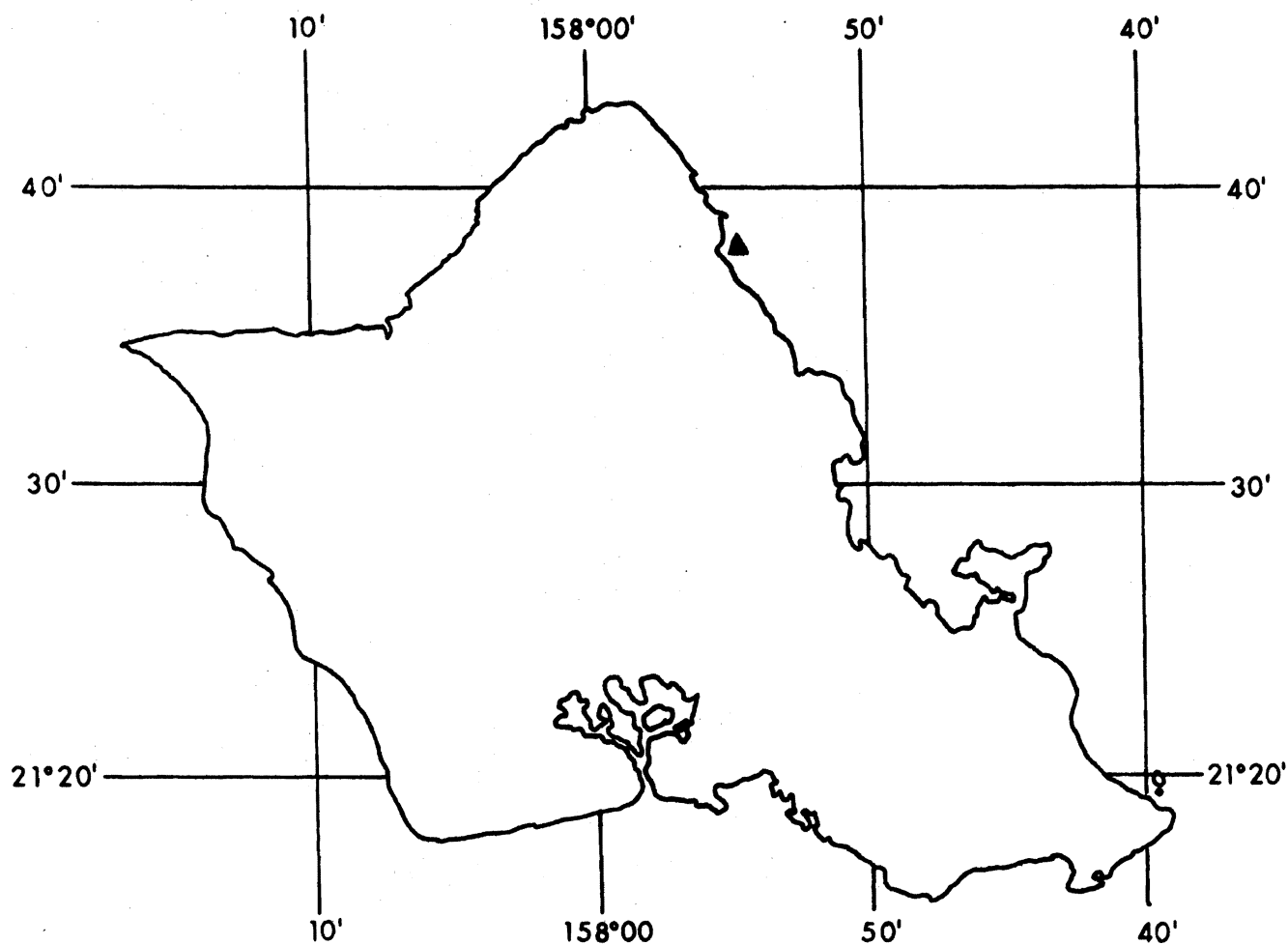
Hawaiian Records

Hawaiian Islands. Pilsbry, 1916.

Laniloa Point, Laie, Oahu. Pilsbry, 1927.

Hawaii. Broch, 1931-1932.

Maui, Molokai, Oahu. Edmondson, 1933.



Distribution of Chthamalus hembeli Conrad on Oahu.

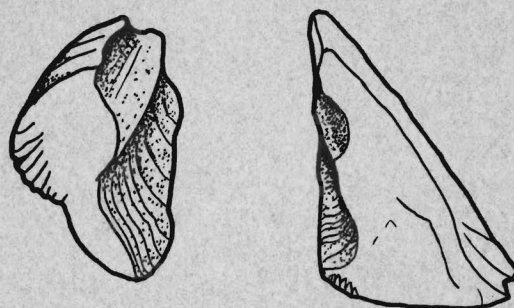


Fig.37

Chthamalus hembeli Conrad. Drawn from Pilsbry, 1916.



Chthamalus intertextus Darwin

1854. Chthamalus intertextus. Darwin, Ray Society, London, 1854, p. 467,  
pl. 19, fig. 1a, 1b.
1913. Chthamalus intertextus. Hoek, Siboga Expedition, Cirripedia, 1913,  
p. 269.
1916. Chthamalus intertextus. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916,  
p. 324.

Habitat

When Darwin first described this species in 1854, it was known only from the Philippine Archipelago. Pilsbry in 1927 was the first to report the species in Hawaii. His report included numerous collection sites: Kahuku Point on Oahu collected by H. E. Gregory and C. M. Cooke on June 16, 1924 from calcareous rock; from Malaekahana, Oahu by C. M. Cooke on a concrete pier; from Diamond Head, Oahu by Pilsbry in 1913 from a reef of volcanic rock which was covered at high tide; from Honaunau Bay, Hawaii by Pilsbry in 1920 on an aa lava flow; and from Necker Island by the Tanager Expedition. From these reports, the species appears to be well established in the Hawaiian Islands. In 1916, Pilsbry described more fully specimens found on the volcanic reef near the lighthouse on Diamond Head. He noted that although the species is far from the original habitat, they seem to be quite typical of the original description. In 1933, Edmondson commented that this species was common on the shore rocks and concrete piers between tide marks.

Hawaiian Records

- Diamond Head, Oahu. Pilsbry, 1916.
- Kahuku Point, Oahu. Pilsbry, 1927.

Hawaiian Records continued

Malaekahana, Oahu. Pilsbry, 1927.

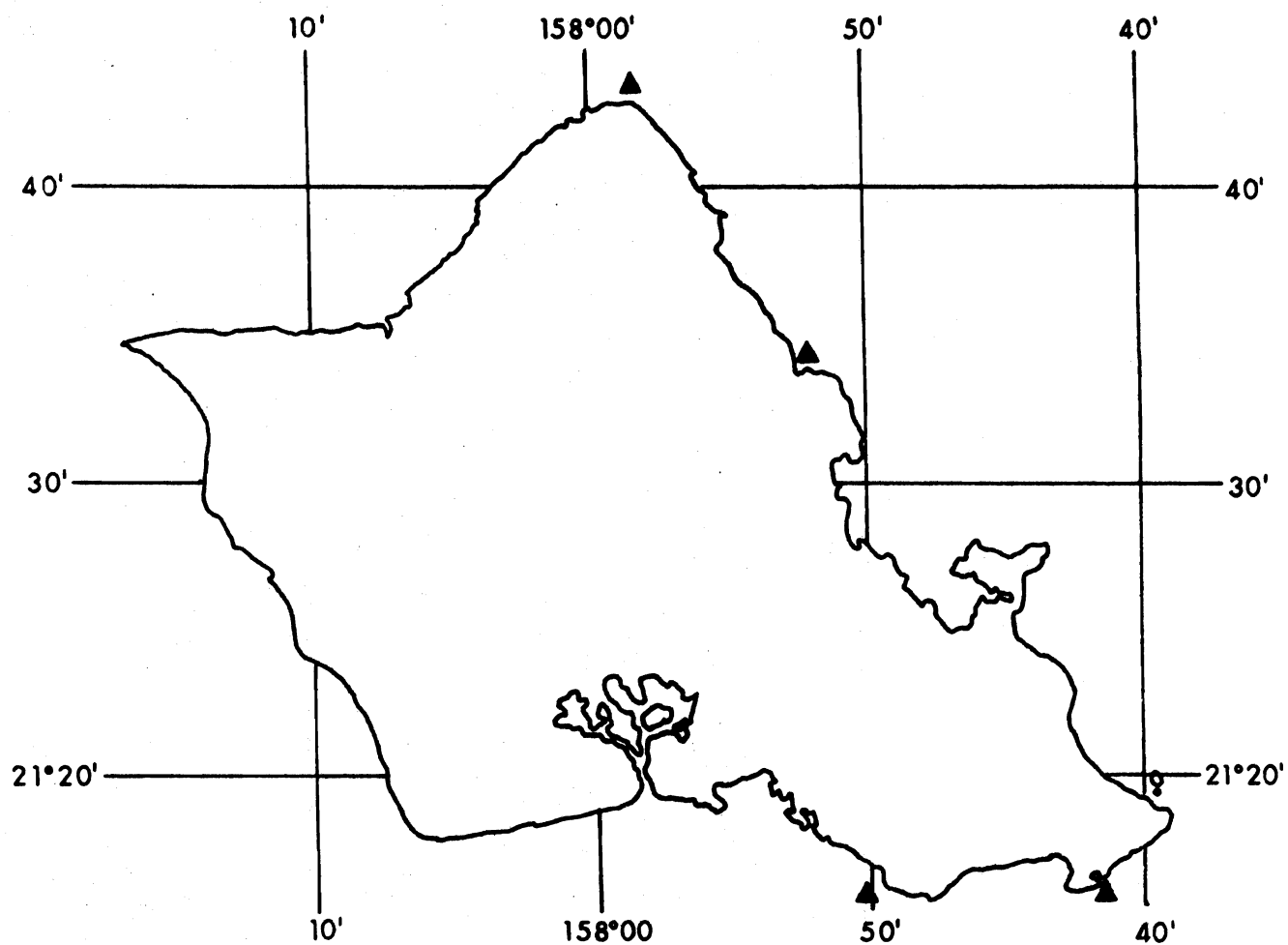
Diamond Head, Oahu. Pilsbry, 1927.

Honaunau Bay, Hawaii. Pilsbry, 1927.

Nehoa Island. Pilsbry, 1927.

Hawaii. Broch, 1931-1932.

Hawaiian Islands. Edmondson, 1933.



Distribution of Chthamalus intertextus Darwin on Oahu.

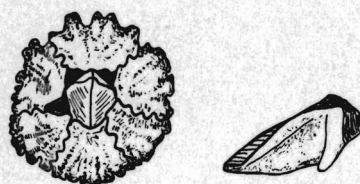


Fig.38

Chthamalus intertextus Darwin, shell; internal view of scum and tergum calcified together, with the suture obliterated in the upper part. Drawn from Darwin, 1854.

Family Verrucidae

Cirripedia without a peduncle. The opercular valves are not furnished with depressor muscles so that they are movable on one side only. The other side is united with the rostrum and carina forming an asymmetrical shell. The shell is extremely asymmetrical, no two of the six compartments resemble each other. This asymmetry characterizes the Verrucidae part from all other cirripeds.

The basis is membranous and is divided into concentric slips, marking the successive increments of growth.

This family is composed of a single genus, Verruca.

Verruca cookei Pilsbry

1927. Verruca cookei. Pilsbry, Proc. Acad. Nat. Sci. Philadelphia 79,  
1927, p. 308, pl. 25, fig. 9; text fig. 1, 2.

Habitat

Darwin (1851) in his description of this genus, declared that this species is generally found attached to living organisms, especially to shells of mollusca and of cirripeds, to gorgoniae and laminariae; less frequently to rocks. In Darwin's time, the genus had been reported from northern Europe, the Mediterranean, the Red Sea, Madeira, the West Indies, Tierra del Fuego, Chile and Peru.

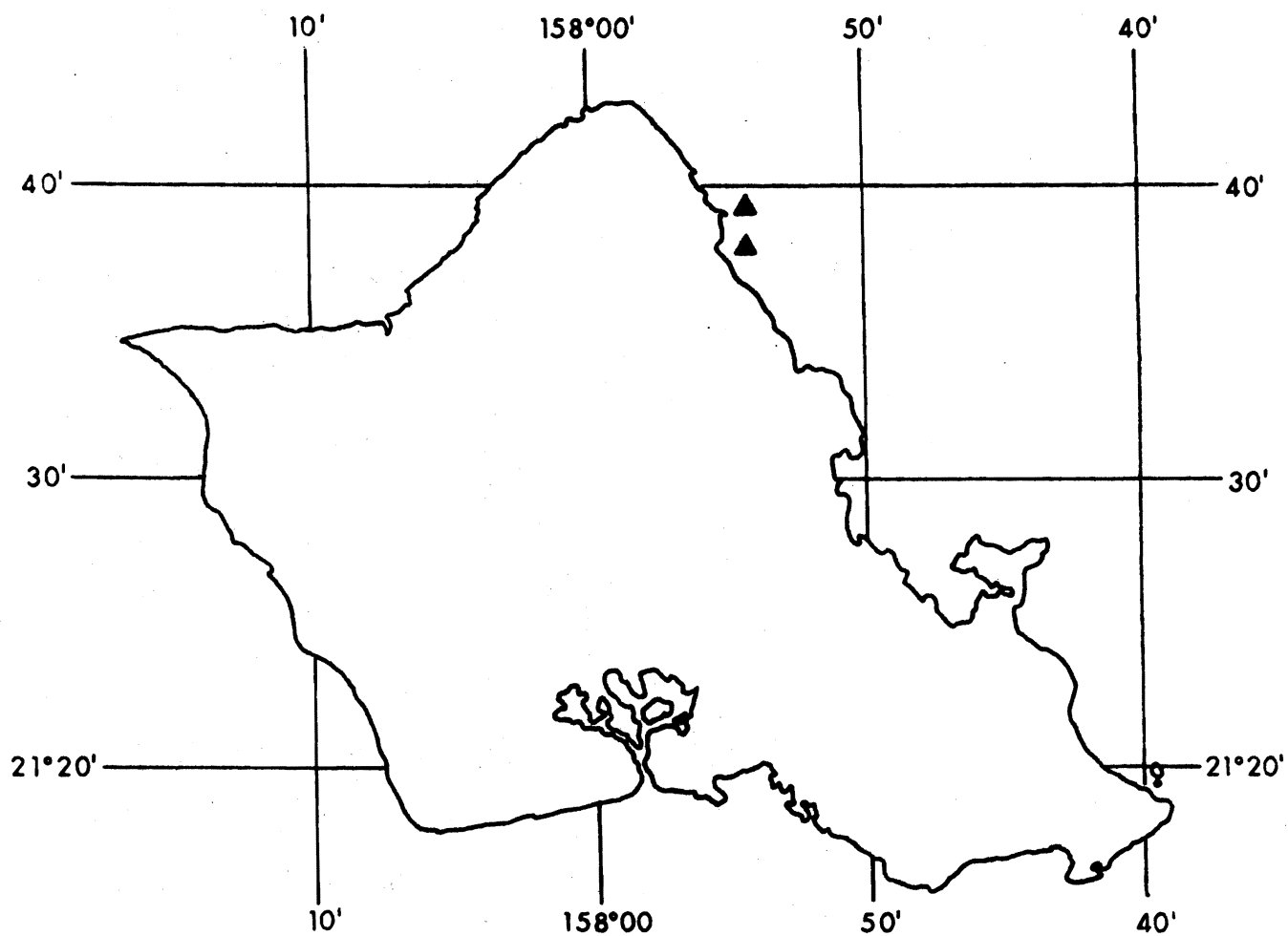
The first (and only) record of this species from Hawaii was by Pilsbry in 1927, who found Verruca cookei growing on Chthamalus hembeli at Laie Point on Oahu.

Hawaiian Records

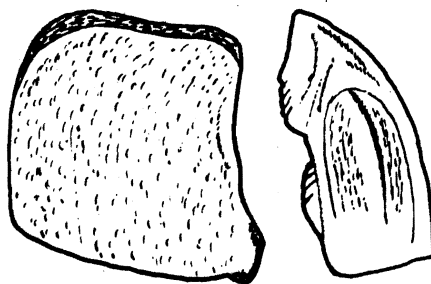
Laniloa Point, Laie, Oahu. Type number 523, Bishop Museum, Honolulu.

Pilsbry, 1927.

Laie Point, Oahu. Edmondson, 1933.



Distribution of Verruca cookei Pilsbry on Oahu.



**Fig.39**

Verruca cookei Pilsbry, tergum and scutum of the type specimen,  
internal views. Drawn from Pilsbry, 1927.



Verruca halotheca Pilsbry

1907. Verruca halotheca. Pilsbry, Bull. Bur. Fish. 26, 1907, p. 188, pl. 4, fig. 9, 10.

1913. Verruca capsula. Hoek, Siboga Expedition, Cirripedia, 1913, p. 130, pl. 12, fig. 1-3; pl. 13, fig. 1-4.

1916. Verruca halotheca. Pilsbry, U. S. Nat. Mus. Bull. 93, 1916, p. 46, pl. 8, fig. 1, 1a.

Habitat

Contrary to Darwin's statement that this genus is rarely found on rocks, the Hawaiian record of this species notes that the species was attached to a pebble of volcanic rock. The cirriped was found in 913 fathoms of water off the coast of Hawaii. (Pilsbry, 1907A). This species was also found off the coast of Kauai in 228 to 235 fathoms of water. (Pilsbry, 1916).

Hawaiian Records

Albatross station 4060, in 913 fathoms on the northeast coast of Hawaii.

Pilsbry, 1907A.

Kauai, in 228-235 fathoms. Pilsbry, 1916.

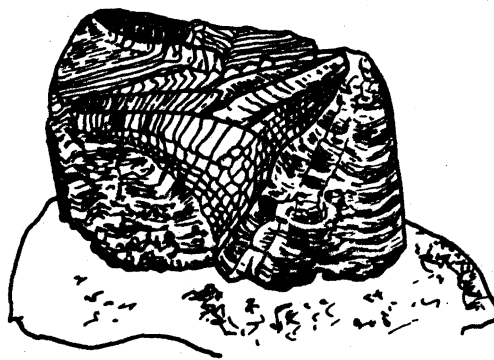


Fig.40

Verruca halotheca Pilsbry. Drawn from Pilsbry, 1916.

### Summary

It is rather interesting to note that of the 37 cirriped species found in the Hawaiian Islands, 13 of them have been reported only from this area. Of the remaining species, 13 are worldwide in their distribution, eight have been recorded previously from the South Pacific area, one from the western coast of North America and two from Japan.

These figures would tend to preclude any argument that the Hawaiian cirriped fauna is composed of species from a specific geographical area, although there may be a slight influence from the South Pacific area.

It is understandable that so many cirripeds are worldwide in their distribution. Cirripeds are fouling organisms. They are carried over the world's oceans on the bottoms of ships crossing the oceanic currents which present a barrier to their free-swimming larvae.

It is surprising that so many species have been recorded only from the Hawaiian Islands. On closer examination, it will be noticed that ten of these species were dredged on oceanographical expeditions. The Albatross Expedition worked in Hawaii in 1902 as part of a larger exploration of the whole Pacific Ocean. The Tanager Expedition worked primarily in Hawaiian waters in 1923-24. The remaining three species were found living on the appendages of other crustaceans by people who were looking specifically for parasitic cirripeds. It may be that these cirripeds are found only in Hawaii but then again it may be that they are found in other areas of the Pacific Ocean where no one has looked.

It would seem that instead of being geographically isolated, the "uniqueness" of the Hawaiian cirriped fauna is due to the more intensive investigations that have been carried on in this part of the world.

I feel quite confident that as more work is done in this field and that as more areas of the Pacific are sampled, the species which are now listed as "Hawaiian" will be found in other areas of the Pacific and the world.

## Appendix 1

Unpublished Observations

Balanus amphitrite Darwin. Coconut Island, on wooden docks. Gordon.

Balanus amphitrite hawaiiensis Broch. Coconut Island, on wooden docks.

Gordon.

Balanus eburneus Gould. Coconut Island, on wooden docks and on styrofoam docks. Gordon.

Balanus trigonus Darwin. Coconut Island, on metal piping. Gordon.

Lepas anserifera Linnaeus. Donated by Robert Cordover. Gordon.

Chelonobia testudinaria (Linn.). On a turtle off the KMCAS, Kaneohe Bay.

Gordon. Found by Neil Lowell.

Conchoderma auritum Linnaeus. On the teeth of a porpoise in the Waikiki Aquarium, identified by W. A. Newman. Reese, personal communication, complete description on next page.

Conchoderma auritum Linnaeus

1767. Lepas aurita. Linnaeus, Systema Naturae, 1767.
1824. Otione Cuvieranus Blanivillianus Bellianus Dumerillanus Rissoanus.  
Leach, Encyclop. Brit., vol. iii, Supp., 1824.
1829. Otione depressa et saccutifera. Coates, Journal Acad. Nat. Sci. of  
Philadelphia 6, 1829, p. 132.
1845. Otione auritus. Macgillivray, Edinburgh New Phil. Journal, 38, 1845.
1795. Lepas leporina. Poli, Test. utriusq. Sicil., 1795, pl. vi, fig. 21.
1815. Lepas corunta. Montagu, Linn. Trans., 6, 1815, p. 179.
1814. Conchoderma auritum et leporinum. Olfers, Magaz, der Gesell. Freunde  
zu Berlin, 3d Quartel., 1814, p. 177.
1815. Branta aurita. Oken, Lehrbuch der Naturgesch., 1815, Th. 11, p. 362.
1817. Malacotta bivalvis. Schumacher, Essai d'un Nouveau Syst., 1817.
1824. Gymnolepas cuvierii. De Blainville, Dict. des Sc. Nat., Art. Mollusc,  
1824.
1851. Conchoderma auritum. Darwin, Ray Society, London, 1851, p. 141,  
pl. 111, fig. 4.

Habitat

Darwin (1851) reported that this genus was found throughout the world in equatorial, temperate and cold seas attached to floating objects. He reported that C. auritum was extremely common being found on ships' bottoms in all parts of the world. It has been found on the coronulae of whales and at times, on slow moving fish. It is often associated with C. virgata, Lepas anatifera, L. hilli and L. anserifera. There is no published record of this species from Hawaii, but a specimen was found on the teeth of a porpoise in the Waikiki Aquarium and was identified by W. A. Newman to be C. auritum.

Hawaiian Records

Honolulu, Oahu. Reese, personal communication.

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