

Native Use of Marine Invertebrates in Old Hawaii

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with the collaboration of

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PREFACE: This paper on the marine invertebrates of Hawaii is one link in a continuing study of the traditional Hawaiian food chain. Many years ago the idea of studying the food customs of the old Hawaiians was suggested to me by a friend, E. S. C. Handy, then an anthropologist at Bishop Museum. Acquiescing, innocently, I began to gather notes on all phases of the subject. Thanks to the great help given to me by Mary Kawena Pukui, a mass of notes was finally brought together and it then seemed best to slow up on collecting information and begin organizing what had been gathered. Some topics have been studied and the results published, notably, "Kava in Hawaii," *Dog and Man in the Ancient Pacific*, and *Native Use of Fish in Hawaii* (Titcomb 1948, 1969, 1972).

The present work is the latest attempt to share the results of our food study. In the preparation of this manuscript, I have been fortunate enough to attract the help of others. To assure accuracy in identifying the shore animals involved, their scientific names had to be included. Dennis M. Devaney, invertebrate zoologist at the Bishop Museum, kindly looked at the manuscript and supplied scientific names of animals covered by his department. Danielle B. Fellows searched the others needed, and added many notes.² Her work has been done with so much empathy with the Hawaiian people and their culture that her contribution to the original paper has been considerable. E. Alison Kay also brought up to date many scientific names from the ever-changing records of nomenclature.

Many persons served as informants during the collection of the material. The list of names included at the end of this paper is much too brief. In many cases where a few words of information were procured, the record of the informant's name may have been lost. This is regretted. Chief among the informants is Mary Kawena Pukui, to whom the Hawaiian record owes so much. The writings of Kaauwana Aukai, S. M. Kamakau, Z. Kepelino, and David Malo also provided a great deal of information.

Grateful acknowledgment is also made for the use of the resources and staff at Bernice Pauahi Bishop Museum in obtaining scientific information, Hawaiian names, photographs, and additional information concerning the animals. A card file of Hawaiian names for marine invertebrates was established at the museum, and a great deal of searching for additional names and identifications was done.

Photographs have proved as revealing as words, and we are most grateful for their use—loaned or donated—as well as the use of the Bishop Museum's collections, especially those of Ray Jerome Baker, made many years ago.

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Some pictures from Edmondson (1933) have been used. Other photographs come from Spencer Tinker, former Director of the Waikiki Aquarium; David P. Fellows; John Maciolek; Dennis Devaney; Warren Roll; Ralph Bowers; and Frank Tabrah. A search for shore scenes showing Hawaiians gathering marine invertebrates in early days yielded only a few. Notable among them are photographs taken long ago by the well-known Alonzo Gartley, a *kama'aina* (old resident) and early amateur photographer. More than others, he chose scenes characteristic of Hawaiian life.

IN HAWAIIAN FOOD ECONOMY, there was great dependence upon marine resources to supplement *poi*, the starchy mainstay among land foods. The figurative expression for food was *i'a a me poi* (fish and poi). The term *i'a* signified not only fish but all animal foods from sea and land. While the emphasis was on the use of marine invertebrates as food, they were also used for medicinal purposes and in making tools.

There was abundant shore life in the old days, because Hawaiians were observant of the supply available and were careful not to take more than could replenish itself. But as foreigners settled in Hawaii, less care was taken, and the supply eventually became much reduced. Some attempts were made to replenish supplies; for example, the Samoan crab (*Scylla serrata*) and other species were introduced. Such introductions have somewhat altered the composition of the shore fauna. Brock (1952, 1960) recorded attempts at introduction of aquatic animals. He points out the difficulties and the lack of success in the majority of attempts.

People have made many changes in shore waters through the addition of high-nutrient sewage; by dumping bagasse from sugar processing; by increasing siltation; through increased fresh-water run-off; and through structural changes, such as neglect of fish ponds, accommodation for ships, dredging and land-fill projects, and construction of berms and retaining walls along property fronting the shoreline.

Depletion of invertebrates is apparent in the local markets. There is little to buy in the way of native forms, which are too scarce to permit commercial collection. The Hawaiians, Japanese, and others who search for the local forms enjoy their catch themselves.

It is now recognized that a period of well-planned conservation must take place in order to preserve the remaining marine resources. Increasing awareness of the deleterious effects of present-day technology and population expansion has resulted in new legislation aimed at protecting Hawaii's shoreline habitats and marine life.

Great use has been made in this paper of the knowledge of Mary Kawena Pukui, part of whose life has been spent in the district of Ka'u (in southern Hawaii) among Hawaiians with food habits that have not changed greatly from the old ways. Other information was found recorded in old Hawaiian newspapers and was chosen and translated by Pukui. Additional sources are noted throughout this paper. No stress has been put upon the timing of each custom. The cited source reveals a good deal, but so many customs were handed down from ancient days and so many others are obviously of recent introduction that the attempt to pinpoint the time of introduction seems futile. When known it has been cited.

Scientific determination of the invertebrates has been done gradually, as informants have offered Hawaiian identification of organisms. Mary Kawena Pukui's knowledge of Ka'u district names and customs has made possible many determinations (Pukui and Elbert 1957). In some instances, scientific determinations have been deduced from the Hawaiian descriptions. Isolated scraps of information have been discovered now and then as notes in privately owned copies of Edmondson (1933), and in journals, letters, and notes from missionaries, adventurers, and scientists.

It must be stressed that the information contained in this work depicts uses and names in the period of Hawaiian history

following *haole* (foreign) contact. We do not know whether precontact uses and names for the invertebrates were different from those given for postcontact Hawaii. If changes were made, they must have occurred gradually. No comparative work in southeastern Polynesia, which might possibly indicate the age of some customs, has been done. Careful analyses of invertebrate remains—principally of mollusks and sea urchins—probably would reflect regional differences in food habits that are not indicated in this work, as well as give additional and perhaps different insight into Hawaiian uses of marine invertebrates.

HAWAIIAN NOMENCLATURE

It would be in error to state that the Hawaiians did not have a system of nomenclature founded on keen observation. One need only examine the groups of animals indicated as *loli* (Holothuroidea, sea cucumbers), *leho* (Cypraeidae, cowries), *'ina* and *wana* (Echinoidea, sea urchins), and *pūpū* (Gastropoda, snails) to realize that the Hawaiians saw relationships among various kinds of animals and subconsciously, perhaps, organized their concepts of these animals into a classification system. But it should be pointed out and emphasized that anatomical and morphological relationships were only part of the basis for classification.

Distances between the islands precluded the amount of communication that would have been needed for complete agreement among the people as to names. What is more, although the astute minds who picked Hawaiian names and groupings did very well indeed, agreement among all the islands was not an aim, and records were not kept—except in memories. Therefore, more than one name may have been chosen, here and there, as acquaintance with the various animals was made. This creates confusion at times, which will become evident as one reads this paper.

Formation of names depended upon habitat preferences, economic uses, behavioral traits, color variations, and particular isolated

stages in the life cycle—all these were equally important with gross body structure in naming and classifying organisms. One must therefore keep an open mind in attempting to attach scientific names to organisms described in Hawaiian literature. In many cases, more than one kind of organism (phylum, class, family, or species) is designated by one particular Hawaiian name, simply because the general appearance, habitat preference, economic use, behavioral trait, color pattern, or stage in the life cycle connotes sameness in the Hawaiian view.

The use of a binomial system of nomenclature is also suggested in Hawaiian names for organisms. If the animal under discussion belonged to a sharply defined group, the particular animal's name was found to consist of the group name followed by a qualifying term, which was in most cases descriptive of the animal's appearance, behavior, habitat preference, or use. In other cases, animals of equal cultural or economic value (or of no value at all) that were only superficially similar in habits and appearances had a common Hawaiian name—if in fact they were named—and only sometimes were their differences denoted by qualifying terms used with the group name.

Finally, as is true in the case of common English names for particular species, Hawaiian names for organisms were found to vary from locality to locality.

GATHERING OF MARINE INVERTEBRATES

As stated in an earlier work on the native use of Hawaiian fish (Titcomb 1972), the custom of food division in the old days when Hawaiians were their own managers was patterned in a communal manner. Food gathered was surrendered to an officer of the high chief and a fair division was made there on the shore, whether the recipients had had anything to do with the collecting or not.

It was chiefly women's work to gather shellfish and seaweeds (*limu*). Every day they went out on the reefs and shores in numbers, with children searching right along with them for everything edible (Figures 1, 2). A



FIGURE 1. Hawaiian women at the shore. (Courtesy of Bernice P. Bishop Museum.)

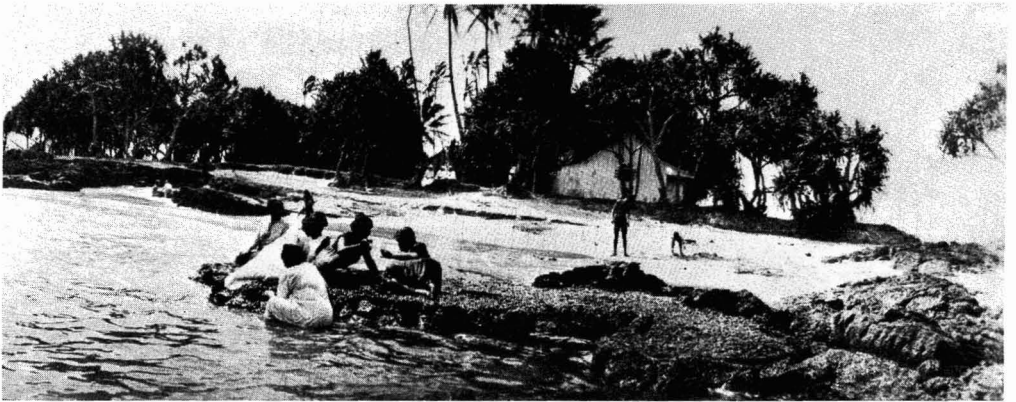


FIGURE 2. Socializing went along with gathering food. (Courtesy of Bernice P. Bishop Museum.)

gourd calabash would be tied to their persons by a string or rope that was long enough to allow the calabash to float out of their way, but it could be pulled in quickly to take the catch. Often, storms would interrupt the

search, as Kamakau (n.d.: chap. 4:43) says: "During the stormy days of winter, winds blow, rains fall, thunder and lightning play, mud is washed into the foaming sea over the squid beds, covering the holes of the

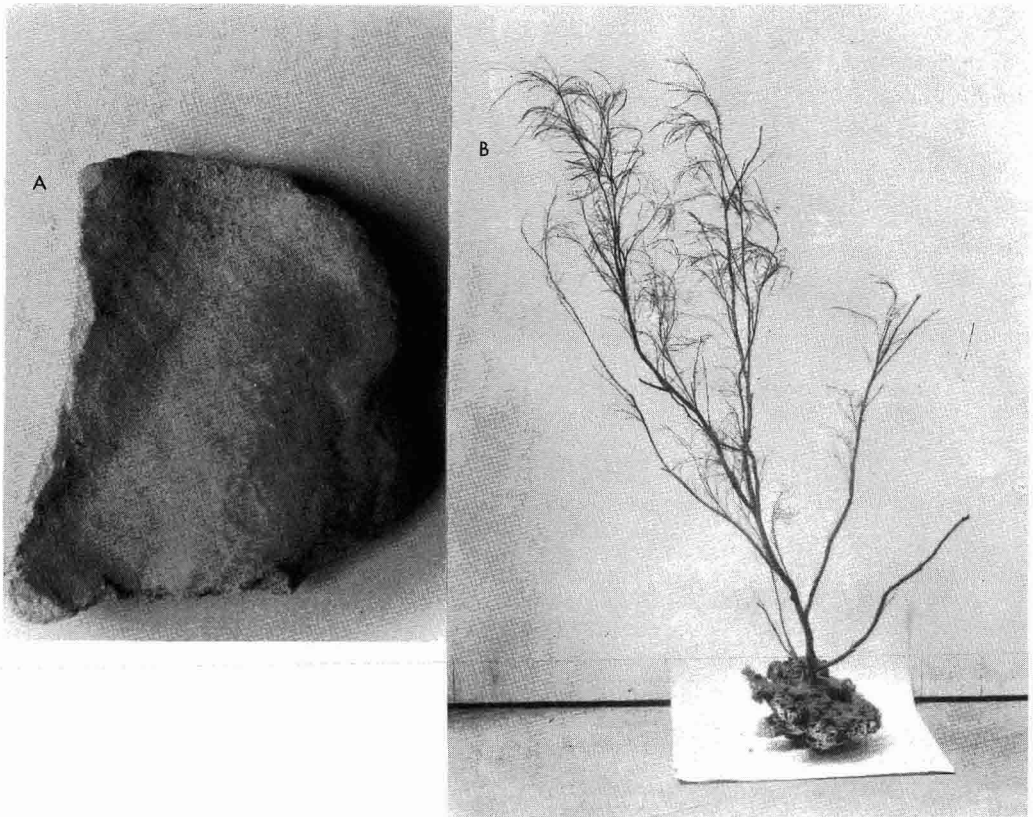


FIGURE 3. Some invertebrates used medicinally. *A*, 'Ana, a siliceous sponge. *B*, 'Ekaha-ku-moana, black coral. (*A*, Photograph by M. Titcomb; *B*, Courtesy of Bernice P. Bishop Museum.)

sand crabs. Shore fishing is impossible with the floor obscured by the silt; the fisherman must turn his attention to the deep sea."

NATIVE USE OF HAWAIIAN MARINE INVERTEBRATES

Sponges

Hu'ahu'a, *hu'ehu'e*, *hu'ahu'a-kai* (foam of the sea), *hu'ehu'e-kai*, *hu'a-kai*; *'ūpī* (derived from the word meaning "to squeeze"): any of the various sponges found in Hawaiian waters. Not used as food or medicine.

'Ana: *Leiodermatium*, a siliceous sponge (Figure 3A). Used as medicine (Kamakau 1964:103, 143). Andrews (1865:54) defines

'ana as "a kind of light stone found in the sea, used by nurses to cure the *ea*, or the white fur on the tongue; also used in rubbing and polishing off canoes and wooden calabashes." Pukui and Elbert (1957:22) define it as a stony sponge, used as medicine and as sandpaper. It has been suggested that perhaps the 'ana used medicinally is different from the 'ana used as sandpaper. The former may be a kind of sponge, *Leiodermatium*, that is relatively uncommon, and the latter may include a common, easily obtained coral, *Porites*, and (volcanic) pumice. Scientific identification of a piece of medicinal 'ana furnished by Pukui was made by G. J. Bakus of the Allan Hancock Foundation, University of Southern California, in November 1963. The following is a description of the medicinal 'ana made by Pooloa (1921):

Let us examine this *pōhaku* 'ana. It is white, its many holes [pores] are grainy, and it looks hard.

This *pōhaku* 'ana is found at Mo'omomi in a hidden cave. One dives into the sea and comes up inside this cave on land. It is guarded by an eel, and there inside by a *mo'o*. It is at Kala'e, Molokai. Let us turn and look elsewhere. This *pōhaku* 'ana is [also] to be found in 'A'alaloa, a hidden cave; one dives into the sea and comes up on land. This is on the island of Maui.

This is the *pōhaku* 'ana that is given as an 'ea remedy to little children and for certain kinds of illnesses found in this life. Pulverize it until it is white then give it with prayer. 'Amama, ua noa.

A Laie, Oahu, woman recommends a rinse or gargle of a mixture of crushed 'ana and water for treatment of 'ea (thrush) (Ryan, informant).

Coelenterates: Hydrozoans

'Ili mane'o, *pa'imalau*, *palalia*, *pololia*: *Physalia*, Portuguese man-of-war. Bryan (1933:146) suggests that the name *palalia* probably comes from *pala*, which means soft, and *lia*, which connotes fear of something. Certainly, the Portuguese man-of-war and its stinging tentacles was as familiar to the old Hawaiians as it is to all swimmers in Hawaii today.

Anthozoans

'Okola, 'ōkole (the anus), 'ōkala (roughness), 'ōkole-emiemi (shrinking anus), 'ōkole-hāwele (tied 'ōkole): Actinarians, sea anemones. Two species were eaten: (1) a white kind (*Radianthus cookei*) (= *Antheopsis papillosa*), about 1 inch across at the mouth and 1.5 inches long, which lives in the sand; and (2) a dark-brown or reddish kind (*Anthopleura nigrescens*), a little larger, which lives on lava rocks (Kawelo, informant).

PREPARATION: Remove the tentacles, rub the rest of the animal with salt to clean off the slime, sprinkle with salt, and leave it for a few hours. Then it may be eaten raw or cooked in *ti* leaves. The center is particularly sweet. "Delicious," say Kawelo and others. Kondo reports that as a child in the Hana district of Maui he and his Hawaiian friends gathered anemones and cooked

them on a charcoal fire; they ate the entire animals.

Kio-noho-one (sand-dwelling *kio*): perhaps *Isarachnanthus bandanensis*. See remarks under *kio-noho-one* in the *Kio* section, below.

'Ēkaha-ku-moana: *Antipathes grandis* and similar forms, black coral (Figure 3B). 'Āko'ako'a-'ele'ele (literally, black coral) is the modern name that was created when interest was aroused in black coral jewelry and the tourist industry demanded that a Hawaiian name be attached to it. Kamakau (1964:103, 144) indicates that it was used medicinally. Kaaiakamanu and Akina (1922: 23-24) give recipes for the use of 'ēkaha-ku-moana:

This is a certain growth in deep water where deep sea fish is sought. It grows like a tree and it is of coral make-up. A small piece from such a growth is used for sores about the mouths of children. The piece is ground to powder and mixed with the juice from the softening or partly decaying banana tree and from four young "kukui" nuts and a piece of mountain apple bark. The mixture is then applied directly to the afflicted part or parts of the mouth.

For lung trouble and for kindred diseases, the following mixture is found to be very effective: an equal amount each of the "koa," mountain apple and "kukui" bark (each piece being the size of the palm of the hand); about a quart full of the *Peperomia* stems and flowers; two onion bulbs; one partly dried coconut and two segments of the red sugar-cane. Have these materials thoroughly pounded together and then pour into the mixture the milk of a partly dried-up coconut. The liquid thus formed is then pressed out and strained. Then four medium-sized red-hot stones are dropped into the liquid to cook it. In the meantime, enough limbs of the "ekaha-ku-moana" have been gathered and powdered, producing an amount which would fill a tablespoon. This and an equal amount of the "ti" juice are then put together and poured into the above mixture after it is cooled to the right temperature. The entire content is then placed in a covered container where its strength can be conserved. The patient then takes about a tablespoonful of this liquid before each meal, morning, noon and at night.

Limu-make, *limu-make-o-Hāna*, *limu-make-o-Mū'olea*: *Palythoa toxica*, a reddish zoanthid or "soft coral" (Figure 4). Previously thought to grow only in one locality in the Hana district, Maui (at Muolea, Kanewai, south of Hana), but recently reported also from Lanai Lookout and Halona Blowhole, Oahu. It is deadly poi-



FIGURE 4. *Palythoa toxica*, the poisonous *limu-make-o-Hāna*. (Courtesy of William J. Cooke.)

sonous, containing a poison second only to botulism in toxicity (Moore and Scheuer 1971, Walsh and Bowers 1971).

A legend tells how a vicious shark-man was destroyed and the ashes of its body were thrown where this soft coral grows; the ashes turned into this deadly organism. The poison from it was used by Kamanawa, grandfather of Kalakaua *ma*, to kill his wife. N. B. Emerson (Malo 1951:201, note 11) states that it was smeared on spear points to make them lethal. The men who did the smearing were called *hamohamo*, the smearers. The following letter to the editor of *Ka Lahui Hawaii* appeared in the August 23, 1877 issue of that newspaper:

Editor, Greetings,

Please permit me to tell something of the poisonous sea weed of Muolea, at Hana, East Maui.

In olden times it did not grow as it does now and the natives who lived near the sea pools did not know that it was poisonous. When some children went to the sea pools to catch ohua fish to eat, those who ate a quantity became dizzy and fainted by the pools. They revived when medicine was administered. After that, a man from Honaunau in Kona, Hawaii, discovered it. When the pigs ate sweet potatoes he went to fetch the sea weed and rubbed it over the potatoes. After the pigs came back to eat them, every single one died. When the dogs went to lick the vomited matter from the dead pigs,

they too died. That is how they found out that it was poisonous, for it also grows in Honaunau, Hawaii.

If you should pick it up with your fingers, they will rot and break off. The only thing to do is to poke it up with a stick and lay it down on a ti or taro leaf. As soon as you touch it it shrinks and wilts like a sensitive plant. It is not long like other algae and is like the suckers on an octopus. On certain kapu nights of the year, a red glow is seen where it is found.

In A.D. 1841 perhaps, the sea pool was filled with stones but now more is growing and out toward the open flats. The fish that swim around it are not harmed, but if you eat the fish of the sea pools, you will die.

This is the fastest working poison like the deadliest haole poison and perhaps more potent. For this reason any person who has not the right to, is absolutely prohibited from going there.

With thanks to the printers and my love to the Editor,

Abraham Kauhi

Muolea, Hana, Aug. 11, 1877

On 30 December 1961, zoologists from the University of Hawaii and Hawaii Institute of Marine Biology (Coconut Island facility) traveled to Kanewai, Hana, to collect living *limu-make-o-Hāna* for research concerning its toxicity. They were repeatedly warned by the Hawaiian residents that the area was *kapu*—that entry into it was a serious transgression of ancient Hawaiian law, and that they might expect punitive action. (On 30 December 1961, at approximately the same time that the zoologists were in the Kanewai area considered *kapu*, a fire of undetermined origin occurred at the Coconut Island marine laboratory, completely destroying the main building and its contents.) On the following day, some specimens of *limu-make* were actually collected and first-hand knowledge of its toxic nature was obtained. The collector absorbed enough of the animal's mucous secretions through numerous scratches and abrasions on his hands and feet to experience nausea, dizziness, headache, swelling of his hands and feet, and general malaise; the latter two symptoms lasted for about a week (Helfrich and Bowers 1962).

Corals

Āko'ako'a, hāko'ako'a, ko'a, ko'ako'a, ko'a kea, puna kea: corals in general.

Āko'ako'a-'ele'ele: modern name for black coral. See remarks under *'ēkaha-ku-moana*.

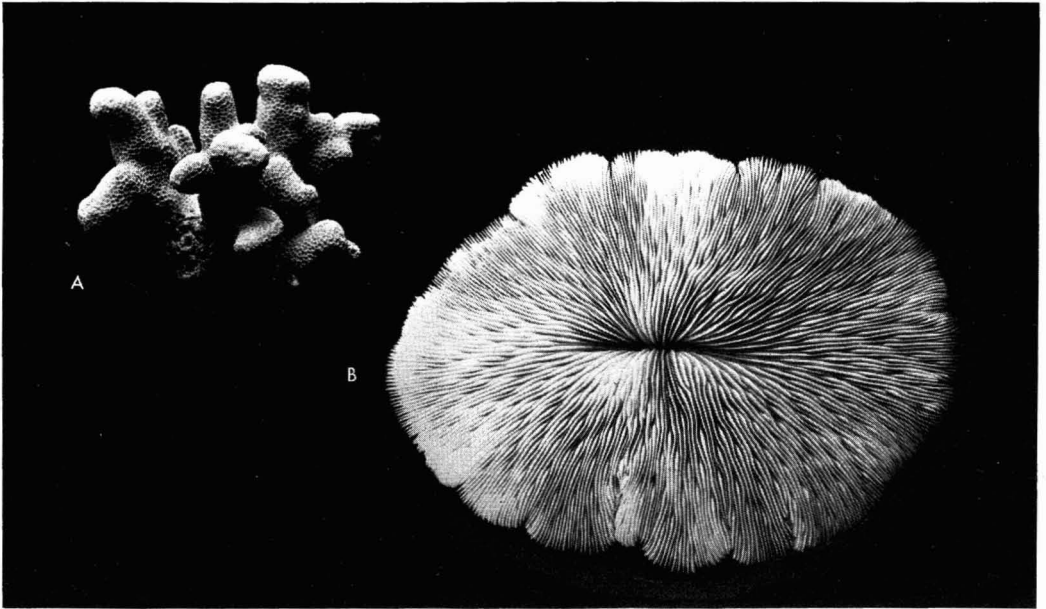


FIGURE 5. Corals were used as abrasives. A, *Pōhaku puna*, Puna coral. B, *Āko'ako'a*, mushroom coral. (Courtesy of Bernice P. Bishop Museum.)

Āko'ako'a-kohe, ko'a-kohe (vagina coral): *Fungia scutaria*, mushroom coral (Figure 5B).

Pōhaku puna, puna: *Porites* spp. (Figure 5A; W. A. Bryan and K. P. Emory, personal communications).

Kāwa'ewa'e: a kind of stone or coral. Used in polishing canoes or in rubbing bristles off pigs destined for the *imu*.

Corals were used as abrasives, the mushroom coral being most effective and popular. See also comments under *'ana*.

Annelids

Muiona: a polychaete annelid worm, resembling a centipede (Pukui and Elbert 1957). No information on uses available.

Kauna'oa, kauno'a, una'oa: *Lanice conchilega*, a terebellid or "spaghetti worm" (Figure 6; Pukui, personal communication to D. B. Barrère 1962). Note that this is a correction to an earlier statement (Pukui and Elbert 1957) that the *kauna'oa* is a vermetid mollusk and that the *kio* is the terebellid worm.

The tentacles were dried, then mixed in

water, and taken as a remedy for cancer, according to some modern informants. Other methods of using *kauna'oa* for this purpose include drinking an infusion of cooked *kauna'oa* tentacles daily for several weeks (Molokai Island), and sucking the body fluid from a live *kauna'oa* through a fine bamboo tube (Kona district, Hawaii Island) (Tabrah 1970).

Ko'e: polychaetes from coral (Bryan 1915: plate 113). No data on uses are available.

See also *'aha-huluhulu* in the section on Echinoderms, Holothuroids, and *Kio-po'apo'ai* in the discussion of *Kio*.

Other Worm groups

Ko'e, ko'e kai: sea worms, as the nemerteans, echiurids, nematodes, etc. (Pukui and Elbert 1957).

Kio

Kio (Figure 7) appears to be the name for a group of animals rather than for a particular

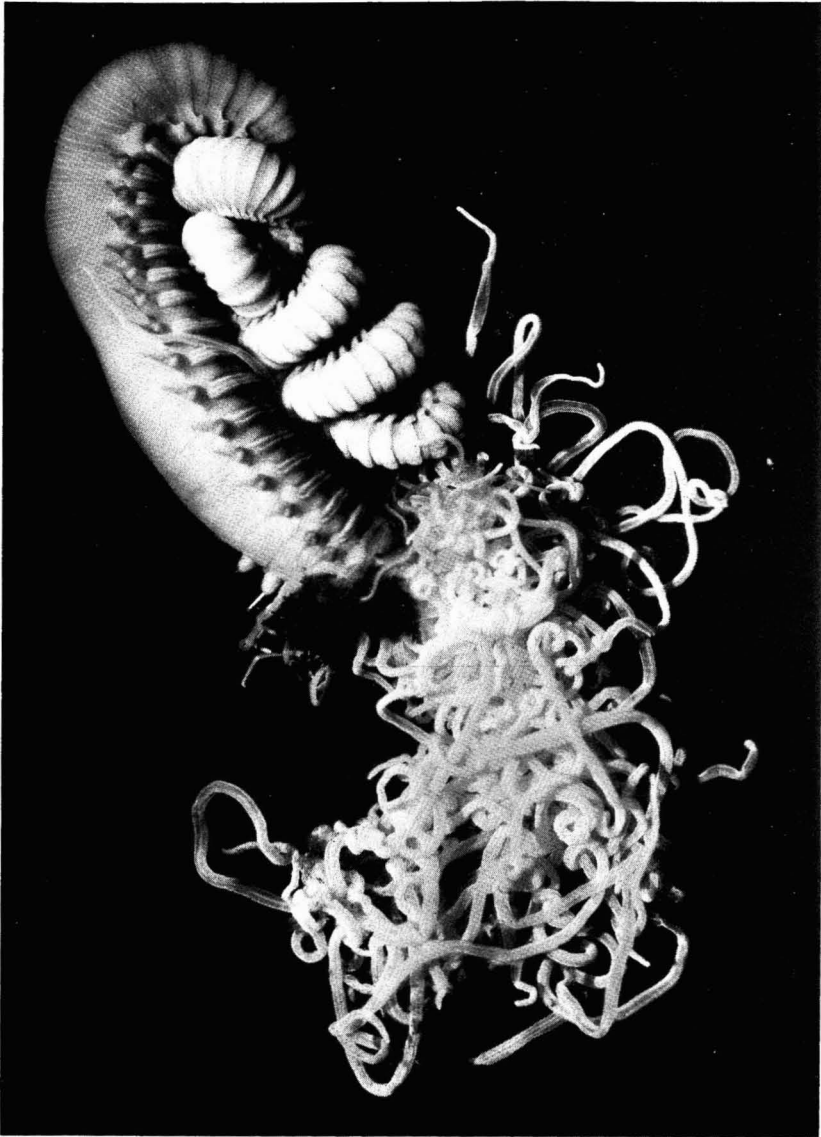


FIGURE 6. A sea worm, *kauna'oa*, *Lanice conchilega*, thought to be of medicinal value. (Courtesy of Dr. Frank L. Tabrah.)

kind of animal or even for a group of closely related animals. In this case, the grouping seems to be based upon a particular aspect of the animals' appearance—a hard, permanent growth or protuberance on or in the substrate, indicating the presence of the animal. The word *kio* itself means protuberance, bubo, projection (Pukui and Elbert 1957); descriptions of the various kinds of

kio animals indicate that, in addition to building or forming protuberances, the animals themselves—or parts of them—protrude/emerge from their structures.

Kepelino describes several sea creatures which he calls *kio* (n.d. I:73, II:74–77). His descriptions are listed here; the authors' interpretations and tentative identifications appear following each description:

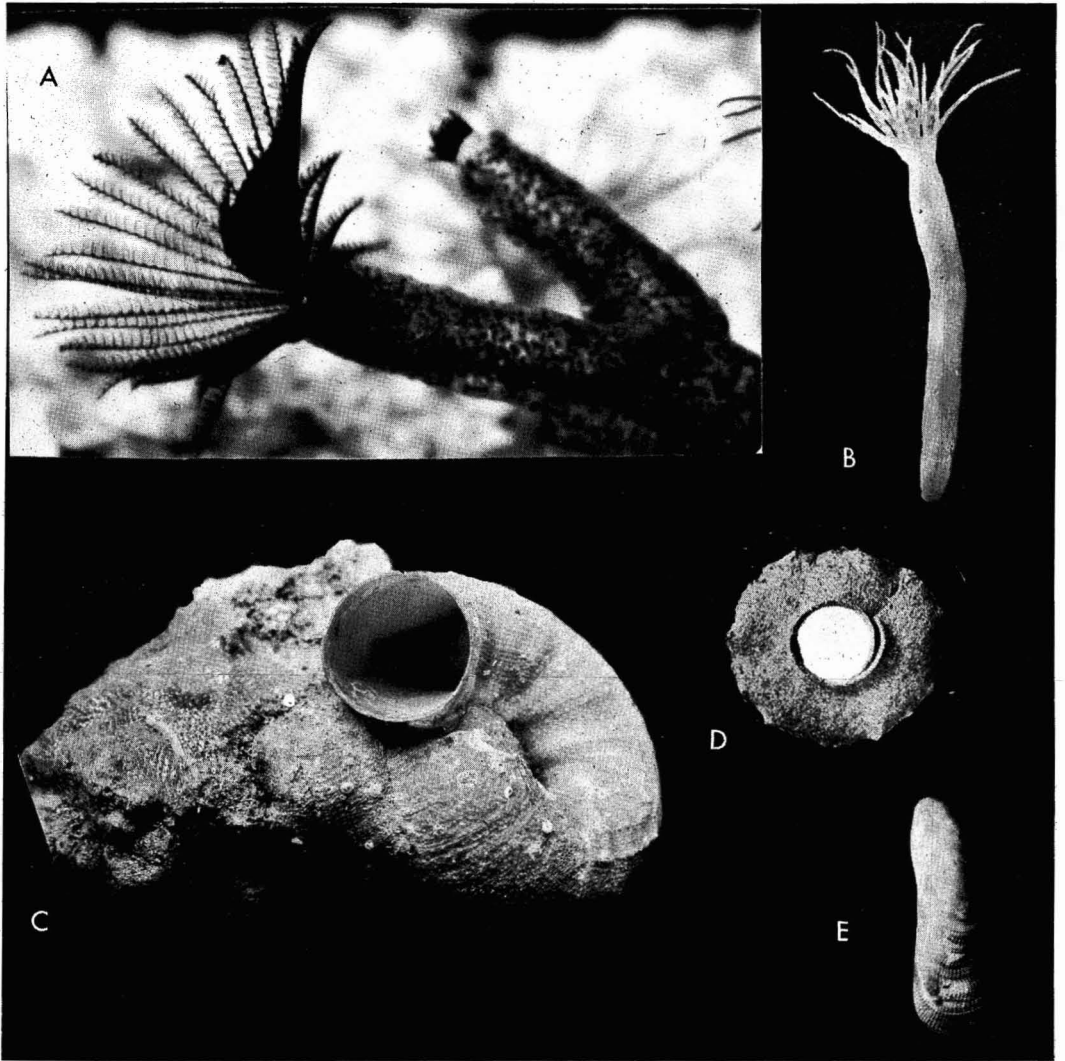


FIGURE 7. *Kio*: various kinds of marine "worms" with distinctive forms. A, *Kio-po'apo'ai*, sabellid worm. B, *Kio-noho-one*, the sand-dwelling sea anemone, *Isarachnanthus bandanensis*. C, Vermetid mollusk. D, Egg mass of the moon shell, *Natica gualteriana*. E, *Kio-nahawele*, the mytilid *Brachidontes cerebristriatus*. (A, courtesy of S. A. Reed; B-E, courtesy of Bernice P. Bishop Museum.)

The *kio* is a very hard creature. The shell surrounding its body is like real stone and around the opening it is like the 'olepe. The flesh is eaten but the shell has to be broken open with a stone to extract the flesh. It is eaten raw like the 'olepe. The kingdom of the *kio* is the beds where the seaweeds grow [I: 73].

There are three kinds of *kio*, 1. the *kio po'apo'ai* [Figure 7A], 2. the *kio* that resembles the *nahawele* [Figure 7E], 3. the *kio* that lives in the sand . . . all good, classed with *i'a* because they are edible. They cannot swim away nor can they leave their homes until they die. So I call them creatures that have taken the Carmelite oath.

These are delicious creatures. Their homes are not alike, some live in sand and some on the rocks.

Kio po'apo'ai (serpentine *kio*): It builds its home on a rock and takes the lime crushed by the sea onto a flat rock where it desires to build. This is how it does it: it reaches down until its tail touches the sand, then it mixes the sand with the lime that is crushed fine as ashes by the sea. This it applies all over its body and gives out some sticky substance within itself. Then the sand and lime become one, like a single shell. Then it begins to build its house close to its head and that is the size and width it will build. When that is done,

then it works on the middle part until it is its whole length, winding around like a coil of rope or the kind of wind instrument called the serpent. In building its home, it does make it look very much like the serpent instrument, in being large at first and tapering down to the tail. Its house is made the size of its body. It is shiny and beautifully smooth inside and extremely hard. The hands alone cannot break its house open, nor can the feet, without the assistance of a rock or iron hammer. When it lives without its house, it hides in the sand and after the house is finished it lives greatly protected. It does not come out nor does anything disturb it. There it is, in its "office," and stretches out its petals from within, at high tide, and it looks very much like a flower in the ocean. But if touched by anything, it immediately withdraws and disappears. Knowledge of what it eats is not certain—I think probably the minute particles in the sea. Its body is entirely fleshy; there is no bone at all. Its flesh is delicious. It does not live where it is always submerged but where it is frequently left emerged ["sea constantly not" is the literal translation]. The "petals" are used to grasp its food and with them it also pushes away any filth or dirt that touches it [II: 74].

The characteristics of the *kio po'apo'ai* seem to be: (1) it makes a serpentine, very hard tube out of mucus, sand, and lime, the full length of its body; (2) it can live without its "house"; (3) it possesses "petals" (branched gills), capable of being instantly retracted; (4) the animal itself can disappear within its "house" when disturbed; (5) it is intertidal. The description fits sabellid worms and serpulid worms (polychaete annelids).

Kio nahawele [Figure 7E]. This *kio* lives on a rock like the *kio po'apo'ai*. Its shell is extremely hard. It makes itself almost immovable on a flat rock. It opens up slightly like the *uhi* [mother-of-pearl shell]. How it makes its house is not clearly understood. I think its house just grows like the *uhi*, *nahawele*, *'olepe*, and so forth [all various kinds of pelecypod mollusks]. Its flesh is like that of the *'olepe*, *nahawele*, and so forth, and their appearance is alike. When something touches the opening, it clamps shut quickly and holds it fast. Its valves (*mau iwi kuapo'i*) are the hands by which it takes its food. Its real name is *kio*. The base (*mole*) of this *kio* is made fast to a smooth rock and one side is turned slightly upward. Where the valves (*mau iwi kuapo'i*) of the shell meet they are closed with a hinge, like the valves (*mau iwi kuapo'i*) of the *'olepe* [clam]. Its shell is extremely hard. The flesh can be removed only by pounding with stone or hammer. It doesn't like to be in calm water but in non-placid [turbulent?] waters, like the *kio po'apo'ai* [II: 76].

To this, Kawelo adds that these creatures

are clamlike, but very small, a large number occurring closely bunched together; it lives at tide level. Pukui and Elbert (1957) identify *kio-nahawele* as *Brachidontes cerebristriatus*, the common mussel; this bivalve mollusk fits the description as amended by Kawelo, although rock oysters (Chamidae) also are a possibility.

Kio noho one [sand-dwelling *kio*; Figure 7B]. This is a creature that lives under the sand. It makes its dwelling (*ke'ena noho*, lit., "dwelling room") under the sand and its workshop (*hale 'oihana*, lit., "office") is built right over the dwelling place. This is what it does: It makes its "office" in the shape of a spiral (*po'ai*), like the steps leading up to the steeple of Mary the Victorious, at Lahaina, Maui. These coils are made very thin like a stiff ribbon, each coil close to the next, like a long ribbon that has been wound up. It is small at the top and nice and big below—perfectly rounded like the wheel of a cart. Its dwelling place stands straight up, four or five or more inches high. Its workshop is as big around as it is long. Its tail takes up the sand and with some sticky substance from its body, it glues the sand grains until they adhere. The tail serves as hands and in making lime for building. With its head, it works back and forth to smooth it. Because of the perfect evenness of the roll of ribbon that it makes, therefore the hole in the center is beautifully round from bottom to the very top. From the outside it looks like a rounded spiral stairway.

When it goes up to work, it goes up from its dwelling place (*ke'ena noho*) to its office (*hale 'oihana*). It spies on the things that move close to its office (*hale 'oihana*) and the small fish (*i'a li'ili'i*) that may be swimming leisurely among the coils of the sandy ribbon that comprise its office. Immediately it allows its body [tentacles?] to touch them like bait and the little fish (*i'a li'ili'i*) are surrounded and caught. They are caught when they are touched by the sticky substance from its body and are unable to escape. So they die. It carries small fish (*i'a li'ili'i*) into its dwelling (*ke'ena noho*). This weak creature is extremely smart. The outward appearance is beautiful, clever, humble, and wise, but its behavior is that of a robber. If it notices that its enemy is stronger, it withdraws its head at once into the spiral and watches from within. If the enemy is too strong for it, it retires into its dwelling place (*ke'ena noho*) [II: 77].

The characteristics of *kio-noho-one* are interpreted as follows: (1) it lives under the sand—it burrows in it, perhaps, but not necessarily; (2) its "dwelling place" and its "office" are different entities; (3) its "office" is made in a spiral, of mucus and sand grains; (4) its "dwelling place" is straight and upright, of mucus and sand grains; (5) it



FIGURE 8. Among materials for ornament: *A*, *Kūpe'e lei* (*Nerita polita*). *B*, Shell lei *palaoa*. *C*, Pearl shell pendant. *D*, Niuhau shell lei. *E*, Lei of *pūpū* and *leho*. (Courtesy of Bernice P. Bishop Museum.)

procures food with its tentacles; (6) being a type of *kio*, it cannot leave its home. Our tentative identification of *kio-noho-one* is that the "office," that is, the spiral part, is the egg capsule of the moon shell (*Natica gualteriana*; Figure 7*D*), common on sand flats exposed at low tide (Pukui and Elbert 1957:142); the animal itself, with its "dwelling place," could be the sand-dwelling *Isarachnanthus bandanensis* (Coelenterata, Anthozoa, Ceriantharia), found in the same habitat as the moon shell (Edmondson 1946:49).

In addition to the varieties of *kio* described by Kepelino, there appears to be another group designated as *kio* by some informants and as *kauna'oa*, *kauno'a* and *una'oa* by others. These are greatly feared because they are capable of inflicting serious cuts if they

are stepped on. These forms are found growing on reef platforms (*papa*) and are not designated as being edible. They are identified as worm shells, family Vermetidae (Mollusca, Gastropoda). Natives of the Pacific believe that unless the wound is cut out or burned out at once, infection will develop and death will surely follow. Cooke remembered a case of a small child stepping on a worm shell years ago. Without the slightest hesitation, the contents of a glowing pipe of tobacco were pressed onto the wound. Pukui and Elbert (1957:127) state that the mollusk was believed to be somehow related to the dodder (*Cuscuta sandwichiiana*, belonging to the morning glory family). Kawelo adds that if anyone steps on it, the suffering is excruciating, and that if it is too far within the flesh to remove it completely, it continues

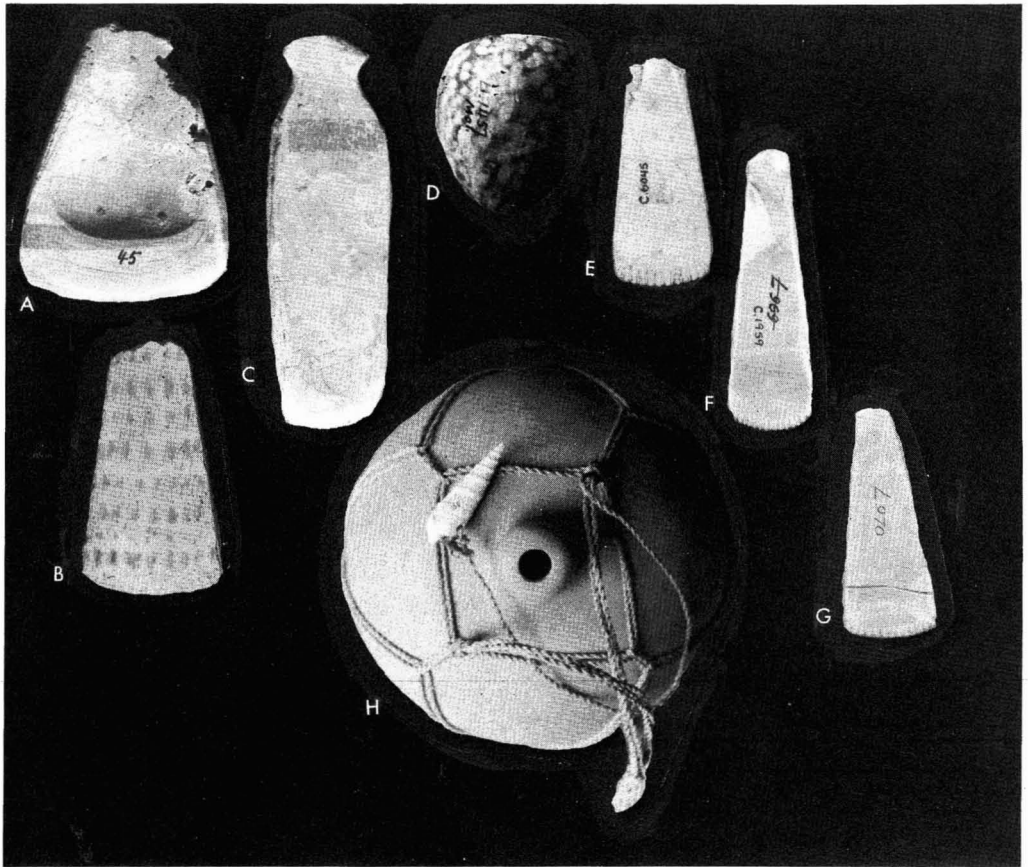


FIGURE 9. Tools of shell were enduring. A–C, Shell adzes. D, *Leho* scraper (for inside of gourds). E–G, Shell scrapers. H, Auger shell (*holoa* or *'oi'oi*) as gourd stopper. (Courtesy of Bernice P. Bishop Museum.)

to grow, just as the shell continues to grow on the reef. According to our informants, at the time when the dodder vine is abundant (in the late summer), the aching is most intense.

Kawelo (personal communication) says, "There is also the *ho* which grows straight upright on the lava—not so dangerous as the *kauna'oa*."

Garrett (n.d.) supplied the name *kio-pōhaku*, or stone *kio*. He noted that it is firmly attached to the rocks on the "bold" shore.

Mollusks: *Amphineura*—Chitons

Kuapa'a (Hawaii name); *pe'elua* (Oahu name); *pūpū-pe'elua*; *pupu-mo'o*: *Acanthochiton viridis* and some other chitons. Not used

as food, but used in the *māwaewae* ceremony for first-born babies (Pukui; see also Pukui and Elbert 1957:157, 224). Hawaiians used to ask the riddle, "What is the fish that has eight scales?" The answer would be *kuapa'a* or chitons (Garrett n.d.). *Naka* was also used by some to designate *Ischnochiton petaloides*.

Gastropoda—Snails

Hawaiian names for gastropod mollusks abound, indicating that this group of marine invertebrates was of major importance in the Hawaiian economy. The uses of these organisms included food, tools, and ornaments (Figures 8, 9). Hawaiians on Kauai used practically all varieties of mollusks found on the reefs as food; often the various

animals were combined and boiled together (Kay 1949). Doubtless this was the case elsewhere as well.

With this abundance of native names comes insight into the structure of Hawaiian nomenclature systems. In addition to different names in different localities for the same species, we find different names for the same shell used in different ways, for variations in shell colors, for behavioral and habitat variations, and, of course, for gross differences in shape among the various snail groups.

The name *pūpū* was used by itself to indicate snail shells in general; there is some indication that it was sometimes used in a more specific sense to connote various shells that terminate in a point, or perhaps to connote all nocturnal species. Shells to which no significance was attached—i.e., those which were simply unnamed, undifferentiated, unnoticed parts of the surroundings—were not called anything. When pointed out specifically to Hawaiian informants, they were called simply *pūpū*, and sometimes a descriptive qualifying term was composed on the spur of the moment. Hence, we have no Hawaiian names for the inconspicuous smaller species of shells, other than the all-inclusive term *pūpū*. This term was also frequently used in combination with qualifying terms to indicate more specifically types of snails important or at least noticed in ancient Hawaii, although the confusing habit of designating various shells solely by their qualifying terms also became evident.

In addition to *pūpū*, frequently encountered Hawaiian names for gastropods include *hīhīwai*, *kūpe'e*, *leho*, *'opihī*, and *pipipi*. These terms, which were widely used throughout the Hawaiian islands, seem to have been treated as names for shell groups rather than for particular kinds of shells. The groupings are based on readily discernible differences in shape, habitat, and behavior among the various snails. Snails included in these groups were obviously the most important gastropod food sources.

All *pūpū* are gathered during the day, as well as during the night when they come out from hiding and climb up onto the stones. There is a special word for this journeying:

e'e. *Ua e'e ka pūpū* means "the *pūpū* have come up onto the rocks."

Hīhīwai, *hapawai*, *hūwai*, *wī*: Family Neritidae, *Theodoxus cariosus*, *Neritina granosa*, *T. vespertinus* (Figure 10). Nerites inhabit fresh and brackish water. Kepelino (n.d. I:68) says: "The *hūwai* is closely related to the *pipipi* but the shell is flattish and the *pipipi* is rounded The *pipipi* lives in the sea and the *hūwai* lives in fresh water or in sea ponds. This is what [*sic*] it is called *hūwai* [water growth] The *hūwai* is eaten."

Pukui differentiates between the *hūwai* and the *hīhīwai*, saying that the *hūwai* is similar in shape to the *hīhīwai* but differs in color and size. The *wī* is called *hīhīwai* in some localities. It lives in streams, hiding under stones by day, and coming up at night. It is easily seen, especially on *Kāloa* nights, the 24th to 26th of the Hawaiian month. Aukai gives us *hīhīwai* for *Neritina granosa*, *hapawai* and *hapakai* for *Theodoxus vespertinus*, and *pipi-wai* for *T. cariosus*, the species that most closely resembles the marine *pipipi*. However, based on the fact that *N. granosa* is truly a brackish-water species (waters part salt and part fresh), Maciolek feels that the Hawaiians probably were referring to this species when using the name *hapa-wai* (half water).

Wī and *hīhīwai* are eaten raw after the shells have been broken and the meat extracted and salted. They are a good accompaniment to *poi*. Formerly, they were cooked in *ti* leaf bundles or in a calabash with hot stones; the flesh was then more easily removed from the shell. Garrett (n.d.) says of the *wī*, "Named perhaps from the fact that they are much eaten in time of scarcity of food." One meaning of *wī* is famine.

As in fishing, men did not speak of going for *wī*, lest only empty shells be found. They thought that the ghosts of the night might overhear them, hurry to the streams, and take the *wī* before they got there.

Kūpe'e: *Nerita polita*, polished nerite, a dweller of sandy, rocky shores with strikingly nocturnal habits, similar in form to the *pipipi* (in fact, closely related to it in the *haole* classification) but sharply differentiated from the latter by the Hawaiians on the basis of the differences in behavior and habitat



FIGURE 10. Gastropod mollusks were an extremely important part of the native diet. A, 'Opihi, *Cellana exarata*. B, C, Pipipi, *Nerita picea*. D, E, Hihiwai, *Theodoxus vespertinus*. F, G, 'Ākōlea, *Littorina pintada*. H, I, Kūpe'e, *Nerita polita*. J–M, Makaloo or pūpū makaloo: *Morula granulata* (J), *Drupa ricina* (K), *D. morum* (L), *Thais intermedia* (M). (A–M, courtesy of Bernice P. Bishop Museum.)

(Figures 10H, I, 11). The Hawaiians had names for many kūpe'e according to their markings. There were the kūpe'e 'ula (red); the ānuenuē (rainbow), red or black striped; the palaoa (whale tooth ivory), creamy white; the 'ele'ele (black), the most common; the kāni'o (vertical stripes), black with white streaks; the mahiole (warrior's helmet), white with red stripes; and the puna, rare. The rarest were the 'ula, ānuenuē, mahiole, and puna, and these were therefore saved for the chiefs. The rare 'ula was believed to have the

ability to leap and hide. The common kūpe'e were used by commoners.

Custom evidently varied among localities regarding the manner of preparing the kūpe'e for eating: Pukui (from Ka'u) states that the larger ones were not eaten raw but were always cooked in the shell and then extracted. Kawelo says they were eaten raw; Kepelino (n.d. I:44) says they were "delicious when cooked." Kay (1949) points out that the kūpe'e is very meaty, so only a few are needed to make a meal.

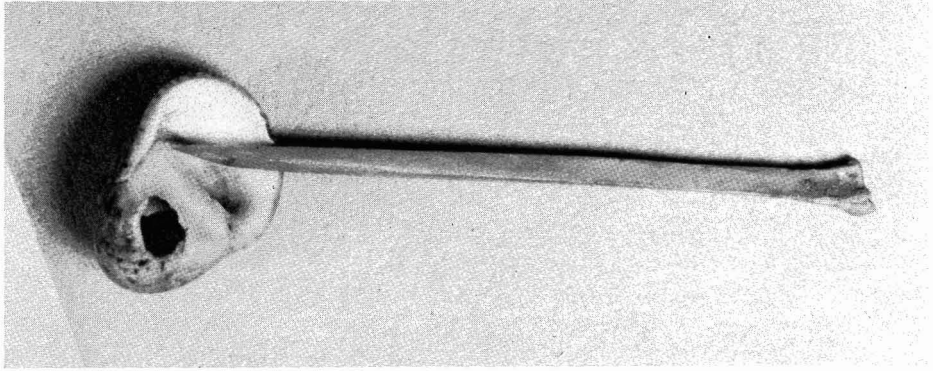


FIGURE 11. Bone pick to aid in extracting flesh from shell of *kūpe'e*, *Nerita polita*. (Courtesy of Bernice P. Bishop Museum.)

Kūpe'e were prized highly as ornaments; they were pierced and strung together as neck ornaments or worn as anklets by hula dancers. In later years, although *kūpe'e* were less often used, the name was retained for any kind of anklet or bracelet.

Kūpe'e niho: *Nerita plicata*, "toothed" nerite (Wiggin and Reist, informants).

Leho: general name for family Cypraeidae, cowries (Figure 12). *Pūleholeho*, long, narrow species of cowries. Garrett (n.d.) says large cowries were called *leho* and small ones, *poleholeho*.

The cowries are as a group readily distinguished from all the other invertebrates with which the Hawaiians were familiar, and the various kinds and variations within the group are also easily discernible to the nonscientist. These may account for the plenitude of names for different types of cowries. The number of names for the various types also indicates that the group was of major importance in the Hawaiian economy as food, ornaments, tools, and octopus fishing lures.

Ālea-alea: snakehead cowry, *Cypraea caputserpentis*, Kauai name (Kay 1949).

Kuoho: a large cowry, probably *C. maculifera* (Pukui and Elbert 1957).

Leho-ahi: *C. mauritiana*. Used as octopus fishing lures as well as food.

Leho-kiko: *C. tigris*. Used less frequently than *C. mauritiana* as food and lures.

Leho-kōlea (literally, *Kōlea*-bird cowry): *C. maculifera*, *C. mauritiana*—i.e., cowries with a pattern of brown streaks and splotches.

Leho-kupa (literally, native cowry): *C. caputserpentis* (Wiggin and Reist, informants).

Leho-kūpe'e-lima: *C. isabella*. Used for bracelets (Pukui and Elbert 1957).

Leho-lei: *C. moneta*. Used in leis (Figure 8E).

Leho-maoli (literally, genuine cowry): *C. caputserpentis*.

Leho-nuku: cowry with the extremities drawn out, as *C. cicerula*. Sometimes used in leis.

Leho-ōkala (literally, rough cowry): *C. granulata*.

Leho-ōma'o: a greenish cowry (diseased cowries sometimes turn greenish).

Leho-ōpule (literally, variegated cowry): *C. helvola* (Kepelino n.d. I: 39).

Leho-ōpu'upu'u (literally, bumpy, or rough cowry): *C. granulata*.

Leho-pa'a: a cowry of a solid color.

Leho-palaoa (literally, ivory cowry): *C. moneta*, yellow form.

Leho-pouli: a very dark brown cowry, *C. mauritiana*.

Leho-puna: *C. moneta*, white color variation.

Leho-uala (literally, sweet potato cowry): *C. moneta*, rare dark yellow form (Kepelino n.d. I: 39).

Leho-ula: Pukui and Elbert (1957) say *C. mauritiana*; Kamakau uses the term to mean a prized cowry, for example, *C. mauritiana* (*leho ahi*, *leho-kupa*), of particularly good coloring for octopus fishing.

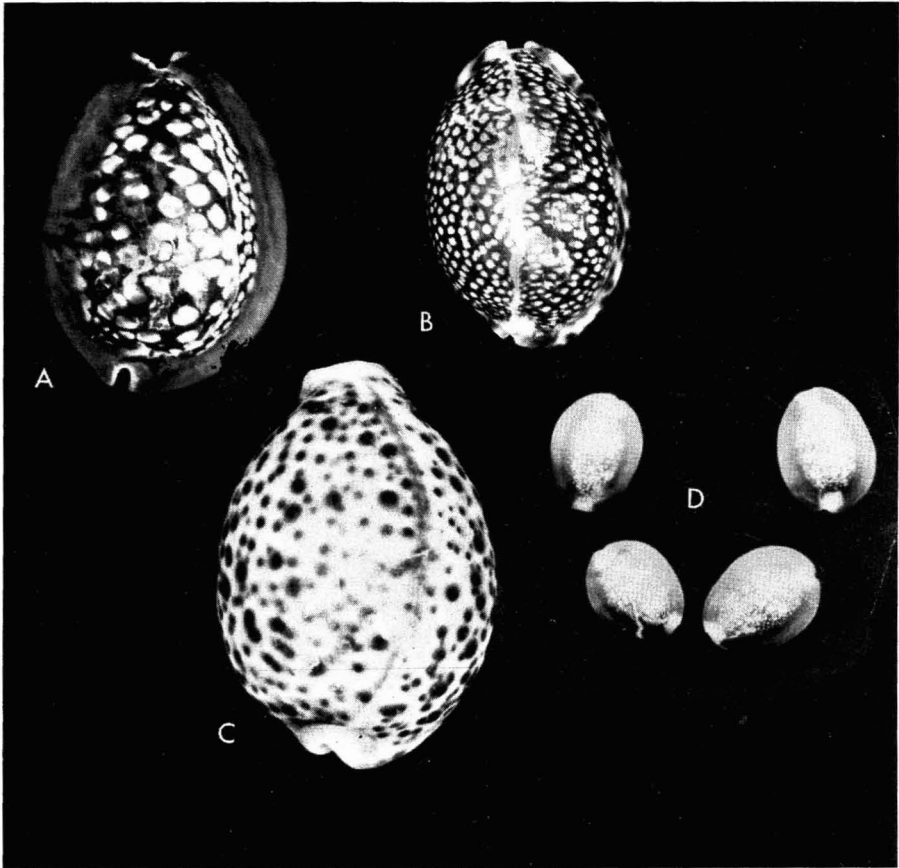


FIGURE 12. *Leho*, cowries. A, *Leho-ahi*, *Cypraea mauritiana*. B, *Leho-kōlea*, *C. maculifera*. C, *Leho-kiko*, *C. tigris*. D. Small *leho*, *C. caputserpentis*. (Courtesy of Bernice P. Bishop Museum.)

Pūleho: *C. isabella*. Used in leis (Pukui and Elbert 1957).

Pūleho-hōlei: a yellowish *pūleho* (Pukui and Elbert 1957).

Pūleho-kāni'o: streaked *pūleho* (Pukui and Elbert 1957).

Pūleholeho: a small *pūleho*. Compare *kuiki* (Pukui and Elbert 1957).

Pūleho-palaoa: an ivory-colored *pūleho* (Pukui and Elbert 1957).

To prepare *leho* for consumption, the shells were broken open, the meat was removed, and then it was worked with salt to remove the black slime. The flesh was wrapped in ti leaves and cooked over coals. Some people merely boiled the shell and then broke it open to remove the meat. On Kauai, *leho* were either boiled as the sole method

of cooking or occasionally eaten raw (Kay 1949). The smaller species were not eaten.

Small yellow and white *leho* were reserved for the chiefs to use as ornaments and were occasionally used as a means of currency. Pukui mentions the use of *Cypraea isabella* for bracelets (*leho-kūpe'e-lima*; Pukui and Elbert 1957).

Larger cowries (*C. mauritiana*, *C. maculifera*) were used to make scrapers for removing the skin from cooked taro and breadfruit and for grating coconuts (Figures 9D, 12A, 12B). These scrapers were elliptical at one end and square at the other end; the square end had a natural curve to it and in some scrapers was ground on the outer edge to a sharp point. Cowry scrapers with a sharp, serrated edge were also used to

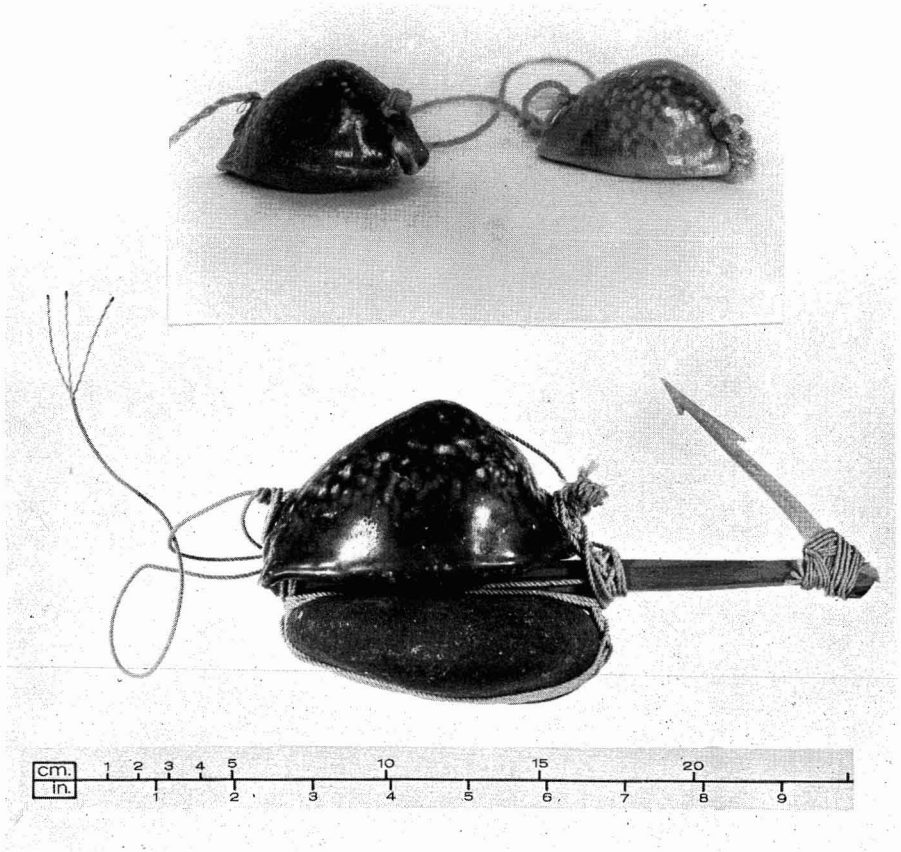


FIGURE 13. Octopus lures—octopus are very fond of *leho* flesh. (Courtesy of Bernice P. Bishop Museum.)

incise *wauke* bark to remove it from the plant (Ihara 1967).

The mauritius and sometimes the tiger cowries were used as lures in fishing for deep-water octopus (Figure 13). According to Beckley (1883:2-3), "only the finest kind of Mauritius or Tiger cowries are employed for this purpose as the octopus will not rise to a large-spotted or ugly one. The spots on the back must be very small and red, breaking through a reddish brown ground; such a shell would have the strongest attraction for an octopus, and is called *ipo* (lover)."

Kamakau (n.d.: chap. 4: 19, 25) says: "Excellent kinds of cowry [for fishing lures] were the *ahi* and the *kupa*. The *ahi* had well-shaped lips, was of a deep red color, extending from the edges of the lips to the very peak . . . The *kupa* cowry might be likened to a dark

red mountain apple ripened in the shade. . . . The *ahi* is used for the morning (says the fisherman), the *ōlūpalaha* and the *pauhu* are to use when the sun warms, and almost at noon I shall use the *kupa* . . ."

W. A. Bryan (1915:458) indicates that sometimes *Cypraea (carneola = leviathan)* was used as an octopus lure: "The squid if captured under certain conditions by this species of shell, was supposed to be a very valuable remedy in the healing of the sick."

Opihi, limpets and forms with similar shells (families Fissurellidae, Patellidae, Siphonaridae; Figure 10A). Again, we find that the Hawaiians differentiated among the various *opihī*; the names varied somewhat in different localities. From Ka'u comes the following list:

Opihī kō'ele: *Cellana talcosa* and other

large, tough 'opihī (Pukui and Elbert 1957). Very large; not easily procured, as they are found on rocks along the abrupt cliffs. Meat is dark colored and tough after being salted. A specimen of *C. talcosa* was identified as *kō'ele* by Pukui to Kondo (informant), although to the Hawaiian mind the *kō'ele* was simply the adult form of the next three kinds listed below.

'Opihī 'ālinalina: *Cellana sandwichensis* (designated as 'ālinalina by Pukui). The favorite; according to Kondo, this form is found only where the waves are the roughest and always rough. Has yellow meat.

'Opihī ko'ala: *Cellana talcosa*. Found on rocks in deep water; yellow meat.

'Opihī makaiaūli: *C. exarata* (Figure 10A). Shell is dark colored; easier to procure than 'ālinalina, for it occurs higher on the rocks than does the 'ālinalina. Meat is bluish-gray.

'Opihī-awa: *Siphonaria normalis* and perhaps *Hipponix* spp. According to Fornander (1916–1919:531), "the kind that clings to water-worn boulders (*pa'alā*)." Small; bitter to the taste; not eaten as food; used by sorcerers.

Kilinahe, an informant on Maui, lists four species: the *maka-ia-ūli*, *pāpapa*, 'awa, and *kō'ele*. He adds that there were two kinds of *kō'ele*, one with dark meat and one with yellow meat. The yellow kind was called 'opihī *kō'ele māku'eku'e*. Aukai (informant) gives *S. normalis* as 'opihī-*ma-kai-a-ūli*; Pukui and Elbert (1957) say "makaiaūli, the bluish-gray meat of the 'opihī."

Other names that have been found for limpets are 'opihī-*kapua'i-lio* (literally, horseshoe 'opihī): *Cellana exarata* (Pukui); *kuapo'i*; *naka-kua-po'i* (Pukui); and 'opihī *makalahi* (thin 'opihī; Garrett n.d.).

The 'opihī were extremely well liked as a food item and in fact were reportedly the most commonly eaten shells in the Hawaiian islands (Kay 1949). Even in 1969, 'opihī were an important part of the diet of most of the Hawaiian families living near the shore. The favorite method of preparation was raw and salted, either with or without seaweed. They were sometimes washed clean and then cooked in the shell, in a calabash with hot stones. The shells were picked out later. This

method enabled the delicious liquor (*kai*) to be saved. *Kai* was appreciated especially by the sick or very young. The raw or cooked meat was plucked from the shells or was sometimes scooped out with an empty 'opihī shell. Babies were fed the soft organs with sweet potatoes or *poi*.

'Opihī, especially the 'opihī 'awa, were used extensively as medicine.

'Opihī shells were good instruments for scooping, peeling, and scraping because of their sharp edges (Figure 14).

Before the days of knives in Hawaii, a sharp-edged stone was used to knock the 'opihī off the rocks, where they cling tenaciously, especially when warned of an attack by an unsuccessful blow. 'Opihī fishing is still called *ku'i 'opihī* ('opihī pounding), although stones are no longer used.

Pukui tells of a belief of Ka'u:

There is a place in Ka'u called 'Opihī-*nehe* (rustling 'opihī). It was *kapu* to make a rattling noise with the shells (always plentiful on a beach in olden days, for 'opihī were often eaten where and as they were procured). If anyone made such a noise it was prudent to go home at once and not camp there. Otherwise he might be lifted from his sleeping place by invisible hands. Anyone near by would hear a voice call, "Inland or seaward?" and an answer, either "Inland" or "Seaward." If the answer was "Inland," he would be taken up and dropped a mile or so inland, where he would be found the next day, bruised and aching; if the answer were "Seaward," he would be tossed into the sea and not return alive. The answer "Inland" signified that he had a relative among the guardians of that shore who had interceded for him.

It was *kapu* for anyone to eat 'opihī on shore while a companion was out gathering more. If one broke this *kapu*, the one still collecting would be pounded by the sea. An 'opihī gatherer was warned never to turn his back on the sea but to watch it to guard against an especially large wave that might wash him to sea if he did not dodge it or get a good grip on some secure rock before the wave struck. Gathering of 'opihī is so dangerous that it was called the fish (creature) of death (*he i'a make*) (Pukui).

Pipipi: family Neritidae, marine nerites (except *kūpe'e*, which see). *Pipipi* do not include *Neritina* spp., which inhabit brackish and fresh water. For the nonmarine forms,

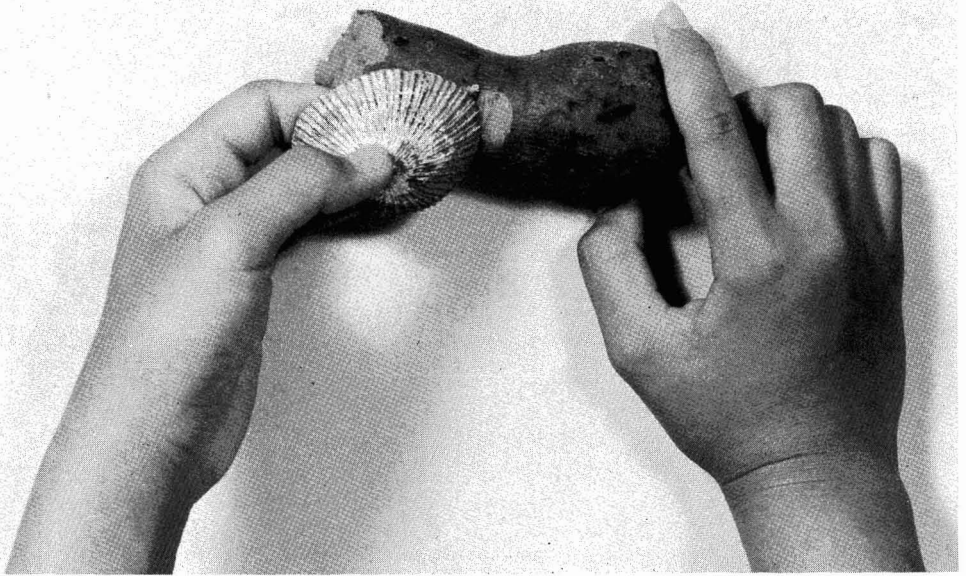


FIGURE 14. 'Opihi scraper. (Courtesy of Bernice P. Bishop Museum.)

see the section on *Hihīwai*. *Theodoxus neglectus* and *Nerita picea* (Figures 10B, 10C) are two species of common *pipipi*. Pukui and Elbert (1957) indicate that *pipipi* is a general name for small mollusks. *Pipipi* is also used with modifying terms to indicate various snails with habits and habitat similar to the above-named nerites; perhaps *pipipi* is the "group name" for small, littoral, edible, common marine snails. The Hawaiians observed that the *pipipi* do not hide but may be found on the rocks during the day or night, whereas the *kūpe'e*, like the *pūpū*, come out on some nights but lie under the sand or rocks during the day.

Pipipi-kai: *Nerita picea*, *Theodoxus neglectus* (Aukai, informant).

Pipipi were enjoyed as a food item. Children would snack on them as they collected them, prying the meat out and eating it at once. Kepelino (n.d. I:66) says the snails were boiled or wrapped in leaves and broiled. "But a needle is required to dig out the flesh." Some people made a broth of the *pipipi*, adding the shells for flavor. Pregnant women were discouraged from eating *pipipi*

lest their children be born with small eyes (*makapipipi*) (Pukui and Elbert 1957).

We have found names and obtained identifications for gastropods other than those included in the groups discussed to this point. Some of the snails that appear in the following list may have been restricted in their use to smaller localities or may have been a minor part of the Hawaiian economy; or the names themselves may have been very localized or perhaps used to designate single species of gastropods. "Several of these species are almost microscopic" (Kay, personal communication).

'*Aha'aha*: miters (*Mitra consanguinea*, *M. litterata*), olive shells (*Oliva sandwichensis*), marginellids (*Kogomea sandwichensis*) (Wiggin and Reist, informants).

'*Ākōlea*, *Littorina* spp.; also called *kōlealea*, *kūkae-kōlea*, *kōlea*, *pipipi-kōlea*, *pūpū-kōlea* (Pukui and Elbert 1957; Figures 10F, G). Maui names for *Epitonium* spp.: *pipipi-ākōlea*, *kōlea*, or *akōlea* (Pukui and Elbert 1957).

Ālealea, *Plectotrema striata* (Pukui and Elbert 1957).

'*Ālilea*: *Turbo sandwichensis* (Pukui and Elbert 1957). Hawaii name, according to Wiggin and Reist (informants). The Oahu name, according to Wiggin and Reist, is *mahina* (literally, moon shell, so-called because the operculum is round like the moon). Edible (Aukai, informant).

'*Ānaunau*: *Cymatium pyrum*, Maui name (Wiggin and Reist). Also '*ānaunau*, *naunau* (Pukui and Elbert 1957).

'*Aoa*: ear shells, *Melampus castaneus* Pukui and Elbert 1957). Garrett (n.d.) identifies '*aoa* as *Planaxis sandwichensis* (= *P. labiosus*).

'*Ā-una-una*: *Nassa sarta* (Wiggin and Reist); Pukui and Elbert (1957) spell it '*ā-unauna*.

Aupūpū: *Thais intermedia* (Figure 10M). Also called *pūpū-awa*, *makaloa* (Pukui and Elbert 1957). Eaten raw; some people like the bitter taste, which is destroyed by cooking.

'*Awa*: *Purpura aperta*, *Drupa ricina* (Figure 10K; Pukui and Elbert 1957, Aukai, Wiggin and Reist). See also *makaloa*, *aupūpū*.

Hālili: sundial shells, family Architectoniceidae (Pukui and Elbert 1957). Also called *pūpū-puhi*.

Hālili lenalena: small yellow shells, possibly *Leptothyra* (Niihau shell lei); Niihau name for *Euplica varians*.

Hā'upu: trochids, as *Trochus histrio*, *Euchelus* (Wiggin and Reist, Aukai).

Iwi moe one: *Colubraria* sp., Maui name (Wiggin and Reist).

Kahele-lani: species of small, colored shells, as *Leptothyra*, *Euchelus*, etc.

Kahele-lani 'ula'ula: small, dark red shells; Niihau name for *Leptothyra verruca*.

Kahele-lani 'ōkala: small, light pink shells, as *Leptothyra verruca*.

Kanaloa: phasianellids (*Tricolia variabilis*); smooth, brightly colored shells (Pukui and Elbert 1957).

Kapua'i lio: same as *kuapo'i*, *Umbraculum sinicum* (Pukui, pers. comm. to Fellows, 1964).

Kaunola: *Heliacus* sp., a sundial shell (Wiggin and Reist).

Kauri: transliteration of cowry (Kamakau n.d.).

Kiki: undetermined shellfish (Pukui and Elbert 1957).

Kio: Vermetidae, see discussion on *Kio*.

Koholua: a long shellfish, as *Terebra* spp. (Pukui and Elbert 1957).

Kualakai: sea hares, *Aplysia*, *Dolabrifera*, etc. According to Wiggin and Reist, eaten by some people but not in the Ka'u district; Pukui says *Aplysia juliana* was perhaps the one most commonly eaten. They were wrapped in *ti* leaves and baked in the *imu* with other foods; it was not necessary to clean them.

Kuanaka: a shellfish similar to the *kuapo'i* (Pukui and Elbert 1957).

Kuapo'i: *Umbraculum sinicum* (Pukui and Elbert 1957).

Kūau: perhaps *Aplysia* (Pukui and Elbert 1957). Kepelino (n.d. II:55) says: "This creature resembles the *kualakai*. It lives under stones in sea pools. It gives out a red slime when touched. If you wish to eat it rub its body on a stone to remove the itchy outer skin. Cut into small pieces. Boil with some water in a kettle but do not boil too long lest it toughen. And in this way it becomes a delicious thing."

Kūkae kōlea: *Littorina* spp.; also *pūpū kōlea* (Wiggin and Reist). Garrett (n.d.) remarked that "the natives are remarkably fond of eating the animals."

Lepelepe-o-Hina: *Dolabella auricularia* and other similar opisthobranchs (Pukui and Elbert 1957; Wiggin and Reist). Not eaten.

Lōloa: Hawaii island name for auger shells, Terebridae (Wiggin and Reist). See '*oi'oi*.

Mahina: Oahu name for *Turbo sandwichensis* (Wiggin and Reist). So called because the operculum is round like the moon (Pukui and Elbert 1957). Eaten.

Maka'aha: horn shells, family Cerithiidae, as *Rhinoclavis sinensis*, *Cerithium nesioticum*, *C. column* (Wiggin and Reist).

Maka'awa: *Morula granulata*, a muricid (Wiggin and Reist). Compare '*awa*, also identified as muricids.

Maka-hālili: *Peasiella tantilla* (Pukui and Elbert 1957).

Makaloa: muricids, as *Drupa morum* (Figure 10L), *Thais intermedia* (Figure 10M), *Morula* spp. (Figure 10J; Pukui and Elbert

1957; Wiggin and Reist). Plentiful on *Kāloa* nights according to Pukui. Kepelino (n.d. I:46) says: "The *pūpū makaloa* [*Morula granulata*] is long and its body is black. Some are yellow and some spotted. One side is rolled inward and one side spreads flat. The back is large and the front small. The flesh is delicious when cooked."

Maka-o-ka-kai: *Bulla* sp. Garrett (n.d.) says "occasionally eaten by the natives."

Mamāiki: *Strombus maculatus* (Pukui and Elbert 1957).

Moa: unidentified small gastropod; also called *kāmoa* (Pukui and Elbert 1957).

Momi: Niihau name for *Euplicia varians* (brown form), the columbellid known elsewhere as the Niihau shell (Figure 8D).

Momi ke'oke'o: white form of *Euplicia varians*, and a Niihau name for *Heliacus variegatus*.

Naka: means sea creature—not any particular kind. Informants, when using the word, merely emphasize the fact that they realize an animal is a sea creature.

Naka-huluhulu: the marine air-breathing slug, *Onchidium* sp. (Wiggin and Reist). Also used for *Umbraculum sinicum*.

Naka-ōni'oni'o: *Pleurobranchus*, a mottled opisthobranch (Pukui and Elbert 1957).

Naunau: family Cymatiidae; also called *ānaunau* (Pukui and Elbert 1957).

Nene: unidentified shellfish (Pukui and Elbert 1957).

Nukuloa: Hawaii name for *Latirus nodatus*, the spindle shell from which drills were made (Wiggin and Reist). Also *Fusinus sandvicensis*, another spindle shell (Pukui and Elbert 1957).

Nunui: large auger shells, as *Terebra maculata* (Aukai).

Oe: *Melampus*. Eaten by the natives in Hilo and Puna (Garrett n.d.).

Oi'oi: Maui name for Terebridae (Wiggin and Reist). Natives were very fond of the flesh as food. The shells were used as drill points, as stoppers for water gourds, and as scrapers (Ihara; Figure 9H).

Ōkole oi'oi: *Trochus histrio*, *Euchelus* spp. (Wiggin and Reist).

Olē: large *Charonia tritonis*, the triton shell used as a trumpet (Figure 15; Pukui and Elbert 1957, Wiggin and Reist). Also *Terebra maculata* and *Pyramidella sulcata* (Pukui and Elbert 1957)—in other words, shells that have elongate, pointed spires.

Olē-kiwi: *Cymatium pyrum* (Pukui and Elbert 1957).

Olē-olē: small triton shell (Wiggin and Reist). Pukui and Elbert (1957) say conch shell, but compare *olē* above.

Ōnohi-awa: tectibranch gastropods, as *Haminoea* spp. (Pukui and Elbert 1957).

Pai: a kind of snail said to be poisonous to the touch (Pukui and Elbert 1957).

Panapuhi: *Conus sponsalis*, Hilo and Puna name (Garrett n.d.).

Pipipi-ākōlea, *pipipi-kōlea*, etc.: see *ākōlea* above.

Pipipi-ākōlea-ihiloa, *pipipi-kōlea-ihiloa*: *Planaxis labiosus* (Pukui and Elbert 1957).

Po'apo'ai, *pōhaku-pele*, *poho-kūpele*: Vermetidae (Pukui and Elbert 1957).

Po'opalaoa: unidentified white shell (Pukui and Elbert 1957).

Pū: shell trumpets; the helmet *Cassiss cornuta* and the trumpet shell *Charonia tritonis* (Figure 15; Pukui and Elbert 1957). Both are eaten (Kay 1949).

Pū ho'okani: conch (Malo 1951), probably *Cassiss cornuta*. Compare *olē*.

Pū puhi: *Charonia tritonis* (Aukai).

Pūhali: a kind of fragile seashell; literally, carried shell (Pukui and Elbert 1957). Perhaps *Janthina* spp. Compare *pūpū-pani* below.

Pūleho: *Tonna perdix* (Aukai); eaten (Kay 1949:119–121).

Pūlewa: same as *hālili* (Pukui and Elbert 1957). Used in tapa making to set the color (Archives of Hawaii n.d.:59).

Pū'ōni'oni'o: *Tonna perdix* (Pukui and Elbert 1957). The partridge tun.

Pūpū-alā: cone shells, family Conidae. In some localities, restricted to types that do not sting. Compare *pūpū-pōniuniu*. Kay (1949) reports that one species, *Conus millepunctatus*, was used by only a few families for food, but that the shell was prized as an ornament.

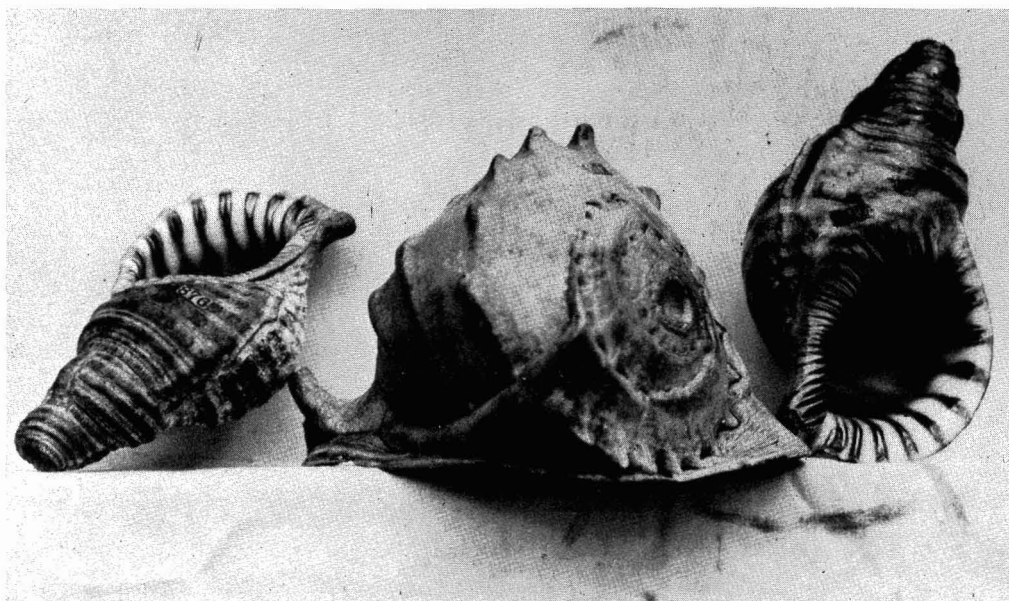


FIGURE 15. Shell trumpets (*pū* and *'olē*), made from the helmet shell *Cassis cornuta* (center) and the triton *Charonia tritonis* (left and right). (Courtesy of Bernice P. Bishop Museum.)

Pūpū-alapa'i: staircase shell, *Epitonium* spp. (probably more than one; Pukui and Elbert 1957).

Pūpūau: *Purpura aperta* (Pukui and Elbert 1957). See also *'awa*, *aupūpū*, etc.

Pūpū hohopu: *Cymatium nicobaricum*, Hilo name (Garrett n.d.).

Pūpū kamoā: *Vanikoro* sp. (Wiggin and Reist).

Pūpū-kui: moon shell, *Natica gualteriana* (Pukui and Elbert 1957). See also *kionoho-one*.

Pūpū-leholeho: bubble shells, *Bullina scabra*, *Haminoea*, *Hydatina* (Wiggin and Reist).

Pūpū leholeho 'ōni'oni'o: pink bubble shell, *Hydatina amphustre* (Wiggin and Reist).

Pūpū-lei-'aha'aha: miter shells (Pukui and Elbert 1957). Same as *'aha'aha*.

Pūpū-lei-hala: the triton *Bursa granularis* (Pukui and Elbert 1957); also, the pink bubble shell, *Hydatina amphustre* (Pukui and Elbert 1957).

Pūpū makaloā (literally, shell with a long, sharp edge): any of several kinds of shells, we surmise, with a lip that is long,

sharp and strong enough to be made into large or small adzes, for example, *Conus leopardus*, *C. quercinus*, *Drupa*, *Thais*, *Nassa*, and other muricids. Compare *makaloā* above (Archeology Collection, Bishop Museum).

Pūpū-Niihau: see *momi* above.

Pūpū-noho: unidentified shell (literally, sitting shell) (Pukui and Elbert 1957).

Pūpū-'ōni'oni'o: *Haminoea* spp. and *Hydatinidae*.

Pūpū-pani (literally, cork shell) and *pūpū-poni* (literally, purple shell; Aukai): violet snail *Janthina* spp., which floats on the ocean surface by means of a raft of bubbles attached to its foot.

Pūpū pō'ai: *Odostomia* spp. (Wiggin and Reist).

Pūpū pōniuniu (literally, dizzy shell): poisonous cone shells, that is, those that sting (Pukui and Elbert 1957). Compare *pūpū-'alā* above.

Pūpū-puhi: sundial shell *Architectonica perspectiva* (Pukui and Elbert 1957). Compare *hālili*.

Pūpū-waha-loa (literally, long-mouthed

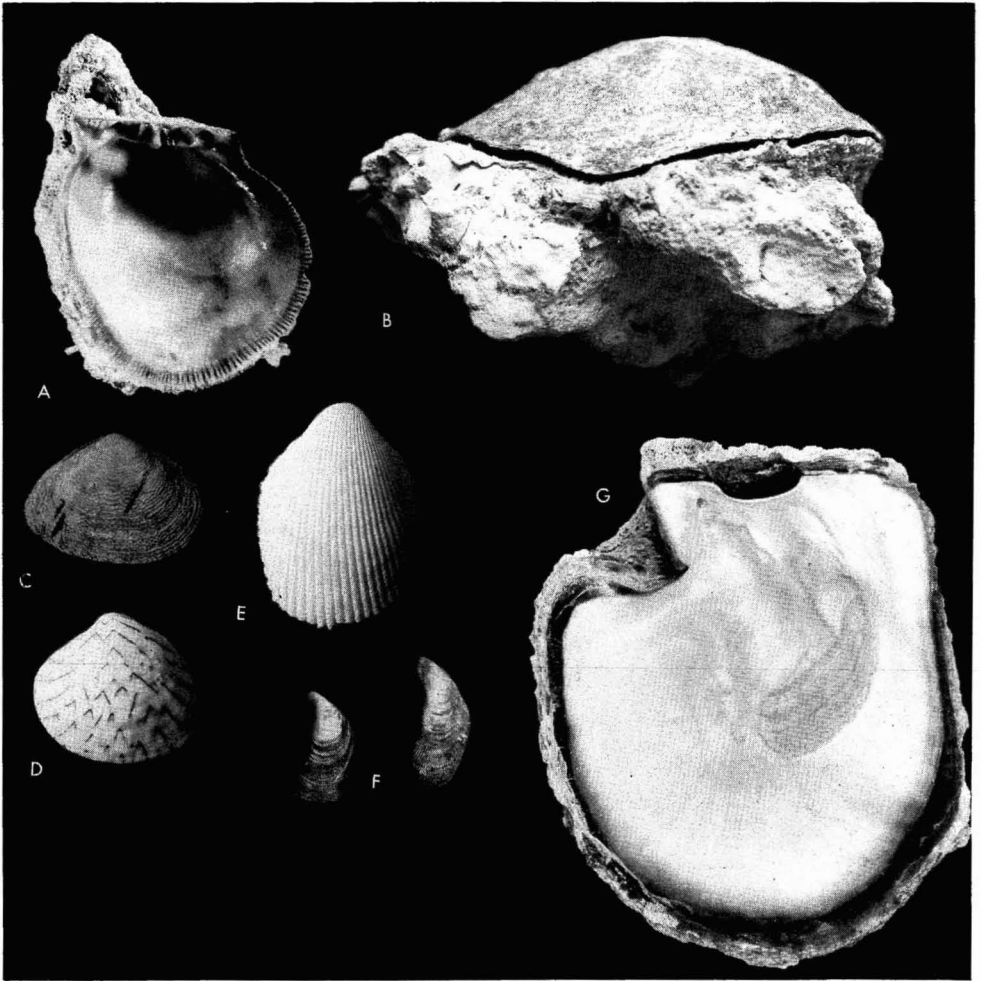


FIGURE 16. Some bivalves used for food. A, 'Ōkupe, *Spondylus tenebrosus*. B, Kupekala, rock oyster, *Chama iostoma*. C-E, 'Ōlepe: *Quidnipagus palatam* (C), *Liocōncha hieroglyphica* (D), *Trachycardium orbita* (E). F, Nahawele, *Brachidontes cerebristriatus*. G, Pā, paua, pāpaua, *Pinctada margaritifera*. (Courtesy of Bernice P. Bishop Museum.)

shell): *Bulla* sp. (Pukui and Elbert 1957).

Pūpū-winiwini: Molokai Island name for all *Terebra* shells (Bryan and Bryan 1902-1919:7).

Uli: name given by Malo for an unidentified shellfish (Pukui and Elbert 1957).

Pelecypods—Bivalves

In studying the Hawaiian names for bivalves, we find the same sort of nomenclature and classification as appears for

gastropods. That is, general names are given for types of shells, and additional, more specific, names are given for the kinds that were of importance in the Hawaiian economy. 'Ōlepe was used in some localities to denote all bivalves (Pukui and Elbert 1957), but Garrett (ca. 1855, in Hilo and Puna and also on Kauai) found that the term was used for "all bivalves resembling the *Cardium* and *Venus*"—that is, for clams only (Garrett n.d.). It may be that the restricted meaning of the word "ōlepe was used

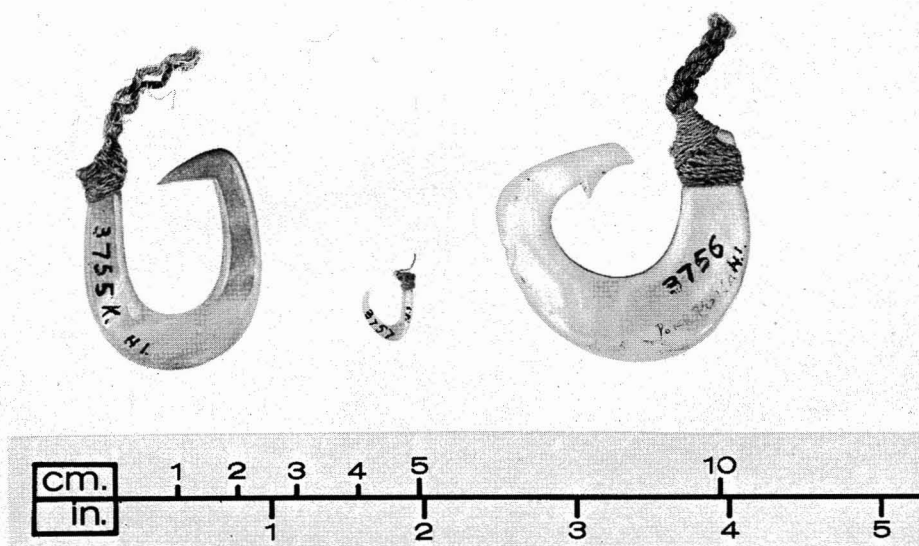


FIGURE 17. Fish hooks of pearl shell. (Courtesy of Bernice P. Bishop Museum.)

in various areas where several kinds of bivalves were available and thus the need was felt to differentiate among them, as opposed to areas in which only a few were present and there was no need for differentiation.

The words *pā* and *paua* have often been encountered with various contextual meanings (Figure 16G). While both words mean valved—as opposed to snail-like—it appears that *pā* was often used only to denote mother of pearl shells of light construction. *Paua* (or *pāpaua*) was used to designate all sorts of shells of heavier construction. *Pā* and *paua* also appear in combination with other words as descriptive modifiers, for example, ‘*ōlepe-pāpaūa*, *Arca* sp.; *pāpaua-momi*, *Chama iostoma* [heavy pearl (shell)].

Bivalves, in general, were not a very popular food item on Kauai when Kay observed native food habits there. Exceptions to this condition were *Pinctada margaritifera* and *Spondylus tenebrosus*.

As to fish hooks (Figure 17), Buck (1957: 325) says: “Shell hooks were usually made of pearl shell (*uhi*) [*Pteria nebulosa* (= *Pinctada*)] in small and medium sizes. The small shell hooks were termed *makau paweo*, and were used for catching ‘*opehu*.”

Shell was greatly appreciated as material for fish hooks, but it was not abundant. Emory, Bonk, and Sinoto (1968:31) say: “The great predominance of bone hooks on Molokai, Lanai, and Hawaii may be due to the lack of sufficient pearl shell There was a steady shift [in archaeological diggings] from pearl shell to bone at the three sites on Hawaii . . . suggesting that pearl shell was preferred but abandoned by necessity. The island of Oahu, on the other hand, had a relative abundance of pearl shell from Pearl Harbor”

Shell was also used in making composite hooks, both the shank and the point, for ocean bonito fishing. At the South Point (island of Hawaii) excavations, bonito hooks were found at the deepest excavations as well as at excavations near the surface, which indicates that bonito were fished from earliest antiquity in Hawaii as well as from then on. According to Emory (personal communication), fish hook remains of all kinds numbered 1710 at the South Point site for archaeological work.

Malo (1951:61) says: “The *pa* was a plate of mother of pearl with a hook of bone attached. It was used as a troll for *aku* (ocean bonito). The color and sheen of the

pearl seemed to have some sort of fascination for the fish." The sheen of all pearl shell hooks shared this fascination.

Kamakau (n.d.: chap. 4:37–38) describes the making of bonito lures: "For pearl shell lures, a good-sized *uhi* or *paua* shell was selected, the size of a hand or larger. The best shells had markings like the arch of a rainbow. The shell was cut down from base to tip. The carver scraped down the coarse outer covering until the smooth part was reached . . . It was to the *aku* as a beautiful chiefess . . ." A hole was drilled through the ridge at the base of the shell and a hook of wood or dog bone fastened to it securely with fine cord. Hog bristles were fastened at the base of the hook where it joined the lift of the shell and crossed there so that the hook would not turn over. As the hook moved over the water, the bristles sprayed on the water, and the *aku* mistook it for the '*iao* (bait fish) and rushed to seize it.

Kā'ope: yellowish mother-of-pearl shell (Pukui and Elbert 1957).

Kupekala, *kala*: family Chamidae, rock oyster (Figure 16B; Pukui and Elbert 1957). Lahilahi Webb (informant), who lived at Ewa on the shore of Pearl Harbor for many years, remembered being taken out to a spot near the inner part of the entrance of the harbor by two elderly women to see where *kupekala* were to be found. They could be seen through the clear water. They looked like small rocks themselves, as they clung to the rocks. The two women dove for them, taking a stone with which to knock them off. It was hard work and they got only seven during the trip. The taste is richer than the famed *pipi*. Aukai says that it is sometimes found at Kualoa, the northern end of Kaneohe Bay. He, too, says it is very good eating, raw or cooked.

Mahamoe: family Ostreaeidae, *Ostrea*. Rock oyster, smaller than the *Kupekala*, about 2 inches long, plentiful at Ewa, of little or no economic value as food (Webb, informant). *Ostrea* is also called *pahikaua* (Aukai).

Nahawe, also *nahanawe*, *pahikaua*, '*oā'oaka*, '*owā'owaka*: mussels, family Mytilidae, as *Brachidontes cerebristriatus*, also

members of the family Isognomonidae, as *Isognomon* spp. (cf. *I. perna*) and Pinnidae (*Atrina saccata*) (see Figure 16F). *Brachidontes cerebristriatus* is also known as *kio-nahawe* (see section on *kio*).

Kepelino says (n.d. I:71): "The '*oā'oaka* resembles the *uhi* but it is tiny. Its body is narrow. The base by which it attaches itself to the stones in the sea is small. Its actions and other habits are very much like those of the *uhi*."

The '*oā'oaka* (also spelled '*owā'owaka*; literally, open-shut mouth) is mentioned in a reference to the fish pond that used to be in Hilo Bay, called Loko-waka (Anonymous 1899b): "This is the place where people dive to get the '*owā'owaka*."

In Pearl Harbor (old name, Pu'uloa), *nahawe* grew to finger length, and sometimes half as long again. They were popular as food, and in later days those who sold them would be careful to keep to themselves the knowledge of just where they grew thickest (Webb, informant). In Kaneohe Bay they are reported to be smaller, usually about an inch and a half long, but good to eat raw or cooked. Kepelino (n.d. I:72) includes *nahawe* among the seafoods that were delicious.

Pahikaua is a modern name for *nahawe*; the meaning is sword—literally, battle knife. *Brachidontes cerebristriatus* is also called *nahawe-li'ili'i* (Pukui and Elbert 1957). *Pahikaua* is designated as *Ostrea sandvichensis* by Aukai, however.

'*Ōkupe*: *Spondylus tenebrosus* (Figure 16A). Similar to a rock oyster to the informants: "abundant at Ewa; . . . dirty gray in color, thick shelled" (Pukui and Webb). *Spondylus tenebrosus* is also called *pūpū-momi* (Aukai, Pukui and Elbert 1957) and *pana-pana-puhi* (Kay 1949:119–121). Length 10.3 cm.

'*Ōlepe*: clams (Figure 16C–E). Hawaiians classed many species of clams as '*ōlepe*. Just which ones were the favorites as food is not recorded. Edible clams are not commonly found in the market.

According to Kepelino (n.d. I:70), "The '*ōlepe* is entirely white; its shell is ridged. Its body is round and plump . . . The '*ōlepe* lives in the sand. Its flesh is delicious, eaten just as it is—raw." Aukai says, "The '*ōlepe*



FIGURE 18. Opening season for taking clams from Kaneohe Bay, September 1968. (Courtesy of Warren R. Roll.)

is a delicious bivalve which we ate raw with *limu* 'ōnīni, which grew in sea ponds. It was generally eaten raw, the slime removed by stirring it in salt; the flesh is soft."

Sereno Bishop (1916:46) wrote: "In the thirties . . . there was at Pearl River a handsome speckled clam, of a delicate flavor which contained milk white pearls of exquisite luster and perfectly spherical. I think the clam is still found in the Ewa Lochs." This clam is probably *Lioconcha hieroglyphica*. Length 5 cm.

'*Ōlepe-kupe* (literally, native clam): also *pūpū-kupa*, *pūpū kupe*, *Trachycardium orbita* (Wiggin and Reist, informants), *Periglypta reticulata* (Aukai, informant). *Ctena* (Pukui and Elbert 1957), *Codakia* (Pukui and Elbert 1957).

'*Ōlepe-kupe* 'ōpioio: *Ctena bella* (Aukai). Length 7.3 cm.

'*Ōlepe-naka-loa* (literally, long face): *Martesia striata* (Pukui and Elbert 1957).

'*Ōlepe-pāpaua*: *Arca* sp. (Pukui and Elbert 1957), *A. reticulata* (Aukai).

'*Ōlepe-waha-nui* (literally, big-mouthed 'ōlepe): *Rocellaria* (Pukui and Elbert 1957, Wiggin and Reist, Aukai).

Pūpū-ōlepe: *Tapes philippinarum*, family Veneridae (Pukui and Elbert 1957). This must be a modern name because the species was introduced early in this century (Kay, personal communication).

An illustration (Figure 18) of people streaming into Kaneohe Bay in September 1968 to greet the opening of the clamming season of that year shows the public enthusiasm for the bivalve that lives in that bay. This animal is not Hawaiian but is the Japanese little-neck clam (*Tapes philippinarum*), first introduced to Hawaii in 1920 (Brock 1960). Following the 1968 season, however, soil erosion, associated with heavy rain, contributed to the demise of the Kaneohe Bay population (*Honolulu Star-Bulletin*, June 13, 1969). A ban on clamming has remained in effect up to the present time due to the slow revival of the population.

Pā, paua, pāpaua: *Pinctada margaritifera*

(Figure 16G), *Pinctada radiata*, family Isognomonidae (Aukai, Kay, Pukui and Elbert 1957). This is a little larger than the pearl oyster. It too was and is eaten, and has been successfully transplanted into Kaneohe Bay.

PREPARATION: Let them stand overnight in water to free the sand from the shell. Remove the slimy fluid with salt. Cook or eat raw (Kawelo, informant).

Pā hau: shell with white on inside (Pukui and Elbert 1957).

Pā mae: variegated shell (Pukui and Elbert 1957).

Pipi: *Pinctada radiata*, pearl oysters.

Unahi-pipi: young *pipi* (Pukui and Elbert 1957).

The *pipi* was referred to in many old chants. Poetical names for it were *ka i'a hāmau leo o 'Ewa* (the silent fish of 'Ewa) and *ka i'a kuhi lima o 'Ewa* (the gesturing sea creature of 'Ewa)—it was forbidden to talk while gathering them (Pukui and Elbert 1957). The *pipi* used to be very abundant in Pearl Harbor, and in modern times was transplanted to Kaneohe Bay. The populations of *pipi* in these areas fluctuate in size from year to year.

According to Kamakau (n.d.):

The oyster from Namakaohalawa to the cliff of Honouliuli, from the sea ponds of upper Ewa clear out to Kapakule; the shell that came in from the deep water to the shallow mussel beds near shore, from the channel entrance to the rocks along the edges of the lochs. They grew right on the mussel shells Not six months after the *hau* branches [kapu signs] were set up, pearl oysters were found in abundance for all Ewa, fat with flesh, and sometimes within the oyster a pearl . . . shining with the colors of the rainbow, with red, yellow or dark colors and some pinkish white, ranging in size from small to large and of great value, but in those days considered rubbish in Ewa.

Sereno Bishop (1916:46) wrote: "In the thirties the small pearl oyster was quite abundant and common on our table. Small pearls were frequently found in them. No doubt the copious inflow of fresh water favored their presence. I think they have become almost entirely extinct, drowned out by the mud."

Pipi were eaten both raw and cooked. When taken out of the shell the animal is covered with slimy fluid. For common people

the *pipi* was merely salted. For chiefs and children it was removed from the shell, salted, and placed in a nest of 'ahu'awa (a sedge) fibers to drain all night. The next morning the *pipi* were wrapped in clean *ti* leaves and taken to the chief (Webb, informant). Pukui reports that the meat is delicious and says, "I have seen my uncle cook them by laying them, still in the shell, on hot coals, or boiling them in a very little water."

In fishing for *pipi*, one had to keep perfectly still and talk by gesture only. Hawaiians believed that if there were a ripple made on the water, or a word uttered, the oyster would drop off the spot where it was visible into the depths of the water. This belief is often referred to in Hawaiian literature. Evidently, even the winds knew that gathering *pipi* had to be done in silence, as shown in this tale (Anonymous 1899a):

When I came to the new land (Ewa) to live I found a wife here and she told me, "Do not speak lest the wind blow." We went to the beach of Keamona'ale, and the day was very calm, there was not a breath of wind and the sea was still. We swam out and saw the *pipi* which so resembled the *pāpaua* bivalve. We gathered them in silence and then . . . I called out in a loud voice, "Say! There are a large number of *pipi* here!" I kept on calling. Not five minutes later, the wind blew all around us and . . . doubt of the truth of my wife's words left me.

An explanation of both the origin and disappearance of the *pipi* is set forth in the same story of Ewa:

It was Kanekua'ana, the famous lizard god of Ewa, who brought this *pipi* from Kahiki [ancient homeland of Polynesians] The goddess possessed her aged keeper (a woman of Ewa) and said: "I am taking the *pipi* back to Kahiki and they will not return until all the descendants of this man [a man who had fined the keeper of the god because she took some *pipi* when they were *kapu*] are dead. I shall go to sleep. Do not waken my medium, let her waken of her own accord." The command was obeyed, and she slept four days and four nights, during which time the pearl oysters vanished from the places where they had been found in great numbers, up to the very shore The few we find today are nothing

As to the pearls, Kamakau (n.d.) says: "Inside of the *pipi* were beautiful pearls like the eyeballs of fish. Some were white and



FIGURE 19. *He'e* drying, Molokai, 1974. (Courtesy of D. M. Devaney.)

were called *mūhe'e-kea*. Some had red colors in them and were called *mūhe'e-mākoko* . . .”

Uhi: probably *Pteria nebulosa*. Also called *paua*. Kepelino (n.d. I:69) says:

The *uhi* is a large flat creature (about 8 inches across), some plump and some flat and thin. It has a hard, blackish shell. The edges are very thin and fine. It has two shells as covers and between the two shells is its meat. The end upon which it fastens itself to a rock is very small. It opens like the mitre of an archbishop . . . The *uhi* is used in making hooks for *aku* fishing, called *pa*, with a hog's tusk for shank and hog's bristles at the back for lure . . . The *uhi* keeps its mouth open in order to catch its enemy. If something gets into the mouth, the two edges clamp together and its enemy is eaten entirely. Thus it obtains its livelihood. If a man's finger gets into it, he can never release it . . . its grip is very strong. Its flesh is delicious indeed.

As to the hook, Kamakau (n.d. 4:36) says, “The *aku* mistook it for an *'iao* or other small fish and rushed roaring to seize the shell.”

Wāwāhi-wa'a: borer that bores into canoe hulls; a teredo, *Teredo* spp. and related forms (Pukui and Elbert 1957).

Cephalopods—Squid, Octopus

In Hawaii the term “squid” is used indiscriminately to signify both squid and octopus. While as many as thirty different forms of cephalopods have been reported from Hawaiian waters, only a few are found in shallow waters (Figure 19).

The Hawaiians had names for the reef species of octopus: *he'e*, the common species, the day octopus, *Octopus cyanea*; *he'e-mākoko*, rarely eaten, bitter, used in medicine, probably *O. ornatus* (Pukui and Elbert 1957); *he'e pali*, the young tiny octopus that clings to rocks along sea pools, especially in certain seasons (probably the young of the *O. marmoratus*); *he'e māhola*, the octopus given for sickness caused by sorcery (Pukui and Elbert 1957); *he'e-pū-loa*, or *pū-loa*, is *O. ornatus*, the “night octopus,” considered excellent food by some (Edmondson 1946: 216), but according to Pukui and Elbert (1957) used for bait rather than for food and distinguished by “longer head (*pū*) and tentacles than those of the common octopus.” Garrett, however, says, “They [octopus] are much esteemed by the natives, who call them *Ha pale* [*?he'e pali*] when young and *Ha* when fully grown. It is quite common among the natives to give different names to the young and old of the same species” (Garrett to Barnard). Pukui and Elbert (1957) also give *'āpe'ape'a* as the name for an unidentified cephalopod.

The term *mūhe'e* was used to designate true squids, including *Sepioteuthis arctipinnis* and *Euprymna scolopes*. Beckley (1883:9) notes that the *mūhe'e* is “a kind of squid that floats on the sea in great quantities.”

Shells of the paper nautilus, *Argonauta argo*, were designated as *'aumoana*, *'au-wa'a-lā-lua* (the usual name), *moamoa*, and *moamoa-wa'a*. *Naukilo* is a transliteration of

Nautilus and probably entered the vocabulary in modern times. The chambered nautilus, *Nautilus pompilius*, and related forms has—as far as is known—never been reported from Hawaiian waters.

The common *he'e* was, and is, exceedingly popular as food.

PREPARATION: In a pan or calabash put a handful of Hawaiian salt (the residue of seawater evaporated in shallow pools, or in artificially hollowed places along the shore; it dries in coarse crystals which have considerably more abrasive power than our finely ground table salt). Hold the octopus just below the bulbous head. Spread out the tentacles and pound the octopus against the salt until the tentacles begin to curl. The slimy fluid will ooze out by this treatment. Pinch the flesh at the base of the head. If the skin breaks easily, it is ready to be cut into pieces. By pressing off the slime rather than washing it off, no salt is lost in the pounding process, and the flesh keeps well. Washing removes too much of the salt and the flesh begins to decompose quickly, turning pink.

He'e is eaten raw or cooked. For eating raw, it is cut into small pieces, perhaps half an inch long, and salted or left unsalted. Some of the deep brown fluid of the '*ala'ala* (liver), some *kukui* nut relish, some chili pepper (introduced in Hawaii in the early days and popular at once), and perhaps some *a'ala'ula* or *lipe'epe'e limu* (seaweed) may be added to it. Raw *he'e* does not keep long and in a day or two turns pink and develops an unpleasant odor. This stage is called *mākole* or *paholoholo*. Some Hawaiians are fond of *he'e* in this partially decomposed state.

Dried *he'e* was popular. When well dried it keeps for many years, and is therefore ready to eat at any time. To dry *he'e* it is first cleaned. A large number are most easily cleaned by putting them into a large container (barrel in post-European times), sifting ashes of a nonpoisonous wood over them generously, then working the entire contents of the container around and around with a stick. Care must be taken to wash all the ashes from the tentacles. Cut open the head so that it can be flattened out, remove

the internal organs, taking care not to cut the ink bag (*weka*) that lies close to the liver; the livers are set aside for separate treatment. The cleaned *he'e* are sprinkled generously with salt and left in the brine for several hours or overnight, after which the excess salt is rinsed off. The *he'e* are hung to dry in a sunny, airy place, sometimes on the branches of trees (Figure 19). When thoroughly dry—which may take two or three days—the tentacles are braided tightly together to assist efficient packing in a calabash or other container. When wanted, dried *he'e* are cut into bite-size pieces and eaten as is. Some people prefer to broil them first. Aukai (informant) described the drying process also and added that "Soaking in fresh water does make it [the flesh] tender, and some did it, but the strong smell is unpleasant to many." The '*ala'ala* (livers) are salted and dried separately. When thoroughly dry, they resemble prunes. They are eaten as a relish.

Fresh *he'e* was also cooked in *ti* leaf bundles in the *imu*; dried *he'e* were not so used. The *he'e* was cut into portions and salted; then it was wrapped, sometimes with greens such as sweet potato or taro leaves, in *ti* leaves and placed at the edge of the food heap in the *imu*, where the heat would not be too severe. In modern times, the expressed cream of grated coconuts is usually added—a culinary custom imported from southern Polynesia.

Mūhe'e, that is, true squid, was also eaten, although it was not as popular as octopus. It was not eaten raw.

He'e has always been such a popular food item that comments about it are easily obtained. Aukai tells us that one of the best places for catching *he'e* was the Ko'olau shore of Oahu, along Kaneohe Bay and beyond. *He'e* were caught and dried by the thousands. There are good *he'e* banks at various spots in the bay. Sometimes *he'e* were taken to the islands in the bay, Kapapa or Ahu-o-Laka (Sand Island), to be dried on racks. Sometimes the vital organs were not cut away but were left hanging onto the slashed and flattened head (*pū*). The stomach was opened to remove the contents; the intestines were thrown away. The people of

Ewa made excursions to the Ko'olau side for the *he'e* fishing season, using a path over the mountains.

Beckley (1883: 3) describes octopus fishing: "In shallow water the spear is used. Women generally attend to this. Their practised eye can tell if an octopus is in a hole whose entrance is no larger than a silver dollar³ Those caught in shallow waters vary from one to four feet in length, but the larger kinds live in deep water always and are known as *he'e-o-kai-uli* (deep-water *he'e*)." She continues with a description of catching *he'e* with cowry shell lures (see the section on Cowries).

Garrett also described the process of catching octopus: "The natives capture them [octopus] with a baited hook, above which are firmly attached 3 or 4 cowery [*sic*] shells, (*C.—mauritianana*) upon which the animal fastens its cups [suckers on tentacles] while feeding upon the bait, and is easily drawn up in that position."

Kamakau (n.d.: chap. 4:19) speaks eloquently of the use of *he'e*: "Squid fishing and *aku* fishing were aristocratic sports. It was not necessary to go into the sea or out to the ocean, for the fish came close to shore." He tells us that the fisherman let down the cowry shell on a line to lure the *he'e*, and waved it to and fro "as in a dance." No bait was used. Kamakau (n.d.: chap. 4:25–29) continues:

The squid of the shallows and rocky ledges were, in the old days, a famous seafood. They were countless; the air was foul with them [when many were caught]. It was a *tapu* seafood. The *tapu* varied in various places . . .

[In squid season] when the tide was high, the squid moved along the edge of the sea in files, like schools of mullet, and when the tide was low, the whole floor was furrowed as if rooted up by hogs, with the burrows scattered in every direction, and the squid would be lying spread but flat, like lumps of dark earth, moving the head about slightly. If they saw a man they would squirt and he had to run to escape.

In the morning came the squid spearing. Men and

³Kondo (informant) stresses the presence of bits of crustaceans, shells, etc., found at the entrance of an octopus burrow; the Hawaiian name for this telltale sign is '*āhilu*' (Pukui and Elbert 1957).

women went down to the sea . . . a multitude The spearing went on until the tide came in. Then the squid fishers went ashore The squid were portioned out, 50 to 100 to each If a man was evil-minded he hid his catch in the sea. After the division was over, he hurried out in a canoe to gather them up.

There were numberless thus collected, and they made a great stench. They were salted and dried on drying frames, ten to a house.

The squid today [1869?] number about fifty percent . . . from old times. When they were dry, the ends of the tentacles were braided until they stiffened . . . they were worked over and thumped [pounded against a stone] until the tentacles curled over. Then they were salted until they turned pink. The salt was rinsed off with water, the head and neck were cut open, and the squid left to dry. A squid so treated was tender, the salt would whiten it, and it could be kept a long time without spoiling.

If it was to be eaten at once, it should be rinsed with wood ashes and worked with a very little water until the tentacles curled. Then the tentacles should be drawn through the hand to remove the slime, and thumped again vigorously until they curled and the skin drew up about the head and neck, and the tentacles broke off easily, and the flesh, if pinched [pricked?] with the fingernail, tore easily. [The directions are]: Then turn it upside down, exposing the teeth; use a quantity of salt where the teeth are; turn it right side up, grasp it by the head, and thump until the salt goes between the teeth into the head. Then place it, slime and all, into a gourd, and cover it over. This helps to turn it pink. For eating immediately, the tentacles should be drawn through the hand to remove the slime and salt, and it is thick and tender. It should be cut up in pieces in a gourd dish and some liver (*'ala'ala*) worked in, and some juice of the *lipa'akai* [a seaweed] to make the dish fragrant.

This is what the people did in the old days to win the favor of their masters.

Kamakau (n.d.: chap. 4) also says that "it was a *tapu* seafood, and the *tapu* was not alike in all places; in some it might last four or five or six months after setting up the *hau* branch [*kapu* sign] some time in January or February. In other places it might be shorter . . ." This is evidently a seasonal taboo to protect the young octopus. There were also chiefly taboos. On fishing grounds owned by the chiefs, some fish or shellfish were tabooed for chiefly revenue; on good *he'e* grounds this animal was often the chosen one.

Kepelino (n.d. I:43) describes the food-gathering habits of the *he'e*: "The tentacle called the '*ave-puhi*' is used to entice fish. . . . The *he'e* hides itself in a burrow or in the sand and when a fish grabs at the tempting

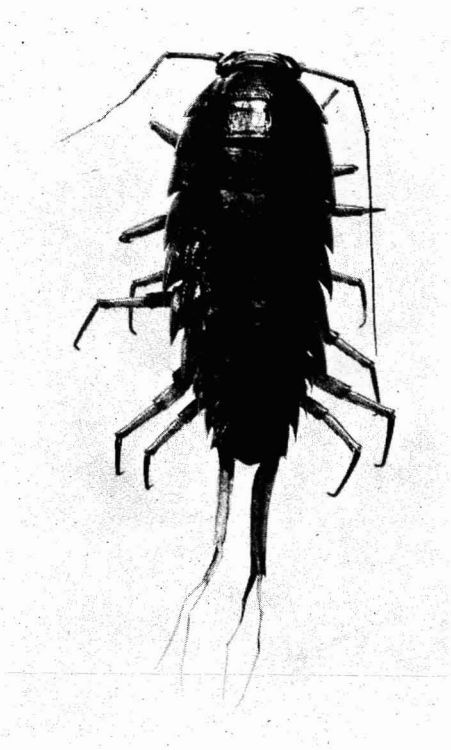


FIGURE 20. *Poki*, a sow bug. (Courtesy of Bernice P. Bishop Museum.)

ave-puhi the fish is killed When it is among seaweeds, it takes the appearance of seaweeds; if a red stone is at its place, it assumes that color . . . the *he'e* is changeable"

Hawaiians often used habits of fish as bases for proverbs. Such a proverb is "*He mūhe'e ke hoalike, ka i'a hololua o ka moana,*" which means "You are like the *mūhe'e*, the reversible creature of the sea," that is, you are double-dealing (Kinney, informant).

The name *he'e* means to flee. It also means a miscarriage. This latter meaning came from the custom of feeding female dogs the slime of the *he'e* mixed in their food for a month or so before they were to give birth.

Crustaceans—Copepods, Mysids, Amphipods

Copepods, mysids, amphipods, and other small forms with similar habits and appear-

ance to the untrained eye; sea lice, sea hoppers: *'ami-kai*, *mahiki*, *'uku-kai* (literally, sea bug), *'uku-limu* (literally, seaweed bug) (Pukui and Elbert 1957). No data on uses available, although they were undoubtedly noted by the Hawaiians.

Cirripedes—Barnacles

'Ōkohekohe: acorn barnacles (Pukui and Elbert 1957).

Pi'oe, *pi'oe'oe*: goose barnacles (Pukui and Elbert 1957).

Una'oa: "the barnacle on the outer plank of a ship" (Andrews 1865). Probably acorn barnacles, as Pukui and Elbert (1957) say *una'oa* is an alternate name for *kauna'oa*, Vermetidae.

No data on uses of barnacles have been found.

Isopods

Sow bugs, pill bugs: *pokipoki*, *poki* (Figure 20; Pukui and Elbert 1957). Parasitic on fishes (family Cymothoidae). Eaten when there were enough of them gathered; cooked in *ti* leaves (Alona, informant).

Stomatopods—Mantis Shrimps

Family Squillidae, called *aloalo* (Maui name), also *alowalo* (Figure 21); *lohelohe-kai* (Hawaii name) (Wiggin and Reist). Large species especially were prized highly as food. Kawelo (informant) reported that they were plentiful in Kaneohe Bay, Oahu, in season; they were also abundant at Molokai.

Stomatopods are difficult to catch. Those who know how follow their own technique carefully. The animal has to be lured out of its hole before being grasped. The hole is as wide as is the animal, but it cleverly builds a false front across most of the hole which can be broken down. A male and a female live in the same burrow. If the female is caught first, the male is sure to follow her out; if the male is caught first, there is little use in waiting for the female to emerge.

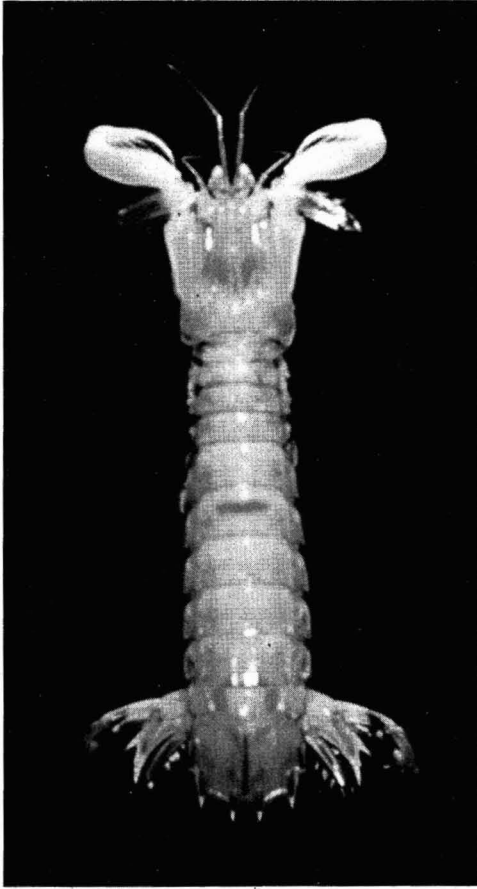


FIGURE 21. *Aloalo*, mantis shrimp, *Squilla oratoria*. (Courtesy of S. W. Tinker.)

The *aloalo* is particularly delicious, tender, and full of flavor.

Decapods—Shrimps, Lobsters, Crabs

SHRIMPS: Generally known as ‘ōpae (Figures 22, 23, 24). *Mahiki* was used to mean any shrimp used ceremonially. We gather that shrimps were used ceremonially to cast out evil spirits (Pukui and Elbert 1957:202).

According to Bryan (1933:157), the Hawaiians did not have separate names for many of the shrimps and prawns. They called most prawns *aloalo*, and shrimps were called ‘ōpae.

Distinctions among some kinds of ‘ōpae were noted, however:

‘*Ōpae-hiki* (literally, shrimp that appears): *Halocaridina rubra*, a cave-dwelling shrimp.

‘*Ōpae-huna*, ‘*ōpae-hune*, ‘*ōpae-‘ohuna*, ‘*ōpae-‘ōhune* (literally, small shrimp): applied to sea shrimps (e.g., *Stenopus hispidus*, the bandana shrimp, and *Enoplometopus occidentalis*) as well as to various shrimps and prawns almost transparent in color, found in brackish waters (e.g., *Palaemon debilis*, Figure 23B). In writing of Moanalua, Oahu, Mokumaia (1922) speaks of the ‘*ōpae-huna*: “The lips felt the sharpness of the shell but it warded off hunger when moved downward by the *lehua poi* of Iemi.” Kawelo says ‘*ōpae* are good to eat, raw or boiled.

‘*Ōpae-iwi-nui* (literally, shrimp with large chelae): *Conchodytes meleagrinae* (Wiggin and Reist). Undoubtedly the name would be used for many large-clawed shrimps.

‘*Ōpae-kai*: any sea shrimp.

‘*Ōpae-kākala*: a spiked shrimp (Pukui and Elbert 1957)—that is, one with a rostrum.

‘*Ōpae-kala-‘ole* (literally, spineless shrimp): *Atya bisulcata*, *Ortmannia henschawi* (Pukui and Elbert 1957), for example.

‘*Ōpae-kapaka*: unidentified shrimp (Pukui and Elbert 1957).

‘*Ōpae-ke‘oke‘o* (literally, light-colored shrimp): given as the name for a light-colored shrimp but not identified.

‘*Ōpae-kolo* (literally, creeping shrimp): for example, *Atya bisulcata*, *Ortmannia henschawi* (Pukui and Elbert 1957).

‘*Ōpae-kuahiwi* (literally, mountain ‘ōpae): forms living in mountain streams.

‘*Ōpae-lōlō* (literally, stupid shrimp), may have originally been ‘*ōpae-loloa* (literally, long shrimp), *Penaeus marginatus*. Juveniles are found in shallow inshore water, adults in deep water (Cordova, informant). According to the story of Kawelo (Green and Pukui 1936), ‘*ōpae-lolo* is an introduced sea shrimp. Chinese people are very fond of it. It is seen 2 or 3 months after a period of flooding rain; it then rises to the surface and can be caught.

‘*Ōpae-luahine* (literally, old-lady shrimp): saltwater shrimp (Pukui and Elbert 1957).

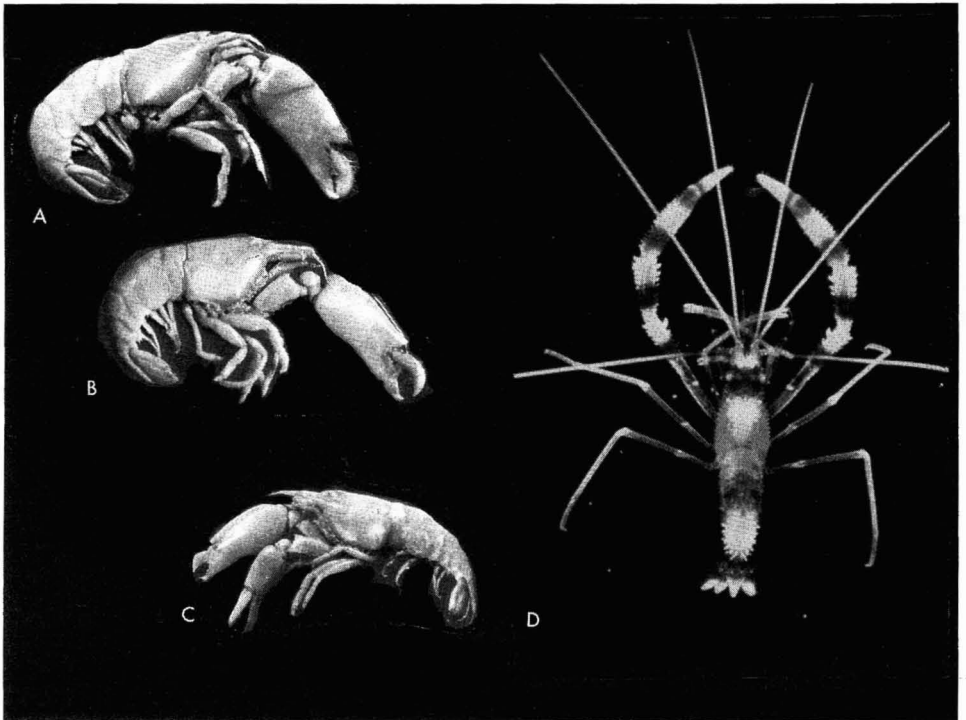


FIGURE 22. 'Ōpae, shrimps. A–C, 'Ōpae-'ula, snapping shrimp, *Alpheus lottini*. (Courtesy of Bernice P. Bishop Museum.) D, 'Ōpae-huna, bandana shrimp, *Stenopus hispidus*. (Courtesy of S. W. Tinker.)

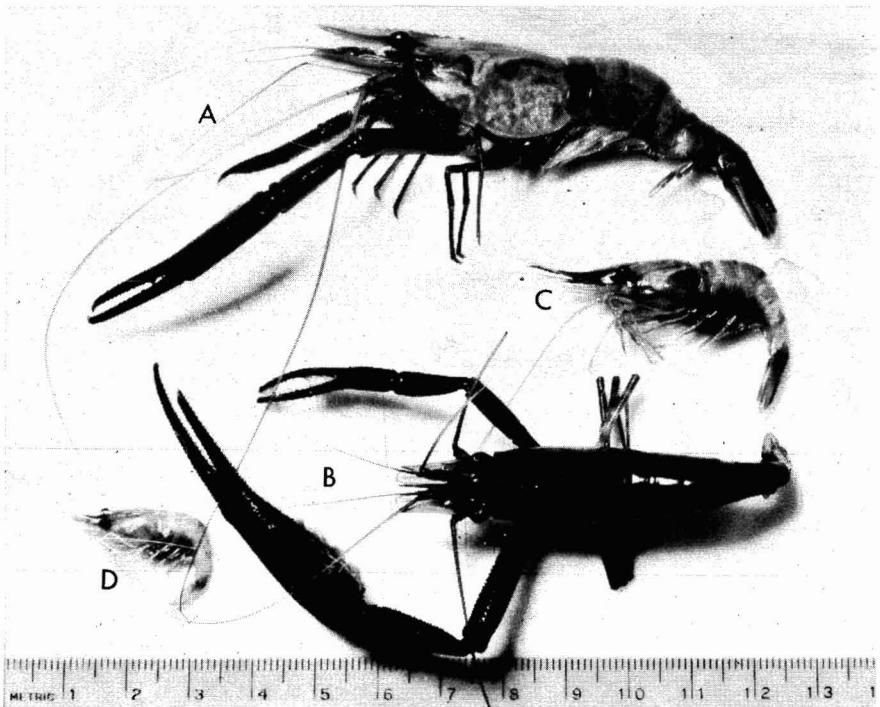


FIGURE 23. A, B, 'Ōpae-'oeha'a, clawed shrimp, *Macrobrachium grandimanus*. C, D, 'Ōpae-huna, *Palaemon debilis*. The same name was sometimes applied by Hawaiians to a plant or animal if the likeness was striking, as in the two 'ōpae-huna shown here. (Courtesy of John Maciolek.)



FIGURE 24. Hawaiian woman with her broom for pushing shrimp into her basket. (Courtesy of Bernice P. Bishop Museum.)

'*Ōpae-'oeha'a* (literally, crooked-walking shrimp): clawed shrimp, *Macrobrachium grandimanus*, found in streams and taro

patches (Figure 23A; Pukui and Elbert 1957). '*Ōpae-'ōlulo*: variety of soft ('*ōlulo*) freshwater shrimp (Pukui and Elbert 1957).

'*Ōpae-ʻula* (literally, red shrimp): snapping shrimp, family Alpheidae. Sometimes eaten but not in Kaʻu (Wiggin and Reist). Small, reddish shrimp (including *Alpheus lottini*), used for '*ōpelu* bait (Pukui and Elbert 1957). Omsted (1937b:30) says, in speaking of Waiʻānapanapa, Maui, "in the spring the stones are said to be of a redder hue caused by the gathering of the '*ōpae-ʻula*—red shrimp." This would be *Halocaridina rubra* according to Devaney (see '*ōpae-hiki* above).

Women usually gathered '*ōpae*, finding freshwater '*ōpae* under stones in the mountain streams. Beckley (1883:5) describes how they did it—moving through the water with a basket shaped something like a coal scuttle and made of '*ieʻie* vines: "They move along in a crouching position, moving the stones and sticks under which the '*ōpae* hide, driving them to a spot where vegetation overhangs the water. Here the woman places her basket underneath the leaves and lifts out the '*ōpae*, dumping them into a calabash which, attached by a string, floats behind her. Fern leaves were placed on top of the '*ōpae* to keep them from jumping out."

In a note for the story of Kawelo (Green and Pukui 1936:36), there is mention of gathering sea shrimps: "*Hoku-kau-ʻōpae*, also called *Ka-hau*, was the shrimp star. At certain seasons of the year, it rises early in the morning, followed by *Hoku-hoʻo-kele-waʻa*, or star for guiding canoes, and then by *Hoku-loa*, the morning star. Shrimps for bait can be gathered easily from the surface of the water if collected early when the 'shrimp star' is rising."

Kamakau (n.d.) speaks of "the fine-fleshed shrimp, the coarse-fleshed shrimp, such as come from the sea into the inland ponds."

Stewart (1831:II, 228–229) relates an incident describing a rather novel way of eating shrimp:

After the meats were removed, Madam Boki drew the casters and sallad [*sic*] bowl near her, as I at first supposed, to give us a specimen of her tact in sallad dressing; but, on seeing a servant approach with a parcel handsomely done up in green leaves, dripping with water, and observing a smile of archness playing on the features of her ladyship as she received it from him, I began to suspect it was only in preparation for some *bonne bouche*, peculiarly epicurean in its character.

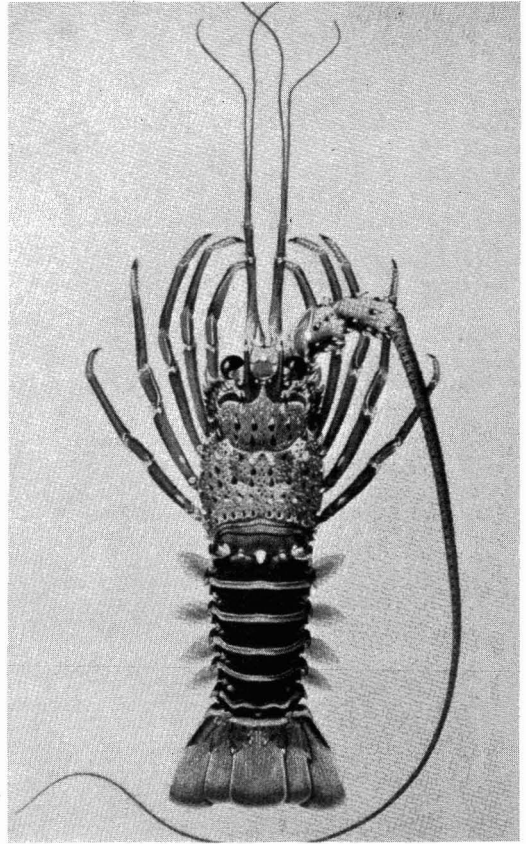


FIGURE 25. *Ula*, spiny lobster. (Courtesy of George and Holthuis.)

Such it proved to be; for on carefully untying it, while her eye brightened more and more with pleasantry, she suddenly scattered the contents—a quantity of live shrimp, as pure and transparent as could be, and as sprightly as crickets—over the cresses, and dashing the cruet of vinegar upon the whole, caught up a half dozen of the delicate creatures in the leaves of the sallad, and tossed them, with a laugh, into her mouth, by way of encouragement to us to join in the course.

The Hawaiians probably designated the mud shrimps, Callianassidae, as *aloalo*. They inhabit burrows in sandy and muddy shores and crevices of porous rocks on the reefs (compare the section on Stomatopods).

CRAYFISH (in Hawaiian parlance, "lobsters"), SPINY LOBSTERS: Generally known as *ula* (Figure 25).

Ula hiwa (literally, choice lobster): dark-colored *Panulirus penicillatus* (compare Pukui and Elbert 1957:67).

Ula iki kua lenalena (literally, small lobster with a yellow back): name given by Fornander (1917–1918:4, 584–585).

Ula koa'e: *Panulirus* spp. (Pukui and Elbert 1957). Full of good flesh.

Ula maka'ele: an all-black form, considered by Galbraith (informant) to be the best eating of all lobsters; probably *Panulirus pencillatus*. (Personal experience has shown that the flesh of lobsters varies from delicious to unpalatable. A marine zoologist, D. P. Fellows, has found some correlation between tastiness and stage of the individual lobster's molt cycle, the meat being least palatable immediately before and after molting.)

Ula malule (literally, limp lobster): probably denotes a lobster that has recently shed its hard shell (compare Pukui and Elbert 1957).

Ula papa: translated as "red rock lobster" (Fornander 1917–1918:4, 584–585). Probably "reef lobster" (Pukui and Elbert 1971 ed.: 376). Cf. *kualoa* in crabs section, wherein *ula papa* is listed as an alternate name for *Ranina ranina*, the "Kona crab."

Ula-pāpapa (literally, flat lobster): slipper lobsters, *Paribaccus*, *Scyllarus* (Pukui and Elbert 1957). Common in some localities, absent in others. Particularly good to eat, having more delicious flavor than other *ula* (Pukui).

Ula pehu (literally, swollen lobster): slipper lobsters (e.g., *Paribaccus antarcticus*, *Scyllarides squammosus*). Has a tail smaller than that of the *koa'e* (Kilinahe, informant).

Ula poni (literally, purplish *ula*): Kilinahe (informant) described it as light brown with blue markings, about a hand in length, caught with a net and eaten as are crabs. *Spirontocaris marmoratus*?

Other names that have been used to denote lobsters are 'āpa'apa'a, hāwa'ewa'e, and ninole (Pukui and Elbert 1957).

Kepelino (n.d. I:38) makes a noble effort to describe the *ula*:

The *ula* has a long, hard shell covering its entire back. The front part where the head is located is thick with some sharp pointed growths and then an irregular depression that seems to divide the front from the back. It is not a joint but a part of the whole shell, extending from the eyes to the back portion (of the body). On the portion in front, near the eyes, are hard projections,

long and sharp in that place. Among other sharp projections there are the feelers, some that are an inch in length standing among shorter ones. The lower half of the *ula* is smoothly jointed, six joints marked by tooth-like spikes, like the teeth of a saw turning downwards. In front of these rows of saw-like teeth are four divisions in a row, standing between the four saw-like teeth. Four leaf-like growths stand between the first saw-like teeth, extending from one end to the other. They are located on the second joint and by second teeth. These divided, leaf-like sections are purplish in color and soft. The side toward the back, where it joins, is rimmed in red and then a white rim around the leaf-like projection, and then it finishes off by dividing into minute branches. The inner side or the forward side, is only bordered in white. The row of saw-like teeth and the projections lie equally from one end to the other. If the *ula* is a female, the egg clusters are found in these leaf-like projections standing in rows from the first joint down to the tail. The number of egg clusters is eight, four on each side. At the ends of the leaf-like projections are rows of leaf-like growths that separate them between the borders. When the first portion is separated, there are two more joints left before the tail is reached. The tail is composed of four leaf-like parts and the base of each of these leaf-like growths is rough and lumpy. And so it is at the end of the last (leaf-like growth) that separates (the egg clusters).

There are ten legs in all, that is, five on each side and each of these legs is irregularly jointed because the bony sections are unequal, some longer than others. At the tip of each leg is a claw like a bird's and hairy on the side toward the front. And each foot on either side has three sections. On some of the sections are sharp points and at the end of these legs, close to its teeth are some very short legs, two inches in length when the *ula* is a small one. And these hairy legs are called *kihēle'ai* (food gatherers) for they serve as hands. Because it is these legs that reach for the food. Next to these, on the inner side are appendages, perhaps, that are short and flat called *pu'ili* (holders) because these hold the food which the teeth chew. These things are flat, broad, and hairy. On the outside of the teeth, on each side are two thin, long, soft bones called the *kāmau* (helpers) because these help the *pu'ili* to hold the food. Directly in front of the teeth are some tiny rounded bones with hairy tips called *kōmikōmi* (presses) because these bones press in the food and hand it to the teeth while eating. At the base of the teeth are some thin, hairy and flat bones called *pani* (shutters) because these are the things that shut in the food and it rests on these before the chewing begins. The teeth are hard and strong. In front of the teeth are short thin curtains called *pale niho* (teeth curtains). They are flat bones attached to a circle called the *hena niho* (teeth center). Inside of the *hena niho* are three sharp needle-like bones, the center one being the longer. Adjoining those are some short bones. At the sides of these bones, away in under the back shell are droopy things called the *'ohelo* (ever-moving) because they move constantly. The eyes are long and purple, with a streaked knob at the tip attached to a thin base. The feelers are long, rounded,

and prickly, tapering to a thin base. There are some thin, sharp feelers in front of its eyes near the large feelers. Next are some small, rounded feelers which taper and divide into two thin branches. One of the branches is short, hairy, and very flexible at the tip. The intestine of this creature lies in a straight line from front to tail. There is its voiding vent, close to the long tail. This is a delicious "fish," and full of meat. The *ula* is found in rocky hollows.

Ula was a source of food for the ancient Hawaiians, as it is today, being a much sought-after catch for local fishermen and divers.

PREPARATION: For eating raw, *ula* is removed from the shell and the digestive system is removed; the meat is cut into pieces, salted, and put away. When the time comes to eat it, some *wana* (sea urchin) juice and meat are added. If wanted cooked, *ula* is broiled over coals. Some Hawaiians like it half cooked, some like it well done. Some like it in a decomposed state, running out of the shell.

Lobsters were sometimes used to represent pig in sacrifices to the gods, as related in the following story (Anonymous 1923):

Ke'oahimakaokeakua was seen going directly toward the goddess Haumea with two crayfish of the *poni* variety in his hand . . . Haumea took the two crayfish . . . and went with them to the pile of stones erected by Kahinihini'ula as he was directed by the chiefs of Kahoupo-a-Kane. This was the heiau that he named Ka'enakilolani. Haumea uttered these words, "The flesh of the crayfish from which the shell is stripped is the sacrificial 'hog' to the hosts of the night. Here is the 'fish' from Ho'okokohipapa, for the hosts of gods of Laumiha." . . . She threw the crayfish on the pile of stones and no sooner had they touched them when their shells turned red like the crayfish we see broiled over the coals, and there they lay motionless.

CRABS: As is the case with gastropod mollusks, we have a quantity of Hawaiian names for crabs, indicating that this group was economically important. Habitat as well as general appearance and behavior seem to have been major features in distinguishing different kinds of crabs (Figures 26, 27).

Pāpa'i is the all-inclusive name for crabs. Again, as in the gastropods, we find groupings of crabs: *kukuma*, *'elekuma*, *'ōhiki*, *pokipoki*, and *unauna* are examples. We also find names used for particular species of crabs, names whose applications are each limited to a

specific kind of crab. These limiting names are sometimes composed of an inclusive group name followed by a word or phrase that serves to limit the group name to a particular species.

The use of specific names for particular species of crabs does not necessarily mean that those kinds were more important economically than were those designated solely by the more inclusive group names. Rather, as was pointed out earlier, we think that the presence of limiting names suggests simply that definite differences in use as well as striking differences in appearance existed and that these naturally had to be clearly distinguished. Crabs for which no restricted or different uses existed did not have to be sharply separated from the others; group names—or even the word *pāpa'i*—sufficed.

'A'ama: *Grapsus tenuicrustatus*, the black grapsid crab, probably the most common crab found along rocky shores (Figure 28A). Eaten raw, that is, salted, but seldom cooked, although some say it is delicious broiled. It was a favorite crab of Ka'u, eaten extensively when the sea was rough. To salt and keep *'a'ama*, the carapace was pulled off and the *au* sac (digestive gland) was removed. The legs were broken off the body and the meat was removed from them and salted; the resulting liquor, *kai 'a'ama*, was added to the body of the crab, which was salted well and then stored. *'A'ama* kept a long time so prepared.

The *'a'ama* is said to have been a special or favorite sacred food for certain priests; care was taken to see that the crab was whole—no missing legs, etc. It was also used in medicine, usually to finish off a course of treatment in certain diseases. The *'a'ama* crab was offered in sacrifices so that the gods would loosen (*'a'ama*) and grant the request (Pukui and Elbert 1957). Kepelino (n.d.) tells us that the "claws close to the mandibles are called *niho-kilou* [hooking teeth]." Probably the term was applied to that apparatus in all crabs.

'A'ama kua lenalena (literally, *'a'ama* with a yellow back): *Grapsus tenuicrustatus*. Yellow form, found with the black *'a'ama* along rocky shores.

'Ala'eke: an edible portunid crab, sand-



FIGURE 26. Hawaiian with crab net and crabs. (Courtesy of Bernice P. Bishop Museum.)

colored, found in shallow water (Pukui and Elbert 1957), as *Portunus granulatus*, *P. orbicularis*, *Charybdis orientalis*, *C. erythroactyla* (Figure 28B).

Alakuma: *Carpilius maculatus*, the seven-eleven crab. Eaten in some localities, but in

others such as Puna, not eaten. Some ate it cooked. There is a legend of this crab (Ward 1937:215):

On the reefs of ancient Hawaii the sea god was wont to search for delicacies to assuage his divine hunger,



FIGURE 27. Crabbing at Waikele, district of Ewa, Oahu. (Courtesy of Bernice P. Bishop Museum.)

and one fine morning he espied a fine, big crab, fat of body, smooth, shining, and of a uniform, yellowish-pink shade, very beautiful to behold. Seized with a desire to add this delectable morsel to his repast, the god grasped the crab. This sudden attack surprised the crab, and, seizing the god by the fingers, it drew blood. The god, in surprise and pain, dropped the crab, leaving a row of red finger marks on its back. Quickly overcoming the shock of the first encounter, the god seized the crab again, only to relinquish his hold of the powerful creature a second time, leaving a second set of finger prints. For the third and last time the god caught the crab, which had no doubt been greatly weakened by this contest with divinity, and killed it. The descendants of this beautiful tropical species, *Carpilius maculatus*, all display the red imprints of the god's fingers.

'*Alamihi* (also '*elemihi*, '*elepī*, Pukui and Elbert 1957; see also *kūkūau*): *Metopograpsus messor*. A very common little square-backed grapsid crab of muddy, flat reefs near the mouths of rivers. "It dwells in the foul smelling sand," says Kepelino (n.d. I:63). The color is gray to dark green or black. In spite of its habitat it has a special flavor that is enticing to Hawaiians. Eaten raw, sometimes cooked—"the best of all things, so fragrant," writes one Hawaiian informant.

"It is fond of mud and likes to make tunnels," says Pukui, "and [it] can be detected by the smacking noise it makes" (air bubbles and movements of the crab in the mucky substrate in which it burrows make this noise). It sometimes travels as much as 100 ft inland. '*Alamihi* used to be plentiful at Kalia (now Ala Moana Park, Honolulu). The author remembers seeing a Chinese peddler take kerosene cans full of '*alamihi* to sell to Hawaiians living near the old Lunalilo Home on Piikoi Street and come home with empty cans every time.

'*Ā-loa*: same as *maka-ā-loa*, but compare *kualoa*, alternate name '*āloa*.

'*E'eke*: hard-shelled crab (no data) (Pukui and Elbert 1957); given as alternate name for '*ala'eke*.

'*Elekuma*: small xanthid crabs, as *Pseudozizus caystrus* (according to Pukui and Elbert 1957).

'*Elekuma āko'ako'a* (literally, coral '*elekuma*): *Phymodius laysani* (according to Wiggin and Reist).

'*Elekuma 'ele'ele*: *Chlorodopsis areolata* (Wiggin and Reist), a small xanthid. One of the most abundant forms under stones and in the crevices of rocks near shore.

'*Elemihi*: same as '*alamihi* and '*elepī* (Pukui and Elbert 1957).

'*Elepī*: same as '*alamihi* and '*elemihi* according to Pukui and Elbert (1957). Kepelino (n.d. I:62), however, differs: "It resembles the '*a'ama*, is slightly larger than the '*elekuma*, its legs are hairy. The back is reddish and the front [undersurface] is white. In general appearance and habits it is like the '*a'ama* . . . short legs." Perhaps *Geograpsus crinipes*; see *pai'ea* below.

Hihī-wai: identified in Pukui and Elbert (1957) as *Planes minutus* (= *cyaneus*), a pelagic form typical of the open ocean and only occasionally drifting close to shore. However, Pukui says that *hihī-wai* is smaller than '*a'ama*, yellowish with black spots, found along rocky shores in the same habitat as '*a'ama*. On the basis of the latter information, we are inclined to disagree with Pukui and Elbert (1957) that *Planes minutus* is the *hihī-wai*, but rather suggest that another grapsid crab is the *hihī-wai*.



FIGURE 28. Pāpa'i, crabs. A, 'A'ama, *Grapsus tenuicrustatus*. B, 'Ala'eke, *Charybdis erythroductyla*. C, Kūmimi-pua, *Lybia edmondsoni*. D, Kūmimi-māka'o, *Petrolisthes coccineus*. E, Kukuma, *Palicus maculatus*. F, Pāpā, *Percnon planissimum*. (Courtesy of Bernice P. Bishop Museum.)

Kualoa: *Ranina ranina*, the Kona crab, variant Hawaiian names: 'āloa, ula papa. A deep-water crab. Figure 29 shows two drawings, top and underside, the first drawings of a crab from Hawaii. For a time it was thought to have disappeared from Hawaiian waters, but it became abundant again and was frequently captured off the Kona coast of

Hawaii in 1938 and later. It is considered one of the best crabs to eat.

Kuapā: a crab of the species *pai'ea*, but with a hard shell (Andrews 1865).

Kuapā'a: *Chlorodopsis areolata* (Wiggin and Reist), *Zozymodes biunguis*, *Xantho crassimanus*, and perhaps others.

Kūhonu: *Portunus sanguinolentus*, a large

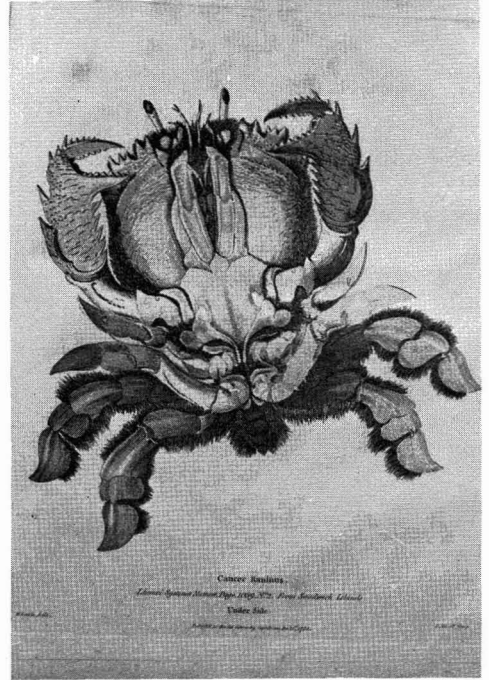
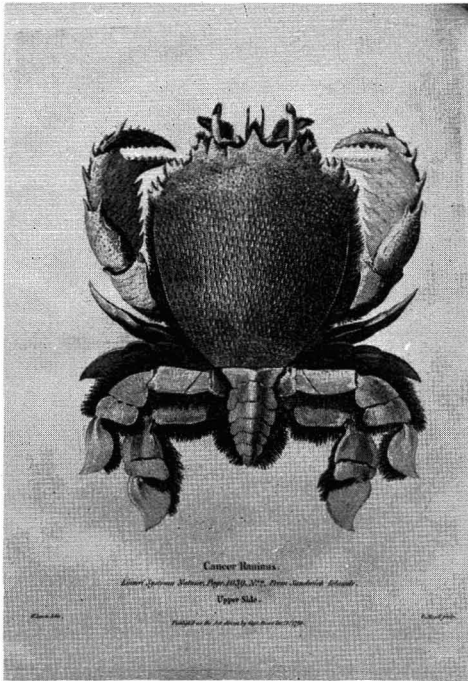


FIGURE 29. *Kualoa*, Kona crab, *Ranina ranina*. (From Dixon 1789.)

portunid crab (Pukui and Elbert 1957). Also called *kuahonu* and *kuohonu*. Its habitat is the coral reefs, where the crayfish live. It is caught in nets and is eaten raw or cooked. *Kūhonu* is a favorite relish. It is not very common in Ka'u or Puna, but is common on Oahu, where it used to be on sale in the market frequently, tied up with a bullrush.

It was liked several hours old when the flesh inside the legs began to shrink away from the shell, called *pōholoholo* [fitting loosely]. It was then prepared as any other crab. If eaten raw, the legs were broken off and the meat sucked out—with quite a bit of noise. The meat was not actually running out of the shell but was loosened enough to make sucking easier. It is a good eating crab, raw or cooked, but does not keep as well as others.

Kūhonu and *pokipoki* crabs often were found in the same area. *Kūhonu* are best when fat. They spoil after 24 hours, even if salted, whereas *mo'ala*, for example, last a month or so when salted.

Kūkūāu: *Metopograpsus messor* (Forskål). Kepelino (n.d. II:12) agrees that *kūkūāu* is

“in the same class as the ‘*a'ama*,” but his description does not match *Metopograpsus messor*: “Pale dots are all over it. There are several little white dots right on top of its back, as though imprinted there with the point of a nail. It has small, red eyes. Its claws are like hard and strong pincers. Its actions are exactly like those of the ‘*a'ama*. Its legs are small, thin and smooth. The posterior is irregularly narrow. The *kūkūāu* is edible.”

Another informant says that the *kūkūāu* is a large, deep-sea crab with brown spots. “A large crab (probably *Carpilius convexus*)” is another identification (Pukui and Elbert 1957).

Kukuma: as nearly as can be determined, any of various species of grapsid crabs, as *Palicus maculatus* and *Sesarma* spp. (Figure 28E; Wiggin and Reist). Pukui and Elbert (1957) say perhaps *Aphanodactylus edmondsoni*, but as this is a small species commensal in the shelly tube of a terebellid worm, this identification is doubtful.

Kukuma kea: *Aphanodactylus edmondsoni* (Wiggin and Reist), but compare comments

under *kukuma*. It is believed that the name was attached to what the informants thought was a white grapsid.

Kukuma-ōhuluhulu: *Sesarma obtusifrons* (Wiggin and Reist), and presumably others similar in appearance.

Kūmimi: *Lophozozymus intonsus* (Owen 1839: 77–78, Edmondson 1933: Fig. 154e), *Etisus splendidus* (BPBM specimen, Edmondson 1933: Fig. 153f).

Kūmimi-māka'o: *Petrolisthes coccineus* (Figure 28D; Pukui and Elbert 1957). Also called *na maka o Kaha'i* (the eyes of Kaha'i, Pele's oldest sister). Used in sorcery.

Kūmimi-pua: *Lybia edmondsoni* (Figure 28C; Pukui and Elbert 1957). Used in sorcery.

While the identities of *kūmimi-maka'o* and *kūmimi-pua* seem undisputed, we have conflicting identifications for the third kind of *kūmimi*. Owen obtained the Hawaiian name for *Lophozozymus intonsus* (= *Xantho eudora* Owen, see Rathbun 1906) from the natives of Oahu. This species is grayish white, mottled with reddish brown or dull orange. However, notes on *kūmimi* recorded by the author indicate that Pukui describes it as being large, bright red, and living in the deep sea at the outer reef. A specimen of *Etisus splendidus* in the Division of Invertebrates at the Bishop Museum is labeled (by whom we do not know) *kūmimi*. Pukui thinks that this same specimen is *pāpa'i-'au-moana* (pers. comm. to Fellows, 1964). Pukui also indicated during the same conversation that *Lophozozymus intonsus* (Owen's *kūmimi*) is '*ala'eke*; *kūmimi* is the same shape "but is all one color on the tips of the claws." But compare '*ala'eke* as defined by Pukui and Elbert (1957)—a portunid!

Kūmimi were considered inedible by the Hawaiians and in fact are reportedly poisonous at certain times of the year when the water is murky. Confusion about crabs being poisonous stems from inaccurate translations of the words '*awa* and '*awa'awa*, which Mrs. Pukui and other informants use in describing various invertebrates: '*awa* and '*awa'awa* mean bitter, sour, poisonous (Pukui and Elbert 1957). Pukui describes the *au* (gall sac; in invertebrates, the digestive gland) as being '*awa*, meaning bitter, sour—not poisonous,

for personal experience has demonstrated that the digestive gland of these animals is definitely not poisonous. *Kūmimi-māka'o* and *kūmimi-pua* were used in sorcery (Pukui and Elbert 1957). Tabrah (1967) has heard that "these small creatures, squeezed in the hand, produce enough toxic substance to poison a man." Pukui indicates that the large red *kūmimi* (*E. splendidus*?) was "highly poisonous, very bitter, and was used in medicine, sometimes as a heart stimulant."

Kumu-lipoa (literally, *lipoa* source), also called *makua-o-ka-lipoa*, *pāpa'i-limu*, *pāpa'i-lipoa*: *Simocarcinus simplex*, commonly found in *lipoa* seaweed (*Dictyopteris* spp.), one of the three most popular kinds of edible seaweeds (Pukui and Elbert 1957). Eaten raw as they were found—it was considered too much bother to gather and prepare them for a meal.

Ku-moana, also called *pāpa'i-'au-moana*, '*au-moana* connoting the open ocean, as opposed to *kai*, inshore waters. Hawaiian informants say it is very large, as large as the Samoan crab, with chelipeds powerful and sharp enough to "bite a coconut." Its carapace is light or yellowish gray with reddish or yellowish spots. It is a deep-water crab. It is considered delicious and is always eaten cooked.

Kuohonu: see *kūhonu* above.

Maka-'ā-loa (literally, long, bright eyes), also '*ā-loa*, '*ōhiki-maka-loa*: an ocypodid crab, *Macrophthalmus telescopicus*, found on mud flats (Pukui and Elbert 1957). This crab is not common everywhere: it is not found in Puna or Ka'u; it was found at Kalia Beach, Ala Moana, Honolulu, and near Hau'ula, Oahu. It was plentiful at Kalia before that area was dredged to make Ala Moana Park, but since the dredging was done they have all disappeared. Eaten (Wiggin and Reist).

Makua-o-ka-lipoa: see *kumu-lipoa* above. Also, sponge crabs, *Dromia dromia* (Wiggin and Reist).

Mo'ala: *Podophthalmus vigil*, the sentinel crab, a large portunid. Found in ponds and shallow water. In Puna it is brownish black; on Oahu its color is reddish, blue, and purple. In Puna it comes up on the beach

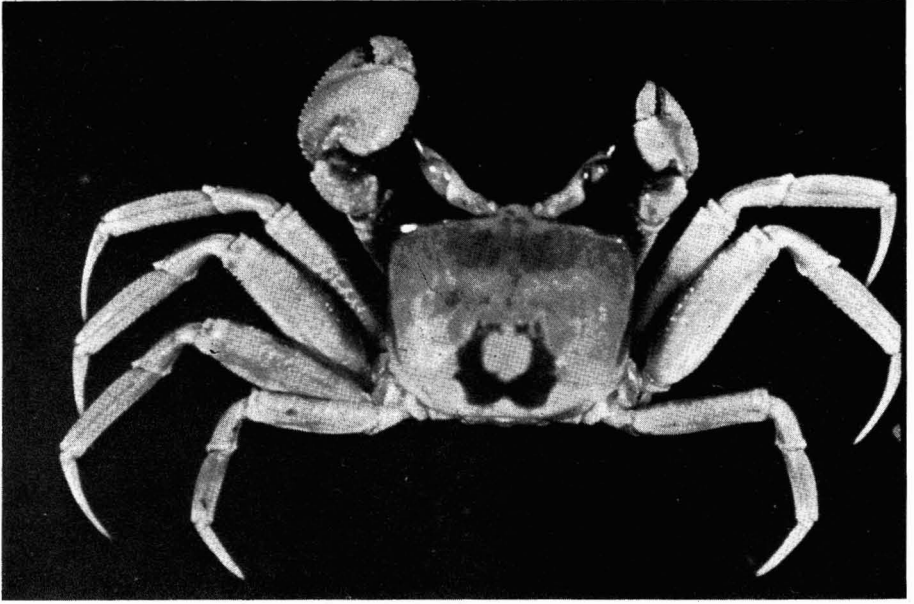


FIGURE 30. 'Ōhiki, ghost crab, *Ocypode ceratophthalmus*. (Courtesy of D. P. Fellows.) Burrows and sand mounds

at night; in Moanalua (Oahu) it frequents muddy places. (It may be that the same name is applied to different crabs in these two places.) It is eaten raw or cooked (now, usually boiled); as late as 1946 it was considered to have considerable economic importance, as it was then used extensively as food, and large numbers were sold in the Honolulu fish markets (Edmondson 1946: 283). In Puna it was cooked and was a favorite. Webb said: "This was the crab that the mountain or inland people got when they came to the shore, 'crab hungry'. This lasts longer than the *kuahonu*, which is another common crab but which has to be eaten right away. They would take a goodly number with them back to the mountains, and eat one a day. The *mo'ala* lasts a month or so, lightly salted and packed in a calabash."

Mū: *Dynomene hispida* (Pukui and Elbert 1957).

Ninole: a crustacean said to resemble a lobster (Pukui and Elbert 1957).

Ōhiki: ghost crabs, *Ocypode ceratophthalmus*, *O. laevis* (Figure 30). These crabs are very common on many sandy beaches, although the pressure of increased human and dog populations along the beaches has very noticeably decimated the crab populations. Some people eat the *Ōhiki*, raw or cooked, but too generous amounts will cause stomach upsets. At Laie, Oahu, *Ōhiki* are sometimes soaked in a pail of fresh water for an hour or so before being prepared as are other crabs—that is, the backs and legs are pulled off and the crabs are salted. They are then ready to eat raw or broiled.

Ōhiki-ʻau-moana (literally, ocean-swimming *Ōhiki*): possibly *Planes minutus* (= *cyanea*) and/or *Pachygrapsus marinus* (Pukui and Elbert 1957).

Ōhiki-maka-loa (literally, long-eyed *Ōhiki*): see *maka-ʻā-loa* above.

Ōunauna: same as *unauna*, hermit crabs (Pukui and Elbert 1957).

Pai'ea: *Plagusia depressa tuberculata* (Wiggin and Reist), a grapsid crab associated with the *a'ama*. Kepelino (n.d. I:59) points out the differences between the two kinds: "The *pai'ea* is reddish while the *a'ama* is black. The legs of the *a'ama* are long while those of the *pai'ea* are short. The bones of

the *a'ama* are soft and those of the *pai'ea* are hard. The habits are the same. This is a delicious creature." Pukui and Elbert (1957) indicate that, compared to *a'ama*, *pai'ea* has a harder shell and shorter legs fringed in front with short, stiff hair. Pukui says it is good to eat when it is raw. The flesh is lighter in color than that of the *a'ama*.

Pākiki: a variety of poisonous crab, said to be the same as *kūmimi* (Pukui and Elbert 1957).

Pāpā: *Percnon planissimum* (Figure 28F, Pukui and Elbert 1957, Wiggin and Reist). Also *pāpā'i pāpaua* (Pukui), *Planes cyaneus*. Considered good to eat—a favorite food in Lahaina, Maui, where it was plentiful; found in Puna, Hawaii, but not appreciated there. Eaten raw; it has the fragrance of seaweed (Pukui).

Pāpā'i: general name for crabs (Pukui and Elbert 1957).

Pāpā'i āko'ako'a (literally, coral-dwelling *pāpā'i*): *Charybdis erythrodactyla* (Wiggin and Reist), a coral reef inhabitant. Compare *'ala'eke* above. Eaten raw or cooked; one informant indicated that it was usually eaten raw, although another said it was not often eaten at all.

Pāpā'i-ʻau-moana: *Etisus splendidus* (Pukui). Compare discussions on *kūmimi* and *ku-moana* above.

Pāpā'i holu: soft-shelled crab (Pukui and Elbert 1957).

Pāpā'i-iwi-pūpū (literally, bone-shell crab): modern name for hermit crabs (Wiggin and Reist). Also called *ounauna*, *unauna* (Pukui and Elbert 1957), *pāpā'i-una*, *pāpā'i-pūpū* (Pukui). Most Hawaiian informants say they were not eaten, but Kepelino (n.d. II:28) claims they were, and describes their habits:

This creature will not run at the sight of man. If it sees one of its many enemies it will quickly draw back into the inside of its bony shell (the old shell of a *pūpū*, *pipipi*, *kūpe'e*, *leho*, *pu*, etc.), and so will escape It lives in pools along the shore. When it wants to kill some tiny *i'a* it keeps half its body within the shell, leaving the big pincer outside and keeps opening and shutting it like a blacksmith's "pincers." If it sees *i'a* swimming along before it, it will eject some food from its mouth quickly. When the *i'a* see this they swim closer to get it and then the pincers snap together immediately, holding fast a little fish.

Pāpa'i-kua-lenalena: yellow-backed crab (Pukui and Elbert 1957).

Pāpa'i-kua-loa (literally, long-backed crab): *Ranina ranina* (Pukui and Elbert 1957, Wiggin and Reist). See *kualoa* above.

Pāpa'i-Lāna'i: a kind of crab (Pukui and Elbert 1957).

Pāpa'i-limu, *pāpa'i-līpoa*: see *kumu-līpoa* above.

Pāpa'i malule: crab in the soft shell stage (Pukui).

Pāpa'i pāpaua: see *pāpā* above.

Pāpa'i-una: see *pāpa'i-iwi-pūpū* above.

Papaki: see *pokipoki* below.

Paua: a rare crab (Pukui and Elbert 1957).

Pe'eone (literally, sand-hiding): *Hippa pacifica* (Pukui and Elbert 1957). See also discussion under *pokipoki* below.

Pōhaku-hali (literally, stone fetcher): crabs perhaps of the family Leucosiidae (Pukui and Elbert 1957).

Poki: also called *pokipoki*, see the section on Isopods.

Pokipoki: box crabs, family Calappidae, including *Calappa calappa*, *C. gallus*, *C. hepatica* (Pukui). Also called *papaki* (Owen 1839), *popoki* (Pukui and Elbert 1957). Considered edible; not particularly enjoyed as food according to Pukui and Elbert (1957), but by other sources considered as excellent cooked but never eaten raw. Kepelino (n.d. I:65) states: "It crawls in the sand and lets waves lift it from among the stones. When the wave recedes then it returns to its place. When the tide recedes and the sea floor is exposed it sinks under the sand . . ." Often found in the same area as the *kuahonu* crab (Pukui); they live in the "wet sand" (Kamakau n.d.).

We believe that *Hippa pacifica* was also designated by the name *pokipoki*: "This is the *pokipoki* that lives in the sand where the sea washes up to the shore. We used to pin a piece of fish down on the sand with a long stick, using several sticks. The *pokipoki* came out of the sand to get the fish. Many came at once from every direction and were easily picked up and dropped into the buckets. They were washed and wrapped in *ti* leaves and cooked over hot coals" (Titcomb notes, source not given).

Pokipoki-'au-moana (literally, sea-swimming *pokipoki*): a kind of deep-water crab (Pukui and Elbert 1957).

Pokipoki-kua-pa'a (literally, hard-backed *pokipoki*): *Calappa* spp. (Pukui and Elbert 1957).

Pua-kala: a kind of crab (Pukui and Elbert 1957); probably the same kinds as are meant by *kumu-līpoa*.

Ula papa: see *kualoa* above.

Unauna: general name for hermit crabs (Pukui and Elbert 1957), the old name for hermit crabs (Wiggin and Reist). See *pāpa'i-iwi-pūpū* above.

Echinoderms: Asteroids—Star Fishes

Evidently, star fishes were of no economic importance to the Hawaiians, as we have found no mention of them except in the most general terms. They were denoted by several older Hawaiian names: *pa'a*, *pe'ape'a*, *'ōpe'ape'a*, *hōkū-kai* (Pukui and Elbert 1957), *pe'a* (Wiggin and Reist). The name *i'a hōkū* is a modern translation of *star fish*.

Echinoids—Sea Urchins

The Hawaiians recognized many kinds of sea urchins, with names for the various kinds: those with long spines were called *wana* (Bryan 1933:151); others were distinguished as *hā'uke'uke*, *hawa'e*, *'ina*, etc.

Kepelino (n.d.) divides the group into five kinds: (1) *'ina maoli* (true *'ina*); (2) *wana* (long-spined forms); (3) *hāwa'e* (pincushion and heart urchins); (4) *hā'uke'uke-iwi-loloa* (literally, long-boned *hā'uke'uke*); (5) *hā'uke'uke kaupali* (literally, cliff-perching *hā'uke'uke*). This classification scheme is generally in accord with the information we have obtained from other sources, although we have found further differentiation, chiefly through the use of qualifying terms.

'Ina group: *Echinometra* spp., the most frequently encountered of the Hawaiian sea urchins. They are found on reefs in both shallow and deep water, usually in holes the entrance to which is smaller than the circumference of the urchin. They may be grasped in the bare hands.



FIGURE 31. Hawaiian woman collecting *wana* (sea urchins). (Courtesy of Bernice P. Bishop Museum.)

'*Ina* 'ele'ele, '*ina*-uli (black '*ina*): *Echinometra oblonga*.

'*Ina* kea, '*ina* ke'oke'o (light-colored '*ina*): *Echinometra mathaei*; whitish-greenish form.

'*Ina*-ula, '*ina* 'ula'ula (reddish '*ina*): *Echinometra mathaei*; reddish form.

Sometimes a sauce is made of '*ina* by breaking the tests into large pieces and adding just enough water to cover them and enough salt to suit the taste. After several hours the liquid is carefully drained off. The liquid is called *kai* '*ina* and is well liked with raw fish. As the color of the juice of the '*ina* is reddish lavender, that color also is called *kai* '*ina*.

Wana group: *Echinothrix* spp., *Diadema paucispinum*. Not usually gathered with the bare hands, as the spines are too sharp and the large spines are intermingled with smaller, slender, hollow spines that have a poison sac at the base (Figure 31). The spines cause deep, painful puncture wounds.

Wana hālula: *Diadema paucispinum*, a species with longer spines than the "regular" *wana* (Pukui and Elbert 1957).

Wana kauila (literally, *kauila* wood *wana*): form with spines the color of *kauila* wood (Kepelino n.d. I:40).

Wana were evidently considered the most delicious eating of the urchins. Kepelino says (n.d. I:40) that all kinds of *wana* are good to eat raw, and are also good cooked or dried in the sun. "It keeps the diaphragm moist" [Hawaiian equivalent for "tickling the palate" (Pukui)]. He says the spines on the underside of the *wana* are short, so it is easy to touch them there, but all kinds require a stick to turn them over in order to pick them up. A stick was also used to knock off spines.

Wana were apparently quite seasonal, as indicated by the saying *Pala ka hala, momona ka hā'uke'uke* ("When the *hala* flowers are ripe the sea-eggs are fat") (Judd 1930). Sea urchins were apparently not "edible" when they contained no gonads.

To prepare *wana* for eating, the spines are removed, usually by knocking them off or rubbing them against stones. They are opened by crushing part of the test, or by putting salt on the mouth of the urchin and leaving it thus overnight, then making a little crack all around the mouth area and lifting it off. The five orange-colored tongues of gonads (*elelo*) clinging to the test may then be scooped out. This is the choice "meat" sought for, but the fluid, *kai*, is well liked too. It is always drained from the body cavity and the mouth parts. The *kai* and *elelo* combined make a relish that is well liked with poi or sweet potatoes. A little salt is added to the relish and it is ready to eat when the salt is dissolved. In large *wana*, the *elelo* are about 2 inches across and as thick as a child's tongue. The combination of crayfish and *wana* was a favorite; *wana* was also combined

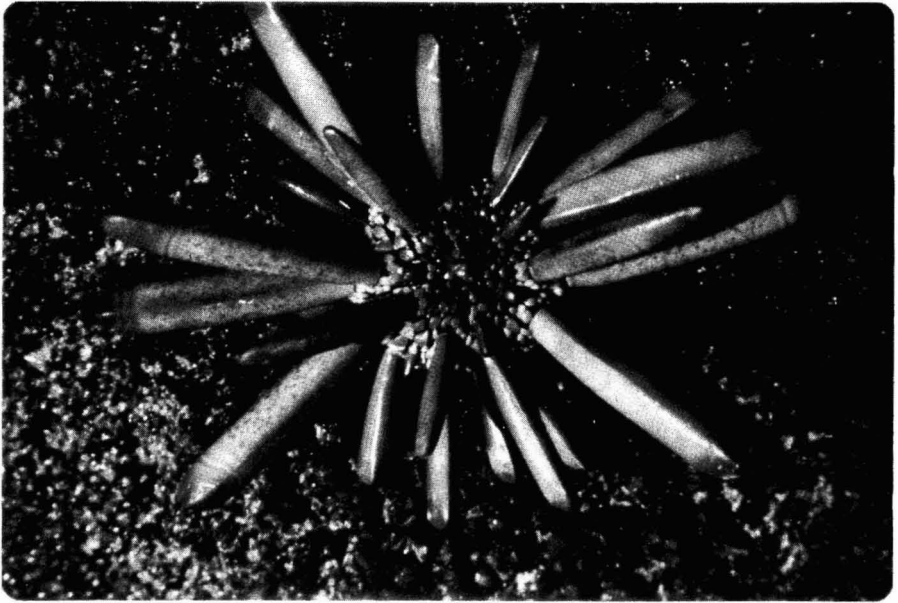


FIGURE 32. *Hā'uke'uke 'ula'ula* or *pūnohu*, slate-pencil sea urchin, *Heterocentrotus mammillatus*. (Courtesy of D. P. Follows.)

with raw fish or 'opihī, and, in modern times, with salt salmon.

Hāwa'e group: pincushion urchins, *Tripneustes gratilla*, *Pseudoboletia indiana*, and heart urchins, *Brissus latecarinatus*. Hawaiians noted their presence in both deep and shallow water, and in rocky and sandy areas. The spines are fine and short. They were not considered as tasty as other sea urchins. On Maui many fishermen take *Tripneustes* only, even though *Echinothrix* are available.

Hāwa'e maoli (literally, natural *hāwa'e*): probably *Tripneustes gratilla*, which has purplish-black spines or gray spines.

Hāwa'e po'o hina (literally, gray-headed *hāwa'e*): perhaps *Pseudoboletia indiana*, a species with delicate pink spines.

Hā'uke'uke group: also called *hā'uke*, *hāku'eku'e*, *hāku'e*, *hā'ue'ue*. Species with short or flattened spines, as in *Eucidaris metularia*, *Colobocentrotus atratus*, and *Heterocentrotus mammillatus*. Considered delicious but not as good as the *wana*. Qualifying terms were used to differentiate among the species (compare the Kepelino system above). *Hā'ue'ue* is the name for *Heterocentrotus*, at least on Maui (Abbott, personal communication; Pukui and Elbert 1957).

Colobocentrotus atratus: *hāku'eku'e*, *hāku'e* (Pukui and Elbert 1957), *hā'uke*, *hā'uke'uke* (Kauai name, according to Pukui), *hā'uke'uke kaupali* (Kepelino n.d.).

Heterocentrotus mammillatus: the slate-pencil urchin, was also called *pūnohu* (Figure 32; Pukui and Elbert 1957), and *hā'uke'uke 'ula'ula* denoted the brilliant red-orange specimens. The spines of this species were often actually used as "pencils." "Five carved spines have been found on Kahoolawe" (Buck 1957:503; see also Figure 33).

Eucidaris metularia: *hā'ue'ue* (Hawaii name), *peni* (Maui name, Wiggin and Reist). This species was not large enough or common enough to have had any importance as food.

Other Hawaiian names for sea urchins include *hailimoa* (Kepelino n.d. I:40) and *hulu'anai* (Pukui and Elbert 1957). See Figure 34.

Holothuroids—Sea Cucumbers, *Bêche-de-mer*

These are generally known by the Hawaiian name *loli*. Kepelino (n.d. I:49) and Pukui



FIGURE 33. Carved slate-pencil sea urchin spines, the larger possibly representing an 'aumakua (personal god). (Courtesy of Bernice P. Bishop Museum.)

and Elbert (1957) give the following names for various kinds of *loli*:

Hūlalilali (shiny), also *hulali*. Same as *kūnounou*.

Kāhuli (literally, changeable).

Kohe-lelewa, *kohe-lewalewa*, *konalewalewa*, *kōnalelewa* (literally, hanging vagina).

Kūnounou or *kūneuneu*, also called *hulali*.

Loli-ka'e (literally, edged *loli*).

Loli-kohola (literally, reef *loli*).

Loli-lū'au (literally, taro-tops *loli*).

Loli mākoko, *loli-koko* (literally, blood-red *loli*).

Loli-pua (literally, flower *loli*): *Holothuria cinerescens* (Maui name). Favorite for eating.

Ma'i-hole.

'Unae.

Weli, *weliweli*.

Another source adds *auloli* (a white variety). Synonym: *kūkaeloli* (Pukui and Elbert 1957).

'Aha-huluhulu (hairy 'aha), *huluhulu*. Aside from Pukui and Elbert (1957:6, 84), Kepelino (n.d. II:73) is the only source of Hawaiian information about this animal. He says:

This is a creature without eyes. It resembles the *loli* in appearance. It is bumpy and entirely a whitish red in color. It is not classed with edible fishes nor is it classed with the *loli*. Its whole body appears hairy and very ugly to the sight. It dwells under water-worn rocks and drinks sea-water until it is full. If it is tossed on dry land, the water runs out of it and it dies. It is so bad that it is never eaten but its deeds are very good. It sucks in all the filth in the sea until it fills its belly. Its length is about four inches and its girth about the size of a finger. But when it sucks in the sea and filth it attains the length of nine feet and more. Therefore it is an ugly creature but good in deeds. It cleans the filth under water that the lives of fishes and man may be spared.

While Pukui and Elbert (1957) give the identification as *Eurythoe pacifica*, an annelid worm, the description of its appearance and habits agrees with that of *Opheodesoma spectabilis*, a holothurian familiar on mud flats as are found in Pearl Harbor and Kaneohe Bay.

Loli okuhi kuhu: *Holothuria atra* (West Maui name), identified by Devaney from a specimen collected at Ka'a Beach, near Wailuku, Maui. Not eaten by local residents. Probably also *Holothuria difficilis*, *H. hilla*.

Because preserved *loli* fail to resemble living specimens and the pictures available to show informants also fall short of resembling living holothurians, we have in most cases been unable to equate satisfactorily scientific species with the Hawaiian names.

We have learned, though, that the *loli-pua* was the favorite for eating.

PREPARATION: As soon as one is caught, the slime is rubbed off, leaving the skin a purplish color. Then the *loli* is washed, cut open, and entrails removed, washed again, cut into small pieces, salted, and stored in a container until wanted. It is not eaten cooked. Sometimes pounded *limu 'a'ala-'ula* is added, or 'ina, meat and fluid (Alona, informant). The *loli-ka'e* was also considered good eating, either raw or cooked (Bryan 1933:152). The *loli-koko*, which is reddish and will discharge its Cuvierian organs on very slight stimulus, was not eaten (Bryan 1933:152).

Loli are evidently not equally good at all seasons: "When you longed for the *loli* of Kaupo, the prophet told you that it was not the best time to get *loli* to eat. The *loli* were in the sand and were bitter" (Anonymous 1894). *Loli* are found on rocks or in holes in

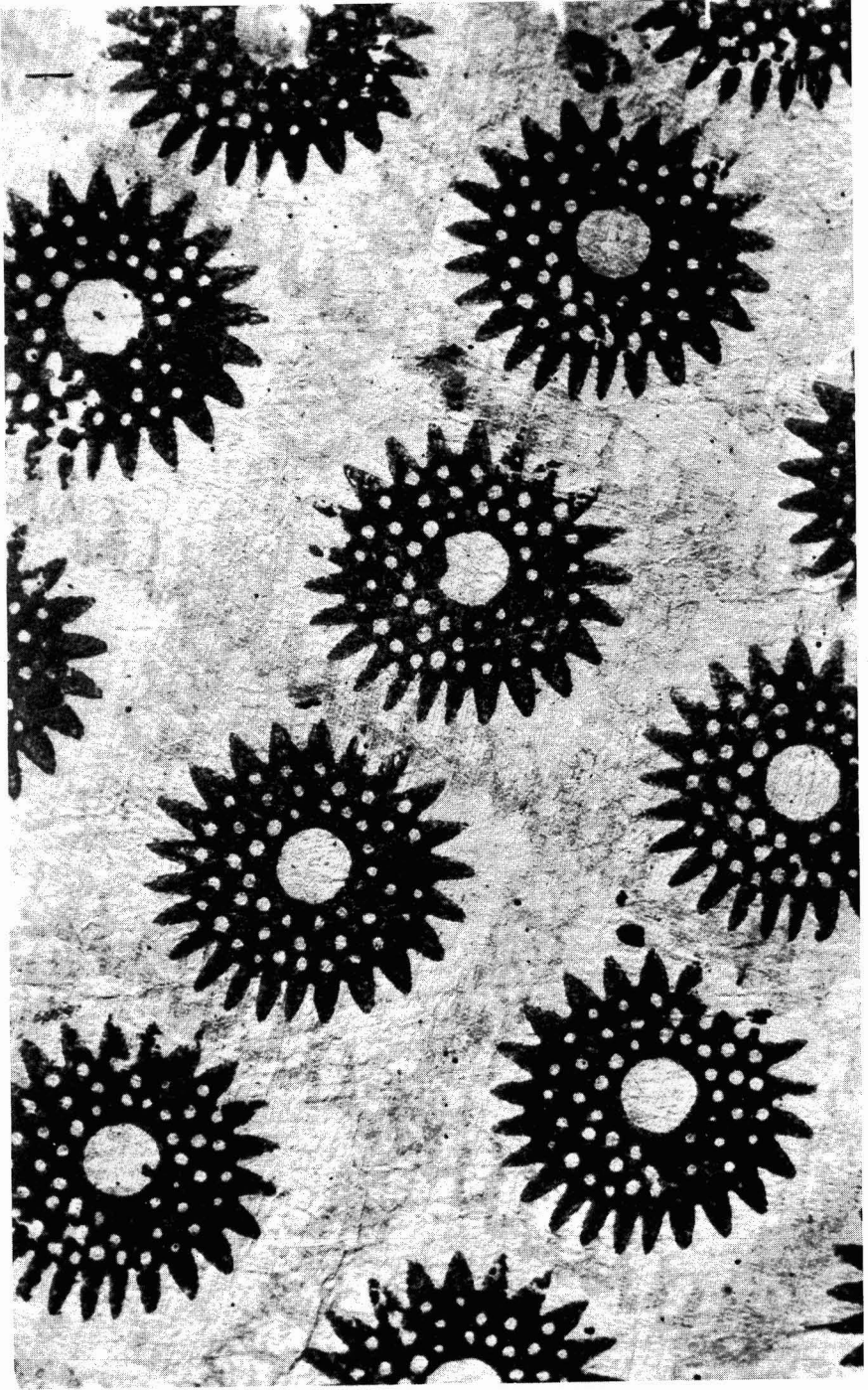


FIGURE 34. Sea urchin motif in a Hawaiian tapa design. (Courtesy of Bernice P. Bishop Museum.)

the rocks of the reef. They may sometimes be seen in very shallow water. "You see the inert slugs, red, brown, black, white and speckled, lying around plentifully (in waters of Lana'i)" (Anonymous 1873).

The legendary origin of the *loli* is related in a story of Hema (Anonymous 1920). The tale, in brief, is that Hema went to sea to catch a certain kind of fish. Instead, he caught a person, Kaukawehi, who dwelt at the bottom of the sea. Hema scooped out Kaukawehi's eyes for bait, as the particular fish he wanted (to satisfy the craving of his wife) would take no other kind of bait. Borne by the current, the sightless, but not lifeless, body of Kaukawehi was washed ashore at Keonepoko, Molokai, and remained caught among the *pohuehue* vines. Above this spot was a spring and a sweet potato patch. The owner of the patch, coming to fill his water bottle at the end of the day, cleared away some of the sweet potato vines, throwing them on the *pohuehue* vines where the body lay. The vines falling into the eye sockets of Kaukawehi restored his vision. (Because Kaukawehi's sight was restored, medical kahunas have used the sweet potato as a medicine for blindness and failing sight, hence the expression, "If the eyes are blinded, the potato will heal them.") He moved to and fro, assuming an earthly form of a big caterpillar, ate of the sweet potato leaves, and made himself free with those of the patch itself. Kaukawehi's body rolled over and over on the sand, and, carried high by the tide, was carried back to the sea and stranded on a rocky ledge. This was the origin of the *loli*. There is a saying, "You have caught a *loli*, the sightless creature of the sea."

Following the Hawaiian line of thought that linked sea and land creatures showing some resemblance, Kepelino (n.d.) says: "The caterpillar is the 'parent' of the *loli*. When the caterpillars move seaward they turn into *loli*. When a caterpillar changes into a *loli*, then the end of the caterpillar becomes the head of the *loli*, and, again, the *loli* is the parent of the eel. The *loli* gives birth to baby eels. The *loli-ka'e māku'e* is the parent of the *pūhi vela* (eel); the *loli-koko (mākoko)* is the parent of the *pūhi-kauila*, the *loli-ka'e 'ōpika-pika* is the parent of the *kāpā* (eel)."

The *loli* is *kapu* to some families because it is their 'aumakua, or family god, and is actually poisonous to those who transgress the *kapu* and eat it, according to our informants.

Ophiuroids—Brittle Stars

As is the case with the asteroids (star fishes), the brittle stars were of no economic importance to the Hawaiians. *Pe'a* and *pe'ape'a* (Wiggin and Reist) are the only old Hawaiian names we have found for them; *i'a hōkū* is the modern translation of star fish and is used for brittle stars as well.

SUMMARY

The native Hawaiians made full use of marine invertebrates as food. Regardless of appearance, habitat, or life style, all types were considered edible if no adverse effects were experienced upon eating them. Uses of the various forms as tools, ornaments, and medication evolved from experimentation and close observance to supplement materials available from the land.

The Hawaiians lived as an integral part of the island ecosystem, utilizing their marine resources fully but refraining from exploiting them, ensuring that there would be enough for the future.

INFORMANTS

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AUKAI, KAAUWANA. A conferred name; true name was Hong Kong Yu, a citizen of Punaluu, Oahu, well-versed in Hawaiian lore. In this paper he is referred to by his second name, Aukai, by which he was affectionately known. In December 1936, A. F. Judd recognized his ability and knowledge and asked him to name specimens of marine animals recorded in a curator's copy of Edmondson (1933).

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LITERATURE CITED

- ANDREWS, L. 1865. A dictionary of the Hawaiian language. Whitney, Honolulu. 552 pp.
- ANONYMOUS. 1873. Lana'i. Trans. M. K. Pukui. *In Ka Nuhou*. Sept. 12.
- . 1894. O Lua ke Ali'i. Trans. M. K. Pukui. *In Aloha Aina*. June 9.
- . 1899a. Na Wahi Pana O Ewa. Trans. M. K. Pukui. *In Ka Loea Kalaiaina*. July 30.
- . 1899b. Waka-ke-aka-i-ka-wai. Trans. M. K. Pukui. *In Ka Loea Kalaiaina*. July 30.
- . 1920. Tale of Hema. Trans. M. K. Pukui. *In Ka Nupepa Ku'oko'a*. Aug. 27.
- . 1923. The story of Makalei. Trans. M. K. Pukui. *In Ka Nupepa Ku'oko'a*. May 17.
- ARCHIVES OF HAWAII. n.d. Miscellaneous notes. Trans. M. K. Pukui. 59 pp.
- BECKLEY, E. M. (later: Emma Metcalf Nakuina). 1833. Hawaiian fisheries and methods of fishing. Advertiser Steam Print, Honolulu. 21 pp.
- BISHOP, S. E. 1916. Reminiscences of old Hawaii. Hawaii Gazette Co., Ltd., Honolulu.
- BROCK, V. E. 1952. A history of the introduction of certain aquatic animals to Hawaii. Rept. Bd. of Commissioners of Ag. & For., Terr. of Hawaii, 114–123.
- . 1960. The introduction of aquatic animals into Hawaiian waters. *Int. Revue ges. Hydrobiol.* 45(4):465–480.
- BRYAN, E. H., JR. 1933. Hawaiian nature notes. Honolulu Star-Bulletin.
- BRYAN, W. A. 1915. Natural history of Hawaii. Hawaiian Gazette, Honolulu. 596 pp.
- BRYAN, W. A., and E. L. BRYAN. 1902–1919. Annotated check-list of the marine mollusks of the Hawaiian Islands. Manuscript, Division of Malacology, Bernice P. Bishop Museum.
- BUCK, P. H. 1957. Arts and crafts of Hawaii. Bernice P. Bishop Museum Spec. Publ. 45.
- DIXON, G. 1789. A voyage round the world . . . 1785–1788 . . . London. App. 1.
- EDMONDSON, C. H. 1933, 1946. Reef and shore fauna. Bernice P. Bishop Museum Spec. Publ. 22. 1946 edition, 381 pp.
- . 1977. Reef and shore fauna of Hawaii. Ed. D. M. Devaney and L. G. Eldredge. Bernice P. Bishop Museum Spec. Publ. 64(1). A revision of Edmondson 1933, 1946.
- EMORY, K. P., W. J. BONK, and Y. H. SINOTO. 1968. Hawaiian archaeology: fishhooks. Bernice P. Bishop Museum Spec. Publ. 47.
- FORNANDER, A. 1916–1919. Fornander collection of Hawaiian antiquities and folklore. Vols. 1–2. Memoirs Bernice P. Bishop Museum 4–5.
- GARRETT, A. n.d. Manuscript notes, journal, descriptions, etc. Division of Malacology, Bernice P. Bishop Museum.
- GEORGE, R. W., and L. R. HOLTHUIS. 1965. A

- revision of the Indo-West Pacific spiny lobsters of the *Panulirus japonicus* group. Zool. Verh., Leiden 72, pl. 2.
- GREEN, L. C., and M. C. PUKUI. 1936. The legend of Kawelo. Published privately, Honolulu. 185 pp.
- HELFRICH, P., and R. M. BOWERS. 1962. Unpublished notes on *Limu-make-o-Hana*. Courtesy of Dr. Bowers.
- HONOLULU STAR-BULLETIN. June 13, 1969.
- IHARA, V. K. 1967. Hawaiian marine shells. Res. Materials, State of Hawaii Dept. of Ed., Bull. 12.
- JUDD, H. P. 1930. Hawaiian proverbs and riddles. Bernice P. Bishop Mus. Bull. 77.
- KAAIAKAMANU, D. M., and J. K. AKINA. 1922. Hawaiian herbs of medicinal value. Trans. A. Akana. Hawaii Territorial Board of Health, Honolulu. 74 pp.
- KAMAKAU, S. 1964. Ka po'e kahiko—the people of old. Bernice P. Bishop Museum Spec. Publ. 51. 165 pp.
- . n.d. Moolelo o Hawaii: traditional beliefs and customs. Manuscript, Bernice P. Bishop Museum, drawn from Hawaiian newspapers. Portions of this material were published in 1976, in a somewhat revised translation, as: The works of the people of old. Na Hana a ka Po'e Kahiko. Trans. M. K. Pukui; arr. and ed. D. B. Barrère. Bernice P. Bishop Museum Spec. Publ. 61. 170 pp.
- KAUHI, A. 1877. Letter to the editor. Trans. M. K. Pukui. Ka Lahui Hawaii. Aug. 23.
- KAY, E. A. Hawaiian marine mollusks. Manuscript, Bernice P. Bishop Museum, Honolulu.
- . 1949. Some edible mollusks of Kauai, Hawaiian Islands. Nautilus 62(4): 119–121.
- KEPELINO, A. n.d. Ka moolelo o na i'a Hawaii. Manuscript, Bernice P. Bishop Museum.
- MALO, D. 1951. Hawaiian antiquities. 2d ed. Ed. J. S. Emerson. Bernice P. Bishop Museum Spec. Publ. 40. xv + 278 pp.
- MOKUMAIA, J. K. 1922. Moanalua, past and present. Trans. M. K. Pukui. In Ka Nupepa Ku'oko'a. Mar. 3.
- MOORE, R. E., and P. J. SCHEUER. 1971. Palytoxin: A new marine toxin from a coelenterate. Science 172:495–498.
- OMSTED, E. K. 1937a. Waianapanapa—a legend of Maui. Paradise of the Pacific 48(3):16, 30.
- . 1937b. Waianapanapa—a legend of Maui. Paradise of the Pacific 49(4):12, 30.
- OWEN, R. 1839. Crustacea. In The botany of Captain Beechey's voyage . . . in H. M. Ship Blossom . . . 1825–1828. London.
- POOLOA, G. 1921. The medicinal 'ana. Trans. Dorothy B. Barrère. In Ka Nupepa Ku'oko'a. Aug. 19.
- PUKUI, M. K., and S. H. ELBERT. 1957. Hawaiian-English dictionary. University of Hawaii Press, Honolulu.
- . 1964. English-Hawaiian dictionary. University of Hawaii Press, Honolulu.
- RATHBUN, M. J. 1906. The *Brachyura* and *Macrura* of the Hawaiian Islands. Bull. U.S. Fish Comm. 23(3).
- ROBERTS, H. 1926. Ancient Hawaiian music. Bull. Bernice P. Bishop Museum 29.
- STEWART, C. S. 1831. A visit to the South Seas in the U.S. Ship *Vincennes*, 1829 and 1830 . . . Vols. 1–2. John P. Haven, New York.
- TABRAH, F. L. 1967. Sea may hold cancer fighter. Honolulu Star-Bulletin. Oct. 9.
- TABRAH, F. L., M. KASHIWAGI, and T. R. NORTON. 1970. Antitumor activity in mice of tentacles of two tropical sea annelids. Science 170:181–183.
- TINKER, S. 1938. Animals of Hawaii. Nippu Jiji Co., Honolulu. 188 pp.
- . 1965. Pacific Crustacea. Charles E. Tuttle, Rutland, Vermont, and Tokyo.
- TITCOMB, M. 1948. Kava in Hawaii. J. Polynesian Soc. 57(2): 105–171.
- . 1969. Dog and man in the ancient Pacific. Bernice P. Bishop Museum Spec. Publ. 59. 91 pp.
- . 1972. Native use of fish in Hawaii. University Press of Hawaii, Honolulu. 175 pp. Reprint of Mem. Polynesian Soc. 29, 1952.
- WALSH, G. E., and R. L. BOWERS. 1971. A review of Hawaiian zooanthids with descriptions of three new species. Zool. J. Linn. Soc. London 50(2):161–180.
- WARD, M. 1937. The crab in medicine, magic and myth. Australian Museum Magazine, 6:211–216.

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