

Marine Resources II

This article is a continuation on the major marine resources concentrating on Crustaceans, Echinoderms, Polychaetes [bristleworm] and Scyphozoa [jellyfish].

CRUSTACEANS

Crustacean is a group of animals with hard exoskeletons, jointed legs and segmented body that is bilaterally symmetrical. There are about 40,000 known species of crustaceans in the world of which most are marine. The group includes animals such as crabs, lobsters, shrimps, prawns, copepods and barnacles.

Some crustaceans are important sources of food and income in Samoa in the subsistence and artisanal fisheries, particularly the mangrove crabs, spiny lobsters and the freshwater prawns.



Bivalve, Anadara sp., sold at the Apia Fish Market

Crabs: Crab species more commonly known in Samoa include:

- the coconut crab, *Birgus latro* [uu];
- mangrove crab, *Scylla serrata* [paalimago];
- several coastal crab species including the land crabs, *Cardisoma carnifex* [tupa], *Cardisoma* sp. [mali'o] and the red-claw mangrove crab, *Sesarma erythroductyla* [u'a]; hermit crab, *Pagurus* sp. [uga]; ghost crab, [*Ocypode ceratophthalmus* [aviivii]; rock crab, *Grapsus* sp. [amaama]; and the Fiddler crab, *Uca* sp.
- reef crabs such as, *Carpilius maculatus* [kuku], *Leptodius* sp [vaevaeuli] and *Zosymus aeneus*.
- coastal lagoon crabs such as the swimmer crab, *Thalamita* sp. [paatala] and the burrowing crab, *Calappa* sp. [tapola].

Lobsters

The more commonly known lobster species in Samoa include:

- Spiny lobsters [ula sami]: *Panulirus penicilatus*; *P. versicolor* [rare in Samoa], *P. longipes femoristriga* [very rare in Samoa];
- Slipper lobster [papata], *Parribacus antarcticus* and *Par. caledonicus*;
- Deep-water lobster [*Palibythus magnificus*]. The only existing specimens of this species in the world are those caught from Samoa.

Two species of freshwater crayfish, *Cherax quadricarinatus* [redclaw] and *C. destructor* [yabby] were introduced into Samoa from Australia in 1994 for aquaculture purposes. The aquaculture venture involving these introduced species has ceased and it is not known whether these species have entered our local fresh-water environment.

Shrimps/prawns

Indigenous freshwater prawns recorded and utilized in Samoa include *Macrobrachium lar* [fa'ivaie/ula vai] and *Palaemon* sp. One author listed two *Palaemon* sp. found in Samoa. The giant Malaysian freshwater prawn, *Macrobrachium rosenbergii*, was introduced on several occasions into Samoa starting in 1979 for aquaculture purposes. It is not known whether this introduced species has entered and established itself in our local freshwater environment.

The more commonly known marine shrimp species recorded in Samoa include:

- coastal shrimps: mantis shrimp or banded prawn-killer, *Lysiosquilla maculata* [valo]; clam shrimp, *Pontonia* sp.; the cleaner shrimp, *Lysmata* sp.; and the banded coral shrimp, *Stenopus* sp. A small unidentified shrimp also exists near the shore especially near mangroves where there is some fresh-water influx.
- deep water shrimps: seven native species of deep-water shrimp species, belonging to two genera of carid species and one Peneaid, have been recorded in Samoa. These are the stars and stripes shrimp [*Plesionika edwardsii* (= *longirostris*), stripes gladiator shrimp [*P. ensis*], golden shrimp [*P. martia*], mino nylon shrimp [*Heterocarpus sibogae*], smooth nylon shrimp [*H. laevigatus*], Madagascar nylon shrimp [*H. dorsalis*], and *Penaeid* sp.

The marine shrimp known as the giant tiger prawn, *Penaeus monodon*, was introduced into Samoa from Tahiti in 1980 for culture trials. Since the number of harvested animals after the culture trials was less than the number introduced, it is not known whether any specimen escaped into the wild and establish.

ECHINODERMS

The echinoderms are diverse animals all of which are marine animals. The phylum name "echinoderm" is derived from the spiny skin these animals have. They are classified into 5 related classes, Holothuroidea [sea cucumbers or holothurians], Echinoidea [sea urchins, heart urchins and sanddollars], Asteroidea [sea star or starfish], Ophiuroidea [brittle stars, serpent stars and basket stars], and Crinoidea [feather stars and sea lilies]. Echinoderms are characterized by radial symmetry, several arms [5 or more] radiating from a central body. The body actually consists of five equal segments, each containing a duplicate set of various organs. They have no heart, brain nor eyes. There are about 6,000 living species of echinoderms in the world.

Several species of sea-urchins and sea cucumbers are utilized locally for food and are also sold either at market outlets or along the roadside.

Sea cucumbers

There are several sea cucumber species that are of importance and utilized in Samoa. The edible species are usually collected by women during their reef gleaning and sold in local markets or along the roadsides in bottles. Some of these species were utilized in the bech-de-mer commercial undertakings that were in operation in the early 1990's.

Sea cucumber species recorded in Samoa which are utilized include: *Holothuria* [*Halodeima*] *atra* [lollyfish - loli], *Stichopus horrens* [pricklyfish - sea], *Bohadschia argus* [leopardfish - ulutunu/fugafuga gatae], *B. marmorata* [tigerfish - fugafuga ai], *Actinopyga mauritiana* [surf redfish - mama'o], *A. echinites* [redfish - mama'o], *Holothuria* (*Microthele*) *nobilis* [black teatfish - susu valu uliuli], *H. fuscogilva* [white teatfish - susu valu pa'epa'e], *H. eiulis* [pinkfish - sea amu'u], *H. fuscopunctata* [elephant's trunkfish], *Stichopus variegatus* [curryfish - neti], *Thelenota ananus* [prickly redfish - fa'atafa, sauai], *T. ananx* [giant bech-de-mer], *Microthele axiologa* [elephant's trunkfish - sauai] and *S. chloronatus* [greenfish - maisu]. Some other sea cucumber species not utilized include, *Holothuria hilla* [amu'u] and the two species of peva, *Synapta maculata* and *Euapta godeffroyi*.

There are no reliable figures on the levels of exploitation of sea cucumber resources locally. However, several species of sea cucumbers important in the subsistence/artisanal fisheries are known to have declined. Localized disappearance of some species from certain areas in Samoa have been observed.

Sea Urchins

There are a few species of sea urchins recorded in Samoa, of which about 4 are utilized for consumption. They are harvested from October to December, which is when their gonads are in their late developing stage and good to eat. The smaller species are sold in baskets while the bigger species are sold in bundles of a few individuals.

The sea urchin species found in Samoa include: *Echinometra matthaei* [boring sea urchin - tuitui]; *Tripneustes gratilla* [short spine sea urchin - sava'e]; *Diadema* sp. [long spine sea urchin - vaga]; *Toxopneustes pileolus* [tapumiti]; *Brissus latecarinatus* [sand dollar - ofaofa]; *Heterocentrotus mammillatus* [pencil urchin - vatu'e]; *Diadema savignyi* [long spine black urchin - vaga]; *Echinothrix calamaris* [banded urchin - vaga]; *Echinothrix diadema* [black sea urchin], and *Mespilia globules* [globular sea urchin].

The first four sea urchin species listed above are important seafood locally with the boring sea urchin as the most abundant species.

Starfishes

Various starfish species have been recorded in Samoa and these include, *Acanthaster planci* [Crown of thorns - alamea], *Culcita novaeguineae* [cushion star], *Linckia laevigata* [blue starfish - 'aveau], and *Linckia multiflora* [spotted sea star - 'aveau].

The Crown of thorn starfish is a major prey on corals and severe infestations have been recorded.

Brittle stars [aveau ma'ale'ale]

These are closely related to starfish, but have wriggly arms, which are easily broken. Several species have been documented to occur in Samoa including, *Ophiolepis superba* [banded brittle star], *Ophiomyxa* sp. [serpent brittle star], *Ophiomastix* sp. [Zubi brittle star] and *Ophiarachnella gorgonia*.

Feather stars

At least two species of feather stars have been reported to occur in Samoa. One of the species is *Comanthus wahlbergii*.

POLYCHAETES

Polychaetes is a large group of marine animals known widely as bristleworms. These are segmented worms and all species in the group possess an array of bristles on their many leg-like special appendages called parapodia. The most well known Polychaete species in Samoa is the Palolo.

Palolo

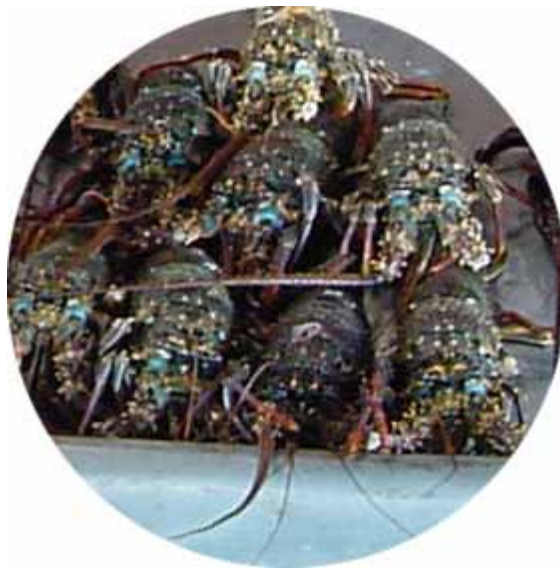
The palolo, *Eunice viridis*, is harvested in Samoa when its epitokous segment [hind reproductive segment of the worm] swarm to the sea surface during spawning in October and/or November, correlating with the third quarter of the moon. The name "palolo" originally referred to the Samoan species, *E. viridis*, but is now applied to a number of other polychaetes all of which exhibit a similar swarming behaviour. The Palolo epitokes containing eggs during spawning are blue-green in colour while those containing sperm are tan (brownish/creamy).

Other Polychaetes

Other marine Polychaetes found in Samoa include unidentified bristle worm species known locally as atualoa-sami.

SCYPHOZOA [THE TRUE JELLYFISH]

True jellyfish [cup animals] are graceful but some species are deadly. Their stings may cause skin rashes, muscle cramps or even death. Jellyfish range in size from a few millimetres to more than two meters across. They have no head, no skeleton and no special organs for respiration or excretion. The most common jellyfish species found in Samoa is the upside-down jellyfish [alualu], *Cassiopea* sp. It is often found lying on the bottom upside down, exposing its green algal symbionts to the sun. This species is consumed locally and is sometimes sold wrapped in leaves.



Spiny lobsters offered for sale at the Apia Fish Market

Childrens Corner



- 1) Lobsters, Crabs and shrimps have
 - [a] hard exoskeletons
 - [b] soft exoskeletons
 - [c] hard endoskeletons

- 2) What is the species of lobster of which the only existing specimen in the world are from Samoa
 - [a] Spiny lobster (*Panulirus penicilatus*)
 - [b] Slipper lobster (*Parribacus antarcticus*)
 - [c] Deep water lobster (*Palibythus magnificus*)

- 3) Echinoderms derived their name from one of their characteristics which is

- [a] hard endoskeletons
- [b] spiny skin
- [c] bristles

4) Which marine worm is a delicacy in Samoa?

- [a] *Eunice samoensis*
- [b] *Casseopea* sp.
- [c] *Eunice viridis*

5) _____ is a star fish that feeds on corals.

- [a] *Ophiomyxa* sp. (serpent star)
- [b] *Acanthaster planci* (crown of thorns)
- [c] *Ophiomastix* sp. (zubi)

6) Which is the edible segment of *Eunice viridis* (palolo)?

- [a] head segment
- [b] epitokous segment
- [c] mid segment

7) Which is correctly matched?

- [a] *Cassiopea* sp. = Crab
- [b] *Holothuria atra* = Lobster
- [c] *Stichopus variegatus* = Sea cucumber

8) *Cassiopea* sp. is often found _____

- [a] floating on the sea surface
- [b] lying upside down on the bottom of the sea
- [c] lying right side up on the bottom of the sea

9) How many aquatic crustacean species have been introduced into Samoa?

- [a] 34
- [b] 50
- [c] 4

10) The most common edible sea urchin in Samoa is _____

- [a] Boring sea urchin
- [b] Short spine sea urchin
- [c] Long spine sea urchin

11) There are ___ species of deep water shrimp

- [a] 11
- [b] 5
- [c] 7

12) The bech-de-mer industry utilised _____

- [a] Deep water lobsters
- [b] Sea cucumbers
- [c] Sea urchins

Word Find

Find the following words

Crustaceans
Spiny lobster
Mantis shrimp
Echinoderms
Sand dollars

Brittle stars
Prawn
Sea
Ghost crabs

J	L	E	S	H	T	B	R	V	E	M	O	S	Q	X
D	W	C	B	P	Y	G	H	B	V	X	P	R	T	S
T	F	H	A	O	I	D	B	J	L	U	A	S	R	E
C	K	I	R	M	T	N	D	X	Z	P	Y	A	K	A
R	A	N	C	Q	W	F	Y	H	L	T	L	E	A	Z
U	Q	O	T	K	O	P	H	L	U	L	F	W	X	O
S	P	D	S	G	C	B	M	N	O	U	E	Y	D	I
T	Z	E	O	T	G	K	S	D	P	B	L	N	M	U
A	Q	R	H	H	O	I	D	Z	O	Q	S	T	U	N
C	F	M	G	E	P	N	A	Y	J	O	Q	T	V	W
E	U	S	T	J	A	P	Q	W	M	P	F	S	E	A
A	I	O	Y	S	L	W	I	Y	A	C	H	V	B	R
N	F	L	W	Z	C	M	L	V	C	J	C	J	X	P
S	R	A	T	S	E	L	T	T	I	R	B	U	J	K
B	J	P	M	I	R	H	S	S	I	T	N	A	M	N