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GIANT CLAM RESOURCE INVESTIGATIONS IN SOLOMON ISLANDS

by

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SUMMARY

In the course of work carried out by staff of the ICLARM Coastal Aquaculture Centre the following six tridacnid species have been found in Solomon Islands: Tridacna gigas, T. derasa, T. squamosa, T. maxima, T. crocea, and Hippopus hippopus.

Tridacnid clams are an important food source in many coastal areas of Solomon Islands and the shells are used to some extent in the local carving and jewellery trades.

Significant numbers of tridacnids are harvested, particularly by Taiwanese poachers, and this may represent a serious threat to stocks of the larger tridacnids.

## 1. Introduction

Solomon Islands comprises some 800 islands with a land area of about 28,000 square kilometres (km), extending over 1,400 km in the western equatorial Pacific Ocean. The islands are located in two archipelagoes (Main Group Archipelago or MGA and Temotu) between latitudes 5° and 13°S and longitudes 155° and 168°E (see Fig. 1).

Giant clams of the family Tridacnidae (Cardiacea: Bivalvia) are reef-dwellers of the tropical Indo-Pacific and may attain sizes in excess of 1 metre in shell length (SL). One important characteristic of the tridacnids is their ability to "farm" large numbers of unicellular symbiotic algae named zooxanthellae which contribute substantially to the nutrition of the clams (Munro and Heslinga, 1983). This symbiosis restricts the clams to the shallower waters of coral reefs where the light intensity is highest, which combined with their sedentary behaviour makes them highly susceptible to over-harvesting.

Solomon Islands is one of the few countries in the region with relatively good stocks of all species of tridacnid clams (with the probable exception of Hippopus porcellanus). There is also a great diversity of coastal marine habitats, ranging from deep fiords to atolls and from coastal shelves to immense lagoon systems.

Largely due to the above two facts the International Center for Living Aquatic Resources Management (ICLARM) is establishing a Giant Clam Hatchery as the first facility at the Coastal Aquaculture Centre (CAC) on Guadalcanal Island, in collaboration with the Fisheries Division of the Solomon Islands Government (FD-SIG) and the Guadalcanal Provincial Government.

As part of the same project investigations have been made into Solomon Islands' tridacnid resources and this paper is based on field trips undertaken by CAC staff to some areas (New Georgia, east and west Guadalcanal, north and south Malaita, Ysabel, and Savo). Reliable reports made by FD-SIG staff and local fishermen are also included. On none of the field trips were quantitative surveys carried out, but presence or absence of different species was ascertained as was their relative abundance.

## 2. Tridacnid species present and their distribution

The following six of the seven extant tridacnid species have been observed in Solomon Islands: Tridacna gigas, T. derasa, T. squamosa, T. maxima, T. crocea and Hippopus hippopus. Hippopus porcellanus has not been sighted or reported.

### 2.1 Tridacna gigas

T. gigas is the largest species of giant clam (up to 137 cm SL) and occurs unattached, relying on its weight alone to stay anchored to the reef (Rosewater, 1965). It is the current focus of the mariculture programme at the CAC.

Distribution: T. gigas seems to be found throughout the MGA but is generally rare in areas of high population density and fishing pressure such as the north coast of Guadalcanal and north-west Malaita. T. gigas has been observed in S. Malaita, E. Guadalcanal, Ysabel, and eastern New Georgia. The species is reliably reported from Choiseul, Gela, Wagina, Shortlands, Sikaiana, western New Georgia, and the Russell Islands. It is also reputed to be present in Rennell, Ontong Java, and Temotu.

Habitat: This species is found on coral rubble and embedded in living coral, on all types of reefs, between the intertidal zone and depths of 15 metres. In the Marau Sound and the Marovo Lagoon, T. gigas appears to be more abundant on the outer reefs than in the lagoon interior, the reasons for this are unclear.

## 2.2 Tridacna derasa

The second largest species (up to 51 cm SL), it is also unattached in its adult form.

Distribution: T. derasa appears to have the most restricted distribution of all tridacnid species within Solomon Islands. To date this species has only been observed in the Marau Sound and the northern Marovo Lagoon although it is reputedly present in other areas.

Habitat: Not enough specimens have been observed to generalize about its habitat but both the localities where this species is known to occur are on outer reefs bathed in oceanic waters, and due to the local geography, do not receive any major freshwater inputs.

## 2.3 Tridacna squamosa, T. maxima, and T. crocea

The three smaller species, all occur attached to varying degrees. The smallest species, T. crocea, is found deeply embedded in coral heads, while T. maxima, the next smallest, occurs only partly embedded and T. squamosa does not burrow at all.

Distribution: T. squamosa, T. maxima, and T. crocea are widely distributed and appear in largely the same areas. T. crocea is probably the most abundant of the three followed by T. maxima.

Habitat: These three species have been observed on reef flats, patch reefs and coral drop-offs both inside and outside lagoons although T. crocea appears more abundant on shallow reef flats whereas T. squamosa has been observed more frequently on shelving fringing reefs.

## 2.4 Hippopus hippopus

One of the larger species (up to 40 cm SL), occurs unattached.

Distribution: After T. derasa, H. hippopus is the least commonly observed species but this may be due to its more cryptic nature. This species has been seen in east Guadalcanal, Ysabel, the Marovo Lagoon, and Savo and has been reported from other parts of Western

Province, Choiseul, and Sikaiana.

Habitat: This species is found mainly on shallow reef flats with slightly muddy, sandy, or sea grass substrates. On occasions high densities have been observed.

### 3. Domestic utilization

Tridacnids are a well known marine resource amongst the inhabitants of coastal communities in Solomon Islands. All eleven of the languages spoken by coastal communities studied so far have different names for most of the tridacnid species that occur locally although T. gigas and T. derasa frequently go by the same name as do T. maxima and T. squamosa occasionally.

#### 3.1 Tridacnids as a source of food

All species of Giant Clam are widely eaten throughout Solomon Islands and in a number of coastal communities are highly esteemed and form a significant part of the local diet.

Communities which belong predominantly to the Seventh Day Adventist Church are a notable exception and clams are not supposed to be eaten, for religious reasons, in these areas; mainly Western Province, Rennell, Bellona and some areas of Malaita.

Coastal villagers have often been observed to collect live specimens of the larger tridacnids from offshore reefs and keep them on nearby reef areas as "clam gardens". Usually these clams are kept until required for eating but this is a common practice even in the areas where clams are not eaten.

Tridacnid clams are sometimes brought, from areas where they are more abundant, into the capital, Honiara, where their flesh is sold at local markets for about the same price as fish (1-2 US\$/kg).

#### 3.2 The use of tridacnid shell

Portions of tridacnid shells are used to some extent for inlays in locally produced carvings, for example in Western Province and eastern Makira.

Tridacnid shell is also used in the manufacture of some items of local jewellery such as medallions in Malaita.

Large tridacnid shells are sometimes used for ornamental purposes and as pig troughs.

#### 3.3 Local conservation of tridacnids

In the Marovo Lagoon and at the eastern end of Guadalcanal a good local awareness exists of the decline in clam stocks due to over-fishing. The establishment of "clam gardens" by some of the inhabitants of the Marovo area, where clams are not eaten, seems to be for broadly conservationist reasons.

#### 4. Commercial harvesting

Tridacnids, particularly the larger species, have been harvested on a commercial scale on at least five occasions in recent years, both legally and illegally.

##### 4.1 Authorised harvesting of giant clams

The Taiwanese fishing vessel, Kao Tung #1, received a licence to carry out a trial clam fishing operation in the Marovo Lagoon, in 1983. A total of 1318 clams were harvested in 41 days (Enekevu, 1983) most of which were L. gigas, this amounted to 1227 kg of adductor muscle. A visit to the same area by the author in 1987 suggested that the clam stocks are still seriously depleted (Govan, 1988).

Giant clam shells were harvested in the Marau Sound, at the eastern end of Guadalcanal, about 10-15 years ago. Approximately 25 tonnes of large tridacnid shells were taken locally and reputedly shipped to Japan for the ornamental shell trade.

##### 4.2 Poaching of giant clams in Solomon Islands

There is evidence to suggest that poaching of the larger tridacnid species is not uncommon, particularly on the more isolated outlying reefs e.g. Roncador and Indispensable reefs. The following recent cases have been reported:

In 1982 a Taiwanese clam boat, the Handa Bau, was arrested and convicted for illegal fishing after having already been arrested by Papua New Guinea and being reported in outlying islands for over 3 months (Evans, 1983).

In February 1983 another Taiwanese clam boat, The Man Hsiang Huei, was arrested, and subsequently fined, for taking 120 kg of giant clam adductor muscle along the northern coast of Ysabel whilst ostensibly operating under a licence to survey for scallops (Evans, 1983).

In April 1987 a Taiwanese fishing boat, the Her Cheng Fong #3, was apprehended by the Solomon Islands patrol boat "Savo" on Roncador Reef. The Taiwanese captain later pleaded guilty to a charge of fishing without a permit. Over one tonne of fresh and frozen clam adductor muscle was found on board the fishing vessel which was estimated to have come from about 10,000 giant clams of which at least some, and possibly most, were taken in Solomon Islands (G. F. Usher, personal communication, 1987).

#### 5. Conclusions

Six species of tridacnid occur in Solomon Islands all of which are utilized, although stocks of the larger species are depleted. The latter is due in part to local fishing pressure but mainly to the activities of Taiwanese poachers.

Regulation of the domestic utilization is very difficult, if not

impossible and it is difficult to adequately police all the areas in Solomon Islands susceptible to Taiwanese poaching due to the distances involved.

The production of farmed clams should significantly ease pressure on wild stocks.

#### 6. References

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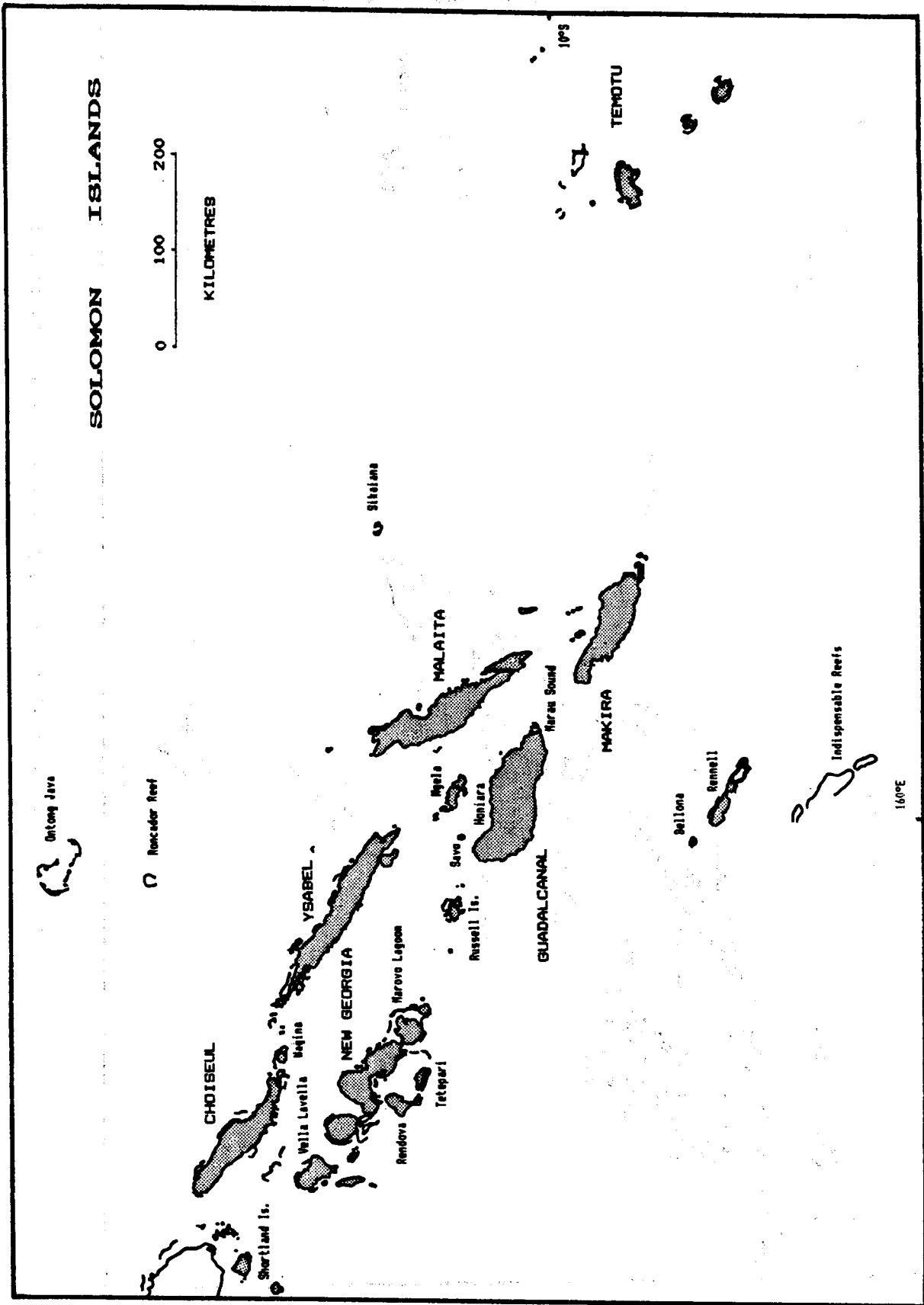


Figure 1. Map of Solomon Islands showing localities mentioned in the text.

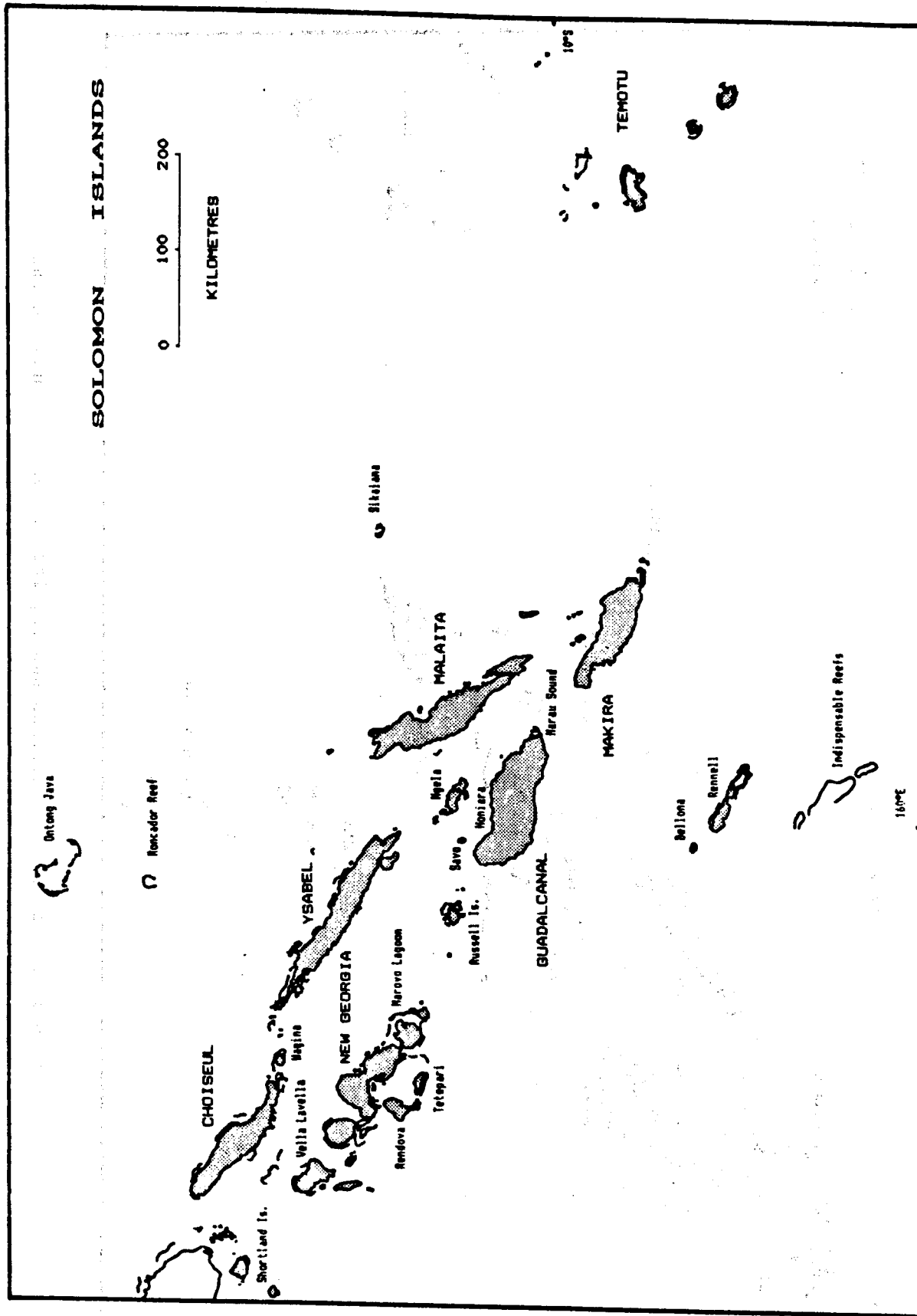


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