REPORT ON THE INSTALLATION OF THREE NEW COMMUNITY GIANT CLAM SANCTUARIES IN THE VAVA'U ISLAND GROUP KINGDOM OF TONGA

BY
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In September of 1990, the Fisheries Department of the Ministry of Agriculture, Fisheries and Forestry of the Kingdom of Tonga, set up three community giant clam sanctuaries in the Vava'u Island Group of the Kingdom of Tonga. Financial assistance was provided by the South Pacific Aquaculture Development Project of the Food and Agricultural Organization (FAO) of the United Nations. Assistance was also provided by the Marine Research Foundation and Earthwatch volunteers.

Community Giant Clam Sanctuaries were developed in the Kingdom of Tonga as a way of restoring Tridacnid stocks on reefs which had been severely overfished. Surviving, scattered adults were taken by local fishermen from remote coral reefs and placed into sanctuaries to improve breeding success. The sanctuaries were located in shallow water in close proximity to a participating village. The first Giant Clam Sanctuary was built in Tongatapu in 1986 as a joint project of the Ministry of Lands, Survey and Natural Resources and the Fisheries Department. A second, Community Giant Clam Sanctuary was constructed at the village of Falevai, on Kapa Island in the Vava'u Island Group in January of 1988.

1987 and 1988 surveys by the Marine Research Foundation and Earthwatch located few juvenile specimens of *Tridacna squamosa* and no juvenile specimens of *Tridacna derasa* in the inner islands of Vava'u. 1989 and 1990 surveys found 119 juvenile *Tridacna*

derasa, and a significant increase in juvenile *Tridacna squamosa* in the areas near the Falevai Community Vasuva Sanctuary. Water current studies and the size of the juveniles indicated these juveniles probably came from the community circles. The Falevai villagers reported finding "basketfuls" of juvenile clams in 1989 and 1990 and were enthusiastic supporters of the program.

In June of 1990, based on the success of Falevai, ten other island villages requested assistance from the Fisheries Department in the installation of giant clam sanctuaries near their villages. Three of the village areas, Matamaka (which included Lape and Nua Papu Villages), Ovaka, and Taunga were selected for assistance in 1990. Local fishermen gathered the specimens and they were arranged into circles or letters at sites selected by the Town Officers near the three villages in September of 1990.

The Matamaka Community Vasuva Sanctuary has six circles made of *Tridacna squamosa* and five circles made of *Tridacna derasa*. Each circle has ten clams. The clams are numbered from north to south, with number 1 nearest the village. They circle a patch reef about 150 meters south of the village. In each circle, number 1 is in the center and number 2 is the clam furthest from the reef top (the deepest clam). The clams are then counted clockwise from number 2.

In the table, S indicates *Tridacna squamosa* and D, *Tridacna derasa*.

CIRCLES

	1	2	3	4	5	6
S1	210	317	268	301	393	343
S2	232	349	237	340	289	314
S3	234	319	284	282	357	284
S4	234	266	285	283	328	309
S5	213	222	250	280	315	331
S6	191	303	279	294	354	298
S7	256	301	251	300	319	324
S8	270	283	342	374	346	272
S9	249	273	292	330	316	336
S10	236	277	301	328	261	303
	1	2	3	4	5	
D1	450	486	475	506	363	
D2	362	433	330	368	420	
D3	303	410	343	425	421	
D4	367	471	454	445	395	
D5	220	413	335	276	424	
D6	284	412	430	461	425	
D7	393	440	475	269	420	
D8	383	504	413	462	446	
D9	327	442	442	385	382	
D10	300	478	466	260	349	

Table 1. *Tridacna squamosa* (S) and *Tridacna derasa* (D) in the Matamaka Community Vasuva Sanctuary. 9 October 1990. Measurements are total shell length in millimeters.

The clams in the Taunga Community Vasuva Sanctuary were arranged in letters which spell out the words ONGO MATUA, meaning `All of the parents.' The measurements of the clams are given in Table 2. The word `ONGO' was made from 48 *Tridacna squamosa*, and `MATUA' was made from 50 *Tridacna derasa*. Clam number 1 is the specimen at the lower left side of the letter and the others are counted clockwise. In the letters A clams 10 and 11 are the cross-bar. In the T clams 5,6,and 7 are the cross-bar. The clams are in about 2 meters depth on the northwest edge of the barrier reef around Taunga. The bottom is coral and coral rubble. The Sanctuary is directly in front of the village and the village people have taken an active interest in keeping boats clear of the area.

In the Ovaka Community Vasuva Sanctuary, the clams were arranged into circles of 10. There were 5 circles of *Tridacna squamosa* and 4 circles of *Tridacna derasa*. A fifth circle contains 6 *Tridacna squamosa* and 2 *Tridacna derasa*. The measurements of the clams are given in Table 3. The circles are numbered from east to west. The number one clam is the one in the center of the circles. Number two is the clam towards the small island off Ovaka as viewed from the center of the circle. The remaining clams are counted clockwise. The circles are in about 2.5 meters of water on sand and rubble. The area is well protected from adverse weather but is on the side of Ovaka away from the village and thus difficult to protect. It is, however, where the villagers wanted to put it and they believe they can prevent poaching.

Four *Tridacna derasa* were added to the community sanctuary at Falevai where there are now seven circles of ten *Tridacna derasa* and 70 *Tridacna squamosa* which are not arranged into circles.

The divers collected five live and one dead specimens of an undescribed tridacnid.

The five live specimens were placed in a group at Falevai in 10 meters depth. The shell of the new species is thinner and the convolutions along dorsal the edge of the shell shallower than *Tridacna derasa*. The major difference, however, is in the configuration of the mantle and its attachment to the shell. In the new species, the mantle is humped up in the center forming a mound with the excurrent siphon pointed towards the anterior of the shell. In *Tridacna derasa* the mantle is flat or concave and the excurrent siphon is a cone pointed dorsally. The pallial line - the point of attachment of the mantle to the shell - covers a more restricted part of the shell in the new species than in *Tridacna derasa*. In the new species, the anterior-posterior length of the pallial line scar is 44% of the shell length while in *Tridacna derasa* it is 63%. The adductor muscle scar is larger in the new species. It's greatest anterior-posterior diameter is 38.4% of the anterior-posterior pallial line scar in the new species and in *Tridacna derasa* the same proportion is 21.7%. These measurements were taken from a 430-mm n.sp. and a 404-mm *Tridacna derasa*.

LETTERS

	O	N	G	O	
S1	272	327	277	366	
S2	377	290	305	284	
S3	337	277	365	300	
S4	376	312	303	310	
S5	323	327	310	314	
S6	286	294	170	295	
S7	282	283	342	306	
S8	143	284	309	301	
S9	252	311	296	306	
S10	138	285	304	376	
S11	154	275	322	342	
S12	287	301			
S13		303			
S14		269			
	M	A	T	U	A
D1	441	426	485	427	457
D2	406	395	408	452	443
D3	435	382	376	407	485
D4	382	427	448	370	295
D5	386	440	437	387	419
D6	407	425	387	438	422
D7	325	296	371	392	496
D8	347	431		456	446
D9	381	293		506	446

D10	415	450		458	360
D11	346	492			461

Table 2. *Tridacna squamosa* (S) and *Tridacna derasa* (D) arranged in letters at the Taunga Giant Clam Sanctuary. Shell lengths are in millimeters.

CIRCLES

	1	2	3	4	5
S1	317	349	305	323	324
S2	359	290	327	313	248
S3	304	318	286	279	299
S4	294	309	360	300	314
S5	268	321	338	360	286
S6	292	335	308	290	295
S7	252	303	351	315	295
S8	300	343	324	308	344
S9	285	318	313	280	299
S10	366	313	391	283	303
	1	2	3	4	5
D1	451	464	412	503	S276
D2	328	452	320	280	D435
D3	356	346	343	400	D467
D4	352	413	407	405	S225
D5	299	360	372	407	S353
D6	319	327	271	387	S282
D7	420	344	321	321	S248
D8	294	385	336	415	S316
D9	412	242	272	434	

D10	364	400	401	384	

Table 3. *Tridacna squamosa* (S) and *Tridacna derasa* (D) in the Ovaka giant clam sanctuary. Clams arranged in ten circles. Measurements are shell length in millimeters.

The existing four giant clam sanctuaries are located in the central portion of the Vava'u Island Group. Five other villages have asked for assistance with the installation of sanctuaries. Of these, Oloua and Ofu are on the up-current side of the island group and would supply larvae for the eastern embayments. Hunga has an almost enclosed lagoon and would be an excellent area to construct a sanctuary, especially for *Tridacna squamosa*.

RECOMMENDATIONS

1. Install another three giant clam sanctuaries beginning in January or February of 1991 at Oloua, Ofu, and Hunga. Install a giant clam sanctuary at Pangaimotu island in Ha'apai in 1991.

2. List the community giant clam sanctuaries under the Birds and Fish Preservation Act Schedule 2.

3. Continue to support the presentation of a `Best Vasuva Sanctuary' award during the Agricultural Show.

4. Fisheries should inspect the giant clam sanctuaries at least once a month and report any missing clams to the Town Officer immediately. Fisheries should maintain floats with warning signs painted on them to alert the public to stay clear of the giant clam sanctuaries.