

FISHERIES PROFILE OF BAIS BAY, NEGROS ORIENTAL

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INTRODUCTION

Bais Bay is a major source of fish and shellfish for Bais and nearby towns. It has been supporting about 1,463 fishing families in the coastal barangays of Bais and about 151 fishermen in the coastal barangays of Manjuyod and Tanjay, all surrounding Bais bay. The issue on overfishing in the bay and the lack of fish catch data was raised by the Bais community during a consultative workshop with community members and the Silliman University-Environment and Resource Management Project (SU-ERMP). Thus, a study to address this problem was organized. Its primary objective was to provide information for the development of a management scheme for sustainable fisheries in the Bay. The specific objectives were:

1. to collect additional secondary information about the Bay including
 - a) coastal population statistics, i.e. the number of fishermen in the area and
 - b) the number of registered commercial fishing operators as well as the average annual catch of their commercial fishing boats;
2. to identify the different fishing activities in the bay and to describe the quantity and the gear types actively in use;
3. to determine the composition and the relative abundance of the various fish species harvested;
4. to determine the average size and the length frequency distribution of economically important species;
5. to identify the areas associated with specific fishery resources;
6. to know the extent of distribution ("export") of fish captured from the Bay;
7. to assess how the exploiting population perceive the resources;
8. to identify the problems related to management and conservation of the bay's resources; and
9. to train field workers in collecting relevant data.

In this report, the results of ten months' primary catch data monitored from January to October 1992 are presented.

METHODOLOGY

The fishery team visited the coastal barangays surrounding the bay to collect data on its fishery profile, fish species caught, possible index of fishing pressure and the fishermen's perception of the fishery resources. Barangay captains were interviewed to collect more data on fishery profile. Existing secondary data from the Department of Agriculture Office of Bais, Manjuyod and Tanjay were gathered. Fish landing sites were identified and ten of these were chosen as study sites (Figure 1). The group also went to the Bais City Public Market to take individual photographs of each abundant species to form an identification manual for use in the monitoring of fish catch.

Coordination was made with some fishermen and the president of the Fishermen's Association. From December 27 to 29, 1991, ten residents were trained as enumerators for the daily fish catch monitoring.

Daily fish catch monitoring was conducted for ten months from January 1, 1992 to October 31, 1992. This was done by ten trained enumerators coordinated by a hired resident (the president of the Fishermen's Association in Pulong Daco) and supervised by the study leader and research assistant. The enumerators were assigned landing sites which they visited daily. They weighed the landed catch by species, identified the species and took the length and weight of each of at least 30 samples for each abundant species. The study leader and research assistant visited the field workers at least once a month to supervise the proper collection of data especially the identification of species. The coordinator helped convene the enumerators for emergency meetings called by the study leader, distributed catch data forms to the enumerators, collected and deposited data in the SU Marine Laboratory. The collected data were encoded using the software Lotus 123. Fish specimens were identified, using Schroeder (1980), Masuda *et al* (1984) and Randall *et al.* (1990); cephalopods, using Voss (1963); crustaceans, using Grey *et al.* (1983); and sea shells, using Eisenberg (1981).

The fishermen's perceptions of the Bais Bay fisheries were gathered by the SU-ERMP fishery team from interviews of some fishermen in the landing sites as well as from comments by fishermen living around the Bay regarding the Coastal Resources Management proposed under the Coastal Living Resources Project.

RESULTS

Table 1 shows 16 barangays -- 10 in Bais, five in Manjuyod and one in Tanjay -- surrounding Bais Bay. Within these barangays, there are 13 fish landing sites. Among

the 13, only Canibol pier in Okiot is the major landing site which receives the great number of fishermen from Olympia. Fishermen from Pulong Daco (Okiot, Capiñahan and Looc) bring their catch directly to their homes.

The ten fish landing sites chosen for the study were Opao and Dawis in Canlargo; Capiñahan; Sanlagan, Lag-it and Canibol in Barangay Okiot; Tavera Dike in Barangay II; Batugan in Bifiñon; Dunggu-an and Campuyo in Manjuyod.

There is no report on commercial fishing in Bais Bay.

Fishing Gears

In a survey done by the fishery team, 19 gear types (Table 2 and Figure 2) and four fishing techniques were observed in the bay area. The fishing techniques are *gango* (miracle hole), *pamusaw/panamal* or *sikop* (fishing with bare hands), *panulo* (fishing with the use of torches) and *panginhas* (gleaning). Of the fishing gears, the most widely used is *pukot* or gill net (408 units) followed by *bunsod* or fish corral (205 units), *panggal* or crab pots (2,439 smaller units) *pasol* or hook & line (192 units), *pana* or spear (71 units) and *sahid* or beach seine (49 units). *Hulbot* or modified Danish seine (45 units), are used in Capiñahan, Looc, Okiot and Dungguan. Other less commonly used gears are *bubo* (fish trap), which are used only in Lo-oc and Okiot; *katay* (multiple hook and line) in Capiñahan, Lo-oc and Okiot; *sudsud* (push net) in Tangculogan and Luca; *handok* (muro-ami), only in Campuyo; *target* or *sabay* and *sabinet* (fish nets) in Capiñahan, Okiot, Campuyo and Maaslum; *pangkulabutan* (squid trap) only in Olympia; *pangnokos* (squid jigger) in Capiñahan, Okiot and Olympia; *sikpaw* and *sibot* (dip nets) in Okiot; *pamasayan* (screen net) only in Maaslum; and *tapsay* (mullet net) in Capiñahan, Okiot and San Jose.

Fish Catch Distribution

Fish and shellfish harvested from the bay are brought by the fishermen's wives to fish markets in Tanjay, Bais and Manjuyod, and sold to vendors. Bais market receives most of the harvested fish and shellfish since this area is more accessible to most fishermen. Some fish and shellfish, however, reach the Dumaguete fish market but empty seashells are sold in sacks to the shellcraft industry in Cebu.

Species Composition of Catch

Primary catch data collected from January to October 1992 showed that 159 fish species belonging to 52 families, 13 crustacean species belonging to four families, 39 mollusks species (6 cephalopods, 1 sea hare and 32 seashells) and an undetermined species of sea cucumbers (Table 3 and Figures 3-4) are harvested from Bais Bay using

17 types of gear and 4 fishing techniques. Table 4 lists the species caught by each type of gear and fishing technique.

Among the fishing gears used, *pukot* or gill net harvested the most number of species (140), followed by *bunsod* or fish corral (123), *sahid* or beach seine (92), *hulbot* or modified Danish seine (75), *pana* or spear (74), *katay* or multiple hook and line (56), *handok* or muro-ami (43), *bubo* or fish trap (28), *pasol* or hook & line (25), *target/sabay* or fish nets (24), *tapsay* or mullet net (18), *panggal* or crab pot (11), *sabinet* or fish net (10), *sikpaw* and *sibot* (dip nets), 7 and 4 species, respectively.

Of the fishing techniques, *sikop* (fishing with barehands) caught 26 species, *panginhas* (gleaning) 40, *gango* (miracle hole) 20, and *sulo* (torch) 13. Major species caught from the Bay vary with gear type and fishing techniques. Fish comprise from 1-100% of catch of the 15 types of fishing gear, namely: *bubo* (100%), *bunsod* (76%), *handok* (98%), *hulahop* or *hulbot* (92%), *katay* (100%), *pana* (88%), *panggal* (1%), *pukot* (94%), *pasol* (94%), *sabinet* (99%), *sahid* (73%), *sibot* (85%), *sikpaw* (91%), *tapsay* (99%), and *target* (99%); and 23-99% of the harvest of three fishing techniques: *gango* (99%), *sulo* (23%) and *sikop* (43%) (Table 5).

Cephalopods (squids, cuttlefishes and octopus) make up 100% of catch of *pangnokos* and *pangkulabutan* (Table 5) and only 19% of *sahid*, 12% of *sikpaw*, 8% of *hulahop* or *hulbot*, 7% of *pana*, 6% of *pasol*, 2% of *handok* and 24% of *sulo* (Figure 6). Portunid crabs compose 99% of *panggal* harvest, 5% of *pana*, 4% of *pukot*, 14% of *sulo* and 9% of *bunsod*; penaeid shrimps, 9% of *bunsod* and 28% of *sulo*; sergestid shrimps 19% of *sibot* (Figure 6). Lukot (egg masses of seahares of the Family Aplysiidae) comprises 68% of *sikop* harvest and 36% of *panginhas* or gleaning (Figure 6).

The siganids (Family Siganidae) appear to be most exploited among the fish groups comprising 56 % of *pana* harvest, 55% of *gango*, 37% of *bunsod*, 26% of *sikop*, 14% of *tapsay*, 10% of *sulo* and 2% of *handok* (Figure 6).

Table 6 lists 26 species of gastropods and bivalves harvested from the bay with *litub* composing 33% of the total sample harvest. This appears to be an underestimate because other shell areas (Cambuilao, Talungon and San Isidro), where most shells were reported, were not monitored. Table 6 also shows that gastropods and bivalves (or pelecypods) which are primarily harvested by gleanings are also collected by other fishing gears and techniques such as *hulbot*, *sahid*, *sulo* and *sikop*.

Composition and volume of seashells harvested from culture in Dawis, Canlargo from January to October 1992 is shown in Table 7.

Catch Per Unit Effort (CPUE)

Catch per unit effort was estimated for each of the seventeen fishing gears and four fishing techniques used in the area. Table 10 summarizes the results. *Hulbot* ranks first with an average of 8.28 kg/trip; followed by *handok* 7.57 kg/trip; *sahid* 5.73 kg/trip; *sabinet* 5.20 kg/trip; *tapsay* 4.27 kg/trip; *target/sabay* 4.19 kg/trip; *bunsod* 3.62 kg/trip; *pukot* 3.60 kg/trip; *pana* 3.21 kg/trip; *katay* 2.68 kg/trip; *sibot* 2.23 kg/trip; *pasol* 1.98 kg/trip; *pangkulabutan* 1.87 kg/trip; *bubo* 1.85 kg/trip; *sikpaw* 1.60 kg/trip; *pangnokos* 0.86 kg/trip; and *panggal* 0.05 kg/trip. CPUE for *panginhas* is 4.93 kg/trip; *gango* 4.54 kg/trip; *sikop* 3.28 kg/trip; and *sulo* 2.43 kg/trip.

An estimated total catch by gear is given in Table 9 and monthly income per trip per gear is shown in Table 11. Income from seashell harvest of shell cultures in Dawis is given in Table 8. The important marine fisheries are shown in Figure 7A and their respective peso values in Figure 7B.

Length Frequency Distribution

In general, six of the abundant species harvested from the bay show that at least 10% to as high as 35% were in the 8-18 cm TL size range for *Siganus canaliculatus*; 8-14.5 cm for *Gazza minuta*; 9-16.5 cm for *Upeneus sulphureus*; 8-14.5 cm for *Gerres* sp. (*oyena*); 7-13.5 cm for *Leiognathus splendens*; 11-18.5 cm for *Nemipterus* sp. (*hexodon*); and a 4-7.5 cm carapace length (CL) size range for *Portunus pelagicus* (Figures 8A-G). It can be noted that generally, the sizes of the fish harvested from the bay are not only small as compared with those commonly caught throughout Philippine waters, but they are also much smaller than their maximum sizes (Table 13). Only *Siganus canaliculatus* had sizes ranging beyond 20 cm (Figure 8A). Except for *Siganus canaliculatus* most fish samples were harvested by hulahop or hulbot in the Dungguan fishing areas.

In the size frequency distribution of these species collected for 10 months from January to October 1992, only two species showed a shift in their modes, with a slight increase in their general sizes; e.g., *Upeneus sulphureus* (Figure 8B). This shift suggests a possible growth of as slow as 1 cm monthly from February to March and March to April for *Upeneus sulphureus* (Figure 8B) and from January to February, February to March, and March to April for *Siganus canaliculatus* (Figure 8A). This inference was based on the assumption that the samples belonged to one cohort. The other species--*Gazza minuta* (Figure 8C), *Gerres* sp. (Figure 8D), *Leiognathus splendens* (Figure 8E), *Nemipterus* sp (Figure 8F), *Portunus pelagicus* (Figure 8G) -- did not show a shift in their modes. This can be interpreted to mean that these species may not get bigger in the fisheries; that is, they were fished out as soon as they reached their particular size ranges.

Reproductive/Gonad Stages

Ten out of eleven species sampled from January to July were found to have gonads at stages V to VI (ripe to running ripe) (Figures 9A-L). These were *Siganus canaliculatus* (danggit) where 52% of the population were actually spawning in February, 33% in March and 53% in June; *Terapon jarbua* (buga-ong) with 55% in February, 37% in April and 4% in May; *Liza* sp. (gisaw) with 2% in January, 7% in March, 7% in April and 13% in June; *Leiognathus splendens* (danglay) with 40% in February; *Gerres abbreviatus* (bag-angan) with 13% in March; *Gerres* sp. (kasbo) with 12% in March, 3% in April; *Gazza minuta* (piampe) with 3% in January, 55% in March, 7% in May and 79% in June; *Gerres filamentosus* (lawihan) with 5% in July; *Sardinella* sp. (malangsi) with 50% in January; *Stolephorus* sp. (bolinao) with 20% in January.

Taking the length distribution and the gonadal stages together it can be inferred that these species at Bais Bay fisheries tend to mature at relatively small sizes. Table 13 shows that *Siganus canaliculatus* were mature at 10.6-19.8 cm (TL), *Terapon jarbua* at 15.5-24.8 cm, *Liza* sp. at 15.7-22.8 cm, *Leiognathus splendens* at 10.0-13.2 cm, *Gerres abbreviatus* at 17.0-19.5 cm, *Gerres* sp. at 14.5-16.5 cm, *Gazza minuta* at 11.0-16.5 cm, *Gerres filamentosus* at 14.9-15.4 cm, as evidenced by the presence of gonads at stages V to VI. Dolar, *et al* (Unpub Report) reported that fishes which attain sexual maturity at an earlier time (and are therefore smaller in size) have been observed in many fisheries that are experiencing heavy fishing pressures, which can be explained as the fishes' way of adapting to tremendous pressure.

Alcala and Alcazar (1979) reported that sexual maturity of *Siganus canaliculatus* in the coastal areas of Dumaguete was attained at standard lengths of 100-105 mm (males) (TL= 13.5-14.2 cm) and 111-115 mm (females) (TL=15.2-15.5 cm).

Fishermen's Perceptions

The fishermen's perceptions can be summarized as follows:

1. The fisheries habitats are degraded. The major causes are:
 - a) the direct discharge of wastes from the sugar mills polluting the water which kill fish and other species;
 - b) destruction of mangroves by cutting for wood and disturbing the roots by *embao* gleaners, thereby decreasing the nursery area for juvenile species;
 - c) coral gathering and sand mining in the bay area which decrease the habitat of fishes and disturb their spawning ground;

d) shallowing of the bay by the volume of sediment deposits from river discharges that reduce fishing areas;

e) use of dynamite and poison in catching fish by gleaners from upland barangays. Dynamiting destroys corals and poison kills the coral organisms.

2. Decreasing catch is the result of the degraded fisheries, too many fishermen, and the use of destructive fishing methods such as beach seine, fine meshed gill nets, and *hulbot*, which catch more juvenile fish and invertebrates.

DISCUSSION

Fishing Pressure

Data on fisheries profile in Bais Bay (Table 1) show that fishing effort, as measured by the number of fishermen and number of boats, appears to be higher in Dewey I. (Brgy. Okiot, Capiñahan and Looc) than in Olympia I. However, in Table 1, the number of fishermen in Bais City was given as the number of fishing families, as this was the only data available from the Department of Agriculture, Bais City. Cadelina (1983) reported that in Olympia I., 95% of the fishermen were fulltime, suggesting a high use-intensity of the Bay by these fishermen throughout the whole fishing cycle. Personal observations gave an estimate of an average of two fishermen in a fishing family, giving a total of 2,926 fishermen in Bais City. Taking together the 151 fishermen in the coastal barangays of Tanjay and Manjuyod (Table 1) and the 2,926 fishermen in Bais City would bring a total of 3,077 fishermen exploiting the Bay. The average density, i.e., the number of fishermen per sq km of the Bay area would be 57. With an estimated annual harvest of 951,549.4 kg, the annual extraction rate is estimated at 17,621.3 kg/km² or about 17.6 MT/km². This is higher compared to that reported in Lingayen Gulf (Calud *et al.*, 1989) which is 10.1 MT/km² which suggests that Bais Bay is still relatively more productive than Lingayen Gulf.

Fishing Gears

Among the 19 types of fishing gears used in Bais Bay, *hulbot* (Table 10) is the most efficient, catching 8.28 kg/trip, followed by *handok*, which catches 7.57 kg/trip and *sahid* (5.73 kg/trip). *Hulbot* and *sahid* are more efficient compared to gill net (3.6) as they use finer nets (mesh size = 1 cm) compared to gill net (>3 cm). *Handok* is small-scale muro-ami type of fishing method which pulverizes corals to catch the fish.

Catch Per Unit Effort (CPUE)

Catch per unit effort values in Bais Bay are relatively lower compared with those obtained from other areas. Catch per unit effort data from Bindoy, Bayawan, Bohol,

Ronda, and Siquijor using *pukot*, *pana*, *katay* and *pasol* were higher than those of Bais Bay (Table 12, Luchavez unpublished data). The lower catch per unit effort values in Bais Bay is indicative of overfishing in the area.

Fish Size and Reproduction

It is obvious that for some species of fish caught in Bais Bay, e.g., *Siganus canaliculatus* (see Table 13), the sizes are much smaller than their maximum size, which is indicative of overfishing. It can also be gleaned from the data (Table 13) that some species, e.g., *Siganus canaliculatus*, exhibit seasonality in their reproduction. For such species, management by declaring open and closed fishing seasons may be feasible. In the case of *Siganus canaliculatus*, this species has been found to be reproductive during the months of January to July. Since it is one of Bais Bay's major exploited species (Figure 7) and one that is showing overexploitation, such management option is highly favored.

SUMMARY & RECOMMENDATIONS

Results of the ten-month primary data monitored from January to October 1992 show that Bais Bay is exploited by 1,463 fishing families in the coastal barangays of Manjuyod and Tanjay -- all surrounding Bais Bay. A total of 159 fish species belonging to 52 families, 13 crustacean species and 39 mollusks species -- 32 of which are seashells -- are harvested from Bais Bay using 17 types of gear and 4 fishing techniques. Of the fishing gears, the most widely used is *pukot* or gill net (408 units). However, *hulbot/hulahop* or modified Danish seine got the highest value for catch per unit effort (8.28 kg./trip). The CPUE values in Bais Bay are relatively lower compared with those obtained from other areas. Generally, the sizes of the commonly caught fish in Bais Bay are smaller compared with their maximum size which can be attained by the species. They also tend to mature at relatively small sizes as evidenced by the presence of gonads at stages V-VI.

The evidently small sizes of fish caught from Bais Bay and the low catch per unit effort are indeed indicative of overfishing in the area. This confirms the fishermen's claim of decreasing catch which they themselves believe is the result of degraded fisheries because of too many fishermen, use of poison and destructive fishing methods in the Bay, waste discharges from sugar mills, mangrove conversion into fishponds and siltation. These constitute the problems in the management and conservation of the Bay's resources.

It is obvious that fishing pressure at Bais Bay is high and there are strong indications of growth overfishing (i.e., harvesting before the fish reaches sexual maturity). The following are therefore recommended to decrease fishing pressure:

1. Strict enforcement of laws prohibiting illegal fishing practices in the Bay, most especially the ban on the use of small (1 cm) mesh-sized nets.
2. Encouragement and/or strengthening of community organizations to help monitor illegal fishing practices in the Bay.
3. Seasonal regulation of fishing activities, like the closed fishing season for siganids during their breeding/spawning season.
4. Provision of alternative livelihood projects to fishermen who are totally dependent on fishing.

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Table 1. Bais bay fisheries profile.

(Data on number of fishermen in coastal barangays were taken from DA, May 1990; others were supplied by the barangay captains.)

Municipality	Coastal barangays surrounding Bais Bay	No. of landing sites	No. of fishermen	Estimated No. of boats		Total
				Motorized	Non-Motorized	
Fishing Families						
Bais						
	Barangay II	1	22	0	7	7
	Binohon	1	1 00	0	70	70
	Cambuilao	1	61	0	37	37
	Canlargo	2	13	0	65	65
	Capinahan	catch landed	1 84	1 0	63	73
	Looc	directly to	3 68	7	1 00	1 07
	Oklot	fishermen's	495	2 4	1 82	2 06
	Olympia	house	132	12	1 50	1 62
	Talungon	1	55	0	60	60
	Tangcologan	1	33	0	40	40
SUBTOTAL	10	7	1463 fishing families	53	774	827
Manjuyod						
	Alangilanan	1	16	0	16	16
	Campuyo	1	27	2	30	32
	Dunggan	1	33	0	47	47
	Maaslum	1	19	0	19	19
	San Jose	1	30	0	50	50
SUBTOTAL	5	5	125	2	162	164
Tanjay						
	Luca	1	26	0	45	45
TOTAL	16	13	1 51 fishermen + 1463 fishing families	55	981	1036

Table 2. Total number of gears in all coastal barangays surrounding Bais Bay.
(Data obtained from surveys and from interviews with barangay captains.
Numbers in parentheses are dimensions (in meters) of gear. ND means
number not determined.

COASTAL BARANGAYS

Gear	Brgy II	Bino Camb	Canl	Capinh	Lo-oc	Oklot	Olym	Talu	Tang	Ala	Camp	Dung	Maas	S.J.	Luca	Total
1. Bubo (fish trap)					4	8										12
2. Bunsod (fish corral)	26	5	ND	23	10	14	21	50	4	16	1	8	3	8	16	205
3. Handok (muro-ami)											2					2
4. Hulbot (modified Danish seine) (mesh s.=2.5 cm) (LxW)				5	10	2						21	1	6		45
				(7.5-10x1.5)								(200x5)				
5. Katay (multiple hook & line) (27-850 hooks)				8	ND	23										31
6. Pana (speargun)		1				56	4		4						6	71
7. Panggal (crab pot)	50	292		65	50	50	500				110	482		840	2	439
8. Pangkulabutan (squid trap)								3								3
9. Pangmokos (squid jigger)				10		1	6									17
10. Pasol (hook & line)		3	ND	2	10	150			3	3				1	20	192
11. Pukot (gill net) (range of lengths)	2	25	ND	10	30	107	40	86	15	20	16	24	14	6	11	2
	(56-234)	(104-1000)	(200-600)	(400-1200)	(1000)		(45-300)	(600)	(600)	(600)	(100-1000)	(200-1000)	(500)			
12. Pamasayan (shrimp screen)														4		4
13. Sibot (dip net)						2										2
14. Sahid (beach seine) (range of lengths)		8	ND		4	17		9	3		1	2	4	1		49
								(18)	(18)							
15. Sud-sud (push net)									17						6	23
16. Sabinet (fish net)						2					2		1			5
17. Sikpaw (dip net)						3										3
18. Tapsay (mullet net)				2		3								2		7
						(20x20)								(20x20)		
19. Target/Sabay (fish net) (range of lengths) (mesh s.=1.0 cm)				6							2					8
				(300)									(120-320)			
TOTAL Number	78	334	ND	100	135	285	228	649	27	51	32	142	527	20	868	50
Number of types	3	6	4	4	10	6	13	6	3	6	2	7	5	7	6	5

Table 3. List of fish, crustacean, and mollusk species harvested from Bais Bay.

Species	Local Name
A. Fish	
Family Acanthuridae (surgeonfishes)	
1. <i>Acanthurus</i> sp.	Indangan
2-3. <i>Naso</i> spp.	Bagis
Family Ambassidae (glassyfishes)	
4. <i>Ambassis</i> sp.	Palangan
Family Apogonidae (cardinalfishes)	
5. <i>Cheilodipterus macrodon</i> (Lecepede)	Ibis/Mongaw
6-7. <i>Apogon</i> spp.	Ibis
8. <i>Sphaeramia nematoptera</i> (Bleeker)	Ibis
Family Atherinidae (silversides)	
9. <i>Atherina</i> sp.	Guno
Family Balistidae (triggerfishes)	
10. <i>Balistapus undulatus</i> (Mungo Park)	Pugot
11. <i>Balistapus</i> sp.	Pakol
12. <i>Stephanolepis</i> sp.	Bulaknitan
13. <i>Pseudotriacanthus</i> sp.	Bulaknitan
Family Belonidae (needlefishes)	
14. <i>Strongylura</i> sp.	Balo
Family Blenniidae (blennies)	
15. <i>Salarias fasciatus</i> (Bloch)	Palog
16. <i>Salarias</i> sp.	Palog
Family Carangidae (scads & jacks)	
17. <i>Megalaspis cordyla</i> (Linnaeus)	Bakulan
18. <i>Alepes vari</i> (Cuvier)	Kabalyas
19. <i>Alectis indicus</i> (Ruppel)	Samin-samin
20. <i>Alectis ciliaris</i> (Bloch)	Samin-samin
21. <i>Carangoides armatus</i> (Ruppel)	Badlon
22. <i>Carangoides</i> sp.	Malapati
23. <i>Selar</i> sp.	Tamarong
24. <i>Scomberoides tol</i> (Cuvier)	Lapis
25. <i>Caranx</i> sp.	Baha-ulo
26. <i>Decapterus</i> sp.	Pulag-ikog
27. <i>Atule mate</i> (Cuvier)	Lambayawan
28. unidentified sp.	Tulukitok
Family Caesionidae (fusiliers)	
29. <i>Caesio erythrogaster</i> (Cuvier)	Ulan-ulan
30. <i>Caesio caerulaureus</i> (Lacepede)	Solid

Species	Local Name
31. <i>Pterocaesio pisang</i> (Bleeker)	Lokihok
Family Chaetodontidae (butterfly fishes)	
32. <i>Chaetodon octofasciatus</i> (Bloch)	Kulampiros
Family Chanidae (milkfish)	
33. <i>Chanos chanos</i> (Forsskal)	Awa
Family Chirocentridae (wolf herring)	
34. <i>Chirocentrus dorab</i> (Forsskal)	Balila
Family Cichlidae (cichlids)	
35. <i>Tilapia</i> sp.	Tilapia
Family Clupeidae (sardines and herrings)	
36. <i>Sardinella albella</i> (Valenciennes)	Lilang
37. <i>Sardinella</i> sp.	Malangsi
38. <i>Nematalosa come</i> (Richardson)	Kabase
39. <i>Spratelloides</i> sp.	Bolinabid
40. <i>Dussumieria elopsoides</i> (Bleeker)	Balantiyong
41. Unidentified sp.	Malobgas
42. Unidentified sp.	Hawol-hawol
Family Dasyatidae (stingray)	
43. <i>Dasyatis</i> sp.	Kiampao
Family Engraulidae (anchovies)	
44. <i>Stolephorus</i> sp.	Bolinao
45. <i>Thrissina baelama</i>	Tigue
46. Unidentified sp.	Tugnos
Family Elopidae (tarpons)	
47. <i>Megalops cyprinoides</i> (Brousonet)	Bulan-bulan
48. <i>Elops</i> sp.	Bid-bid
Family Ehippidae (batfishes)	
49. <i>Platax orbicularis</i> (Forsskal)	Dalapugan
Family Fistularidae (flutemouths)	
50. <i>Fistularia petimba</i> (Lacepede)	Tubo-tubo
Family Gerreidae (mojarras)	
51. <i>Gerres</i> sp.	Kasbo
52. <i>G. abbreviatus</i>	Bag-angan/Samulok
53. <i>G. filamentosus</i> (Cuvier)	Bag-angan/Lawihan
Family Gobiidae (gobies)	
54. <i>Ptereleotris</i> sp.	Ananambo
55. <i>Cryptocentrus</i> sp.	Balanghai
56. <i>Oxyurichthys</i> sp.	Wakli-wakli
57. Unidentified sp.	Watlay-watlay
58-59. Unidentified spp.	Bunog

Species	Local Name
Family Haemulidae (sweetlips & grunts)	
60. <i>Pomadasys hasta</i> (Bloch)	Ulibalay
61. <i>Plectorhynchus pictus</i> (Thunberg)	Lipte
62. <i>P. chaetodontoides</i> (Lacepede)	Lipte
Family Hemiramphidae (halfbeaks)	
63. <i>Hemiramphus</i> sp.	Balanban/Salasa
Family Holocentridae (squirrelfishes)	
64. <i>Adioryx ruber</i>	Ganting
65. <i>Myripristis berndti</i> (Jordan & Evermann)	Ganting
Family Kyphosidae (sea chubs)	
66. <i>Kyphosus</i> sp.	Ilac
Family Labridae (wrasses)	
67. <i>Cheilinus celebicus</i> (Bleeker)	Ipos-ipos
68. <i>C. trilobatus</i> (Lacepede)	Ananapan
69. <i>Halichoeres scapularis</i> (Bennett)	Labayan
70. <i>Choerodon</i> sp.	Lupit
71. <i>Thalassoma lunare</i> (Linnaeus)	Labayan
72. <i>Cheilio inermis</i> (Forsskal)	Tanlaron
Family Leiognathidae (slipmouths)	
73. <i>Leiognathus splendens</i> (Cuvier)	Danglay
74. <i>L. fasciatus</i> (Lacepede)	Dagoldol
75. <i>L. elongatus</i> (Gunther)	Tabilos
76. <i>L. bindus</i> (Valenciennes)	Sap-sap
77. <i>Gazza mimuta</i> (Bloch)	Piampe
78. <i>Gazza achlamys</i>	Piampe
79. <i>Secutor ruconius</i> (Hamilton-Buchanan)	Palotpot
80. <i>S. insidiator</i> (Bloch)	Palotpot/Sape-sape
Family Lethrinidae (emperor breams)	
81. <i>Lethrinus lentjan</i> (Lacepede)	Katambak
82. <i>Lethrinus ornatus</i> (Valenciennes)	Katambak
83. <i>Lethrinus</i> sp.	Dogso
Family Lobotidae (triple-tails)	
84. <i>Lobotes surinamensis</i> (Bloch)	Ligad
Family Lutjanidae (snappers)	
85. <i>Lutjanus argentimaculatus</i> (Forsskal)	Mangagat
86. <i>L. fulviflamma</i> (Forsskal)	Lalagan
87. <i>L. rivulatus</i> (Cuvier)	Panta-an
88. <i>L. monostigma</i> (Cuvier)	Aluman
89. <i>L. russelli</i> (Bleeker)	Labungan
90. <i>L. gibbus</i> (Forsskal)	Maya-maya

Species	Local Name
91. <i>L. caeruleovittatus</i> (Valenciennes)	Bangalao
92. <i>Lutjanus</i> sp.	Kalambangis
Family Mugilidae (mulletts)	
93. <i>Liza</i> sp. 1	Gisaw
94. <i>Liza</i> sp. 2	Balanak
95. <i>Liza</i> sp. 3	Yakmo
Family Mullidae (goatfishes)	
96. <i>Upeneus sulphureus</i> (Cuvier)	Hinok 1
97. <i>U. vittatus</i> (Forsskal)	Hinok 2
98. <i>U. tragula</i> (Richardson)	Hinok 3
99. <i>Parupeneus barberinus</i> (Lacepede)	Timbungan
100. <i>Upeneus</i> sp.	Salmonete
Family Muraenidae (moray eels)	
101. <i>Evenchelys macrurus</i> (Bleeker)	Ubod
102-103. <i>Gymnothorax</i> spp.	Bakasi
Family Nemipteridae (threadfin breams & spinecheeks)	
104-105. <i>Nemipterus</i> spp.	Bakay
106. <i>Scolopsis cancellatus</i> (Valenciennes)	Budlat
107. <i>Scolopsis ciliatus</i> (Lacepede)	Gapas-gapas
108-109. <i>Pentapodus</i> spp.	Sulong/Salinggukod
Family Platycephalidae (flatheads)	
110. <i>Platycephalus</i> sp.	Sunogan
Family Plotosidae (marine catfishes)	
111. <i>Plotosus lineatus</i> (Thunberg)	Ito
Family Priacanthidae (big eyes)	
112. <i>Priacanthus</i> sp.	Bungo/Bulgan
Family Pomacentridae (damselfishes)	
113. <i>Dischistodus fasciatus</i>	Palata
114. <i>Chrysiptera</i> sp.	Palata
115-116. <i>Chromis</i> spp.	Kibang
117-118. <i>Dascyllus</i> spp.	Bica-bica
119-120. <i>Abudefduf</i> spp.	Kapal
121. <i>Amphiprion clarkii</i> (Bennett)	Bantay bot-bot
Family Rachycentridae (cobia)	
122. <i>Rachycentron canadum</i> (Linnaeus)	Halo-antasik
Family Scaridae (parrotfishes)	
123-125. <i>Scarus</i> spp.	Mol-mol/Kuyog-kuyog
Family Scatophagidae (scats)	
126. <i>Scatophagus argus</i>	Kikilo

Species	Local Name
Family Scombridae (mackerels and tunas)	
127. <i>Rastrelliger kanagurta</i> (Cuvier)	Anduhaw
128. <i>Scomberomorus</i> sp.	Tangige
129-130. Unidentified spp.	Pirit-pirit/Ihalason
Family Scorpaenidae (scorpion fishes)	
131. <i>Pterois volitans</i> (Linnaeus)	Lalong
132. <i>Sebastes</i> sp.	Bantol
Family Serranidae (groupers)	
133. <i>Cromileptis altivelis</i> (Valenciennes)	Milo-milo
134. <i>Epinephelus suillos</i> (Valenciennes)	Manalhog
135. <i>E. macrospilus</i> (Bleeker)	Lapu-lapu
136. <i>E. caeruleopunctatus</i> (Bloch)	Manan-aw
137. <i>E. fuscoguttatus</i> (Forsskal)	Bantolon
138. <i>E. microdon</i> (Bleeker)	Bantolon
139. <i>E. summana</i> (Forsskal)	Pugapo
140. <i>Cephalopholis boenack</i> (Bloch)	Pugalo
141. <i>C. pachycentron</i> (Valenciennes)	Tangka-an
142. <i>Anyperodon leucogrammicus</i> (Valenciennes)	Lapu-lapu
Family Siganidae (rabbitfishes)	
143. <i>Siganus canaliculatus</i> (Park)	Danggit
144. <i>S. guttatus</i> (Bloch)	Kitong
145. <i>S. punctatus</i> (Forster)	Lalap
146. <i>S. virgatus</i> (Valenciennes)	Talagbago
147. <i>S. vulpinus</i> (Schlegel and Muller)	Talagbago
148. <i>S. spinus</i> (Linnaeus)	Ngisi-ngisi
Family Sillaginidae (whittings)	
149. <i>Sillago</i> sp.	Aso-os
Family Soleidae (soles)	
150. <i>Dexillichthys</i> sp.	Dali-dali/Palad
Family Sphyraenidae (barracudas)	
151. <i>Sphyraena barracuda</i> (Walbaum)	Rompe/Tabangko
152. <i>Sphyraena</i> sp.	Bat-og
Family Synodontidae (lizardfish)	
153. <i>Synodus variegatus</i> (Lacepede)	Tambod
154-155. <i>Saurida</i> spp.	Tambod
Family Teraponidae (tigerfishes)	
156. <i>Terapon jarbua</i> (Forsskal)	Buga-ong
157. <i>Pelates quadrilineatus</i> (Bloch)	Gong-gong

Species	Local Name
Family Tetraodontidae (pufferfishes)	
158. <i>Chelonodon patoca</i> (Hamilton)	Botete
Family Trichiuridae (hairtails)	
159. <i>Trichiurus haumela</i>	Diwit
B. Crustaceans (crabs, prawns, shrimps & lobsters)	
Family Portunidae (Portunid crabs)	
1. <i>Scylla serrata</i> (Forsk.)	Alimango
2. <i>Portunus pelagicus</i> (Linnaeus)	Lambay
3. <i>Thalamita</i> sp.	Kasag
4. <i>Charybdis cruciata</i> (Herbst)	Krusan
5. <i>Podophthalmus vigil</i> (Fabricius)	Kasway
Family Penaeidae (Penaeid shrimps)	
6. <i>Penaeus monodon</i> (Fabricius)	Pantat
7. <i>P. japonicus</i> Bate	Pantat
8. <i>P. merguensis</i> de Man	Boktutay
9. <i>Trachypenaeus fulvus</i> Dall	Bagulan
10. <i>Metapenaeus ensis</i> (de Haan)	Mestisa
11. <i>M. endeavouri</i> (Schmitt)	Mestisa
Family Sergestidae	
12. <i>Acetes</i> sp.	Uyap
Family Palinuridae (lobsters)	
13. <i>Panulirus</i> sp.	Banagan
C. Mollusks	
Cephalopoda (squids, cuttlefish, octopi)	
Sub-order Decapoda	
1. <i>Sepioteuthis</i> sp.	Nokos
2. <i>Loligo</i> sp.	Talostos
3. <i>Sepia</i> sp. 1	Kulabutan
4. <i>Sepia</i> sp. 2	Buko-buko
Sub-order Octopoda	
5. <i>Octopus</i> sp. 1	Kugita
6. <i>Octopus</i> sp. 2	Tabugok/Tamala
Pelecypoda	
Family Lucinidae (lucines)	
7. <i>Phacoides philippinarum</i> (Reeve)	Embao
Family Mytilidae (mussels)	
8. <i>Modiolus metcalfei</i> (Hanley)	Tahong

Species	Local Name
Family Ostreidae (oysters)	
9. <i>Crassostrea</i> sp.	Talaba
10. <i>Crassostrea cucullata</i> (Born)	Sisi
11. <i>Ostrea</i> sp.	Kuya
Family Arcidae (ark Shells)	
12. <i>Anadara</i> sp.	Litub
Family Corbiculidae	
13. <i>Geloina suborbicularis</i> Philippi	Tuway
Family Veneridae (Venus clams)	
14. <i>Tapes litterata</i> Linnaeus	Kandiis
15. <i>Paphia sulcosa</i> Philippi	
16. <i>Circe scripta</i> (Linnaeus)	Pisos-pisos
17. <i>Grafrarium tumidum</i> (Roding)	Bisala
18. <i>Periglypta</i> sp.	Bug-atan
19. <i>Pitar citrina</i> (Lamark)	Tikod-tikod
20. Unidentified sp.	Punao
21. Unidentified sp.	Punao
22. Unidentified sp.	Puti-an
23. Unidentified sp.	Punyete
Family Cardiidae (cockles or heart shells)	
24. <i>Vepricardium</i> sp.	Sulod-sulod
Family Mactridae (surf clams)	
25. <i>Mactra</i> sp.	Bulok-bulok
Family Anomiidae (jingle shells)	
26. <i>Placuna placenta</i>	Lampirong/Tipay
Family Pinnidae (fan mussels)	
27. <i>Atrina</i> sp.	Talab/Atsa-atsa
Family Malleidae (hammer oyster)	
28. <i>Malleus</i> sp.	
Family Pteriidae (pearl oysters)	
29. <i>Pinctada</i> sp.	
Gastropoda	
Family Aplysiidae (seahares)	
30. <i>Dolabella auricularia</i> (Lightfoot) (eggs)	Lucot
Family Strombidae (true conch)	
31. <i>Strombus canarium</i> (Linnaeus)	Bungkawil
32. <i>S. urceus</i> (Linnaeus)	Aninikad
Family Potamididae (mud whelks)	
33. <i>Telescopium telescopium</i> (Linnaeus)	Bagongon

Species	Local Name
34. <i>Terebralia</i> sp.	Dalu-dalu
Family Volutidae (volutes)	
35. <i>Melo</i> sp.	Bilong
36. <i>Voluta</i> sp.	Kibol
Family Muricidae (murex or rock shells)	
37. <i>Murex</i> sp.	Sangka-sangka
Family Haliotidae (Abalones)	
38. <i>Haliotis</i> sp.	Kapinan
Family Trochidae (topshells)	
39. <i>Trochus</i> sp.	Tandok-tandok
D. Sea Cucumber	
1. Unidentified spp.	Balat

Table 4. (Continued)

Type of gear and fishing techniques used to harvest the species.

Species	Bubo	Buns	Gang	Hand	Hulb	Kata	Pana	Pagl	Puko	Pank	Pakb	Paso	Pahi	Sahi	Sibi	Sikp	Sulo	Siko	Taps	Tar	TOTAL			
Family Malleidae																								
28. <i>Mallus</i> sp.																								
Family Percidae																								
29. <i>Pseudis</i> sp.																								
Cestropoda																								
Family Aphyssiidae																								
30. <i>Dababela auncularia</i>		+							+											+			7	
Family Strombidae																								
31. <i>Strombus canarium</i>									+								+						4	
32. <i>S. urceus</i>																							1	
Family Puzosinidae																								
33. <i>Telescopium telescopium</i>																								1
34. <i>Terebralis</i> sp.																								1
Family Voluvidae																								
35. <i>Melo</i> sp.																								1
36. <i>Volva</i> sp.																								1
Family Muricidae																								
37. <i>Murex</i> sp.										+														2
Family Halioidea																								
38. <i>Haliois</i> sp.																								2
Family Trochidae																								
39. <i>Trochus</i> sp.																								1
D. Sea cucumbers																								
Unidentified spp.																								2
TOTAL	28	123	20	4	75	56	74	11	140	1	1	25	40	10	4	7	13	26	18	24				

Table 5. Summary of percentage composition of fish, crustacean and mollusks caught by each gear type from January to October 1992.

Gear Type and Fishing Techniques	Month	Fish		Crustaceans		Mollusks		TOTAL Weight (kg)
		Weight (kg)	% Comp	Weight (kg)	% Comp	Weight (kg)	% Comp	
1. bubo (fish trap)	Sept., 1992	16.62	100.0	-	-	-	-	16.62
	October	197.72	100.0	-	-	-	-	197.72
	TOTAL	214.34	$\bar{X}=100.0$	-	-	-	-	214.34
2. bunsod (fish corral)	Jan., 1992	971.66	76.53	224.39	17.67	73.65	5.80	1 269.70
	February	463.49	76.51	94.80	15.65	47.53	7.84	605.82
	March	481.96	79.38	83.38	13.73	41.82	6.89	607.16
	April	476.09	78.34	99.27	16.33	32.37	5.33	607.73
	May	1 047.54	81.52	167.68	13.05	69.78	5.43	1 285.00
	June	1 143.81	79.52	206.81	14.38	87.84	6.10	1 438.46
	July	1 253.56	76.03	294.39	17.85	100.89	6.12	1 648.84
	August	1 007.36	72.05	310.24	22.19	80.56	5.76	1 398.16
	September	955.38	74.32	286.87	22.32	43.13	3.36	1 285.38
	October	1 434.09	73.54	462.0	3.69	53.95	2.77	1 950.13
	TOTAL	9,234.94	$\bar{X}=76.77$	2,229.92	$\bar{X}=17.69$	631.52	$\bar{X}=5.54$	12,096.38
3. gango (miracle hole)	January, 1992	36.57	99.95	0.02	0.05	-	-	36.59
	February	25.10	100.00	0.0	0.0	-	-	25.10
	March	12.00	92.31	1.00	7.69	-	-	13.00
	April	2.40	100.00	0.0	0.0	-	-	2.40
	May	3.20	100.00	0.0	0.0	-	-	3.20
	June	23.50	100.00	0.0	0.0	-	-	23.50
	July	4.50	100.00	0.0	0.0	-	-	4.50
	August	20.70	100.00	0.0	0.0	-	-	20.70
	September	14.40	100.00	0.0	0.0	-	-	14.40
	October	9.00	100.00	0.0	0.0	-	-	9.00
TOTAL	151.37	$\bar{X}=99.23$	1.02	$\bar{X}=0.77$	-	-	152.39	
4. handok (muro-ami)	January, 1992	-	-	-	-	-	-	-
	February	35.77	100.00	-	-	0.0	0.0	35.77
	March	46.15	95.45	-	-	2.02	4.55	48.35
	April	27.66	100.00	-	-	0.0	0.0	27.66
	May	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-
	July	20.00	100.00	-	-	0.0	0.0	20.00
	August	-	-	-	-	-	-	-
	September	17.60	100.00	-	-	0.0	0.0	17.60
	October	18.37	93.72	-	-	1.23	6.28	19.60
TOTAL	165.55	$\bar{X}=98.20$	-	-	3.43	$\bar{X}=1.80$	168.98	
5. hulbot/hulahop (modified Danish seine)	January, 1992	504.83	92.83	1.15	0.21	37.85	6.69	543.83
	February	7 73.33	93.01	7.66	0.92	50.45	6.07	831.44
	March	7 92.43	94.46	2.36	0.28	44.10	5.26	838.89

Table 5. (Continued)

Gear Type and Fishing Techniques	Month	Fish		Crustaceans		Mollusks		TOTAL Weight (kg)
		Weight (kg)	% Comp	Weight (kg)	% Comp	Weight (kg)	% Comp	
	April	576.93	90.37	1.98	0.31	59.50	9.32	638.41
	May	971.80	94.85	0.20	0.02	52.60	5.13	1024.60
	June	11 03.01	86.64	3.70	0.29	166.43	13.07	1273.16
	July	13 77.65	90.12	1.80	0.12	149.14	9.76	1528.59
	August	13 92.17	99.71	1.10	0.08	2.90	0.21	1396.17
	September	12 76.15	92.04	2.40	0.17	108.00	7.79	1386.55
	October	1448.05	94.19	1.70	5.70	87.60	0.11	1537.55
	TOTAL	10,2 16.35	$\bar{X}=92.82$	24.05	$\bar{X}=0.81$	758.59	$\bar{X}=6.37$	10,9 98.99
6. katay/salabay (multiple hook & line)	January, 199	88.13	99.69	0.25	0.28	0.03	0.03	88.41
	February	25.77	100.00	0.0	0.0	0.0	0.0	25.77
	March	20.29	100.00	0.0	0.0	0.0	0.0	20.29
	April	34.74	100.00	0.0	0.0	0.0	0.0	34.74
	May	18.40	100.00	0.0	0.0	0.0	0.0	18.40
	June	18.90	100.00	0.0	0.0	0.0	0.0	18.90
	July	50.99	100.00	0.0	0.0	0.0	0.0	50.99
	August	25.00	100.00	0.0	0.0	0.0	0.0	25.00
	September	14.00	100.00	0.0	0.0	0.0	0.0	14.00
	October	9.10	100.00	0.0	0.0	0.0	0.0	9.10
	TOTAL	305.32	$\bar{X}=99.99$	0.25	0.028	0.03	0.003	305.60
7. pana (spear)	Jan., 1992	1 03.77	87.86	6.17	5.22	8.17	6.92	1 18.11
	February	2 71.92	90.25	10.29	3.42	19.08	6.33	3 01.29
	March	2 81.16	86.27	21.14	6.49	23.61	7.24	3 25.91
	April	5 02.12	96.91	8.67	1.67	7.33	1.42	5 18.12
	May	4 58.22	97.19	5.04	1.07	8.21	1.74	4 71.47
	June	3 46.81	95.91	3.59	0.99	11.21	3.10	3 61.61
	July	6 11.28	87.23	48.55	6.93	40.90	5.84	7 00.73
	August	3 44.62	84.03	16.95	4.13	48.54	11.84	4 10.11
	September	3 91.24	77.71	66.75	13.26	45.45	9.03	5 03.44
	October	3 18.64	77.87	21.75	5.32	68.80	16.81	4 09.19
	TOTAL	3,6 29.78	$\bar{X}=88.12$	208.90	$\bar{X}=4.85$	281.30	$\bar{X}=7.03$	4,1 19.98
8. panggal (crab pot)	January, 1992	7.71	2.49	299.18	96.81	2.15	0.70	309.04
	February	4.81	0.93	512.82	99.07	0.0	0.0	517.63
	March	4.95	1.39	349.80	98.44	0.60	0.17	355.35
	April	1.55	0.70	220.08	99.30	0.0	0.0	221.63
	May	1.45	0.92	155.74	99.08	0.0	0.0	157.19
	June	0.90	0.44	203.88	99.56	0.0	0.0	204.78
	July	1.05	0.62	168.58	99.15	0.40	0.23	170.03
	August	2.15	0.97	218.33	98.53	1.10	0.50	221.58
	September	3.25	2.25	140.96	97.54	0.30	0.21	144.51
	October	1.20	0.62	192.36	98.81	1.10	0.57	194.66
	TOTAL	29.02	$\bar{X}=1.13$	2,461.73	$\bar{X}=98.63$	5.56	$\bar{X}=0.24$	2,496.40

Table 5. (Continued)

Gear Type and Fishing Techniques	Month	Fish		Crustaceans		Mollusks		TOTAL Weight (kg)
		Weight (kg)	% Comp	Weight (kg)	% Comp	Weight (kg)	% Comp	
9. pukot (gill net)	Jan., 1992	1148.89	90.48	39.79	3.14	81.05	6.38	1269.73
	February	1215.49	96.59	38.58	3.06	4.39	0.35	1258.46
	March	1507.38	97.52	24.68	1.60	13.62	0.88	1545.68
	April	1942.49	94.40	91.49	4.45	23.71	1.15	2057.69
	May	1467.99	96.49	14.32	0.94	39.06	2.57	1521.37
	June	1789.54	94.07	98.32	5.17	14.37	0.76	1902.23
	July	3855.69	94.07	113.73	2.77	129.54	3.16	4098.96
	August	3328.73	91.18	259.66	7.11	62.20	1.71	3650.59
	September	6489.52	95.65	273.64	4.03	21.47	0.32	6784.53
	October	1645.65	92.07	127.97	7.16	13.75	0.77	1787.37
TOTAL	24,391.27	$\bar{X}=9.425$	1,082.18	$\bar{X}=3.94$	403.16	$\bar{X}=1.81$	25,876.61	
10. pangnokus (squid jigger)	Jan., 1992	-	-	-	-	11.51	100.0	11.51
	February	-	-	-	-	4.46	100.0	4.46
	March	-	-	-	-	4.95	100.0	4.95
	April	-	-	-	-	13.60	100.0	13.60
	May	-	-	-	-	7.00	100.0	7.00
	June	-	-	-	-	8.40	100.0	8.40
	July	-	-	-	-	14.30	100.0	14.30
	August	-	-	-	-	9.70	100.0	9.70
	September	-	-	-	-	8.60	100.0	8.60
	October	-	-	-	-	14.10	100.0	14.10
TOTAL	-	-	-	-	96.62	$\bar{X}=100.0$	96.62	
11. pangkulabutan (squid trap)	January, 1992	-	-	-	-	2.50	100.0	2.50
	February	-	-	-	-	-	-	-
	March	-	-	-	-	1.27	100.0	1.27
	April	-	-	-	-	-	-	-
	May	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-
	July	-	-	-	-	-	-	-
	August	-	-	-	-	3.70	100.0	3.70
	September	-	-	-	-	-	-	-
	October	-	-	-	-	-	-	-
TOTAL	-	-	-	-	7.47	$\bar{X}=100.0$	7.74	
12. pasal (hook & line)	January, 1992	-	-	-	-	-	-	-
	February	-	-	-	-	-	-	-
	March	-	-	-	-	-	-	-
	April	9.75	74.71	0.80	6.13	2.50	19.16	13.05
	May	-	-	-	-	-	-	-
	June	11.60	94.31	0.0	0.0	0.70	5.69	12.30
	July	26.07	100.0	0.0	0.0	0.0	0.0	26.07
	August	3.26	100.0	0.0	0.0	0.0	0.0	3.26
	September	2.50	100.0	0.0	0.0	0.0	0.0	2.50
	October	12.90	100.0	0.0	0.0	0.0	0.0	12.90
TOTAL	66.08	$\bar{X}=9.484$	0.80	$\bar{X}=1.02$	3.20	$\bar{X}=4.14$	70.08	

Table 5. (Continued)

Gear Type and Fishing Techniques	Month	Fish		Crustaceans		Mollusks		TOTAL Weight (kg)
		Weight (kg)	% Comp	Weight (kg)	% Comp	Weight (kg)	% Comp	
13. panginhas (gleaning)	January, 1992	-	-	1.16	0.15	755.63	99.85	756.79
	February	-	-	0.40	0.10	379.32	99.90	379.72
	March	-	-	2.00	0.49	401.81	99.51	403.81
	April	-	-	0.0	0.0	292.79	100.0	292.79
	May	-	-	0.0	0.0	62.20	100.0	62.20
	June	-	-	0.0	0.0	66.93	100.0	63.93
	July	-	-	5.00	3.18	152.27	96.82	157.27
	August	-	-	2.00	1.45	135.76	98.55	137.76
	September	-	-	0.0	0.0	98.16	100.0	98.16
	October	-	-	0.0	0.0	192.03	100.0	192.03
	TOTAL	-	-	10.56	$\bar{X}=0.54$	2,53 6.90	$\bar{X}=9 9.46$	2,547.46
14. sahid (beach seine)	January, 1992	83.17	66.57	6.26	5.01	35.50	28.42	124.93
	February	394.36	90.17	3.52	0.81	39.45	9.02	437.53
	March	153.55	82.66	2.40	1.30	29.80	16.04	185.75
	April	129.86	71.09	7.50	4.11	45.31	24.80	182.67
	May	432.47	81.81	25.02	4.73	71.16	13.46	528.65
	June	298.70	71.98	33.15	7.98	83.15	20.04	415.00
	July	483.98	73.22	57.73	8.73	119.35	18.05	661.06
	August	309.27	62.76	46.70	9.51	136.19	27.73	492.16
	September	337.95	72.10	34.32	7.32	96.45	20.58	468.72
	October	387.37	64.45	62.97	10.48	150.66	25.07	601.00
	TOTAL	3,0 10.68	$\bar{X}=7 3.68$	279.57	$\bar{X}=6.00$	807.02	$\bar{X}=2 0.32$	4,097.27
15. sabinet (fish net)	Jan., 1992	7.00	100.0	0.0	0.0	0.0	0.0	7.00
	February	16.86	95.58	0.50	2.83	0.28	1.59	17.64
	March	18.62	100.0	0.0	0.0	0.0	0.0	18.62
	April	9.50	100.0	0.0	0.0	0.0	0.0	9.50
	May	3.00	100.0	0.0	0.0	0.0	0.0	3.00
	June	1.90	100.0	0.0	0.0	0.0	0.0	1.90
	July	27.00	100.0	0.0	0.0	0.0	0.0	27.00
	August	16.10	100.0	0.0	0.0	0.0	0.0	16.10
	September	1.50	100.0	0.0	0.0	0.0	0.0	1.50
	October	5.00	100.0	0.0	0.0	0.0	0.0	5.00
	TOTAL	106.48	$\bar{X}=9 9.56$	0.50	$\bar{X}=0.28$	0.28	$\bar{X}=0.16$	107.26
16. sibot (dip net)	Jan., 1992	0.0	0.0	9.00	100.0	-	-	9.00
	February	9.50	100.0	0.0	0.0	-	-	9.50
	March	8.30	100.0	0.0	0.0	-	-	8.30
	April	3.50	100.0	0.0	0.0	-	-	3.50
	May	5.50	100.0	0.0	0.0	-	-	5.50
	June	3.00	100.0	0.0	0.0	-	-	3.00
	July	6.60	100.0	0.0	0.0	-	-	6.60
	August	-	-	-	-	-	-	-
	September	-	-	-	-	-	-	-
	October	-	-	-	-	-	-	-
	TOTAL	36.40	$\bar{X}=8 5.71$	9.00	$\bar{X}=1 4.29$	-	-	45.40

Table 5. (Continued)

Gear Type and Fishing Techniques	Month	Fish		Crustaceans		Mollusks		TOTAL Weight (kg)
		Weight (kg)	% Comp	Weight (kg)	% Comp	Weight (kg)	% Comp	
17. sikpaw	Jan., 1992	2.40	100.0	-	-	0.0	0.0	2.40
	February	3.10	100.0	-	-	0.0	0.0	3.10
	March	4.30	100.0	-	-	0.0	0.0	4.30
	April	3.40	58.62	-	-	2.40	41.38	5.80
	May	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-
	July	4.10	100.0	-	-	0.0	0.0	4.10
	August	-	-	-	-	-	-	-
	September	-	-	-	-	-	-	-
	October	-	-	-	-	-	-	-
	TOTAL	17.30	$\bar{X}=9.172$	-	-	2.40	$\bar{X}=8.28$	19.70
18. sulo (torch)	Jan., 1992	2.80	27.18	7.5	72.82	0.0	0.0	10.30
	February	6.50	20.63	25.00	79.37	0.0	0.0	31.50
	March	8.00	39.41	7.30	35.96	5.00	24.63	20.30
	April	9.70	29.48	13.20	40.12	10.00	30.40	32.90
	May	4.50	14.38	20.60	65.81	6.20	19.81	31.30
	June	2.90	5.42	41.70	77.94	8.90	16.64	53.50
	July	45.10	52.26	21.60	25.03	19.60	22.71	86.30
	August	9.90	18.50	14.40	26.92	29.20	54.58	53.50
	September	8.50	18.68	14.80	32.53	22.20	48.79	45.50
	October	5.80	7.80	46.30	62.50	22.00	29.70	74.10
	TOTAL	103.70	$\bar{X}=2.337$	212.40	$\bar{X}=5.190$	123.10	$\bar{X}=2.473$	439.20
19. sikop (barehands)	Jan., 1992	31.70	74.24	11.00	25.76	0.0	0.0	42.70
	February	33.71	58.38	0.0	0.0	24.03	41.62	57.74
	March	62.72	32.16	0.78	0.40	131.50	67.44	195.00
	April	209.20	80.52	19.10	7.35	31.50	12.13	259.80
	May	87.25	43.93	1.10	0.55	110.30	55.52	198.65
	June	48.40	39.48	2.20	1.79	72.00	58.73	122.60
	July	184.00	98.66	0.50	0.27	2.00	1.07	186.50
	August	4.85	3.43	0.0	0.0	136.42	96.57	141.27
	September	1.00	0.76	0.0	0.0	129.90	99.24	130.90
	October	2.65	2.39	0.70	0.63	107.33	96.98	110.68
	TOTAL	665.48	$\bar{X}=4.340$	35.38	$\bar{X}=3.67$	744.98	$\bar{X}=5.293$	1,445.84
20. tapsay (mullet net)	Jan., 1992	122.81	100.0	-	-	0.0	0.0	122.81
	February	55.95	100.0	-	-	0.0	0.0	55.95
	March	55.30	100.0	-	-	0.0	0.0	55.30
	April	71.10	99.30	-	-	0.50	0.70	71.60
	May	47.00	100.0	-	-	0.0	0.0	47.00
	June	58.50	100.0	-	-	0.0	0.0	58.50
	July	112.03	100.0	-	-	0.0	0.0	112.03
	August	44.75	100.0	-	-	0.0	0.0	44.75
	September	37.75	100.0	-	-	0.0	0.0	37.75
	October	45.50	100.0	-	-	0.0	0.0	45.50
	TOTAL	650.69	$\bar{X}=9.993$	-	-	0.50	$\bar{X}=0.07$	651.19

Table 5. (Continued)

Gear Type and Fishing Techniques	Month	Fish		Crustaceans		Mollusks		TOTAL Weight (kg)
		Weight (kg)	% Comp	Weight (kg)	% Comp	Weight (kg)	% Comp	
21. target/sabay (fish net)	Jan., 1992	91.53	99.68	0.0	0.0	0.29	0.32	91.82
	February	119.50	99.22	0.0	0.0	0.94	0.78	120.44
	March	98.09	94.57	0.58	0.56	5.05	4.87	103.72
	April	160.20	100.0	0.0	0.0	0.0	0.0	160.20
	May	50.84	100.0	0.0	0.0	0.0	0.0	50.84
	June	44.22	100.0	0.0	0.0	0.0	0.0	44.22
	July	118.00	100.0	0.0	0.0	0.0	0.0	118.00
	August	28.10	100.0	0.0	0.0	0.0	0.0	28.10
	September	25.40	100.0	0.0	0.0	0.0	0.0	25.40
	October	17.70	99.83	0.0	0.0	0.03	0.17	17.73
	TOTAL	753.58	X=99.33	0.58	X=0.06	6.31	X=0.61	760.47

Table 6. Composition and volume of gastropod and pelecypod harvest monitored from January to October 1992.

Local Name	Species	Volume (kg)	%	Fishing Technique
1. litub	<i>Anadara</i> sp.	4172.0	33.7	panginhas (cultured in Dawis)
2. lucot	<i>Dolabella auricularia</i> eggs	2048.9	16.5	sikop, sulo, pukot, bunsod, target, sabinet, sahid, & panginhas
3. punao	Venerid clam	1828.0	14.8	cultured in Dawis
4. tahong	<i>Modiolus metcalfei</i>	1485.5	12.0	cultured in Dawis
5. talaba	<i>Crassostrea</i> sp.	1432.5	11.6	cultured in Dawis and in Hindungawan
6. aninikad	<i>Strombus urceus</i>	606.0	4.9	panginhas
7. lampirong/tipay	<i>Placuna placenta</i>	321.5	2.6	pukot, hulbot, sahid & panginhas
8. embao	<i>Phacoides philippinarum</i>	129.9	1.1	panginhas
9. punyete	Venerid clam	112.0	0.9	panginhas
10. sulod-sulod	<i>Vepricardium</i> sp.	69.2	0.6	panginhas
11. bungkawel	<i>Strombus canarium</i>	59.7	0.5	pukot, sikop, sulo, pana
12. dalu-dalu	<i>Terebralia</i> sp.	26.0	0.2	panginhas
13. pesos-pesos	<i>Circe scripta</i>	22.5	0.2	panginhas
14. piyong-piyong	<i>Anadara</i> sp.	22.0	0.2	panginhas
15. bisala	<i>Grafrarium tumidum</i>	14.9	0.1	panginhas
16. talab	<i>Atrina</i> sp.	14.1	0.1	pana & sikop
17. sisi	<i>Crassostrea cucullata</i>	5.8		sikop & panginhas
18. sangka-sangka	<i>Murex</i> sp.	3.5		pukot & panginhas
19. bug-atan	<i>Periglypta</i> sp.	3.4		panginhas
20. bilong	<i>Melo</i> sp.	3.4		panginhas & sikop
21. kandiis	<i>Tapes litterata</i>	2.4		panginhas
22. bulok-bulok	<i>Mactra</i> sp.	2.3		panginhas
23. tandok-tandok	<i>Trochus</i> sp.	1.8		panginhas & sikop
24. kibol	<i>Voluta</i> sp.	1.0		sulo
25. kapinan	<i>Haliotis</i> sp.	1.0		sulo
26. tikod-tikod	<i>Pitar citrina</i>	0.3		panginhas
	TOTAL	12,389.6	100.0	

Table 7. Volume of seashells cultured in Dawis, Canlargo from January to October 1992.

Species	Volume (kg)										TOTAL
	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	
Talaba	440.0	112.5	175.0	—	—	—	—	15.0	315.0	180.0	1237.5
Tahong	27.0	96.0	181.5	40.0	—	—	90.0	660.0	175.0	60.0	1329.5
Litub	889.0	1032.0	1313.0	242.0	172.5	—	60.0	42.0	249.0	140.0	4132.5
Punao	1157.0	237.0	215.5	32.0	34.0	—	23.0	35.0	29.0	—	1762.5
TOTAL	2513.0	1477.5	1885.0	314.0	206.5	—	173.0	752.0	768.0	380.0	8462.0

Table 8. Income in pesos from seashells cultured in Dawis, Canlargo from January to October 1992.

Species	Volume (kg)										TOTAL
	1992	Jan	Feb	Mar	April	May	June	July	Aug	Sept	
Talaba	1173.30	300.00	466.65	—	—	—	—	40.00	840.00	480.00	3,299.95
Tahong	54.00	192.00	544.50	120.00	—	—	270.00	1980.00	525.00	120.00	3,805.50
Litub	1778.00	2050.00	2626.00	484.00	345.00	—	120.00	84.00	498.00	280.00	8,265.00
Punao	6942.00	1185.00	1293.00	192.00	204.00	—	138.00	210.00	174.00	—	10,338.00
TOTAL	9,947.30	3,727.15	4,930.15	796.00	549.00	—	528.00	2,314.00	2,037.00	880.00	25,708.45

Table 9. Estimated total catch by fishing gear in Bais Bay from January-December 1992.

Gear	# gears	Catch/trip/gear (kg)	Average # trips/mo.	Total # of trips/year (12 months)	Total Catch (kg)
1. bubo (fish trap)	12	1.85	15	180	3,996.0
2. bunsod (fish corral)	205	3.62	15	180	13,578.0
3. handok (Muro-ami)	2	7.57	10	120	1,816.8
4. hulbot (modified Danish seine)	45	8.28	25	300	11,780.0
5. katay (multiple H & L)	31	2.68	15	180	1,495.4
6. pana (speargun)	71	3.21	20	240	5,469.8
7. panggal (crab pot)	2439	0.05	25	300	3,658.5
8. pangkulabutan (squid trap)	3	1.87	10	120	673.2
9. pangnokos (squid jigger)	17	0.86	10	120	1,754.4
10. pasol (hook&line)	192	1.98	10	120	4,561.2
11. pukot (gill net)	408	3.60	25	300	44,640.0
12. sabinet (fish net)	5	5.20	10	120	3,120.0
13. sahid (beach seine)	49	5.73	25	300	8,423.1
14. sibot (dip net)	2	2.23	10	120	535.2
15. sikpaw (dip net)	3	1.60	10	120	576.0
16. tapsay (mullet net)	7	4.27	25	300	8,967.0
17. target/sabay (fish net)	8	4.19	20	240	8,044.8
TOTAL					95,154.4

Table 10. Catch per unit effort (CPUE) in kg/trip for each gear type and fishing technique used in Bais Bay.

1992		January		February		March		April		May	
A. Fishing Gear Rank	Geartype	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
1.	hulbot (modified Danish seine)	7.74±1.46	2	6.80±1.83	2	6.92±0.21	2	6.09±0.7	2	7.05±4.31	2
2.	handok (muro-ami)	—		7.15	1	6.04	1	6.90	1	—	
3.	sahid (beach seine)	6.97±3.76	7	6.67±2.81	4	5.32±3.66	3	4.68±2.63	4	7.57±1.78	4
4.	sabinet (fish net)	3.50±2.12	2	2.03±0.29	2	2.87±2.08	3	2.63±2.30	2	3.0	1
5.	tapsay (mullet net)	10.02±6.1	2	4.47±2.17	2	2.51	1	6.29±4.81	2	3.20±0.28	2
6.	target/sabay (fish net)	4.14±1.05	2	3.69±2.26	2	5.30±4.49	2	6.30±7.62	2	4.70±4.31	2
7.	bunsod (fish corral)	3.41±1.57	10	2.75±1.05	10	2.38±0.79	8	3.03±0.97	7	3.99±1.29	8
8.	pukot (gill net)	2.71±1.35	12	3.83±2.76	12	2.59±1.08	10	4.69±2.81	7	3.35±1.53	8
9.	pana (spear)	2.88±0.82	4	3.57±1.77	3	2.49±2.0	4	2.58±0.3	5	3.50±1.22	4
10.	katay (multiple hook and line)	2.75	1	3.22	1	3.38	1	2.67	1	2.04	1
11.	sibot (dip net)	2.25	1	1.58	1	2.08	1	1.75	1	2.75	1
12.	pasol (hook & line)	—		—		—		2.18±0.60	2	—	
13.	pangkulabutan (squid trap)	2.50	1	—		1.27	1	—		—	
14.	bubo (fish trap)	—		—		—		—		—	
15.	sikpaw (dip net)	1.20	1	1.55	1	1.43	1	1.77±0.90	2	—	
16.	pangnokos (squid jigger)	1.33±0.81	3	0.68±0.28	2	0.84±0.72	2	0.86±0.51	2	0.83±0.53	2
17.	panggal (crab pot)	0.53±0.02	3	0.06±0.01	3	0.04±0.01	3	0.004±0.01	3	0.06±0.03	4
Mean CPUE for all geartypes		3.71		3.43		3.03		3.49		3.5	
B.											
B. Rank	Fishing Techniques	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
1.	gango (miracle hole)	4.05±0.23	2	3.76±1.75	2	4.33	1	2.40	1	2.10±0.14	2
2.	panginhas (gleaning)	7.29±9.05	8	7.79±7.81	5	4.52±2.23	7	5.87±5.53	6	2.22±0.56	3
3.	sikop (use of barehands)	2.55±0.91	3	2.58±2.92	3	2.32±1.20	3	2.39±1.30	5	3.43	1
4.	sulo (torch)	3.45	1	3.50	1	1.45	1	5.88±0.54	2	1.49	1
Mean CPUE for all fishing techniques		4.34		4.41		3.16		4.14		2.31	

Table 10. (Continued)

June		July		August		September		October		AVERAGE
Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	
8.33±2.0	2	11.49±1.85	3	9.13±3.01	2	10.27±2.50	2	8.98±5.38	2	8.28±1.70
—		10.00	1	—		8.80	1	6.53	1	7.57±1.51
6.63±3.14	4	5.38±3.06	4	5.75±1.45	4	3.63±2.34	3	4.93±2.20	5	5.73±1.19
1.90	1	13.50	1	16.1	1	1.50	1	5.00	1	5.20±5.19
4.18	1	3.45±0.74	2	2.98	1	2.55	1	3.03	1	4.27±2.32
3.86±2.43	2	4.00±1.37	2	4.93±2.93	2	2.97	1	1.97	1	4.19±1.22
5.11±4.39	9	4.02±2.01	9	3.91±2.03	9	3.67±1.94	10	3.92±2.09	9	3.62±0.77
3.42±1.61	10	4.32±2.78	14	4.08±2.29	14	3.89±1.69	13	3.13±1.30	11	3.60±0.68
2.90±1.34	5	3.77±2.18	4	3.78±1.51	4	3.47±1.17	6	3.17±1.42	4	3.21±0.48
2.10	1	2.88	1	3.13	1	2.8	1	1.82	1	2.68±0.53
3.00	1	2.20	1	—		—		—		2.23±0.51
2.29±2.24	2	4.12	1	1.18	1	0.83	1	1.29	1	1.98±1.20
—		—		1.85	1	—		—		1.87±0.62
—		—		—		1.51	1	2.19±0.35	2	1.85±0.48
—		2.05	1	—		—		—		1.60±0.33
0.73±0.32	2	1.05±0.66	3	0.79±0.3	2	0.57	1	0.88	1	0.86±0.21
0.05±0.03	5	0.06±0.03	4	0.05±0.01	5	0.05±0.01	5	0.09±0.12	5	0.05±0.02
3.42		4.82		4.44		3.32		3.35		3.65
7.83	1	4.50	1	4.09±0.13	2	3.38±0.60	2	9.00	1	4.54±2.20
3.72±1.67	3	4.04±2.50	3	5.38±3.10	3	4.90±3.74	2	3.53±2.22	3	4.93±1.72
3.83	1	2.88±1.73	2	4.32	1	5.36	1	3.16±2.56	2	3.28±0.98
2.82	1	2.78	1	1.62±1.24	3	1.02	1	0.32	1	2.43±1.61
4.55		3.55		3.85		3.67		4.0		3.8

Table 11. Income (in pesos) per trip per gear and fishing techniques of fishermen in Bais Bay from January to October 1992.

A. Fishing Gear	Jan.	Feb.	Mar.	Apr.	May	June
1. hulbot (modified Danish seine)	197.76	180.22	175.14	174.92	259.16	232.4
2. handok (muro-ami)	-	229.88	144.74	237.56	-	-
3. sahid (beach seine)	132.87	235.76	143	144.4	198.82	172.08
4. sabinet (fish net)	35	49.91	41.02	91.67	35	24
5. tapsay (mullet net)	195.91	90.3	79.32	109.03	105.18	91.75
6. target/sabay (fish net)	98.18	132.14	88.81	220.55	95.94	128.2
7. bunsod (fish corral)	103.26	73.29	86.31	116.91	115.97	109.96
8. pukot (gill net)	122.56	96.33	122.48	122.4	102.06	106.73
9. pana (spear)	100.44	122.2	70.2	85.88	75.29	72.29
10. katay (multiple hook and line)	173.5	98.17	103.89	94.66	75.37	77.9
11. sibot (dip net)	33.75	24.39	18.73	28	33.75	40
12. pasol (hook & line)	-	-	-	84.11	-	112.5
13. pangkulabutan (squid trap)	89.83	-	46.04	-	-	-
14. bubo (fish trap)	-	-	-	-	-	-
15. sikpaw (dip net)	16	28.5	32.08	31.88	-	-
16. pangnokos (squid jigger)	66.76	39.64	20.63	34	25	23.9
17. panggal (crab pot)	1.62	2.12	4.16	1.24	1.12	1.93
Mean income per trip per gear for all geartypes	97.67	100.2	78.44	105.15	93.56	91.82
B. Fishing technique						
1. gango (miracle hole)	138.44	106.94	162.67	66	77.22	227.67
2. panginhas (gleaning)	32.99	22.85	24.71	34.55	21.4	35.09
3. sikop (use of barehands)	76.26	25.82	44.62	60.57	44.04	45.2
4. sulo (torch)	40.83	79.77	38.56	24.94	69.46	52.75
Mean income per trip per gear for all fishing techniques	72.13	58.85	67.64	46.52	53.03	90.18

Table 11. Continued

A.	Fishing Gear	July	Aug	Sept.	Oct.	Average	Range
1.	hulbot (modified Danish seine)	164.82	184.12	229.39	235	203.29±32.77	164.82-259.16
2.	handok (muro-ami)	270	-	264.2	169.81	219.37±51.07	144.74-270
3.	sahid (beach seine)	234.69	148.89	126.88	143.49	168.09±40.93	126.88-235.76
4.	sabinet (fish net)	47.25	192.5	12.5	60	58.89±51.61	12.5-192.5
5.	tapsay (mullet net)	63.68	55.54	45.34	50.7	88.68±43.88	45.34-195.91
6.	target/sabay (fish net)	149.42	127.73	66.82	49.35	115.71±48.21	49.35-220.55
7.	bunsod (fish corral)	101.24	98.23	88.29	107.7	100.11±13.96	73.29-116.91
8.	pukot (gill net)	116.86	185.76	226.36	101.17	130.27±42.19	96.33-226.36
9.	pana (spear)	113.31	67.05	74	83.62	86.43±19.22	67.05-122.2
10.	katay (multiple hook and line)	87.56	54.58	95.5	64.6	92.57±32.46	54.58-173.5
11.	sibot (dip net)	14.37	-	-	-	27.57±9.0	14.37-40
12.	pasol (hook & line)	137.44	50.44	25.5	32.25	73.71±45.3	25.5-137.44
13.	pangkulabutan (squid trap)	-	55.5	-	-	63.79±23.04	46.04-89.83
14.	bubo (fish trap)	-	-	30.01	41.8	35.91±8.34	30.01-41.80
15.	sikpaw (dip net)	10.25	-	-	-	23.64±9.95	10.25-32.08
16.	pangnokos (squid jigger)	36.58	32.73	28.67	44.06	35.20±13.29	20.63-66.76
17.	panggal (crab pot)	1.44	1.29	0.75	0.91	1.66±0.98	0.75-4.16
	Mean income per trip	103.26	96.49	93.87	94.51	89.7	78.44-105.15
	per gear for all geartypes						
B. Fishing technique							
1.	gango (miracle hole)	90	102.17	77.66	168	121.66±51.6	66-227.67
2.	panginhas (gleaning)	30.17	36.61	17.32	13.79	26.95±8.05	13.79-36.61
3.	sikop (use of barehands)	22.47	17.14	19.4	17.91	37.34±20.21	17.14-76.26
4.	sulo (torch)	62.51	38.27	39.36	12.47	45.89±20.45	12.47-79.77
	Mean income per trip						
	per gear for all fishing techniques	51.29	48.55	38.44	57.97	57.97	38.44-90.18

Table 12. Catch Per Unit Effort (CPUE) for each gear type used in Bais Bay, compared with other places.
 Data on Bayawan, Bindoy, Bohol, Ronda and Siquijor taken from Luchavez, unpub. data. CPUE is in kg/trip.

Gear Type	CPUE					
	Bais Bay	Bindoy	Bayawan	Bohol	Ronda	Siquijor
Hulbot	8.25					
Sahid	5.73					
Tapsay	4.27					
Bunsod	3.62					
Pukot	3.60	11.4	7.0	7.8	27.3	14.4
Pana	3.21	5.0		4.7	4.5	3.1
Katay	2.68	5.7	9.4	5.5	6.1	
Pasol	1.98	8.9	4.2	5.9	11.2	3.5
Pangnokos	0.86					

Table 13. Total length (TL) in cm at sexual maturity of some important species harvested from Bais Bay from January to October 1992.

Values in parentheses are standard length (SL) in cm. The commonly caught sizes in Bais Bay and elsewhere are given and the maximum size recorded. Data on maximum size and common sizes caught elsewhere are taken from Rau and Rau (1980) and Schroeder (1980).

Species	Total length of fish with gonad stages				Reprod. Season
	I-VII		Sexually mature (V-VI)		
	Male	Female	Male	Female	
<i>Siganus canaliculatus</i> (danggit)	10.6-21.6 (8.3-16.4)	11.5-22.2 (8.5-16.5)	10.6-17.5 (8.3-13.0)	14.6-19.8 (11.0-15.0)	Jan-July
<i>Terapon jarbua</i> (buga-ong)	12.5-19.5 (10.0-15.0)	12.5-24.8 (10.0-19.0)	-	15.5-24.8 (11.6-19.0)	Feb-July
<i>Liza</i> sp. (gisaw)	12.0-24.0 (9.5-18.5)	11.5-24.8 (9.0-19.0)	16.8-19.2 (13.0-14.5)	15.7-22.8 (12.0-17.5)	Jan-July
<i>Leiognathus splendens</i> (danglay)	8.5-15.5 (6.5-11.5)	9.8-15.5 (7.5-11.5)	10.2-12.9 (7.5-9.0)	10.0-13.2 (7.2-9.5)	Jan-May, Jul
<i>Gerres abbreviatus</i> (bag-angan)	11.5-17.0 (8.5-12.5)	11.5-19.5 (8.5-15.0)	-	17.0-19.5 (12.5-15.0)	March, July
<i>Gazza minuta</i> (piampe)	8.5-13.0 (6.5-9.5)	8.5-16.5 (6.5-12.5)	11.3-13.0 (8.5-10.0)	11.0-16.5 (8.2-12.5)	Jan, Mar, May, Jun
<i>Gerres filamentosus</i> (samulok/lawihan)	10.5-16.5 (8.0-12.0)	9.5-19.0 (7.0-15.0)	-	14.9-15.4 (10.5-11.0)	Jan-March, June-July
<i>Nemipterus</i> sp. (lagaw)					
<i>Gerres</i> sp.(oyena) (kasbo)	8.0-14.5 (5.7-11.0)	8.0-16.5 (5.7-12.0)	14.5-16.5 (11.0-12.0)	-	Jan, Mar-Jun
<i>Sardinella</i> sp. (malangsi)	-	10.0-14.4 (8.0-11.5)	-	10.0-11.5 (8.0-9.0)	Jan, May June
<i>Stolephorus</i> sp. (bolinao)	6.5-8.6 (6.3-6.4)	7.1-8.6 (7.0-6.4)	7.4-8.0 (6.0-7.0)	7.7-8.3 (6.3-7.0)	January
<i>Upeneus sulphureus</i> (hinok)					

Table 13. (Continued)

Species	Maximum Length	Commonly Caught Size Bais Bay	Commonly Caught Size Elsewhere
<i>Siganus canaliculatus</i> (danggit)	20	8-18	10-15
<i>Terapon jarbua</i> (buga-ong)	30	12-20	15-20
<i>Liza</i> sp. (gisaw)	35	12-20	25
<i>Leiognathus splendens</i> (danglay)	14	7-13.5	6-12
<i>Gerres abbreviatus</i> (bag-angan)	23	12-18	12-16
<i>Gazza minuta</i> (piampe)	15	8-14	8
<i>Gerres filamentosus</i> (samulok/lawihan)	25	9-18	15
<i>Nemipterus</i> sp. (lagaw)	30	11-18.5	15-25
<i>Gerres</i> sp.(oyena) (kasbo)	25	8.0-14.5	15
<i>Sardinella</i> sp. (malangsi)	15	10-14	12
<i>Stolephorus</i> sp. (bolinao)	12	6-11	10
<i>Upeneus sulphureus</i> (hinok)	23	9-16.5	12-15

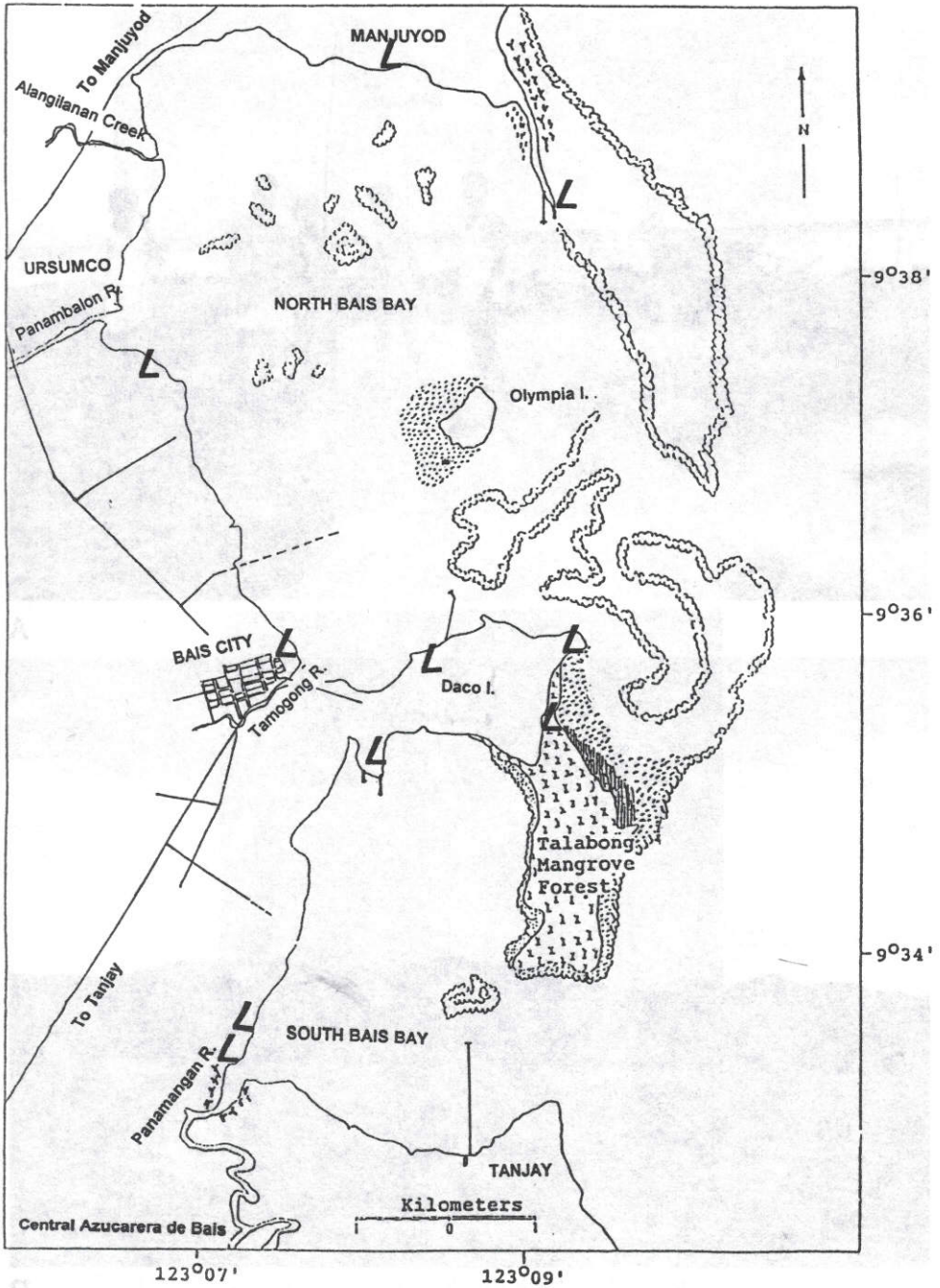


Figure 1. Map of Bais Bay showing fish landing sites.

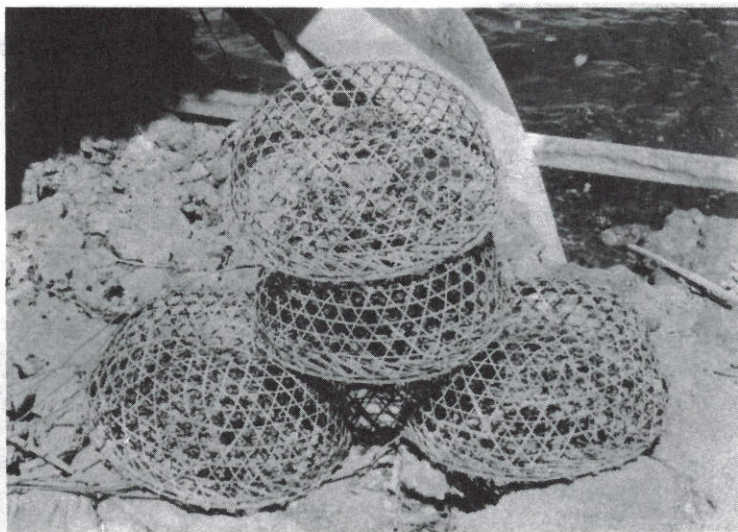


A



B

Figure 2A-B. Five major fishing gears used in Bais Bay.
A. Gill net (Pukot) B. Fish corral (Bunsod)



C



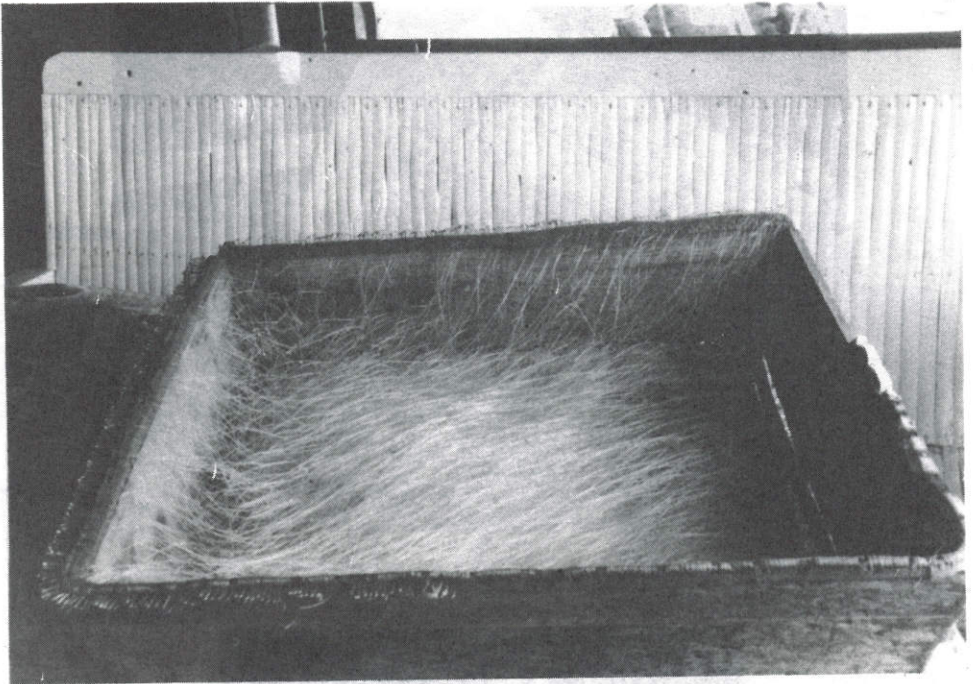
D

Figure 2C-D.

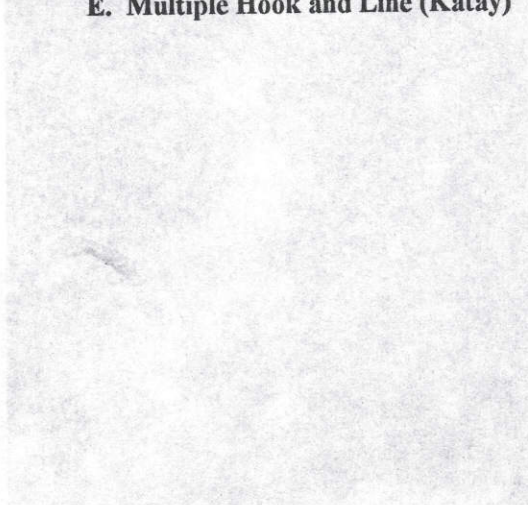
Five major fishing gears used in Bais Bay.

C. Crab Pot (Panggal)

D. Modified Danish Seine (Hulbot)



**Figure 2E. Five major fishing gears used in Bais Bay.
E. Multiple Hook and Line (Katay)**

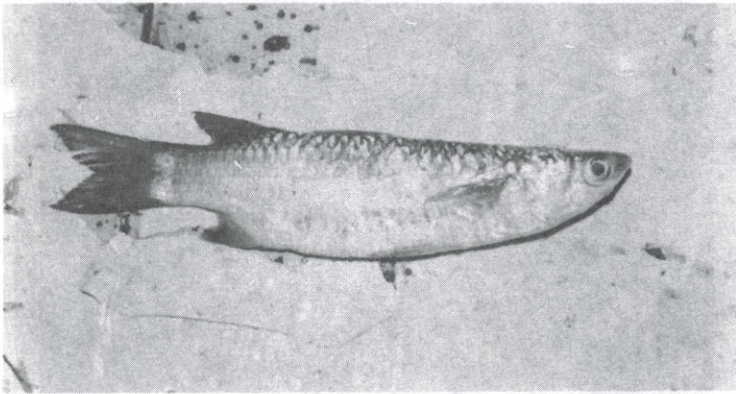


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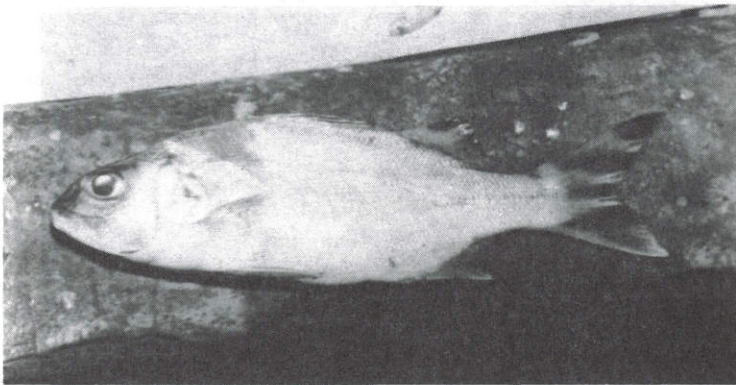
Figure 2E. Five major fishing gears used in Bais Bay.
E. Multiple Hook and Line (Katay)



A



B



C

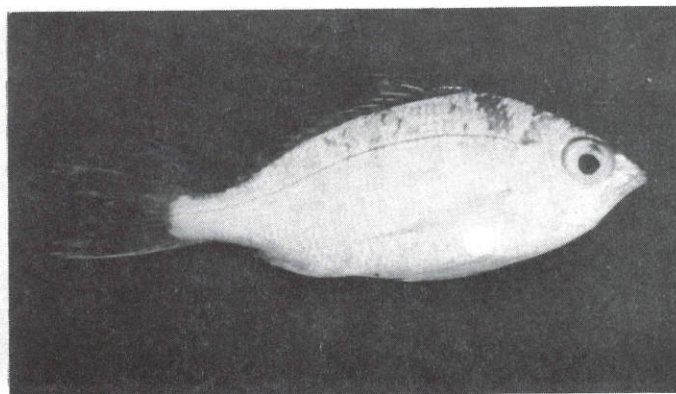
Figure 3A-C. Six most abundant fish species caught in Bais Bay.
A. *Siganus canaliculatus* (danggit)
B. *Liza* sp. (gisaw)
C. *Terapon jarbua* (buga-ong)



D



E



F

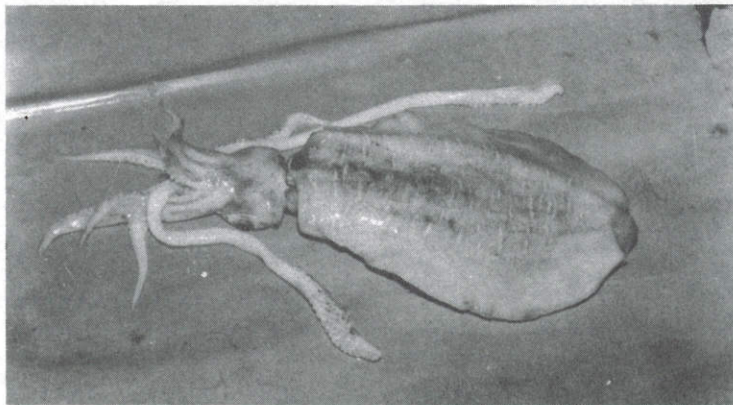
Figure 3D-F. Six most abundant fish species caught in Bais Bay.
D. *Sardinella* sp. (malangsi)
E. *Stolephorus* sp. (bolinao)
F. *Gerres* sp. (kasbo)



A



B



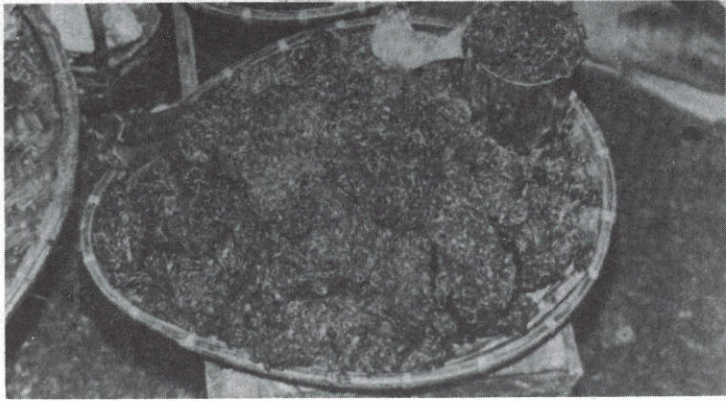
C

Figure 4A-C. Six most abundantly harvested species of invertebrates in Bais Bay.

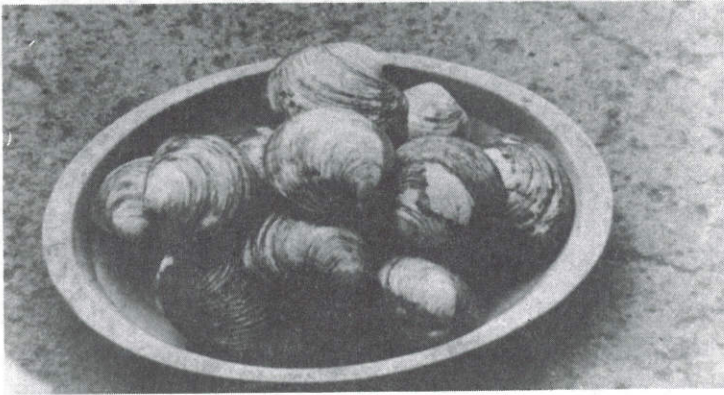
A. *Portunus pelagicus* (lambay)

B. Penaeid shrimps (pasayan)

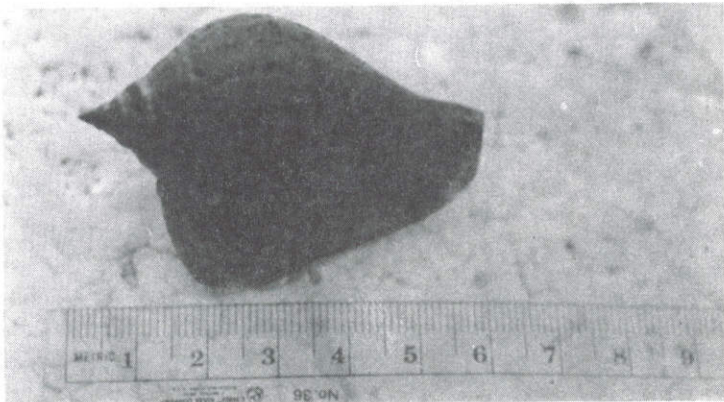
C. *Sepioteuthis* sp. (nokos)



D



E



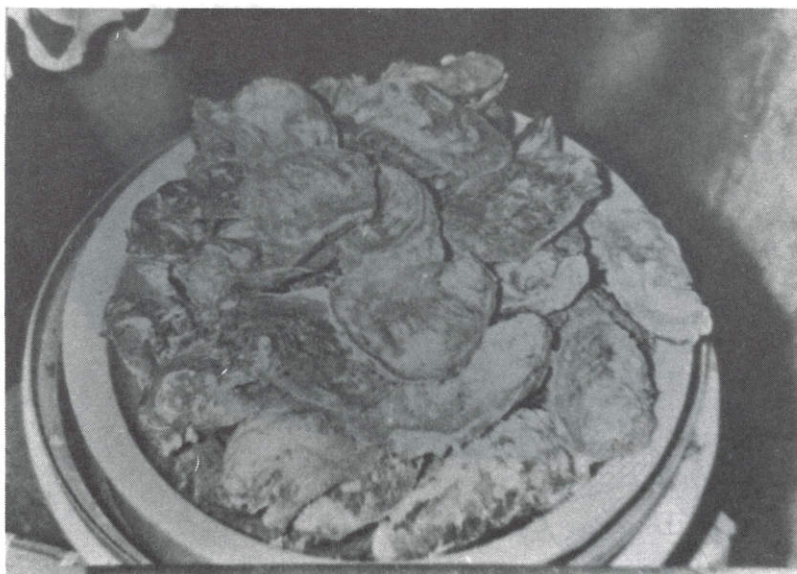
F

Figure 4D-F. Six most abundantly harvested species of invertebrates in Bais Bay.

D. *Dolabella auricularia* eggs (lukot)

E. *Phacoides philippinarum* (imbao)

F. *Strombus canarium* (bungkawel)



A

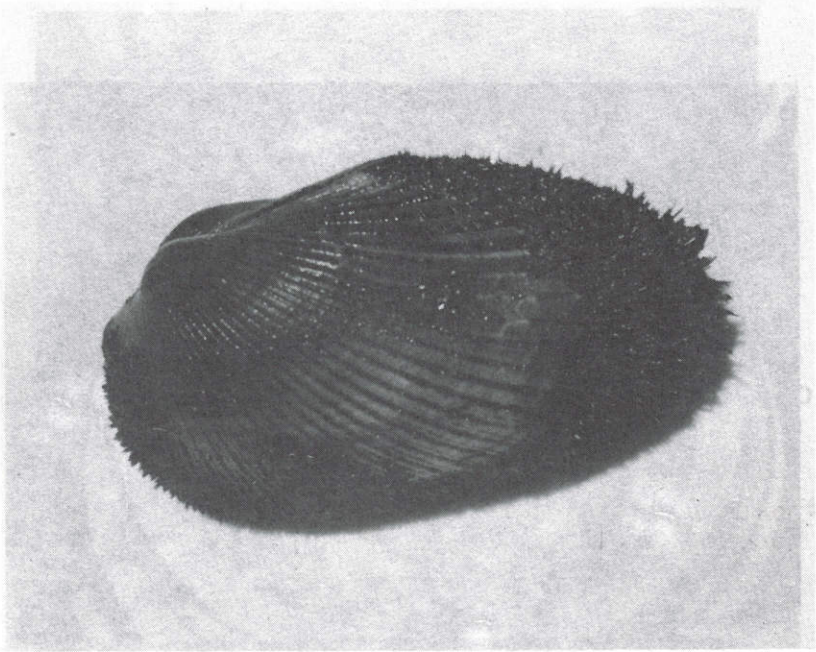


B

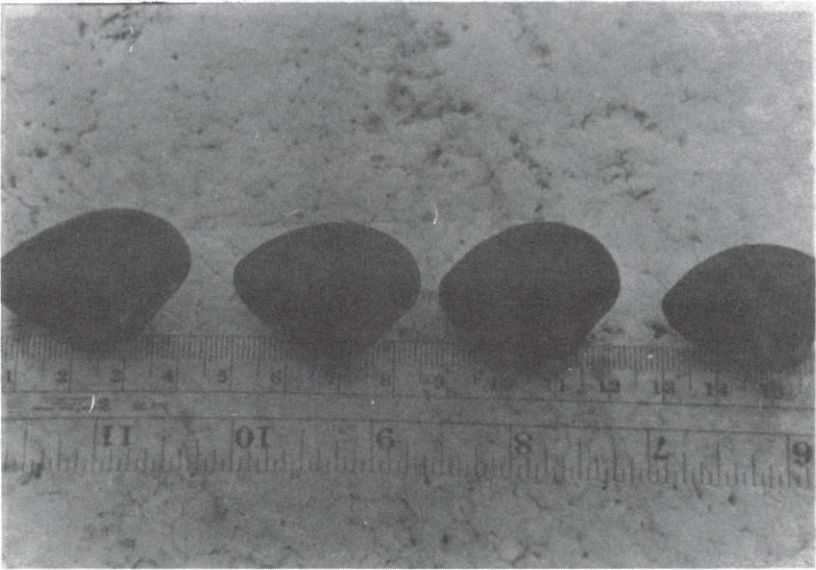
Figure 5A-B. Species of mollusks cultured in Bais Bay.

A. *Crassostrea* sp. (talaba)

B. *Modiolus metcalfei* (tahong)



C



D

Figure 5C-D. Species of mollusks cultured in Bais Bay.

C. *Anadara* sp. (litub)

D. Venereid clam (punao)



Figure 6A-D. Percentage composition of catches by gear and technique.

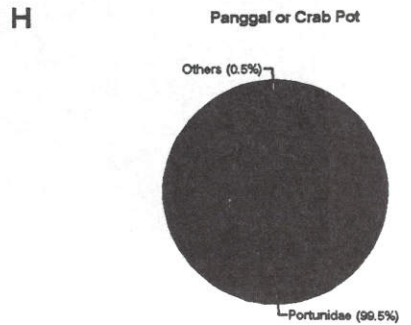
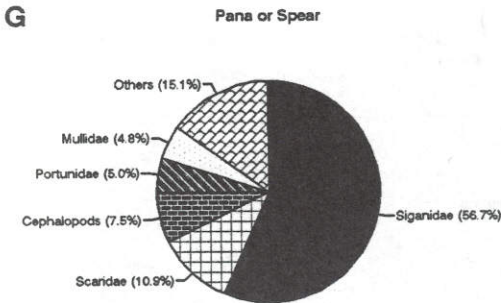
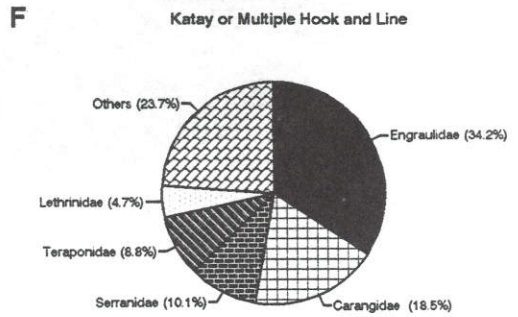
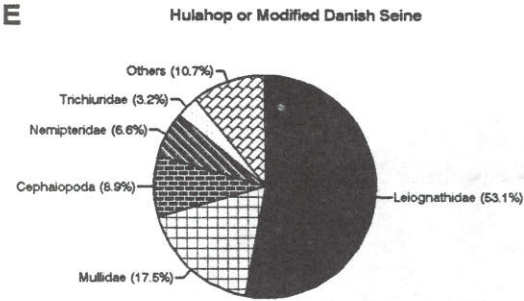


Figure 6E-H. Percentage composition of catches by gear and technique.

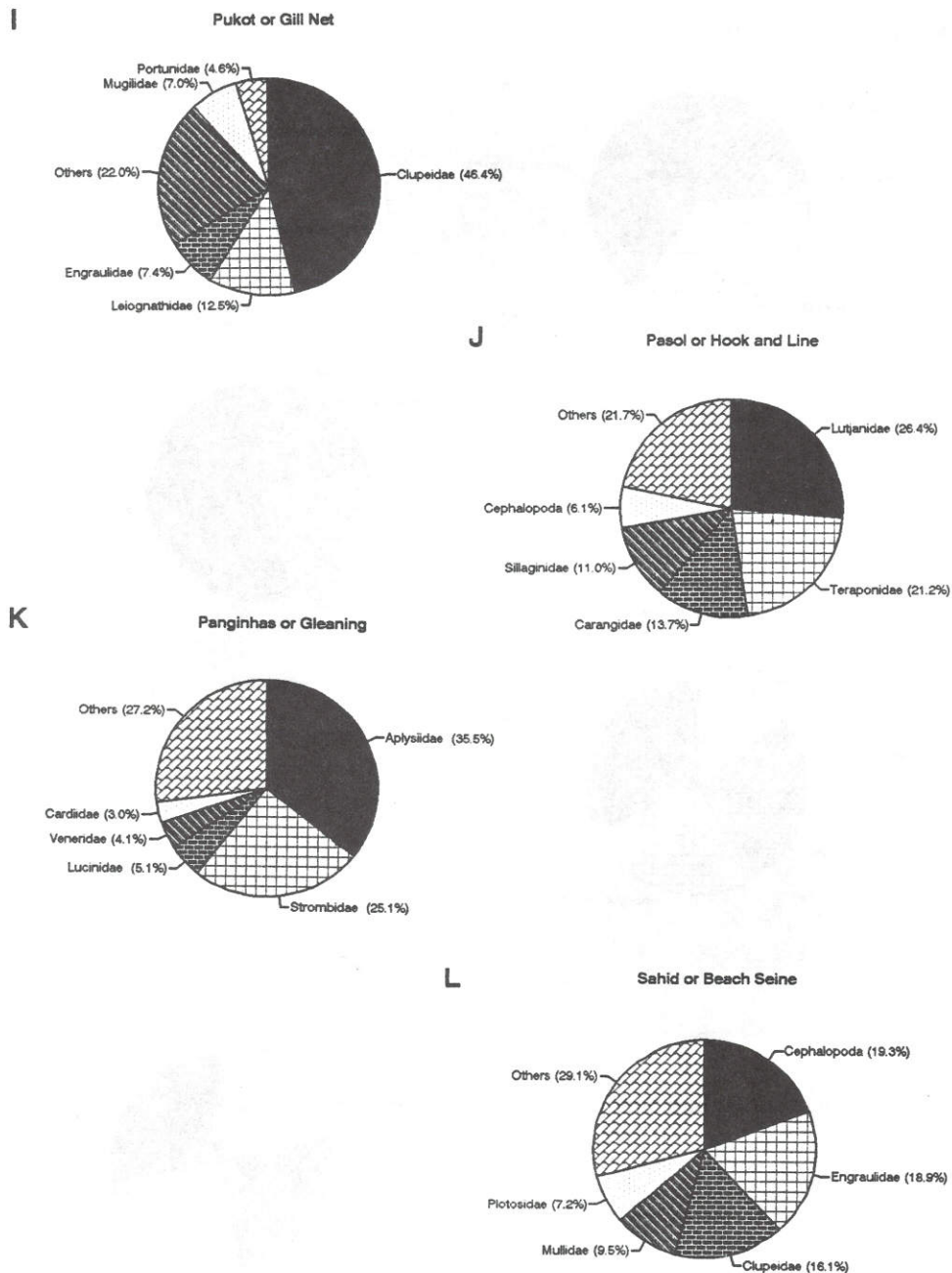
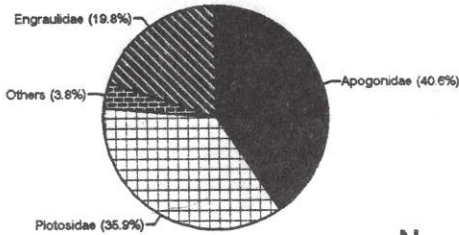


Figure 6I-L. Percentage composition of catches by gear and technique.

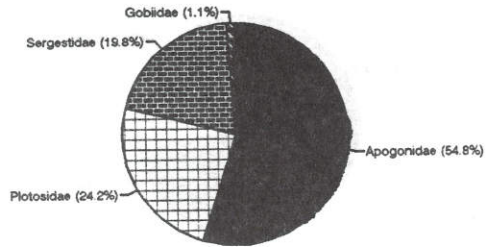
M

Sabinet or Fish Net



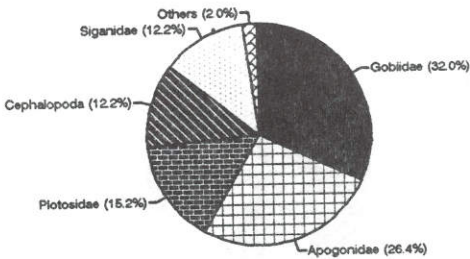
N

Sibot or Dip Net



O

Sikpaw or Dip Net



P

Sulo or Torch

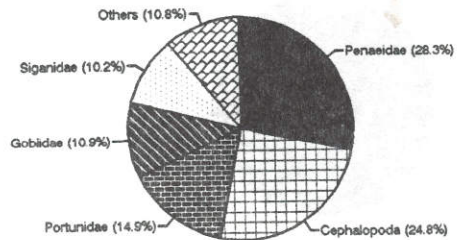


Figure 6M-P. Percentage composition of catches by gear and technique.

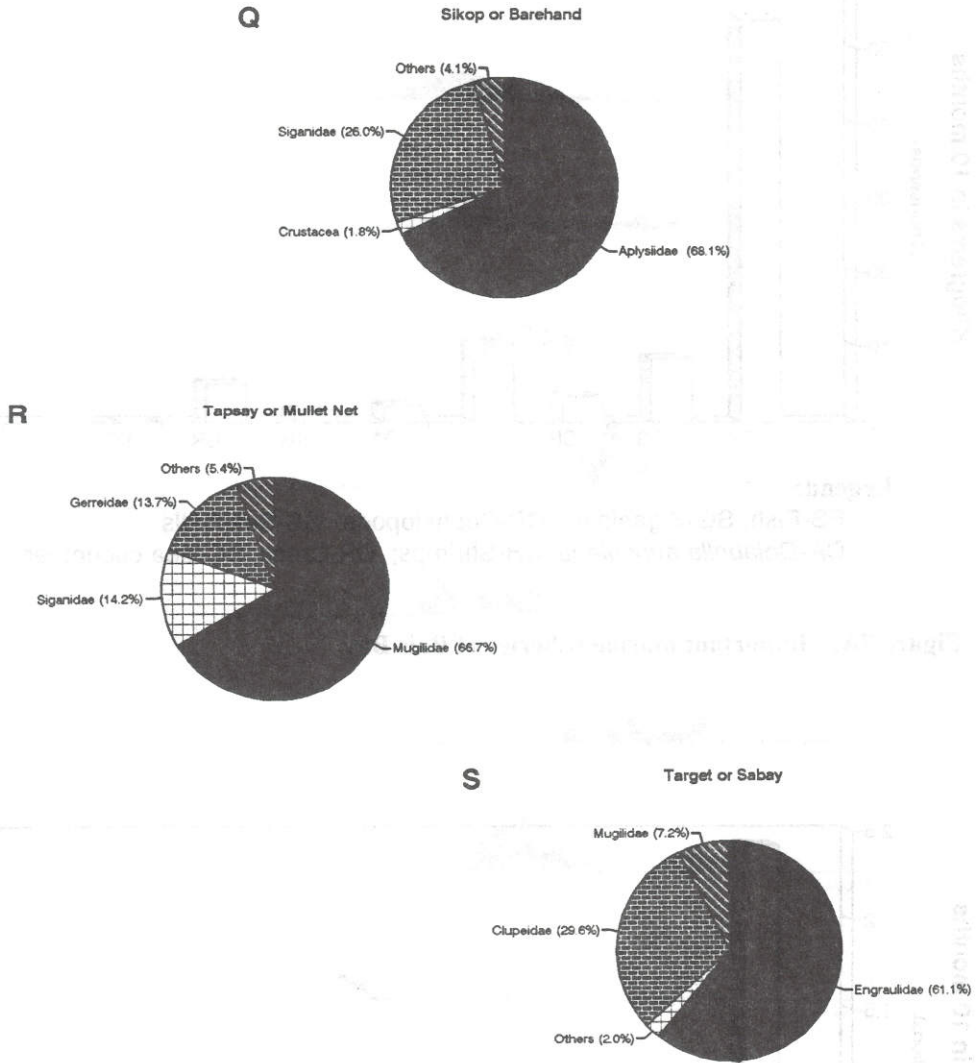
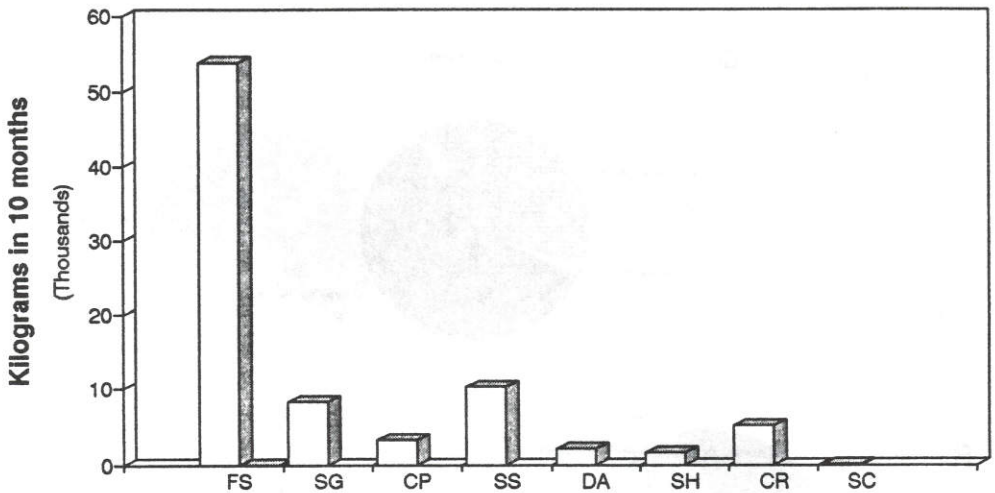


Figure 6Q-S. Percentage composition of catches by gear and technique.



Legend:

FS-Fish; SG-Siganidae; CP-Cephalopods; SS-Seashells
 DA-*Dolabella auricularia*; SH-Shrimps; CR-Crabs; SC-Sea cucumber

Figure 7A. Important marine fisheries of Bais Bay.

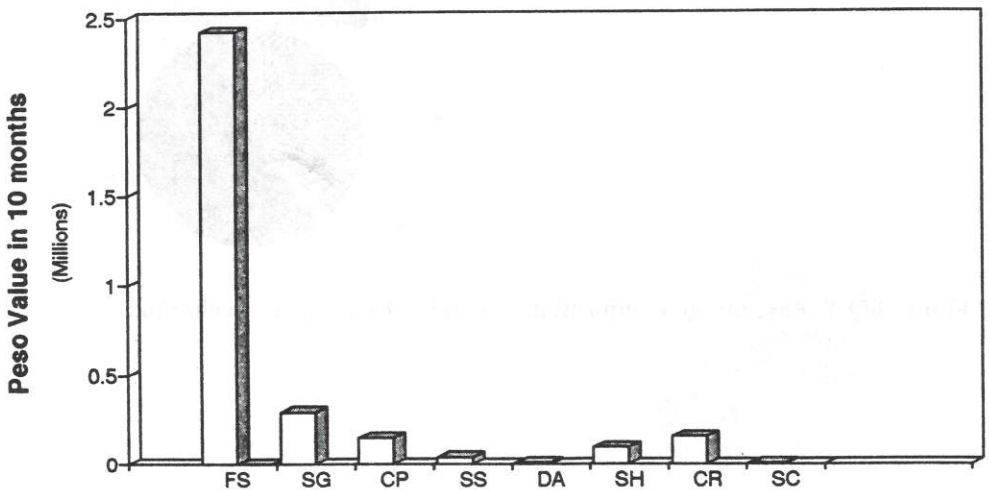


Figure 7B. Peso values of important fisheries in Bais Bay.

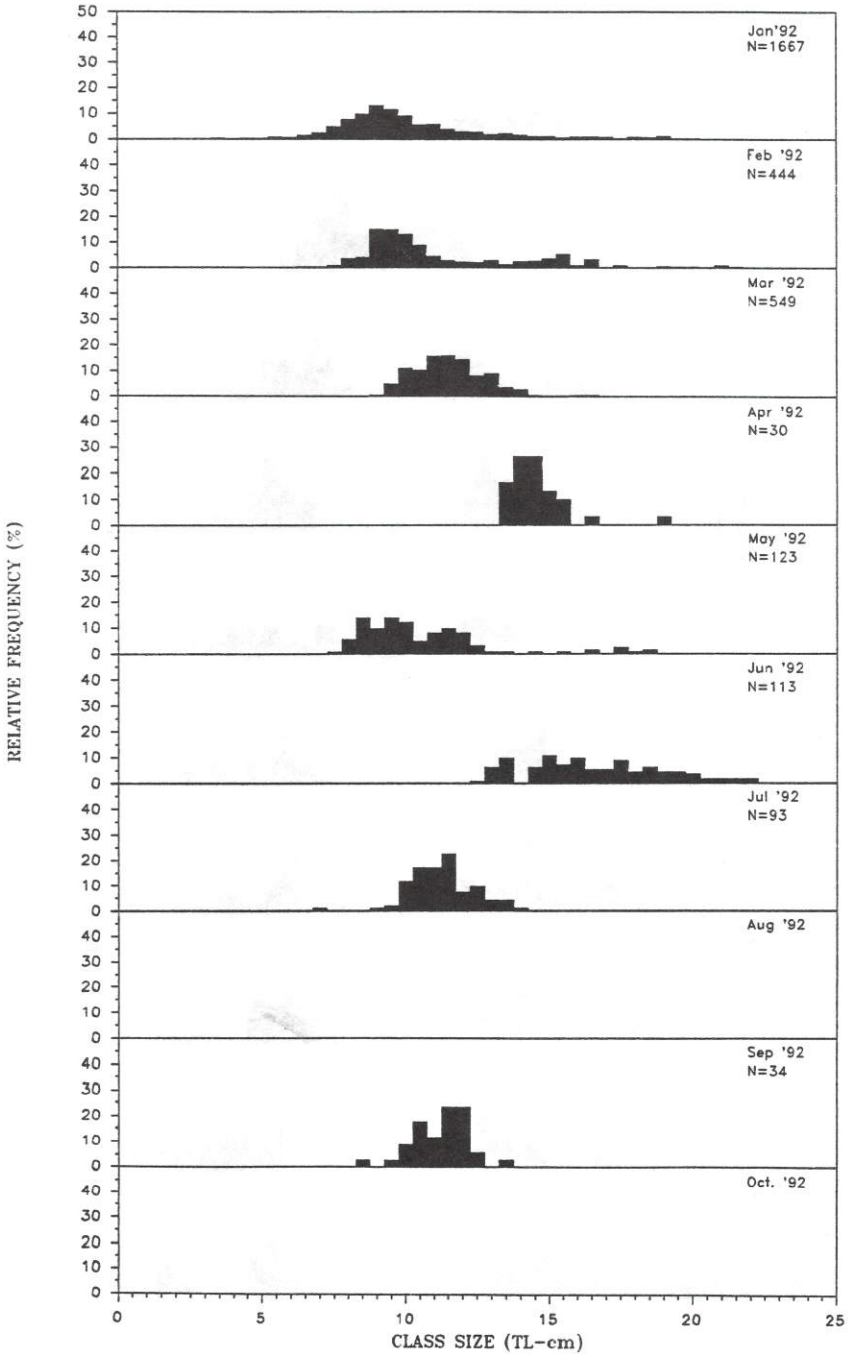


Figure 8A. Length frequency of *Siganus canaliculatus*

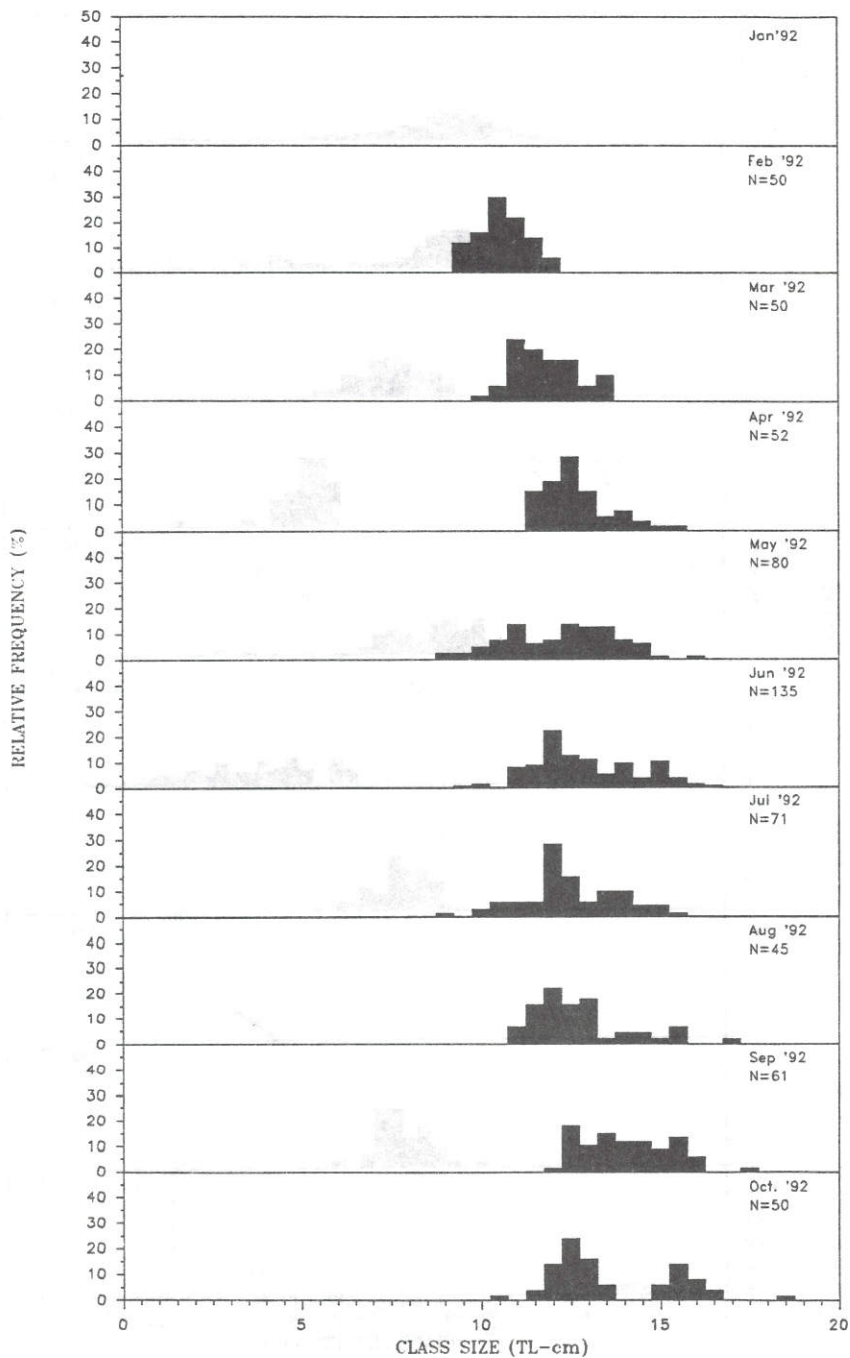


Figure 8B. Length frequency of *Upeneus sulphureus*

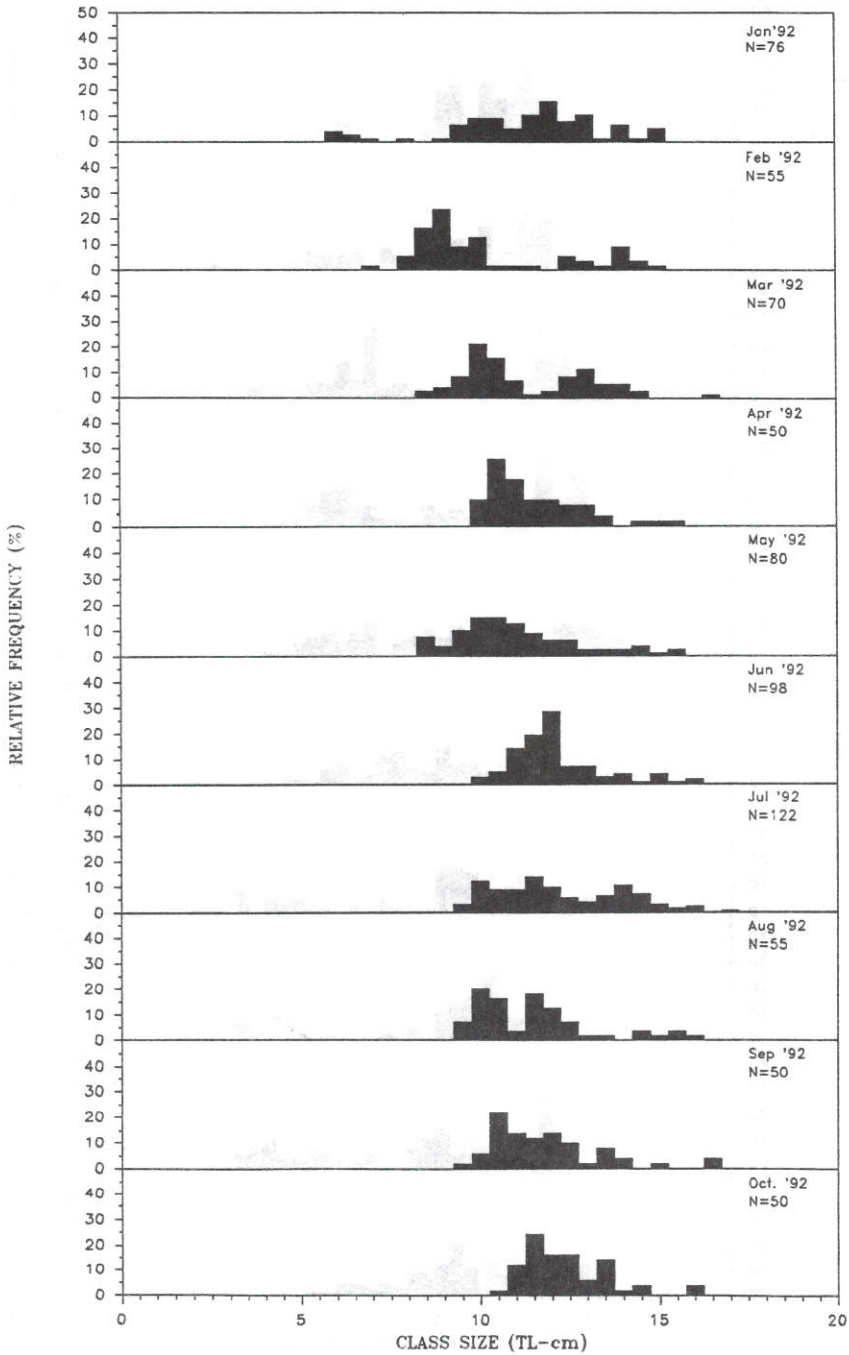


Figure 8C. Length frequency of *Gazza minuta*

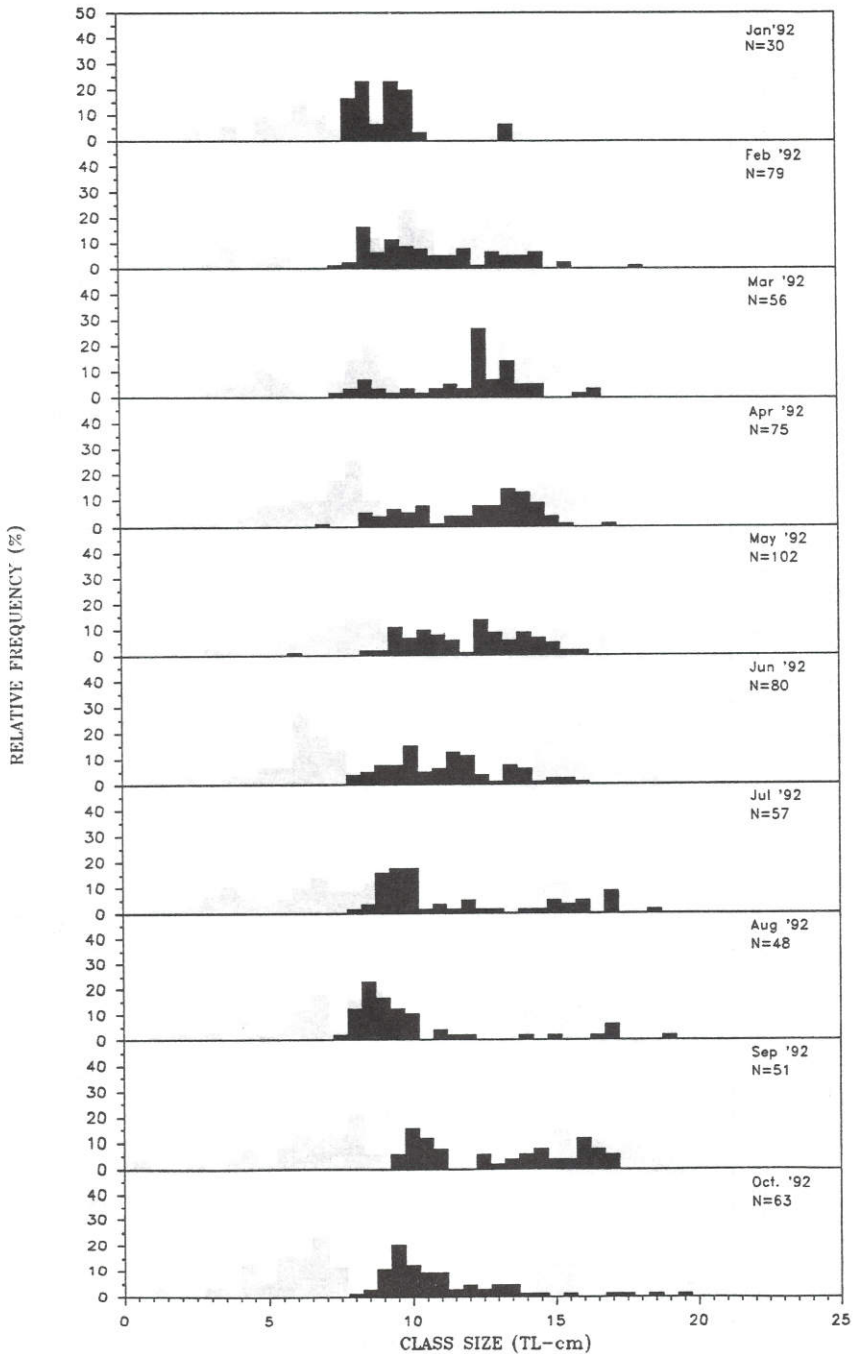


Figure 8D. Length frequency of *Gerres* sp.

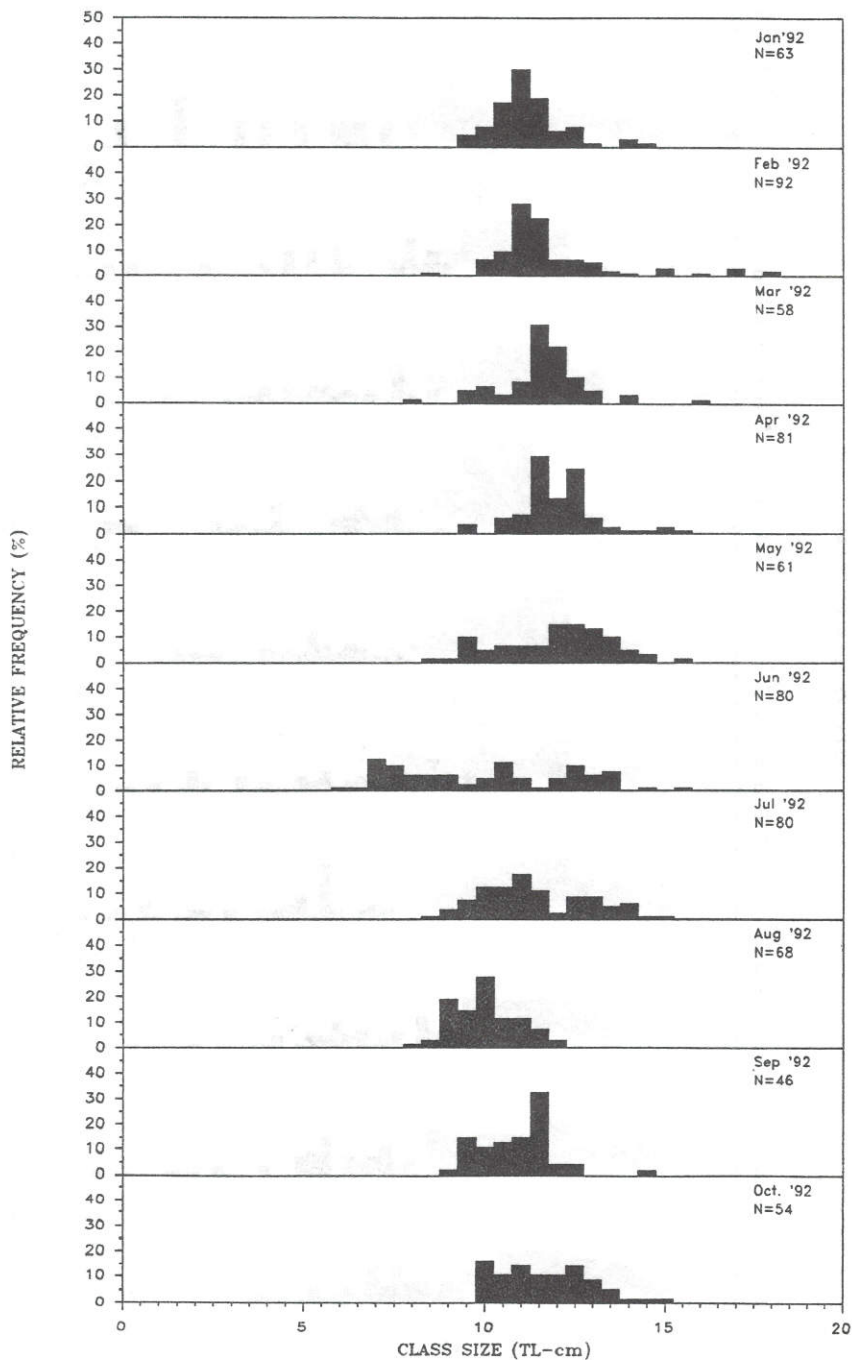


Figure 8E. Length frequency of *Leiognathus splendens*

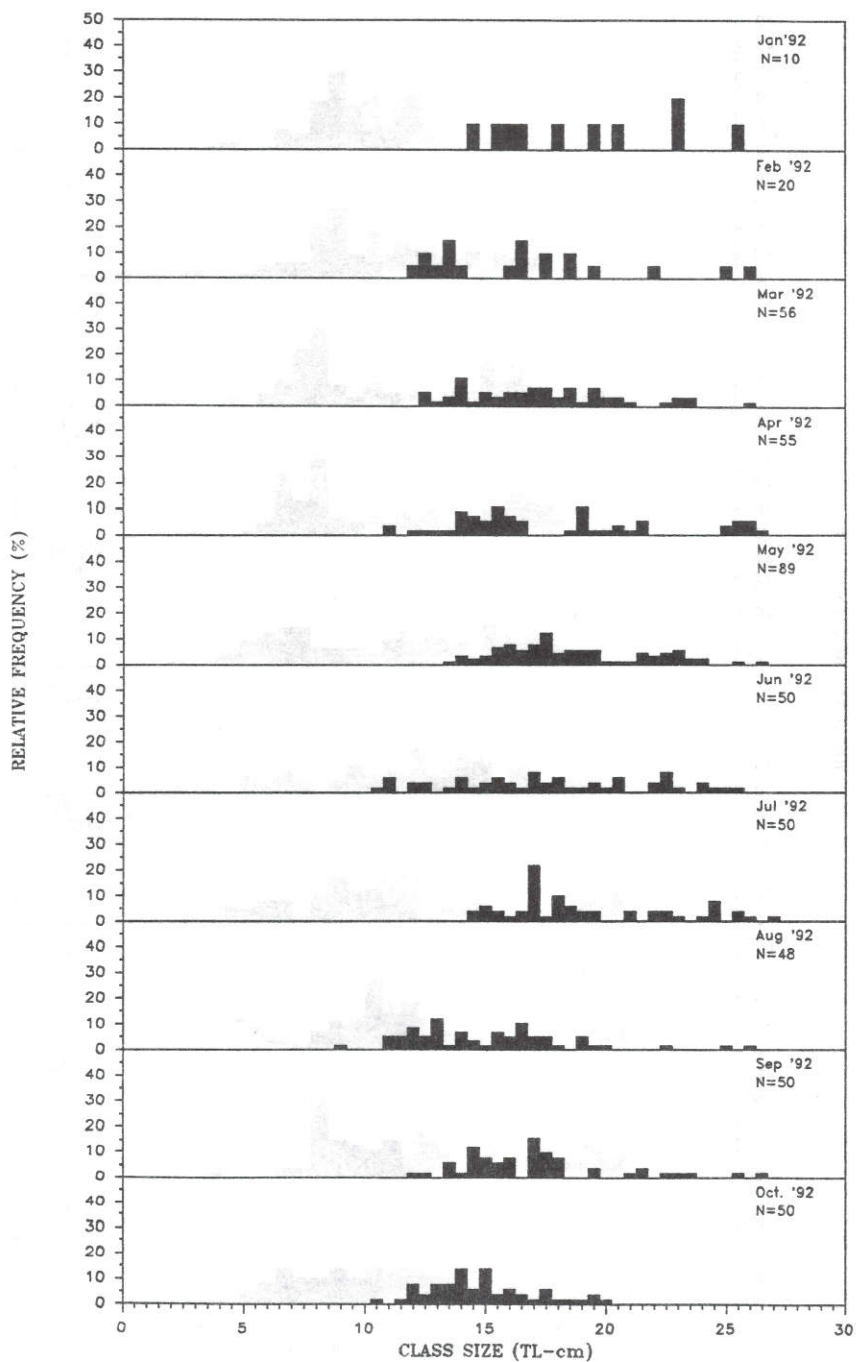


Figure 8F. Length frequency of *Nemipterus* sp.

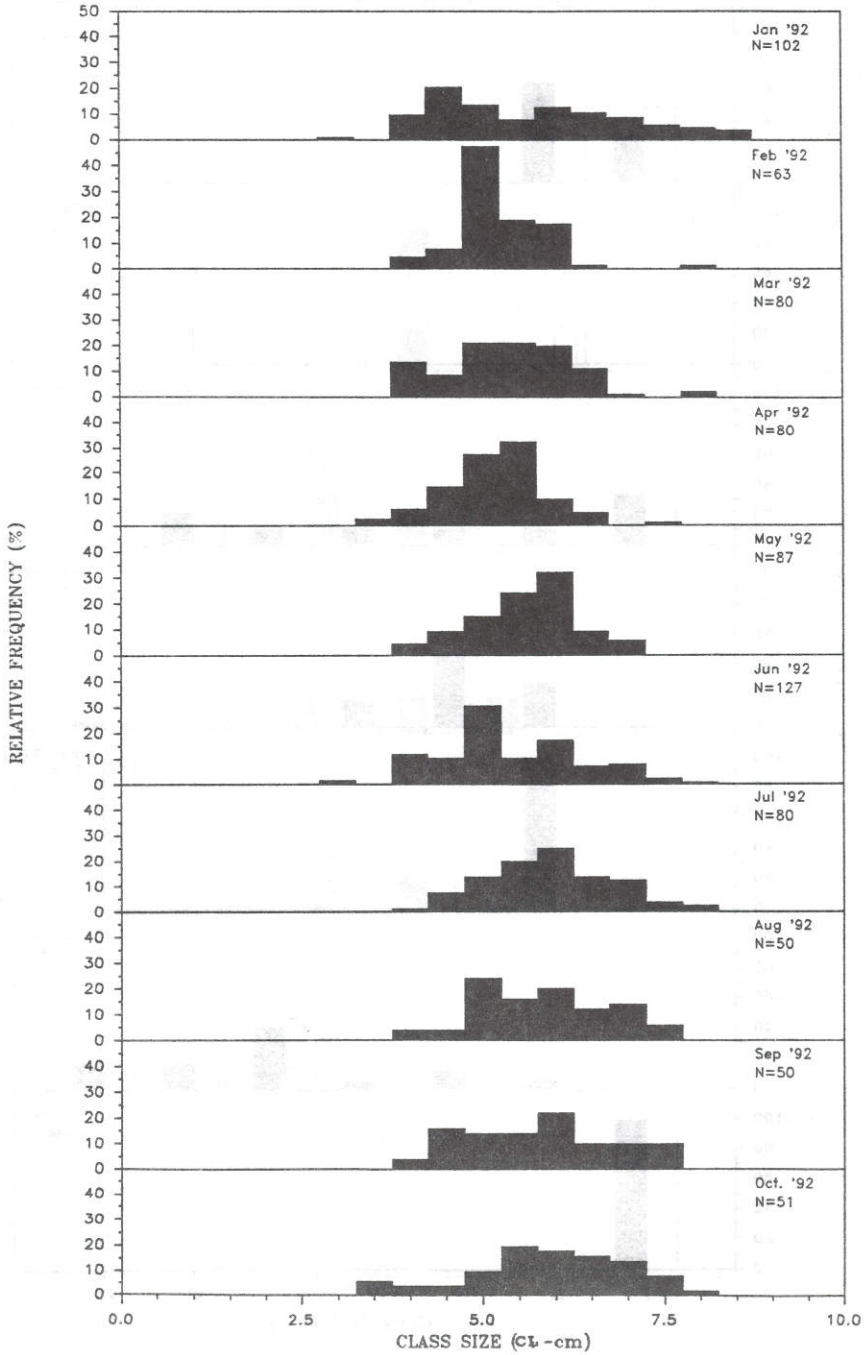


Figure 8G. Length frequency of *Portunus pelagicus*

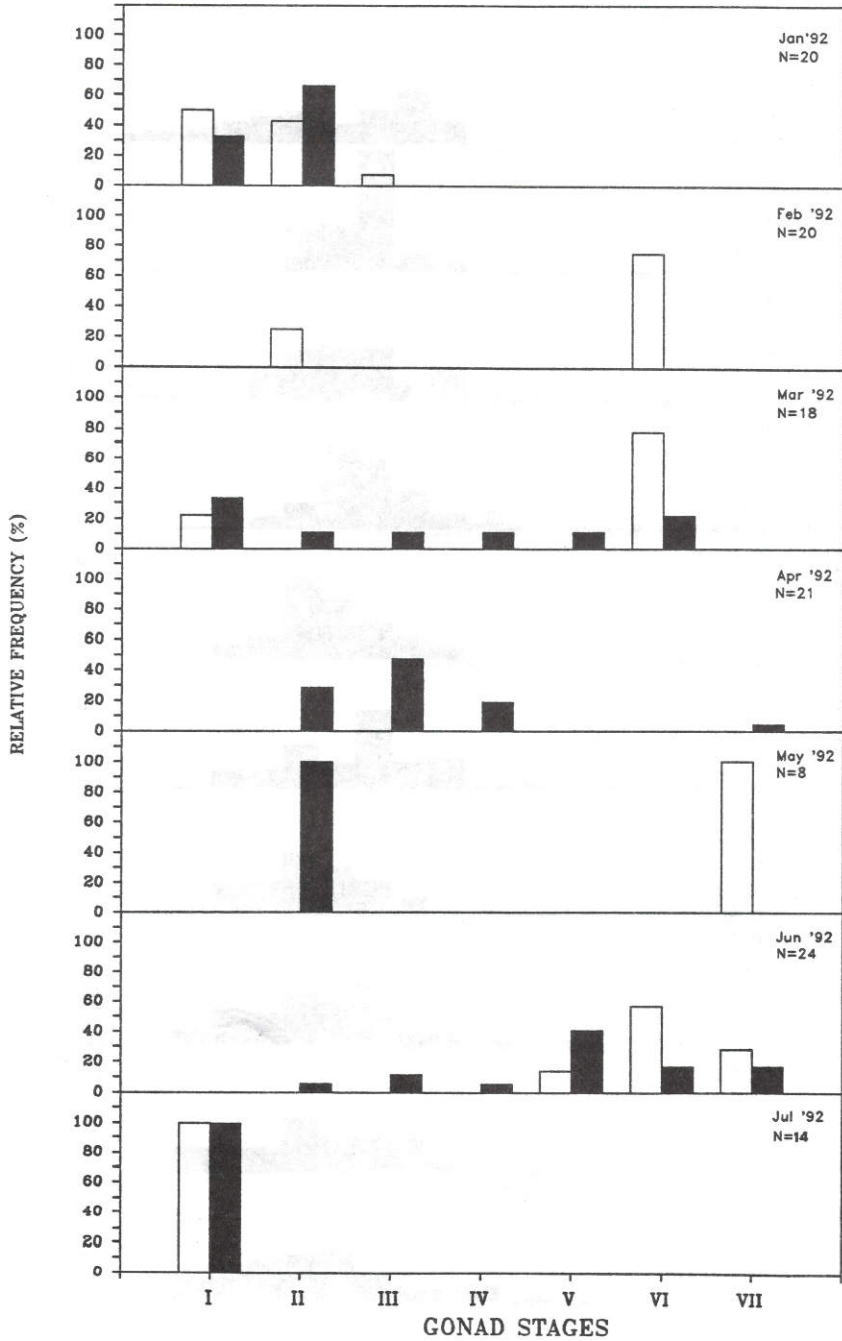


Figure 9A. Gonad stages of *Siganus canaliculatus*.

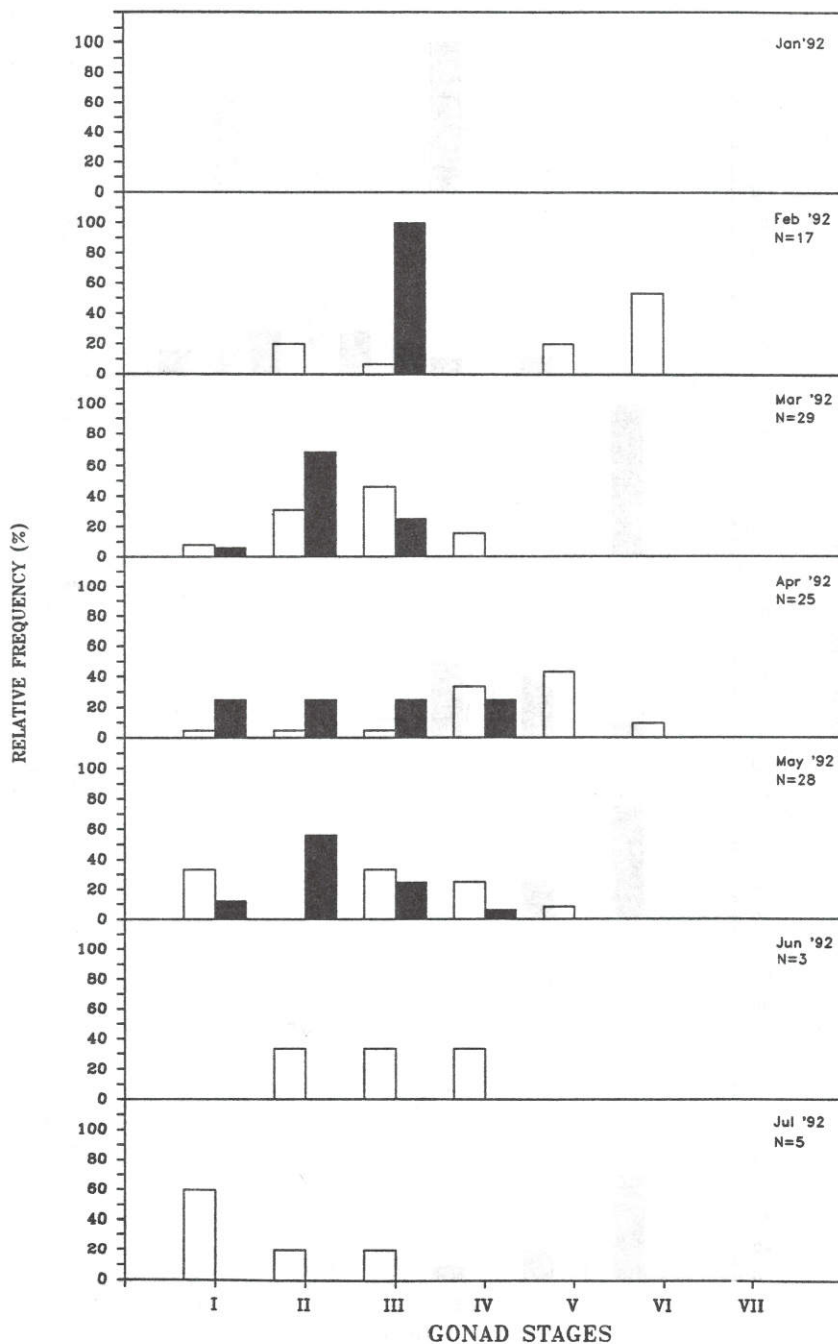


Figure 9B. Gonad stages of *Terapon jarbua*.

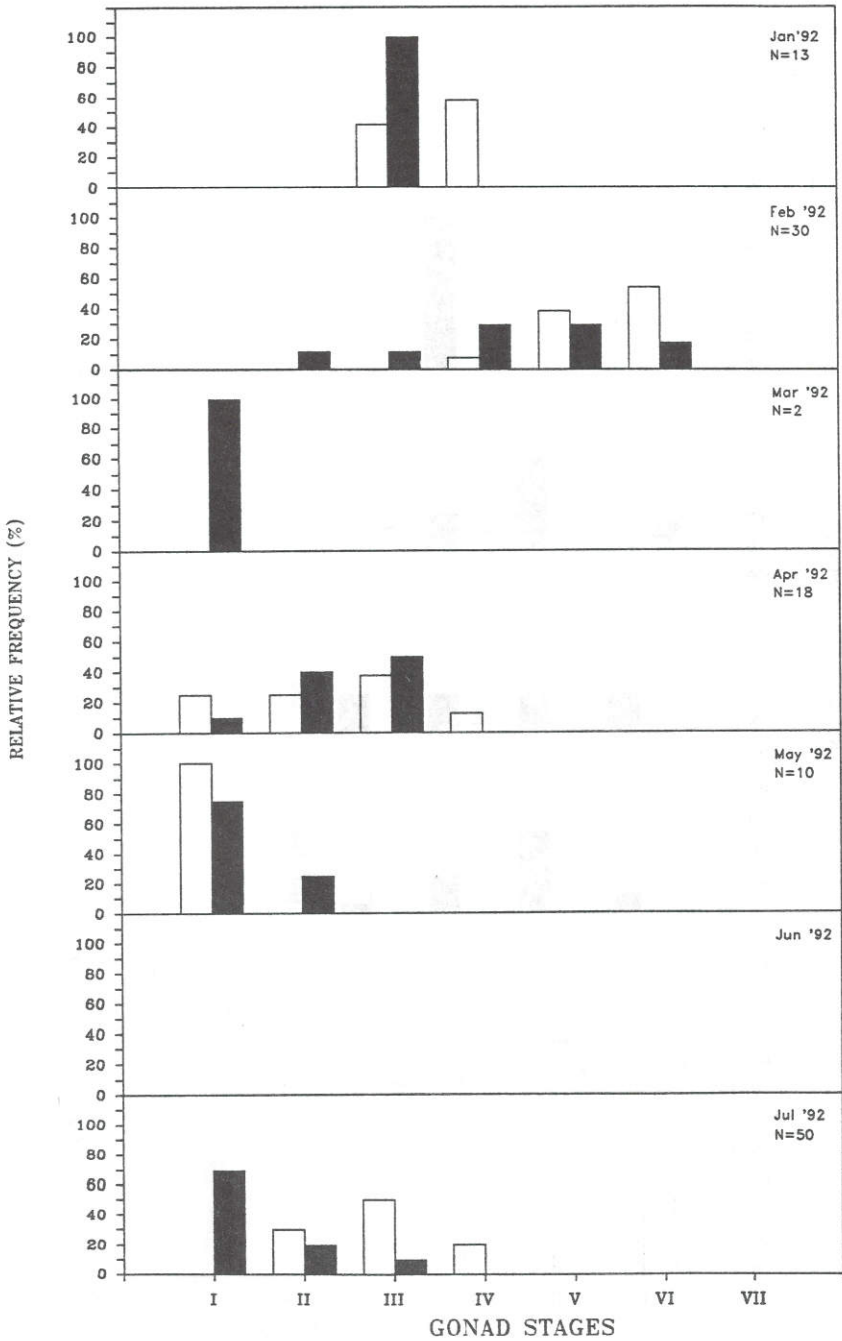


Figure 9C. Gonad stages of *Leiognathus splendens*.

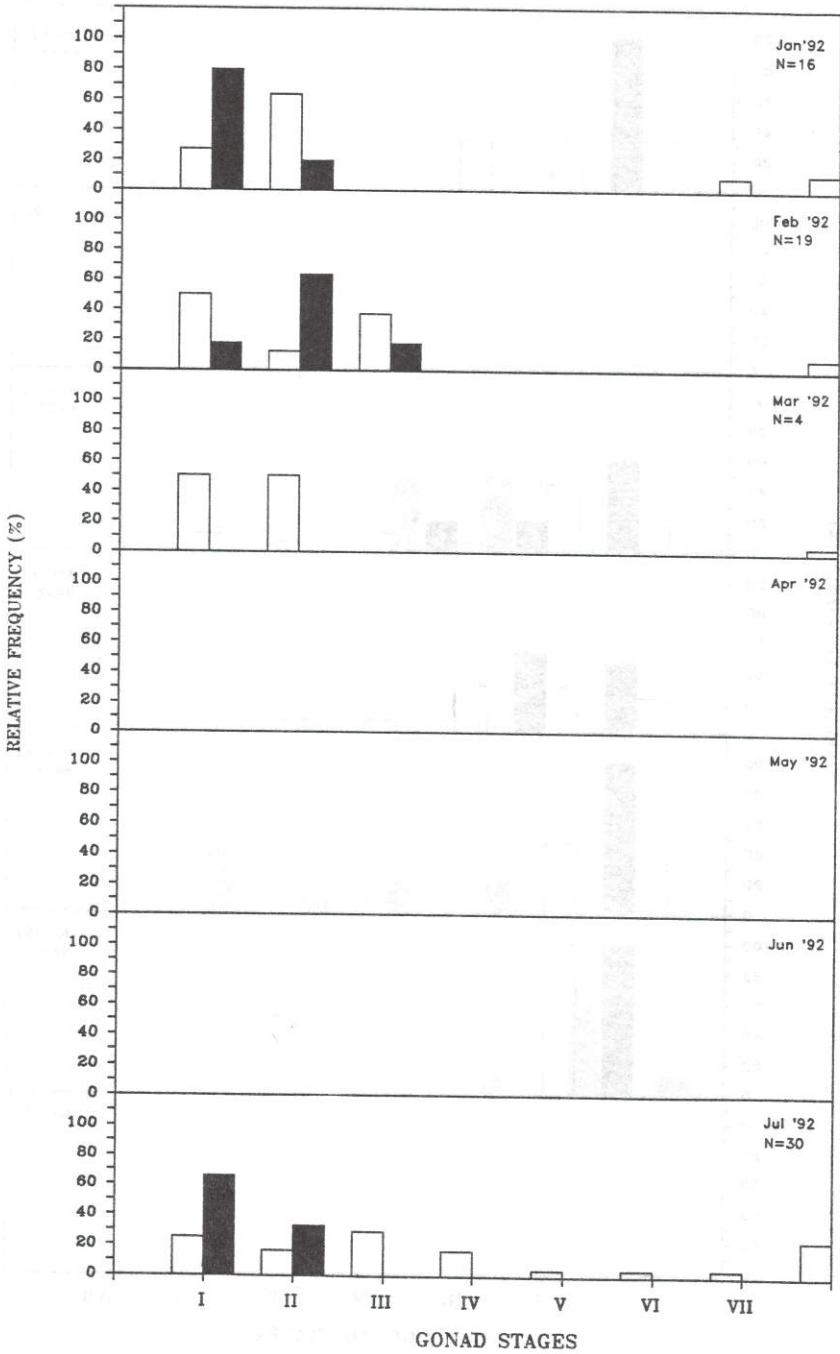


Figure 9D. Gonad stages of *Gerres filamentosus*.

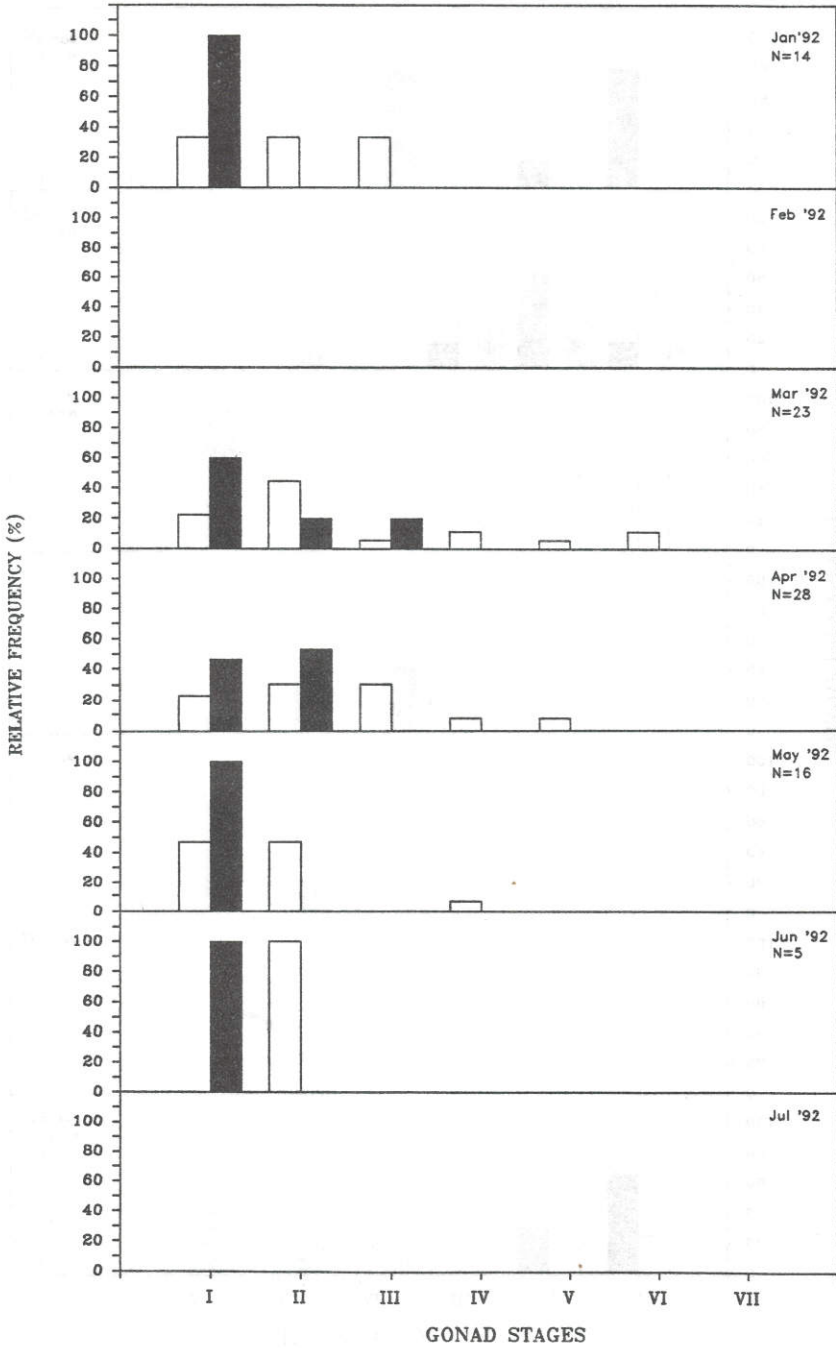


Figure 9E. Gonad stages of *Gerres* sp.

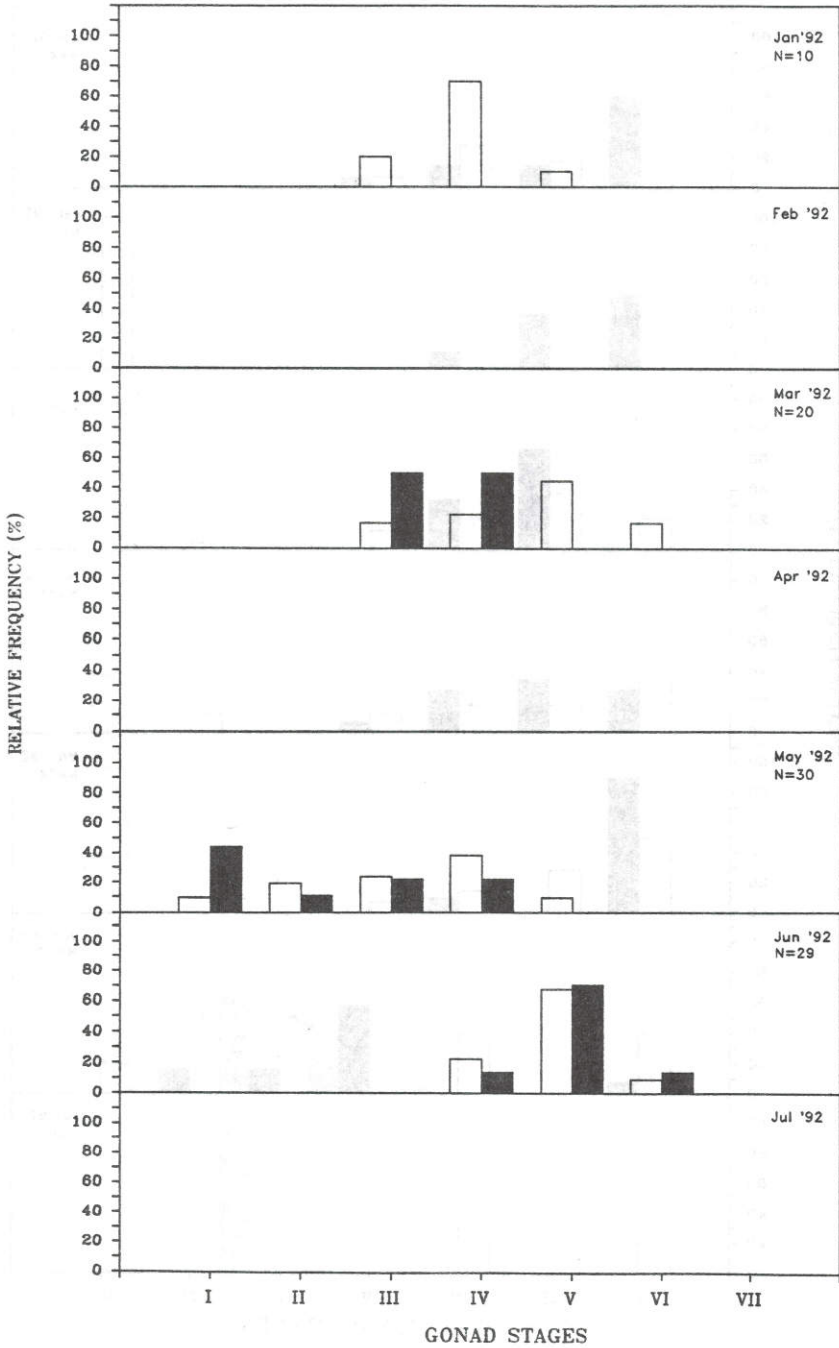


Figure 9F. Gonad stages of *Gazza minuta*

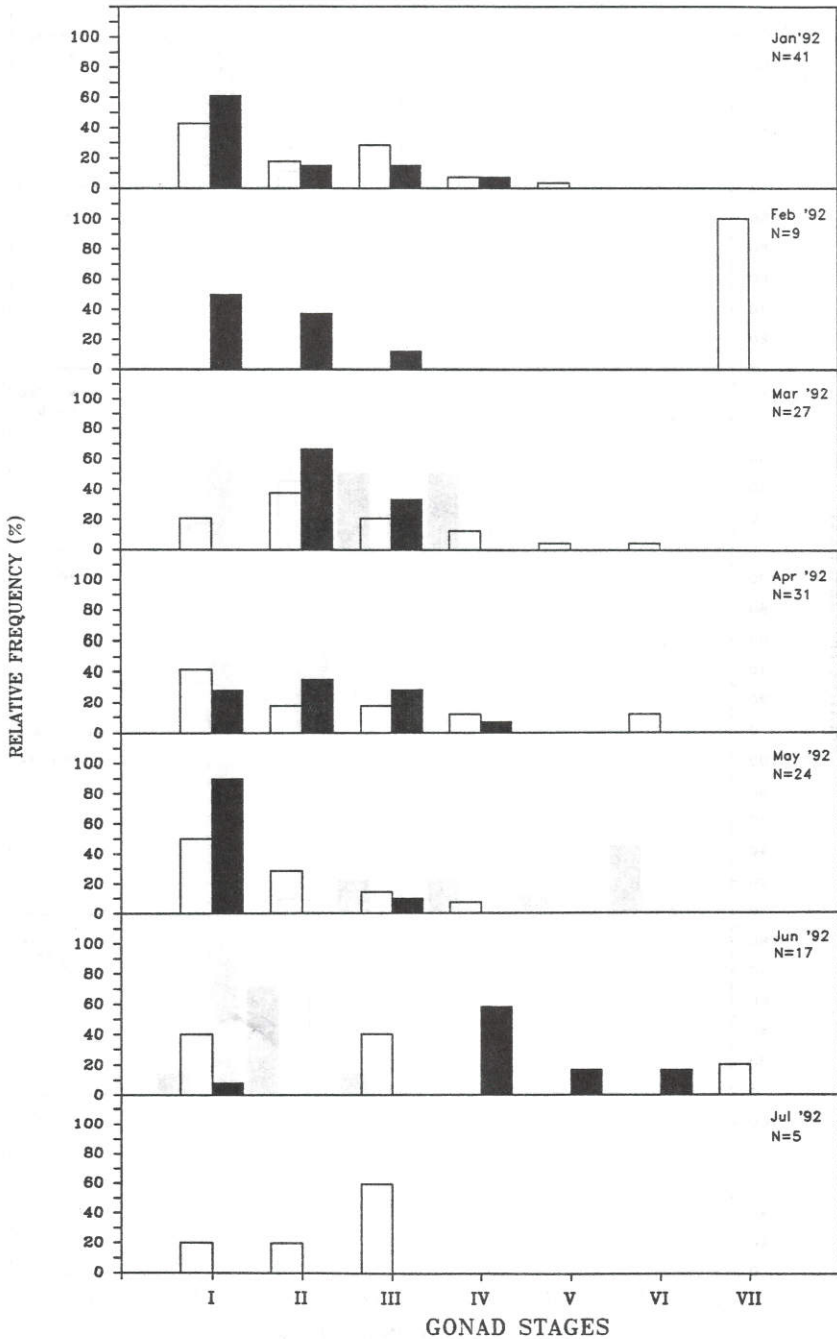


Figure 9G. Gonad stages of *Liza* sp.

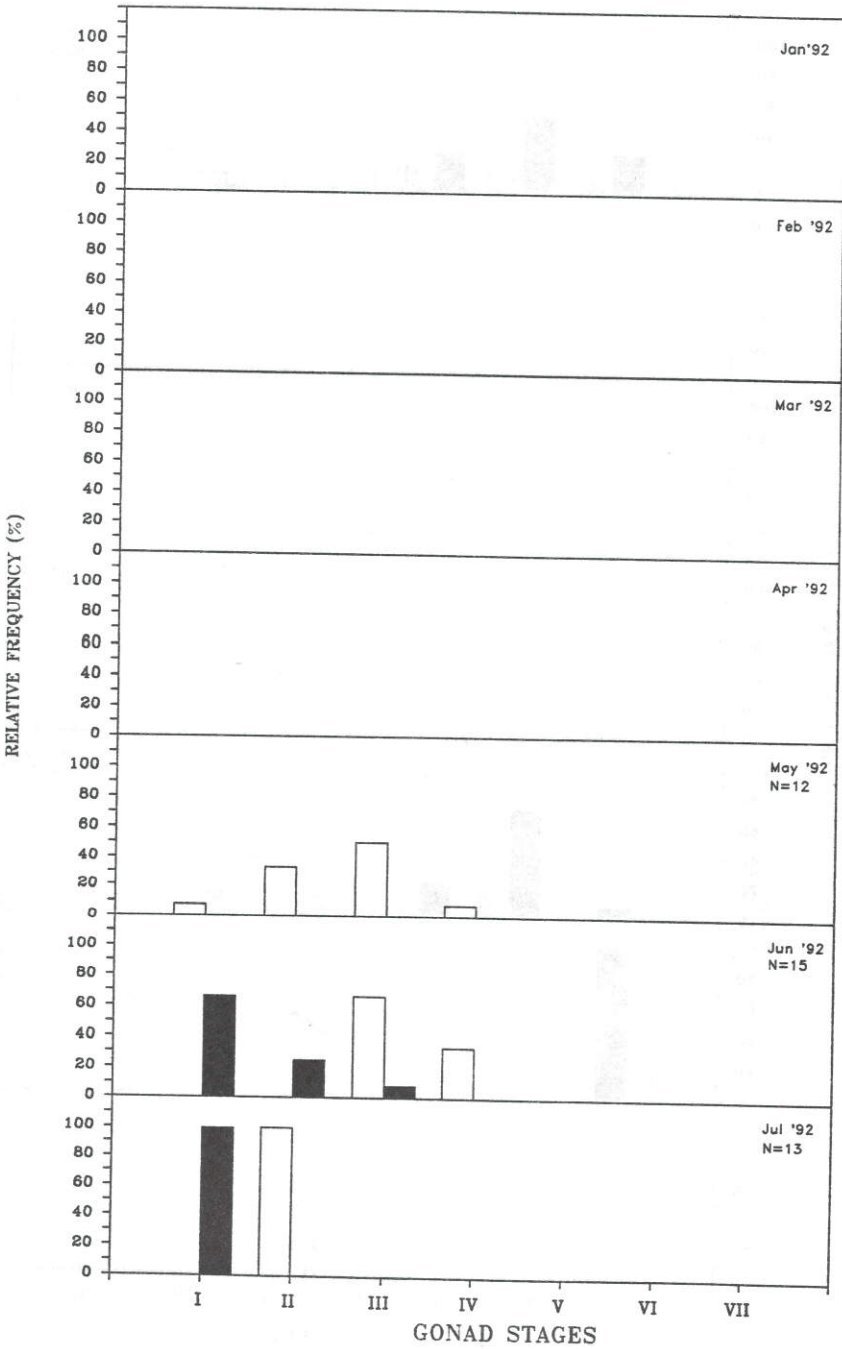


Figure 9H. Gonad stages of *Upeneus sulphureus*

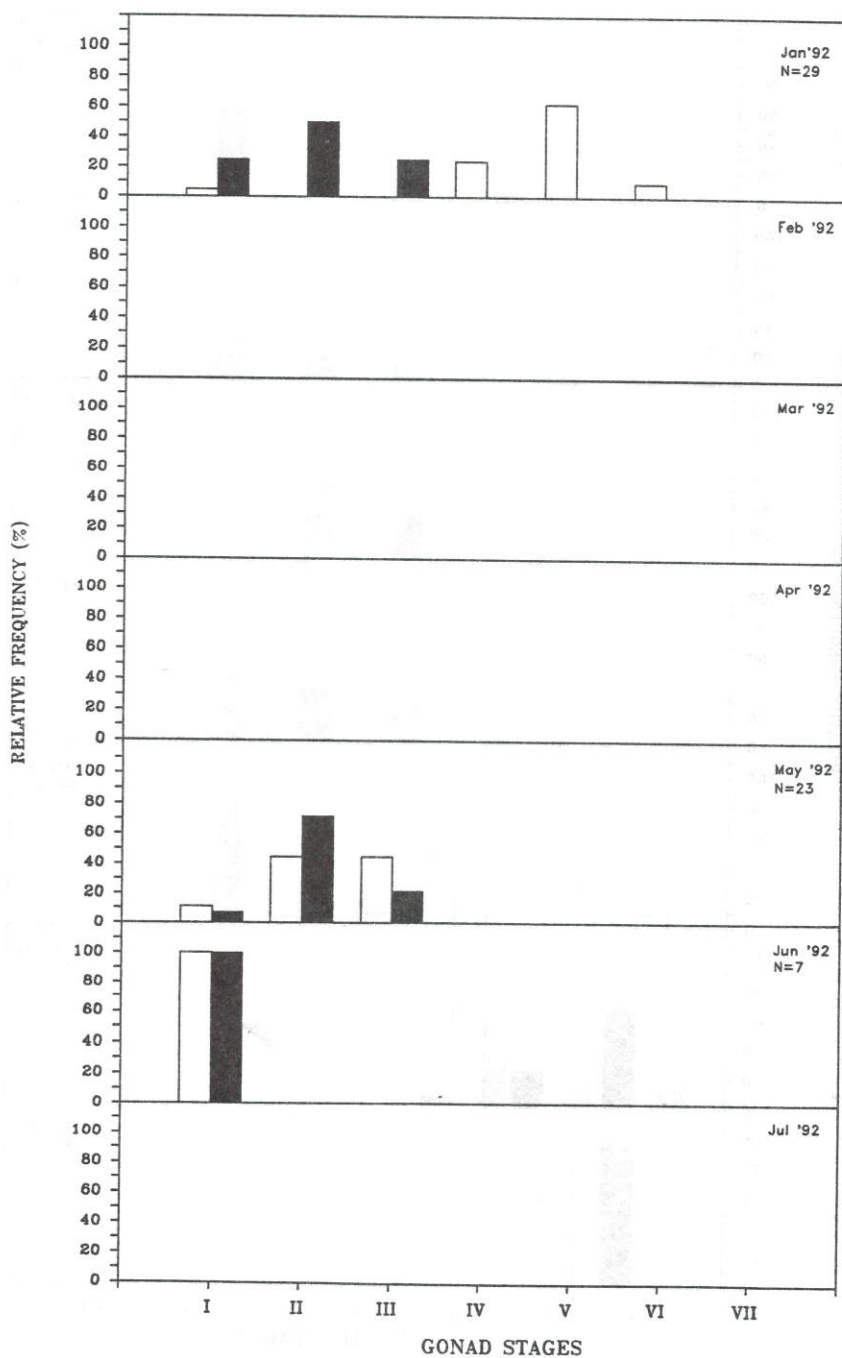


Figure 9I. Gonad stages of *Sardinella* sp..

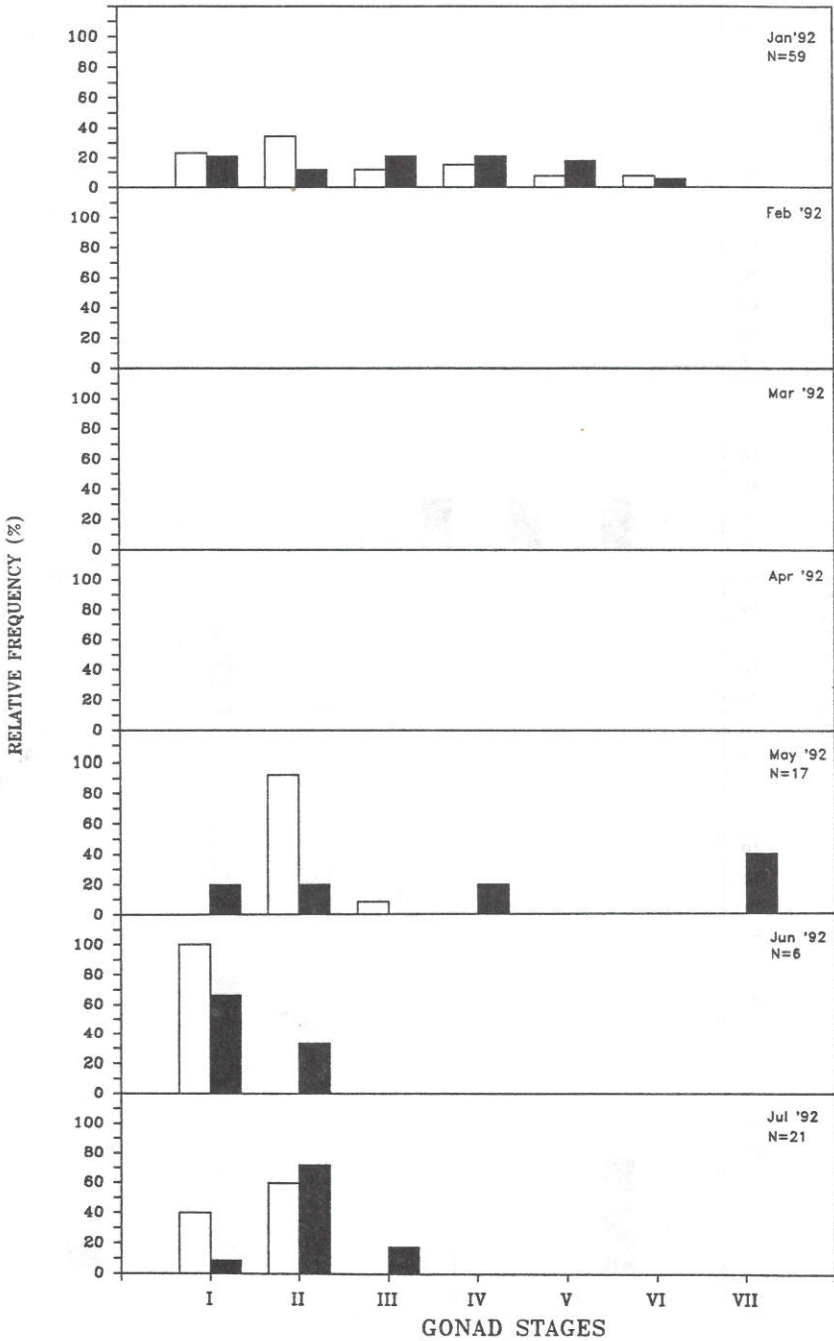


Figure 9J. Gonad stages of *Stolephorus* sp.

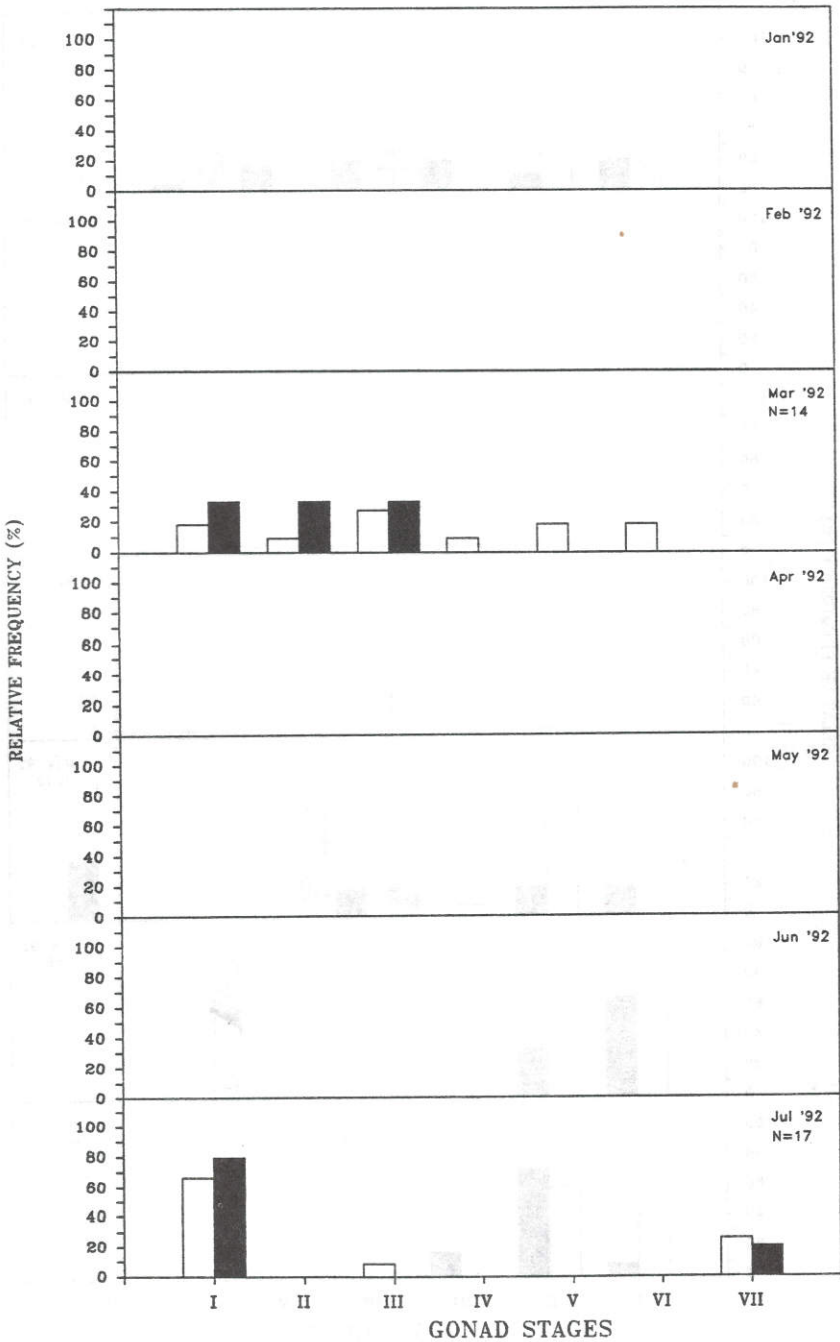


Figure 9K. Gonad stages of *Gerres abbreviatus*

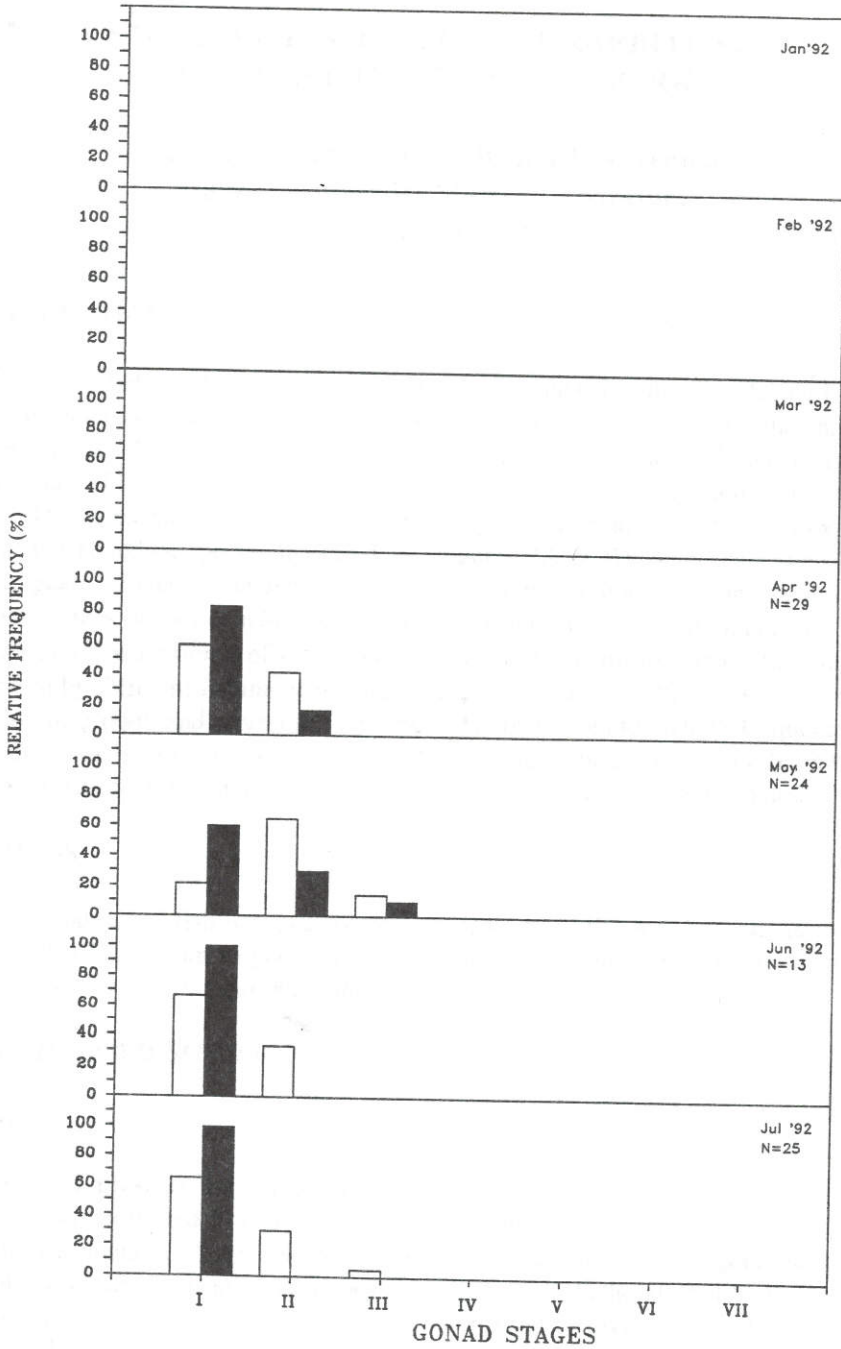


Figure 9L. Gonad stages of *Sillago sp.*