

CEPHALOPOD RESOURCES OF THE SOUTH SULAWESI SEAS

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ABSTRACT

A study was conducted in South Sulawesi including Takaboberate Islands and adjacent areas from October 1994 to March 1995 to describe the cephalopod fauna in the area and to assess the status of their utilization. Six major observations and specimen collection were carried out around Pulau-pulau Selayar, Rajuni, Tinanja, Taka Lamungan, Tarupa and landing places in Ujung Pandang and Pare-pare. Most observations were made by means of snorkelling. Identification of specimens were carried out upon fresh specimens, which were then preserved in 4% formalin for 1-2 days depending on their sizes, prior to transporting for further laboratory observations and deposition. Fifteen species of cephalopods, representing 4 species of the family Loliginidae, 1 species of Enoploteuthidae, 7 species of Sepiidae, 1 species of Octopodidae and 2 species of Nautilidae were identified. During the survey, spawns of 2 species of the family Sepiidae were also collected, however, there were no strong evidence of the occurrence of spawning ground for the species in the area, at least during the period of survey. The MSY for squid was estimated to be 1,850 tons per year, corresponding to an optimum effort of 4,800 bagan-prahu. Further increase in fishing intensity is possible, although a cautious management is required, including continuous monitoring of the fishery and squid biology.

Key words: spawn, maximum sustainable yield.

I. INTRODUCTION

The known cephalopods commonly found at present comprise squid (Teuthoidea), cuttlefish (Sepiidae) and octopus (Octopodidae). Indonesia is one of the main contributors to the world cephalopod fisheries, particularly for squid and cuttlefish. Significant cuttlefish landings has been made from the north coastal water of Java, the east coast of Sumatera and the Maluku seas. Whereas squid has been important in the pelagic fisheries in West Nusa Tenggara, South Sulawesi and the north coast of Java.

Being one of the biggest contributors to the country's squid landings, the South Sulawesi squid fishery has recorded a fluctuating landings from about 800 tons in 1975 to 2,000 tons in 1994 (DGF, 1976-1996), with recent (1995) lower record of 400 tons.

In the framework of fisheries management, the diversity of cephalopod resources in the area as well as their fishery potentials and their biology are significant to be properly understood. At present, however, adequate information

about these aspects has generally been lacking for Indonesian waters (Ghofar, 1989). This study was carried out in South Sulawesi from October 1994 to March 1995 to describe the cephalopod fauna of the South Sulawesi seas and assessing the status of their utilization.

II. MATERIALS AND METHODS

2.1. Materials

Investigation was concentrated upon cephalopods including the species occurring in the area of study, and information on their availability. Collections were carried out upon fresh specimens by means of snorkelling (plus scoop and hand-line) in the seas around the Takabonerate islands and from major fish landings in Ujung Pandang and Parepare. Specimens collected were then preserved in 5% formalin for 1-3 days depending upon specimen sizes, after which they were dipped in freshwater for 12 hours before then preserved further in 70% isopropyl-alcohol.

2.2. Species Identification

Identification of fresh specimens was carried out to species level where possible, using the following sources: Adam (1939, 1954, 1979), Adam and Rees (1966), Philippova (1966), Goodrich (1896), Lu and Dunning (1982), Lu and Phillips (1985), Nesis (1987), Okutani (1980), Okutani *et al* (1987), Roper *et al* (1969, 1984), Sweeney *et al* (1992), Voss (1962, 1963), Voss and Williamson (1971).

2.3. Landings and Fishing Effort Statistics

Data on squid landings and numbers of fishing gears were collected from the province and district fisheries offices. Trends in catch per unit effort were observed to examine any changes in fisheries and production models were then applied using procedure described by Pauly (1984).

III. RESULTS AND DISCUSSION

3.1. Resources Diversity

3.1.1. Pulau Selayar.

Seven species of cephalopods were identified from around the west coast of Pulau Selayar, consisting of 4 species of the family Loliginidae, 1 species of Enoploteuthidae and 2 species of Sepiidae. These species were: *Loligo*

edulis, *Loligo chinensis*, *Loligo sumatrensis*, *Sepioteuthis lessoniana*, *Abralia spaercki*, *Sepia latimanus*, *Sepia recurvirostra*.

3.1.2. Pulau Tinanja.

Six species representing 2 families, Sepiidae and Nautilidae, of cephalopods were collected from the sea of Pulau Tinanja in addition to the spawn of the cuttlefish. These were: *Sepia latimanus*, Spawn *Sepia latimanus*, *Sepia recurvirostra*, *Sepia bandaensis*, *Sepia sp. (A)*, *Nautilus pompilius*, *Nautilus macromphalus*.

About 200 meters from the beach at a depth of 1 meter, clusters consisting thousands of spawns of the Big Cuttlefish, *Sepia latimanus*, were found. The clusters were attached to the basal part of coral, *Acropora tenuis*.

3.1.3. Taka Lamungan.

Spawn of 2 species representing 2 families: Loliginidae and Sepiidae, and probably 2 species of octopod were collected: *Sepioteuthis lessoniana*, *Sepia latimanus*, Octopodidae.

Spawn of *Sepioteuthis lessoniana* was found attaching to the lower dead valve of the Giant Clam (*Tridacna squamosa*). It forms a finger-like cluster containing 3 embryos on any a 'finger'. The spawn of the cuttlefish, *Sepia latimanus*, was attached to the lower part of coral, *Acropora hyacinthus*.

3.1.4. Tarupa Kecil.

One cluster of spawn of the Bigfin Reef Squid, *Sepioteuthis lessoniana*, was found attached to the basal part of a seagrass. Three specimens of octopus, *Octopus cyanea*, were collected by capture from their habitat of coral bed to the north of Pulau Tarupa Kecil where a small scale octopus fishery employing some 63 fisherwomen using hand-operated harpoon exists. Also collected were freshly stranded shells of : *Sepia latimanus*, *Nautilus pompilius*.

3.1.5. Pulau Radjuni.

A Massive number (5400) of cephalopod shells, were collected from the intertidal zone of the island, of which 98% were of the family Sepiidae, and the remaining were Nautilidae. More specifically the cephalopod shells occurring on the island beach were: *Sepia latimanus* (about 75% of total collected specimens), *Sepia recurvirostra*, *Sepia bandaensis*, *Sepia aculeata*, *Sepia savignyi*, *Sepia sp (B)*., *Nautilus pompilius*, *Nautilus macromphalus*.

3.1.6. Ujung Pandang and Pare-pare.

Collection of specimens from the coasts and landing places around Ujung Pandang and Pare-pare indicates the existence of 2 cephalopod species: *Loligo sumatrensis*, *Sepioteuthis lessoniana*.

3.2. Catch per Unit Effort and Resource Potentials.

The data on squid fishery in South Sulawesi seas which may be used for fish stock assessment have been recorded since 1975, before which they have not been partitioned according to specific fishing grounds by surrounding provinces (East and South Kalimantan). The principal gear employed in the fishery is the boat lift net ('bagan prahu'). Figure 1 shows record of the number of bagan-prahu, their landings records and landings per bagan-prahu from 1975 to 1995. There is a general increase in number of bagan-prahu from about 900 units in 1975 to above 3,000 units in 1994 followed by a sharp decrease to around 900 units in 1995. Similar feature is shown by landings as a result, with two observable peaks of 1,800 and 2,000 tons in 1981 and 1994 respectively, followed by a sharp fall to around 400 tons in 1995. The landings consists primarily of *L. edulis* and *L. chinensis*. Fluctuations in landings per unit bagan may be noted with average value of 0.6 tons. The decrease of fishing effort in 1995 was most likely responsible for the sharp falls in both landings and landings per bagan during that year.

A simple landings per unit effort analysis was applied to the data as shown in Figure 2. The maximum sustainable yield of squid was estimated to be around 1,850 tons, which may be caught by about 4,800 bagan prahu. The result of this analysis may be significant in that

there has been a general belief that the Indonesia's principal squid fishery is that of the Alas Strait (Unar and Marzuki, 1982). In any case it may be important to note that there is another big resource in South Sulawesi seas which could be further utilized with cautious management. Continuous monitoring of the fishery and resource biology is required to identify any possible changes in squid stock.

IV. CONCLUSIONS

The study recorded 15 species of the Class Cephalopoda, consisted of 4 species of the family Loliginidae, 1 species of Enoploteuthidae, 7 species of Sepiidae, 1 species of Octopodidae dan 2 species of Nautilidae. These species were: *Loligo edulis*, *L. chinensis*, *L. sumatrensis*, *Abralia spaercki*, *Sepio-teuthis lessoniana*, *Sepia latimanus*, *S. bandaensis*, *S. savignyi*, *S. recurvirostra*, *S. aculeata*, *Sepia sp.(A)*, *Sepia sp.(B)*, *Octopus cyanea*, *Nautilus pompilius* and *N. macromphalus*. The landings of 'bagan-prahu' fishery consist primarily of *L. edulis* and *L. chinensis*. Spawns of 2 species of the family Sepiidae were also found, however, there were no strong evidence of the occurrence of massive spawning ground in the area. The squid MSY was estimated to be 1,850 tons per year, corresponding to optimum effort of 4,800 bagan-prahu. Further exploitation is therefore possible, although cautious management is required, including continuous monitoring of the fishery and resource biology.

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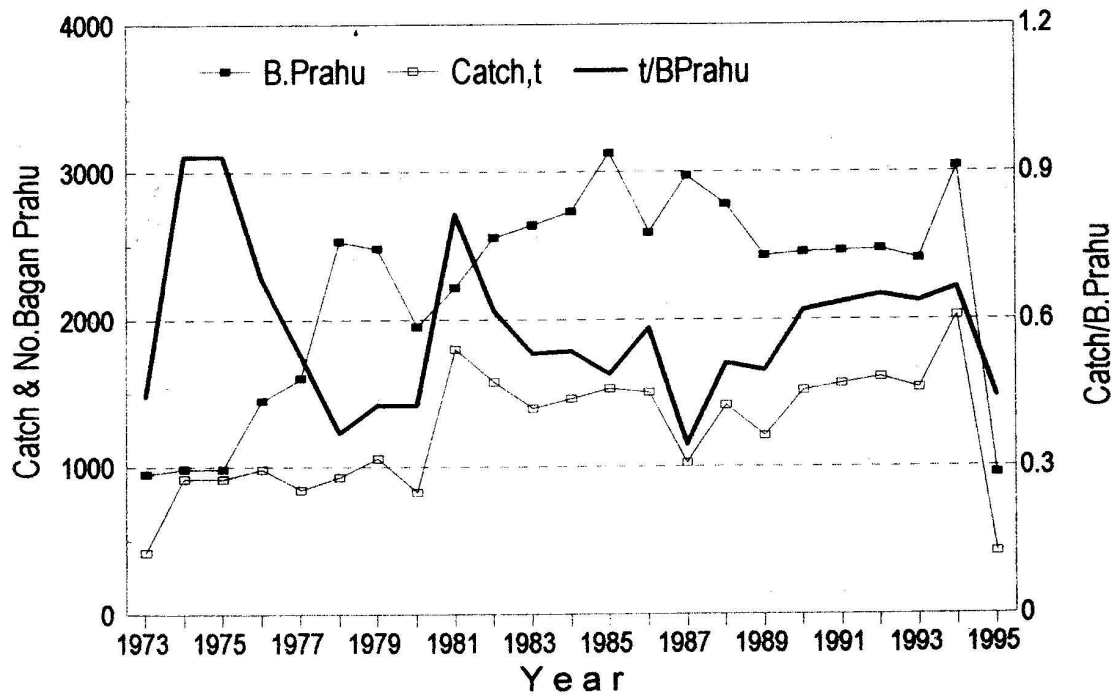


Fig. 1.

Fishing effort, catch and catch per boat in South Sulawesi squid fishery

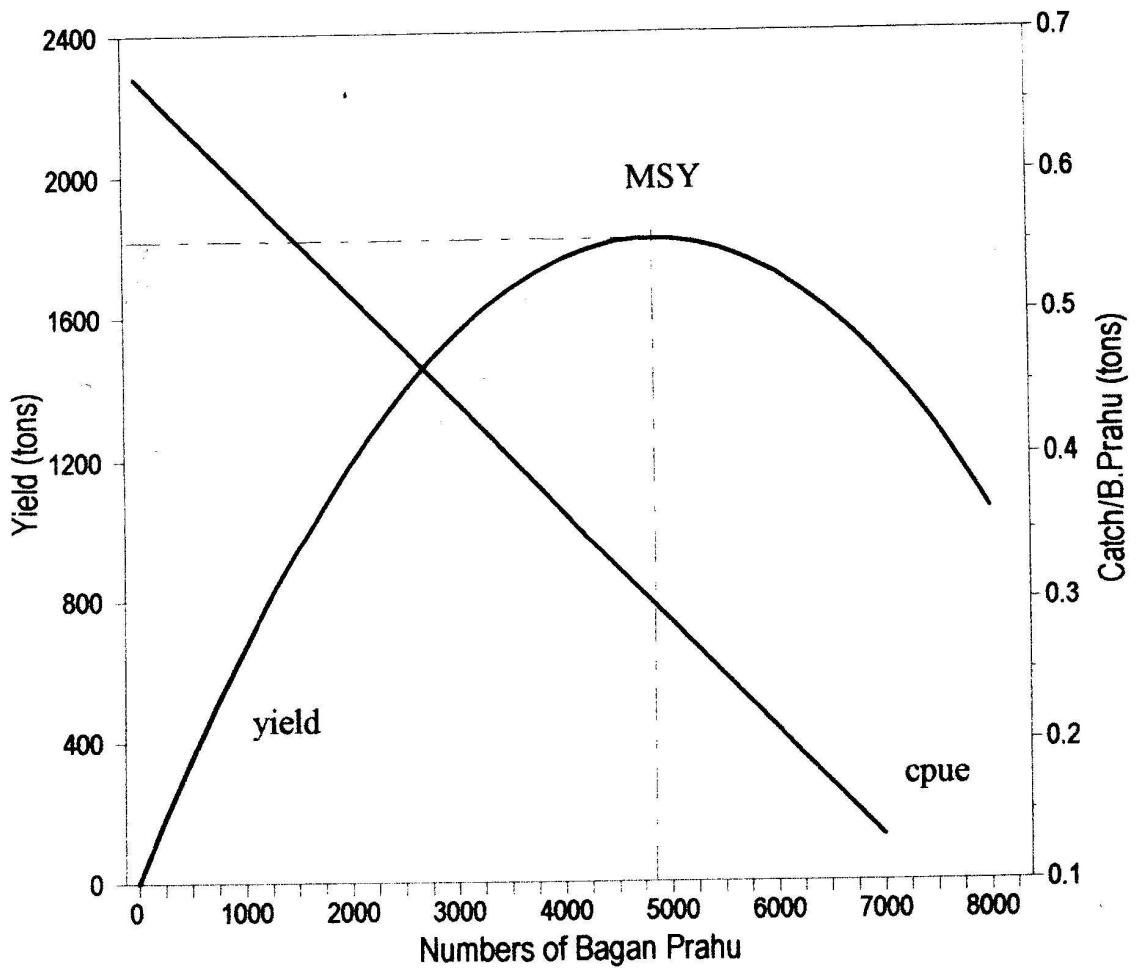


Fig. 2.
Yield curve and catch per unit effort in squid fishery of South Sulawesi