ISSN 0254-380 X

भाकृअनुप
ICAR

समुद्री मात्स्यिकी सूचना सेवा
MARINE FISHERIES INFORMATION SERVICE

No. 114

OCTOBER, NOVEMBER, DECEMBER 1991

तकनीकी एवं विस्तार अंकावली
TECHNICAL AND EXTENSION SERIES

केन्द्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान कोचिन, भारत
CENTRAL MARINE FISHERIES RESEARCH INSTITUTE COCHIN, INDIA

भारतीय कृषि अनुसंधान परिषद
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

BULL'S EYE - AN EMERGING TRAWL FISHERY RESOURCE ALONG DAKSHINA KANNADA COAST*

Introduction

In recent years, the awareness for diversification of fishing activity has been given priority in order to augment the marine fish production in our country. The shrimp oriented export industry has adversely affected the inshore fishery resources, so much so, further increase in marine fish catch can be achieved only through the extension of fishing activities to deeper waters for exploiting the non-conventional demersal resources.

Priacanthid or 'Bull's eye' has been identified as one of the major demersal resources suitable for such exploitation. Exploratory surveys conducted by Fishery Survey of India have indicated an exploitable stock of 40,000 tonnes of this resource in the Indian EEZ (Sudarsan *et al.*, 1988, *Bull. Fish. Surv. India*, No. 18). Recent studies (Anon., 1991, *FSI Annual Report*, 1990-'91) indicate their occurrence from 30 to 500 metres, but the maximum abundance has been reported to be in the 100 to 200 metre depth zone off the west coast. Based on surveys done by FORV *Sagar Sampada*, Bande *et al.* (*Proc. First Workshop Scient. Resul. FORV Sagar Sampada* 1990, 109-114) have reported the abundance of priacanthids along the shelf at 20-262 m and according to them this group formed 42.5% of the total trawl catch upto 100 metre depth.

Till date, priacanthids are not reported to form any substantial portion of the inshore trawl fishery from any part of the west coast. However, Appa Rao (1984, *Indian J. Fish.*, **31** : 380-382) reported an average annual landing of 236 tonnes of *Priacanthus* spp. by industrial shrimp trawlers operating off Visakhapatnam. Recently, Rao *et al.* (*The Second Indian Fisheries Forum, Mangalore, 27-31 May, 1990, Abstract*) reported the occurrence of *Priacanthus* spp. in the landings by the medium sized trawl units operating along the mid-shelf off Mangalore. Since 1979, trawl units operating from Mangalore have ventured to exploit deeper areas (upto 60 m) in comparison with the smaller units which seldom operate beyond 25 m depth zone. The former fishing fleet has been found to exploit unconventional resources including priacanthids. In order to enhance our current knowledge on the fishery of this resource, some aspects of the biology, seasonal abundance, migratory pattern and the future prospects of this new resource along Dakshina Kannada coast are presented here based on data collected during 1986-'91.

Fishery

In the year 1990-'91, Priacanthids formed 3% of the trawl landings from Mangalore and Malpe. 'Disco meenu' (local name) which has been occurring in commercial trawl catches since 1979 formed on an average 3.3% of the trawl catch, consequent to the introduction of medium trawlers (9-14 m OAL) at Mangalore (Rao *et al.*, *op. cit.*). The operation of these trawlers commences during Novermber and lasts till May. These boats are locally known as 'night boats' as they are engaged in fishing during night as well (Sukumaran, 1985, *Mar. Fish. Infor. Serv., T & E Ser.*, No. 65 : 7-12). They usually carry two types of nets, viz., a shrimp trawl with 16-28 m head rope length and relatively larger fish trawl with 25-32 m head rope length. These boats have fish holds to keep their catches in ice and this facility enables them to stay out at sea for 3 to 5 days at a stretch by which they usually make substantial saving on fuel expenditure. The area of operation extends from Kasaragod to Malpe in depth belts of 30-60 m.

Trend of fishery

Priacanthids, on an average, formed 1.5% of the catches of medium trawlers during the period 1986-'87 to 1990-'91. The annual catch varied from a maximum of 603 tonnes in 1990-'91 to a minimum of 59 tonnes in 1989-'90. Maximum catch rate of 23.5 kg/unit has been recorded during 1990-'91. Enquiries revealed that maximum catch of this resource was obtained between 30 and 40 m depth zone.

Abundance was maximum during the pre-monsoon moths with February recording maximum catch rate. However, good catch rate was also seen in the month of January (post-monsoon).

*Prepared by P. U. Zacharia, K. Sunilkumar Mohamed, P. P. Pillai and C. Purandhara, Mangalore Research Centre of CMFRI, Mangalore-575 001.

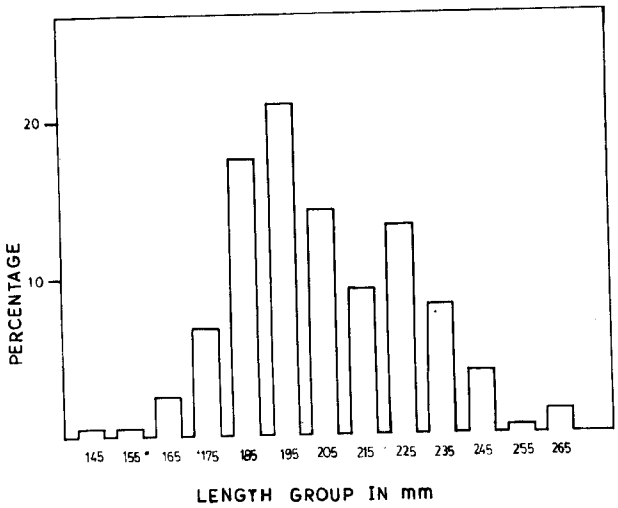

Fig. 1. Size frequency distribution of *Priacanthus hamrur* in trawl catches at Mangalore.

Biology

The catch was constituted mainly by *Priacanthus hamrur* and to a lesser extent by *P. cruentatus*. The size of *P. hamrur* ranged from 145 to 265 mm with modes at 195 and 225 mm (Fig. 1). Females of *P. hamrur* were found to dominate in the catches (sex ratio - F:M = 1.6: 1.0). Maturing male and female fishes were abundant in samples examined. Mature ones contributed 37% of the female population during May. Stomachs examined during the month of May showed less feeding intensity as fishes with empty stomachs were more abundant in the samples (42%). The gut content analysis showed the highly carnivorus nature of priacanthids (Fig. 2). The same has been reported by Appa Rao (*op. cit.*). *Therapon* sp. which is a shallow water fish is found in small quantities in the guts of these fishes.

Remarks

Although deep sea fishing has been advocated as the means for increasing fish production, the economic feasibility of such operations are yet to be established. However, Rao *et al.*, (*op. cit.*) have shown that with suitable modification in the existing inshore trawl fleet, the unexploited areas in the mid-shelf can be utilized economically. Further, the use of both shrimp and fish trawl nets by these boats has partly diverted the emphasis of the fishery from shrimp oriented to shrimp-finfish oriented one. This is a positive trend towards diversification of fishing effort.

The surveys done by FSI in 30-50 m depths in the west coast have shown that priacanthids on an average formed 7% of the total trawl catch (Anon., 1991, *FSI Annual Report* 1990-'91). Moreover, Sudarsan *et al.* (*op. cit.*) has estimated the potential of the resource from west coast as 29,000 tonnes. However, Bande *et al.* (*op. cit.*) indicated the abundance of priacanthids along west coast and estimated their potential from these waters as 1.88 lakh tonnes. Nevertheless, it is surprising to note that the traditional inshore trawl fishery has not been able to exploit this abundance. This could be mainly due to the fact that the traditional fishery is confined to 30 m depth and also due to the differences in gears used by these boats and the exploratory vessels. Though medium sized units operate upto 60 m depth off Mangalore, the average percentage occurrence of priacanthids during 1989-'91 is only 1.5%. Philip and Joseph (1988, *Proc. Sem. Problems and Prospects of Marine Fishing and Fish Processing in Karnataka*, 19-21 June, 1989 : 28-35) also reported the absence of priacanthids in smaller survey vessels (17.5 m) operated in 20-60 m depth off Karnataka coast, whereas they formed 10.5% of the total catch in larger vessels operated in the same area. Hence to exploit the available *Priacanthus* stock in the area to the maximum extent, further modifications of the gear seems necessary.

During the period of study, maximum catches were observed in 1986-'87 and 1990-'91 and the intervening period showed very poor landings of priacanthids. Naik (*Seafood Export Journ.*, **22** (12) 1990, 16-18) reported the decreasing abundance of priacanthids in FSI survey vessels upto 1989 and remarked that this could probably be due to the exploitation of this resource by chartered vessels in the Indian EEZ.

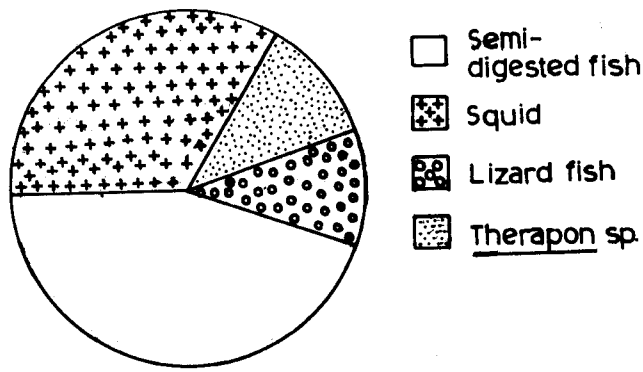

Fig. 2. Percentage occurrence of different food items in the stomach of *P. hamrur*.

Vijayakumaran and Philip (*J. mar. biol. Ass. India*, **32**, 1990, 177-186) have reported the abundance of priacanthids in 200-500 m depth zone during July (monsoon) and in 100-200 m depths during September-November (post-monsoon) off the north Kerala-Karnataka coast. The present study shows peak abundance in the inshore areas (upto 60 m) during February-March (pre-monsoon) and moreover 37% of female fishes were in mature state during pre-monsoon period. Although, Bande *et al. (op. cit.)* have observed the maximum abundance of priacanthids in the south west coast during August, no mention has been made on their depth-wise seasonal abundance. Earlier Vijayakumaran and Naik, (*FSI sp. publ. No. 2*, 1988, 106-119) inferred a southward shallow water migration of *Priacanthus* spp. during pre-monsoon months for breeding purpose. It is apparent that priacanthids along The Karnataka coast undertake an onshore migration from deep waters (200-500 m) in the monsoon period to shallow waters (20-60 m) in the pre-monsoon months for breeding occupying relatively deep areas (100-200 m) during post-monsoon period. Since the deeper areas (200-500 m) in the north Lakshadweep Sea (Eli Kalpeni) are a well known feeding ground for fishes like tuna due to the prevalence of young squids and other forage items (Silas and Pillai, 1982, *CMFRI., Bull. No.* 32), it can be assumed that *Priacanthus* also undertake migration from inshore areas to deeper waters for feeding purposes.

Bull's eye has excellent export opportunities in South East Asian countries (Joseph and John, 1986, *Sem. Potential Marine Fishery Resources, 23 April 1986, CMFRI*). Dhananjaya *et al.* (*Seafood Export Journ.*, 16 (10), 1984, 1-2) analysed the food value of Bull's eye and recommended them as good table fishes. Of late, these fishes are well accepted in markets in Kerala mainly due to the marketing strategy adopted by the local fish vendors (Naik, 1990, *op. cit.*). They are sold as young red snappers (local name:- 'Chemballikutti'). Therefore, the prospects of developing an internal market for bull's eye also appear to be remunerative. From the available account it is apparent that there is vast scope for exploitation of this resource and if properly planned and executed, this will not only help to increase marine fish production, but also help in augmenting marie fish exports of our country.