

NOTE

On the fishery and some aspects of the biology of dogtooth tuna, *Gymnosarda unicolor* (Ruppell) from Minicoy, Lakshadweep

M.Sivadas and A.Anasukoya

Research Centre of Central Marine Fisheries Research Institute, Calicut - 673 005, India

Abstract

The results of a study, on the fishery and biology of dogtooth tuna, *Gymnosarda unicolor* (Ruppell), conducted at Minicoy during 1995 to 1999 are presented. The resource is exploited from around the reef areas during July-August or September for sustenance when the usual fishing activities like pole and line and trolling are suspended. The total catch in a season varied from 56 to 481 kg. The size ranged from 44 to 126 cm fork length with the modal group at 58 and 62 cm. The length-weight relationship was found to be $\text{Log } W = -4.5337 + 2.77 \text{ Log } L$. Fish below 70 cm size was found to be immature.

The dogtooth tuna, *Gymnosarda unicolor* (Ruppell) is a tropical Indo-Pacific epipelagic species usually found around coral reefs. In India, they are reported from Andaman-Nicobar and from Lakshadweep Islands (Silas and Pillai, 1982). In Lakshadweep, they are not exploited by pole and line and troll line but are caught regularly, though in few numbers, by the hand line in the reef areas during night. It is a sustenance fishery when the regular fishing activities are closed during the southwest monsoon. As there is no published information on the fishery or biological aspects of this species from India, the results of a study conducted during 1995-99 are presented.

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Material and methods

Data on catch and biological aspects such as length, weight, feeding condition, maturity, etc were collected almost on a daily basis at the landing centre itself during each season. The entrails of the fishes are removed at the landing centre itself before they are taken home. The length-weight relationship was found out using the formula $\log W = a + b \log L$ where L is fork length in cm and weight W in kg. For this, 65 fishes of size ranging from 44 to 126 cm and weight from 1.2 to 15.3 kg available in the catch were utilised.

Results and discussion

Craft and gear

Wooden crafts of 5 m OAL and 1.75 m width amidships fitted with outboard engines of 8 to 9 HP are used. The gear (hand line) consists of hook no.8 tied to

polythene monofilament of 100 to 200 m length. This is wound around a wooden rod. In a boat, usually 5 to 6 such sets are taken. Besides this, each boat keeps a kerosene pressure lamp also. Three to four people go for fishing in a boat.

Fishing ground and operation

The fishing is carried out in the reef area situated about 2 to 3 km northeast and southeast to the island where the depth is around 100 m. The units start in the evening at around 6:00 PM and reaches the fishing ground by 8:00 PM. The gear mainly aims at exploiting large fishes like carangids, barracuda, etc, which come in groups attracted by the light. Taking advantage of this habit, the gear is operated during night with the help of light from kerosene pressure lamp. It is said that whenever there is good concentration of squids, the dogtooth tuna also appear in the surface. For catching the tuna with the hook, the fishermen first catch the squids with a scoop net for use as bait. Moreover, the lead of the hook will be removed and the baited hooks are paid into the water which when bitten by the fish will be taken out. The fishes also have the habit of jumping out in frenzy and during this process they invariably land in the deck of the boat also. The fishing continues till dawn and they return to the landing centre by 6.00 A.M.

Catch and effort

Fishing is carried out for 3 months from July to September but the peak activity is in the first two months only. It is seen that the magnitude of landing and percentage contribution are very meager. The catch

varied from 56 to 481 kg and it formed 0.9 to 6.6 % of the total catch (Fig.1). Normally this type of fishing is suspended by the middle of September with the resumption of pole and line operation.

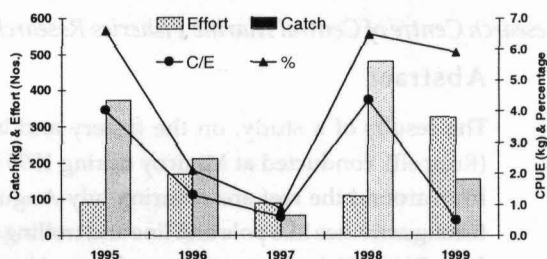


Fig.1. Catch details of dogtooth tuna caught by hand line at Minicoy.

Mode of disposal

As the major fishing activities are suspended during the monsoon, the demand for fresh fish is high. Depending on the catch, a portion of it is sold at the landing centre itself. A fish of 3 kg may fetch around Rs.150/-. Since the fishes caught during this season are for domestic consumption, the fishermen invariably do not sell them.

Biology

The length frequency data collected during the whole period was pooled together. The size varied from 44 to 126 cm fork length with modes at 58 and 62 cm (Fig.2). Fishes in the size range 48 to 74 cm formed the major groups. The examination of gonad showed that fishes below 70 cm were all immature and majority were in that stage of maturation. Out of the 4 mature fishes (stage IV) observed, 3

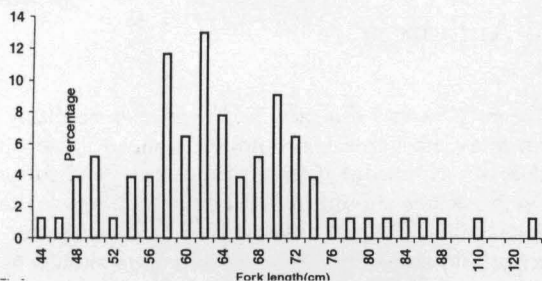


Fig.2. Size distribution of dogtooth tuna.

were males and 1 female. Length-weight relationship was found to be

$$\log W = -4.5337 + 2.77 \log L \quad (r = 0.9697).$$

The fact that the dogtooth tunas are regularly caught from this area whenever the gear is operated does indicate their availability in and around the reef. But their abundance is very low as revealed by the nominal catches recorded during all the years of observation. As this mode of fishing is practiced only for three months in a year, the availability of the resource during the rest of the months is not known. The fishing for a short duration and the very low catches may be the main reason for the absence of any information on the biology of this species. In Maldives, this fish is not caught by the pole and line, however it is reported to occur in the troll in few numbers. But here also, data on catch statistics alone is available (Anderson *et al.*, 1998).

Even though the size ranged from 44 to 126 cm fork length, fishes above 76 cm were sporadic. A fish of 126 cm fork length observed here is a record size. The maximum size of this species given in the FAO identification sheet for Western Indian

Ocean from fishing area 51 is 110 cm fork length. So it is definite that the fish grows above 110 cm. However, from Pacific areas, fish of size upto 150 cm has been reported (Collete and Nauen, 1983). Though sizes up to 74 cm are very common, those above are seldom caught. The habitat of this fish is in and around coral reefs. Since the adults are occasionally caught, the possibility is that the larger fishes prefer to be near the bottom or they may be staying somewhere else. Though they are said to be voracious predators on small fishes such as scads, *Caesio* spp., *Cirrhitilabrus* spp., *Ptercaesio* spp. and squids (Randall, 1980), none of the examined stomachs in the present study showed any food item indicating either regurgitation while hauling up overboard or poor feeding during night. Though Lewis *et al* (1983) based on their study in Fiji have calculated the size at first maturity as 65 cm fork length, the maximum size reported was 100 cm. In the present observation the size below 70 cm fork length were all immature. This may be due to geographical variation. However, further observations on the biological aspects are necessary to arrive at more definite conclusion.

Reference

- Anderson R.C, Z.Waheed, M.S.Adam.1998. *Maldives Marine Research bulletin*, 3: 5-45.
- Collete,B.B. and C.E.Nauen 1983. *FAO Fish.Synop.*, (125) vol, 2:40-42.
- Lewis,A.D.,L.B.Chapman and A.Sesewa 1983. *Tech.Rep.Fish.Div.*, Fiji (4) :1-68.
- Randall, J.E.1980. *Fish Bull.NOAA/NMFS*, 78(2): 201-49.
- Silas,E.G. and P.P.Pillai 1982. *Bull.Cent.Mar.Fish. Res.Inst.*, 32: 15-16.