Indonesian Journal of Agricultural Science 2(1) 2001: 27-29

Short Communication

CATCH DIFFERENCES OF BOTTOM LONG LINE USING FRESH AND SALTED FISH BAITS

Mahiswara and Wudianto

Reseach Institute for Marine Fisheries, Jalan Muara Baru Ujung, Jakarta 14430

ABSTRACT

Bottom long line is an important gear for catching demersal fish and normally uses fresh fish as bait. Recent development indicates that the fishing grounds for bottom long line are further away from the coast and consequently bait with longer life-time may be needed. Research on the use of fresh and salted fish baits for bottom long line has been conducted in the eastern Bali waters. In this study, salted and fresh baits were used simultaneously for fishing. The results showed that the catch of bottom long line using fresh bait was significantly higher than that for salted bait indicating that other suitable preservation techniques are necessary.

[*Keywords*: fish; salted fish; fishing methods; catch composition]

INTRODUCTION

Bottom long line fisheries have played an important role in Indonesian marine fisheries since trawl ban in 1980. Typical line fishing is used for economically important demersal fishes such as snappers, groupers, sharks, rays, baracuda, and eels (Dwiponggo *et al*., 1991) with groupers and snappers are the main target species. Some demersal fishes that dwell around coral reef such as snappers, groupers, and carangids are categorized in carnivorous species which usually feed on small fish, cephalopoda, and crustaceans (FAO, 1974; Reese and Lighter, 1978). Furthermore, Parish (1987) *in* Herianti and Jamal (1993) observed that the stomach contents of snapper (*Lutjanus malabaricus*) consisted of fish and crustaceans. Bottom long line may contribute to the efforts in maintaining a sustainable ecosystem since this gear is highly selective, meaning that only target species are caught.

Studies on the bottom long line fisheries in relation to design, construction, and hook rate have been conducted intensively, such as that for shark in Prigi, East Java (Amin *et al*., 1985), Sunda Strait and Pacitan waters (Susanto *et al.*, 1988; Barus *et al.,* 1989), and for snappers and groupers in Java Sea (Mahiswara and Wijopriono, 1995) and in Bali waters (Wudianto *et al.*, 1995). The efficiency of the bottom long line is influenced not only by the design and hook type, the material, length and spacing of snood, but also by kinds, size, and shape of bait (von Brandt, 1984)

The behavior of target species especially their feeding habit should be considered in determining the kind of bait for long line fishing. There are two kinds of baits usually used for long line fishing, i.e., natural and artificial baits. Some fish prefer natural bait rather than artificial bait and this is related with performance, movement or odor of the bait (Fichter and Phil, 1987). Recently, due to the depletion of demersal fish resources in coastal waters, bottom long line fishermen tend to fish further away from their base. This will require bait that can be used for a longer time during fishing. Salted fish is one option that can fulfill this requirement since the salting and drying process is simple and it does not require a special container on-board. However, it is necessary to test the use of this kind of bait and the present paper reports the effect of the use of fresh and salted baits on catches of bottom long line.

MATERIALS AND METHODS

One unit of bottom long line consisted of 900 m main line with 225 hooks was operated in eastern Bali waters during the study. Detailed description of the experimental bottom long line is illustrated in Fig. 1. Fresh and salted oil sardine (*Sardinella lemuru*) of 60-80 g were used as bait and arranged on hooks alternately.

The fishing experiment was carried out in rocky and rock-sandy bottomed fishing ground of 70-140 m in depth, by using a 5 GT commercial boat. Setting of

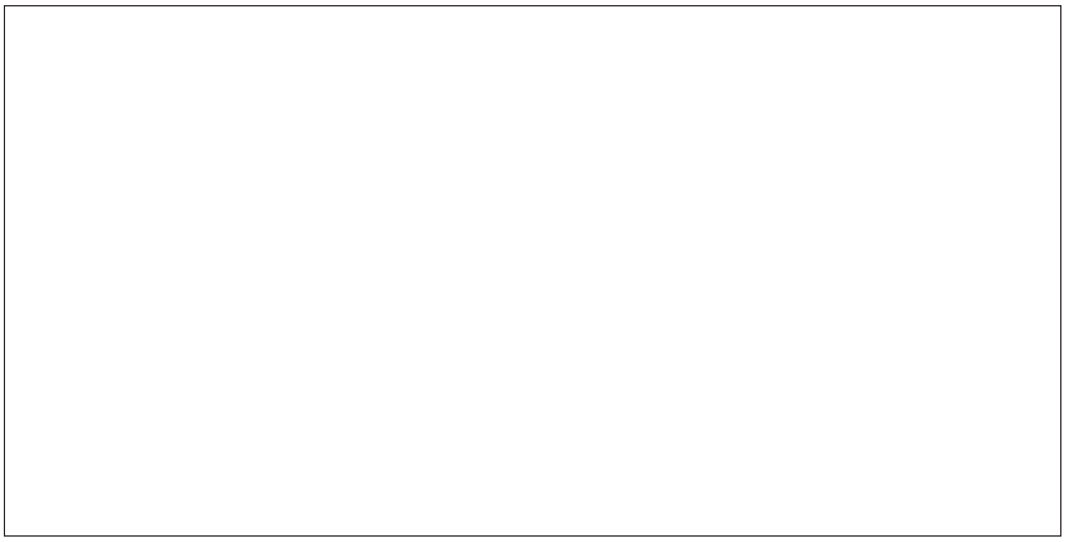

Fig. 1. Design of bottom long line (Wudianto *et al*., 1995).

bottom long line was conducted at night time with 1 or 2 settings per night, and data from each setting were considered as replications for statistical tests. The immersial time of hooks in the water for attracting fish varied from 4 to 6 hours.

A paired comparison random test (Zar, 1984) was used to analyse the catch rate data. The catch rate is indicated by hook rate calculated using the following equation:

$$HR = \frac{TC}{TH} \times 100$$

where: HR is hook rate
TC is total catch (number of fish)
TH is total hooks installed (fresh or salted fish bait)

For identifying the catch composition, FAO Species Identification Sheets for Fisheries (FAO, 1974) was used and compared with those listed by Gloerfelt-Trap and Kailola (1985).

RESULTS AND DISCUSSION

During this study, 24 trips of one day fishing consisted of 58 settings of long line were conducted. The catch, indicated by hook rate, fluctuated depending on the kind of bait used. Catch rate of bottom long line using fresh fish bait varied from 2.5 to 15, while that using salted fish bait was from 2.2 to 10.

Results of statistical analysis using a paired comparison randomization test indicated that hook rate of total catch was affected by the bait. From 58 settings, red snappers were caught in 24 settings and the number of the fish was significantly affected by the bait ($p < 0.01$), in which fresh bait produced higher number and weight than that of salted one. Caranx and groupers were caught in 5 and 8 settings, respectively, but the catches were not affected by the baits used ($p > 0.05$).

In general, this result indicates that salted bait failed to catch fish in similar amounts compared to fresh fish bait. In addition to the feeding habits of the target species, one of other factors which might influence the catch rate of bottom long line, were performance and endurance of fish bait in water during soaking time. In this study, for each setting, the bait was immersed for 4-6 hours in the water in a depth of 70-140 m, and this strongly influenced the performance and endurance of fish bait especially relating to under water pressure. Rehydration of the salted fish in the water eventually affected the structure of the fish which might affect the physical appearance of the fish. In addition, salting also contributed to the odour development of the fish, which might be different from that of fresh fish.

During experimental fishing, thirteen species of fish could be caught using both fresh and/or salted fish bait as shown in Table 1. The catch composition resulting from both baits was slightly different. Rays (*Dasyatis* spp.) and red snappers (*Lutjanus* spp.) were dominantly caught by bottom long line used fresh fish bait, while *Caranx* spp. was more

Table 1. Catch compositions of bottom long line during experimental fishing (58 settings).

Species	Common name	Fresh fish bait		Salted fish bait		Value (Rp kg^{-1})
		Number (fish)	Weight (kg)	Number (fish)	Weight (kg)	
Lutjanus spp.	Snappers	9	16.50	3	2.02	9,000
L. argentimaculatus	Red snapper	3	7.40	1	2.80	9,000
Cepalopholis spp.	Spotted grouper	1	1.80	4	7.19	15,000
Caranx spp.	Jack fish	1	2.10	8	25.48	12,000
Ephinephelus spp.	Groupers	8	22.25	7	20.55	15,000
Lates spp.	Giant perch	1	3.15	1	2.20	10,000
Sphyraena fosteri	Slender sea pike	1	3.05	0	0.00	5,000
Dasyatis spp.	Rays	12	50.95	0	0.00	1,000
Gymnothorax spp.	Eels	6	15.90	7	13.40	1,000
Carcarhinus spp.	Sharks	6	24.65	3	5.25	1,000
Seriola spp.	?	0	0.00	1	2.45	?
Diodon spp.[1]	Spotted poreupine fish	3	8.15	1	1.90	?
Balistes spp.	Trigger fish	0	0.00	1	2.06	?
Total		51	155.90	37	85.30	

[1]Toxic fish, no value
? = no information

frequently caught by bottom long line using salted fish bait.

CONCLUSION

Bottom long line with fresh fish bait caught more fish than with salted fish bait, which was probably related to the behavior of fish target species especially in feeding habits. The catch composition of bottom long line using fresh and salted fish baits was slightly different. *Dasyatis* spp., *Lutjanus* spp., and *Ephinephelus* spp. were dominantly caught using fresh fish bait, while *Caranx* spp. was frequently caught using salted fish bait.

REFERENCES

Amin, E.M., Ch. Nasution, dan H.R. Barus. 1985. Penggunaan rawai dasar pralon (PVC) dan rotan sebagai alat tangkap ikan demersal. Laporan Penelitian Perikanan Laut No. 32: 53-64.

Barus, H.R., M.L. Linting, dan H. Rumeli. 1989. Penangkapan ikan cucut dengan rawai dasar di Pacitan. Laporan Penelitian Perikanan Laut No. 31: 91-97.

Dwiponggo, A., M. Badrudin, D. Nugroho, dan Sriyono. 1991. Potensi dan penyebaran ikan demersal. hlm I.1-10. *Dalam* P. Martosubroto, N. Naamin, dan B.B. Malik (Ed.). Potensi dan Penyebaran Sumberdaya Ikan Laut di Perairan Indonesia. Ditjen Perikanan, Puslitbang Perikanan dan Puslitbang Oseanologi LIPI, Jakarta.

FAO. 1974. Eastern Indian Ocean and Western Central Pacific. FAO Species Identification Sheets for Fisheries Purpose. Vol IV. FAO, Rome.

Fichter, G. and F. Phil. 1987. A guide to fresh and salt-water fishing. Golden Press, New York. p. 58-73.

Gloerfelt-Trap, T. and P.J. Kailola. 1985. Trawled fishes of southern Indonesia and northwestern Australia. ADAB-DGFI-GATC. Canberra, Australia. 406 pp.

Herianti, I. dan R. Jamal. 1993. Dinamika populasi kakap merah (*Lutjanus malabaricus*) di perairan utara Jawa. Jurnal Penelitian Perikanan Laut No. 78: 18-25.

Mahiswara dan Wijopriono. 1995. Perikanan rawai dasar di perairan utara Jawa. Prosiding Simposium Perikanan Indonesia, 25-27 Agustus 1993 (Buku II: Bidang Sumberdaya Perikanan dan Penangkapan). Prosiding Puslitbang Perikanan No. 39: 214-215.

Reese, E.S. and F.J. Lighter. 1978. Contrast in behaviour, adaptations in the aquatic and terrestrial environment. A Wiley-Interscience Publication, John Wiley & Sons. New York, Chichester, Brisbane, Toronto. p. 313-346 and 235-247.

Susanto, K., Ch. Nasution, dan H. Harifin. 1988. Penggunaan mute pada rawai dasar konvensional. Jurnal Penelitian Perikanan Laut No. 49: 61-74.

von Brandt, A. 1984. Fish catching methods of the world (3rd Edition). Fishing News Book, Farnham-Surrey-England. p. 80-99.

Wudianto, Mahiswara, dan M.L. Linting. 1995. Pengaruh ukuran mata pancing rawai dasar terhadap hasil tangkapan. Jurnal Penelitian Perikanan Indonesia I (1): 58-67.

Zar, J.H. 1984. Biostatistical analysis. Prentice Hall Inc., Englewood Cliffe, New Jersey. 718 pp.