



DESIGN AND TECHNICAL SPECIFICATION OF MALABAR THRYSSA (KATI FISH) GILL NET OF SATPATI, MAHARASHTRA

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ABSTRACT

Gill net is one of the popular fishing methods along the west coast of India. However, there are regional variation in the design, construction and operation. The present study deals with design, technical specification and operation of Kati fish gill nets (Thryssa malabaricca) operated off Satpati, Maharashtra. Malabar thryssa (Kati fish) set gill nets were made up of Polyamide monofilament of diameter 0.23 to 0.28 mm with mean of 0.26 mm. White, blue and green translucent colours were commonly used. The mesh size used for Kati fish gill net was 75 mm for the main webbing and the selvedge were absent. The hanging coefficient ranged between 0.37 to 0.40 with mean of 0.38 ± 0.001 and the hung length varied from 33 to 35 m. with mean of 34 ± 0.10 m. The total hung depth varied from 7 to 8 m. The fleet length of Malabar thryssa (Kati fish) gill net ranged from 1320 to 2450 m with mean of

1790 ± 33.10 m. The depth of the operation for Kati fish gill nets ranged from 30-40 m. The nets were operated as surface drift gill net during October to May.

KEY WORDS Gill net, Design, Malabar thryssa, Kati fish, *Thryssa malabaricca*

INTRODUCTION

Gillnets are of special interest to small-scale fishermen, due to the simple design, low investment, high energy efficiency and the requirement of only simple non-specialised small craft for their operation. Being a low energy fishing method, gillnet fishing is favoured in recent years in the context of escalating fuel costs. It is a highly selective gear, as the fish of a particular size in relation to the selected mesh size only is caught while smaller fishes are able to escape. It is a low energy fishing method using relatively low powered vessels expending fuel only for propulsion and not for actual fishing operation (Thomas, 2010). Maharashtra is one of the major maritime states of India having 720 km of coast line spread over six districts viz. Thane, Palghar, Mumbai, Raigad, Ratnagiri and Sindhudurg. In Palghar, a total of 350 gillnetters were in operation (Anon, 2014). Design and general characteristics of marine gill nets of Kerala have been discussed by Vijayan et al., (1993) and Thomas & Hridaynathan (2006). Gill nets are used extensively by the small-scale artisanal fishermen in the fresh, brackish and coastal water (Solarin & Kusemiju, 2003; Emmanuel et al., 2008; Emmanuel, 2009). In gill net, the mesh should be shaped in such away, adjusting to the hanging coefficient that, a fish is caught being gilled. The capture of fish is achieved by one mesh in a gill net, whereas by more than one mesh by entangling type, where it is caught by fouling of meshes in the fish body (Badapanda, 2012). However, the design and technical details of Kati fish gill nets of Satpati, Thane district of Maharashtra state were not reported. The present study is the first attempt on the documentation of the design and technical specification of Kati fish gillnets operated from Satpati.

MATERIAL AND METHODS

The study was carried out during the fishing season from December 2014 to May 2015. The detail information regarding design and construction of gill nets was undertaken by physical sampling of the units and by collecting information from gill net owners in the study area. Structured data collection schedule formulated for the present study comprised of two major sections. The first section dealt with the particulars of gill net owner and the fishing vessel used for gill net operation. The second section deals with the technical specifications design aspects, rigging and the mode of operation of the different types of marine gill nets used by the fisherman of Satpati. The information included in the first section was recorded

according to Kazi *et al.* (2010) whereas; the information in the second section was physically collected and recorded according to Pravin *et al.* (2009). The net design of the gill net was presented according to Nedelec (1975).

RESULTS AND DISCUSSION

The specification and design of Malabar thryssa (*Kati* fish) gill net operated from Satpati landing centre is given in Table 1 and Fig. 1. During the set gill net operation they are generally set to the bottom by using anchor and heavy weights. It was observed that the gill nets were operated from mechanized and motorized gill netters from Satpati.

Gill nets were made up of Polyamide monofilament of diameter 0.23 to 0.28 mm with mean of 0.26 mm. White, blue and green translucent colours were commonly used. During the present study, it was recorded that *Kati* gillnet were made up of Polyamide monofilament of diameter 0.23 to 0.28mm. Similar observation was carried out by Ramarao *et al.* (2002). They reported that Polyamide monofilament material of 0.16 mm diameter was used for Malabar thryssa gill net. Polyamide multifilament of 210dx1x2 mm was reported for Malabar thryssa gill net in Kerala by Thomas and Hridayanathan (2006). Thomas *et al.* (2005) reported Polyamide multifilament of 210dx1x2 mm diameter for *Malabar thryssa* gill net.

In the present study, the mesh size used for *Kati fish* gill net was 75 mm for the main webbing. Ramrao *et al.* (2002) reported the mesh size for *Malabar thryssa* gill net was 50 mm. Thomas and Hridayanathan (2006) observed that for catching *Malabar thryssa* in Kerala mesh size of 14 mm was used. Thomas *et al.* (2005) reported 14 to 28 mm mesh size for Malabar thryssa gill net.

The horizontal hanging coefficient (E) of the set type of *Kati* fish gill net ranged between 0.37 to 0.40 with mean of 0.38 ± 0.001 at Satpati. According to the study of Ramarao *et al.* (2002), hanging coefficient of 0.44 was used for Malabar thryssa gill net in Andhra Pradesh. Thomas and Hridayanathan (2006) reported that the Malabar thryssa gill net with average hanging coefficient of 0.56 in Kerala.

The hung length of each fishing unit for *Kati* fish gill net varied from 33 to 35 m. with mean of 34 ± 0.10 m during the present study. In Andhra Pradesh, 140 m length of gill net unit for Malabar thryssa was recorded by Ramarao *et al.* (2002). In Kerala, Thomas and Hridayanathan (2006) reported that Malabar thryssa gill net with 90m hung length which was longer than the hung length observed in the present study. Thomas *et al.* (2005) reported that hung length 150-400 m was used for Malabar thryssa gill net.

The total hung depth of surface set type *Kati* fish gill net varied from 7 to 8 m and mounted height was 92% of the total stretched height. Ramarao et al. (2002) observed that hung depth of 8 m for Malabar thryssa gill net in Andhra Pradesh. Thomas and Hridayanathan (2006) reported that hung depth of 6.9 m for *Kati* gill net in Kerala. For Malabar thryssa gill net hung depth of 6.8 to 11 m was reported by Thomas *et al.* (2005).

The fleet length of set *Kati* gill net ranged from 1320 to 2450m with mean of 1790 ± 33.10 m at Satpati. Ramarao et al. (2002) reported that 140 m of total fleet length for Malabar thryssa gill net were used in Andhra Pradesh. Thomas and Hridayanathan (2006) noticed that the total fleet length used for *Malabar thryssa* gill net was 360 m in Kerala. In Satpati, fleet length observed was almost seven times more than observed during the studies reported by Thomas and Hridayanathan (2006).

The depth of the operation for set *Kati* fish gill nets ranged from 30-40 m. Thomas and Hridayanathan (2006) reported that depth of operation recorded for Malabar thryssa gill net in Kerala was 4 to 8 m.

In the *Kati* fish set gill net, the accessories included the head rope, the foot rope, marker floats, master floats, flag floats and sinkers. It was observed that the gill nets were operated from mechanized and motorized gill netters from Satpati. For set gill net, the head rope and foot rope of PP having 6 to 8 mm. diameter and PVC of circular (150x30 mm) shape floats (*Budhi*) of 7 to 9 number per unit. (Average of 8 ± 0.08) were used. The square shaped thermocole made marker floats (*Bhusa*) of one number per unit of dimension 20x20x25cm were used and attached to the head rope. The specification of master float was 90x45cm. The rectangular flags (*Shinda*) also used as markings of the gill net having specification of 60x45cm the sinkers (*Ghata*) (120x30 mm) of cemented material and circular in shape having seven to nine numbers with mean of 8 ± 0.08 was used for each unit. The weight of these sinkers was 250 to 300 gm. The master sinker, made of cement were used in *Kati* fish set gill net and they acted as anchors. It helped to maintain the net in the water body. During the study it was observed that, 60 to 90 units were joined together by making the knots at head rope and foot rope. Stapling of the meshes was done to the head rope after every 18 to 20 meshes.

CONCLUSIONS

The documented information on the design and technical specifications of Malabar thryssa (*Kati* fish) set gill net of Satpati, Maharashtra would serve as a base line information for the technological modifications the said gill net may undergo to increase its efficiency in the coming years.

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Table 1 SPECIFICATION OF MALABAR THRYSSA (*KATI FISH*) SET GILL NET (*KATICHI JALI*) OPERATED FROM SATPATI, MAHARASHTRA

| | |
|--|--------------------------------|
| Name of Fishing Village | Satpati |
| Local name of the Gill net | <i>Katichi jail</i> |
| Main webbing mesh size (mm) | 75 |
| Mean main webbing mesh size (mm) | 75 |
| Twine type | Polyamide monofilament |
| Twine specification / diameter (mm) | 0.23-0.28 |
| Mean twine diameter (mm) | 0.26 |
| No. of meshes in depth | 110 |
| Horizontal hanging coefficient (E) | 0.37- 0.40 |
| Mean horizontal hanging coefficient (E) | 0.38 ±0.001 |
| Vertical hanging coefficient (1-E2) | 0.84-0.86 |
| Mean vertical hanging coefficient (1-E2) | 0.85 ±0.001 |
| No. of meshes per unit | 2100 -2400 |
| Mean no. of meshes per unit | 2226 ±15.70 |
| Hung length (m) | 33 – 35 |
| Mean hung length (m) | 34 ±0.10 |
| Color webbing | White, blue, green translucent |
| Selvedge twine type | Absent |
| Selvedge specification / diameter (mm) | Absent |
| Selvedge mesh size (mm) | Absent |
| No. of selvedge meshes in depth | Absent |
| Selvedge hung depth (m) | Absent |
| Total hung depth (m) | 7 – 8 |
| Head rope material | Polypropylene |
| Head rope diameter (mm) | 6-8 |
| Float material | Polyvinyl Chloride |
| Float dimension (mm) | 150x30 |
| No. of floats per unit | 7 – 9 |
| Mean no. of floats per unit | 8 ±0.08 |
| Foot rope material | Polypropylene |
| Foot rope diameter (mm) | 6 – 8 |
| Sinker material | Cemented |
| Sinker dimension (mm) | 120x30 |
| Sinker weight (g) | 250-300 |
| No. of sinkers per unit | 7- 9 |
| Mean no. of sinkers per unit | 8 ±0.08 |
| Total fleet length (m) | 1320 – 2450 |
| Mean total fleet length (m) | 1790 ±33.10 |
| Depth of operation (m) | 30 – 40 |

| | |
|---------------------------------------|---------------------------|
| Fishing craft | Wooden and FRP mechanized |
| Horse power of the engine (HP) | 12-16 |

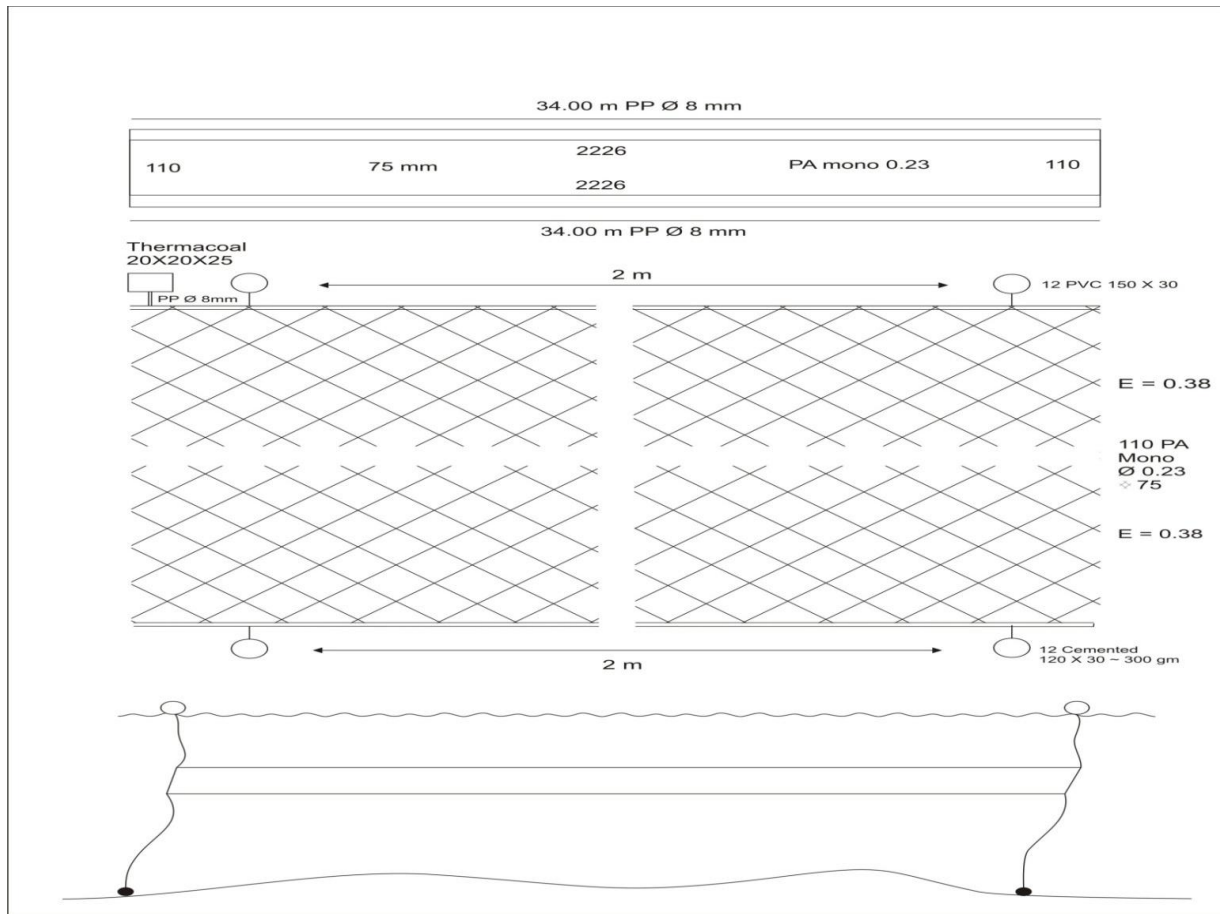


Fig.1 DESIGN OF MALABAR THRYSSA (KATI FISH) SET GILL NET OPERATED FROM SATPATI, MAHARASHTRA

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