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Traditional fishing by using trap of *Acacia nilotica* branches and *Ipomoea carnea* branches as periphytic substrate used as attractant in river Godavari near Nanded, Maharashtra

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Abstract

Acacia nilotica and *Ipomoea carnea* plant branches are used as substrates to develop the periphyton in river ecosystem. The fish species like *Tilapia mosambica*, *Notopterus kapingkat*, *Cyprinus carpio*, *Etilopterus* sp. get attracted towards the substrates heap in water for easily available plenty of food as periphytes. After 6-8 days the substrate site is encircled by using floating gill net and the substrate branches are removed out from encircled area to river coast. Two fisherman enters into the gill net encircled area and operate the cast net for 3-4 times till ensures total fish catch. One fisherman operates 3-4 times such traps in same or different habitats to catch 8-12 kg of fish on each day from one trap earning 10,000-12,000 Rs/week. The fishing continues from late winter to onset of monsoon. It is first report on simple, cost effective, low fishing effort and highly successful fish trap made from local materials by the local fisherman.

Keywords: *Acacia nilotica*, *Ipomoea sp.*, periphytic substrate, traditional trap

1. Introduction

Documentation of the fishing traditional knowledge is need of time before its complete vanishing with people who know it. Most of the traditional methods are evolved amongst the people to utilize the natural resource for their livelihood based on their need [1]. Forest produce like timber, fire wood, leaves, gum, flowers, resins, bark of trees, medicinal plants are widely used all over the world especially by the forest dwellers like tribals [2]. Similarly, the natural resource like fish, crabs, mollusks, aquatic weeds, water flowers, prawns are also used by the dependent people. The freshwater fisheries sector in drought prone Marathwada is mainly divided into reservoir fisheries and capture fishery from various tributaries of main river Godavari. Modernization in fishing gears especially nets has increased the fish catch and decreased the fishing efforts due to affordable and durable net weaving material and readily available nets [3]. Now all over the Marathwada region synthetic nylon threads, plastic floats and metal sinkers being used as perfect replacement against naturally available stones as weights and bottle gourd (Kaddu) used as floats in dry condition. Various kinds of traditional traps are used in riverine fisheries and reservoir fisheries of Marathwada. The Western Ghats tribals named 'Katkari' and 'Thakur' use the embankment trap in streams of Western Ghats [4]. Deposition of algae and subsequent biofoulers viz. aquatic insect larvae on various substrates are the natural phenomenon in any aquatic ecosystem [5]. All that deposited biomaterial is called as periphyton. The researchers have identified the role of various substrates for periphyton deposition that may be used for increasing fish production [6]. Present study deals with simple and effective technique of fishing developed by the local fisherman in Nanded region Maharashtra. Fish are always in search of easily available food in their habitat where they congregate and spend most of their time, locally available tree branches and weed is used as substrates to deposit periphyton on the plant surface and use of cast net, small mesh gill net are the requirements to develop a trap. It is the main theme of this trap for fishing in coastal area of the river [7].

2. Materials and Methods

2.1 Preparation of trap

The fisherman in Nanded area Maharashtra work individually for fishing in river Godavari and its tributaries like Purna, Asna, Penganga, Kayadhu, Manjara and the reservoirs that are not leased. Small gill net of mesh size 2-4 cm, common cast net, fish collection bag and the branches of *Acacia* tree and *Ipomoea carnea* weed are the requirements used to construct the trap shown in Fig. 1. In table. 1 shows the trap characters and in river Godavari and its tributaries in Marathwada, where the fishermen of this region use this trap. 10-15 branches of *Acacia nilotica* or *Acacia vedianas* and semi submerged weed *Ipomoea carnea* were used in mixed way, to construct this trap. These materials are available plenty in the coastal area of these rivers. On a day in evening time one or two fishermen place these tree branches in the form of heap at one place in 3-4 ft deep coastal water of river and 5-6 ft from coast. All branches are placed one above the other. All branches are handy to lift and place in the water. Each branch is approximately 4-5 ft in length and 5-6 kg in total weight. During post winter season the area of river where water remains stagnant is selected to arrange trap. Each trap can be identified from long distance due to few part of branches remain visible above water surface. The fishermen place 1-3 such traps at 50-80 meter distance between two traps. This is first simple step in trap construction. The branches are kept for 6-8 days. Due to stagnant water the trap remain at the same place without any drifting and disturbance. In mean time the periphyton get deposited on the substrate branches and congregation of locally available fish starts at the trap site.

2.2 Method of fishing

After 8 days the fishermen visit the trap area and encircle the branch substrate trap (BST) using gill net from 10-15 ft distance around the BST. To ensure the escape prevention the BST is encircled by gill net from the riverside. One fisherman enters into the encircled area and slowly one by one the substrate plant branches are removed from the place to outside and placed on river coast with the help of another assisting fisherman, usually the fishermen take help of their children as assistant (fig. 2). Once the substrate branches are removed, another fisherman or the assisting person enters into the encircled area and both of them spread the cast net slowly from inner side of encircled gill net instead of routine method of throwing the net (fig. 3). One of the fishermen drags the cast net from top drag line (Fig. 4 and 5.) and trapped fishes are collected from the cast net lower folder area into the nylon

made fish collection bag, locally named as 'Kharrya' 3-4 times shown in fig. 6 and 7. The cast net is operated into the encircled area.

3. Result and Discussion

The fishing practice from study area recognized that evaluation of the traditional knowledge of fishing communities. The materials and operation of traps requires the intelligence and thorough observation. Adichil has been reported from Kerala and present observation reveals the common pattern in fishing practice with this constructed trap. The present observation revealed that the fishers shifted to gill nets and cast nets instead for formation of traditional trap. The researcher reported that traditional fishing method used the natural resource viz. plant material for heap formation for the trap area. This type of fishing method is restricted with pre-monsoon season as compare to Achidil used in the monsoon season for migrating fishes [8]. In one attempt of cast net operation 2-3 kg was fish catch; total catch from one trap was 10-12 kg. Time required for one entire fishing operation and reset of trap again was 30-40 min. Each fisherman fix 2-3 traps at one habitat likewise in a cycle of week from 3-4 habitats in the river a fishermen get 40-50 kg of fish/week. The cast nets catch composition includes mainly *Notopterus kaporat* belongs to family Notopteridae, *Tilapia mosambica* belong to family Cichlidae, *Etioplos sp.* and *Cyprinus carpio* belong to family Cyprinidae in the body weight range 400-600 gm [9]. The fish catch remain live in the fishing process hence catch remain fresh till reach to the market place. Some of the fishermen use ice which they carry to preserve the fish catch [10]. The market price of these species in local market at Nanded was Rs. 150-250 per kg (table. 1). Therefore the fisherman gets Rs. 10,000-12,000 per weeks by fish sale. The operating cost of this trap is nil. The equipments, trap materials are easily available and locally made, similarly less time required to operate this trap. Degraded substrate branches of plants were replaced with new branches. The fishermen didn't share the information on plant branches of which tree species are most successful substrates used in this fishing trap? But we observed they were using mostly *Acacia nilotica* and *Ipomoea carnea* branches. The trap use for fishes ends at the onset of monsoon when flooding the rivers. It was most safe, easy to operate, highly cost effective, locally available, long term used and very successful kind of traditional trap. Some important salient features of the fishing trap are as in table 1.

Table 1: Some important features of the fish trap

Sr. no.	Particular characters	Specification
1.	Water area covered under the trap	Around 7-8 ft.
2.	Height of substrate heap	4-4.5 ft.
3.	Length of substrate branch	7-8 ft.
4.	Approximate weight of substrate branch	6-7 kg
5.	Area encircled using gill net during fishing	Approx. 15 sq ft.
6.	Area covered under cast net	Approx. 15 sq ft.
7.	Depth of water column to set the trap	3-4 ft. in the coastal region
8.	Number of fishermen needed to operate trap	Minimum two
9.	Time required to complete the fishing	30-40 Minutes
10.	Total trials of cast net	3-4
11.	Total fish yield in one operation	10-12 kg/trap
12.	Species in fish catch	<i>Notopterus kaporat</i> , <i>Tilapia mosambica</i> , <i>Etioplos sp.</i> , <i>Cyprinus carpio</i>
13.	Average weekly income to fishermen	10,000-12,000 Rs/week per trap
14.	Fish price in market (2017-18) at Nanded	150-250 Rs/kg
15.	Use of preservative	Ice
16.	Distance from fishing site to fish market	10-15 km



Fig 1: Setting of the substrate trap and encircling with floating gill net



Fig 5: Fish catch from the trap in cast net



Fig 2: Removing the substrates after 3-4 days



Fig 6: Fish collection from cast net



Fig 3: Fish catch from encircled area using cast net



Fig 7: Fish collection within the encircled gill net area



Fig 4: Spreading the cast net in repeated fish catch Trials

4. Conclusion

In the traditional fishing method branches of *Acacia nilotica* and *Ipomoea carnea* were used. On this branches periphyton grown and that is used as attractant in fish catching by traditional method.

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