

## 'Mangrove vegetation trap' technique for improving fishery resources in coastal waters

In India, many types of artificial reefs and fish aggregating devices are used to increase the fishing potential of barren or unproductive areas. These structures serve as spawning and shelter grounds for fin and shell fishes, and are frequently and successfully used to create fishing areas in coastal villages<sup>1-3</sup>. The bark of *Delonix elata*, when it rots in seawater, emits a foul stench, which acts as a fish attractant<sup>3</sup>. In southern Vietnam, the water hyacinth, *Eichhornia*, is being used as a 'shelter trap' to catch the freshwater prawns<sup>4</sup>. While the mangrove plants have been used traditionally as the 'brush park pile' in Sri Lanka to catch the marine prawn/fish<sup>5</sup>, this is not being practised in India. In fact, the mangrove litter in natural waters provides an important nutrient base for commercially grown fishes and invertebrates<sup>6</sup>.

In India, due to over-exploitation the prawn fishery resources in the natural stock are dwindling. From the stock, there has been heavy catch of mother prawns for hatchery development by the aquaculture industries. Furthermore, the recent shortfall in these industries, has resulted in an increase in capture of prawn fishery, which has imposed heavy pressure on the natural stock. Thus, there is a necessity

to find ways for enhancing the prawn fishery resources. Here we have shown the efficacy of 'mangrove vegetation trap' technique for enhancing the catch of fish/prawns.

The 'mangrove vegetation trap' was installed in the shallow waters of the Vellar estuary of southeast coast of India (11°29'N; 79°46'E) during the monsoon months (November and December, 1996), in which the fish catch are usually poor. The trap was made as a cage framed with *Casuarina* poles of 2 m length, 2 m breadth and 2 m height. The trap was filled compactly with fresh shoot branches of mangroves to a height of 1.5 m. Two traps were maintained separately for each of the two species of mangroves (*Rhizophora apiculata* Blume and *Avicennia marina* (Forssk.) Vierh.). To avoid flotation of the mangrove piles, 20 kg of stones were kept on the pile. The mangrove shoot branches were allowed to decompose in the natural waters and to release nutrients and particulate detrital matter, which may support many fishes and prawns. The fishery data were collected around the trap (8 m circumference) on different days of experiment (10, 29, 46, 52 and 59 days of experiment), by using cast nets with mesh size of 5 mm

for prawn and 10 mm for fish, operating four times for prawn or fish catch. Using the same method, the control data for fish and prawns were collected 50 m away from the traps in the same line of water column, on the day of experiment. The data were statistically analysed.

The fishes recorded during the experiments were *Mugil cephalus*, *Liza parsia*, *Hemirhamphus far*, *Etroplus suratensis*, *Ambassis commersonii*, *A. gymnocephalus* and the prawns were *Penaeus indicus*, *P. monodon*, *Metapenaeus monoceros* and *Macrobrachium idae*. These were significantly greater in waters around 'mangrove vegetation trap' than those in control waters (Figure 1). The total number of individuals per trap collected for 5 days during the experimental period, was 49 and 42 around *Avicennia* and *Rhizophora* traps, respectively as against 15 in control waters. Thus there was about 3-fold increase in the number of fishes and prawns adjacent to the mangrove vegetation trap than at control waters. The technique is simple, involving low-monetary input (Rs 15/trap) and yielding about 2.5-fold net profit (Rs 45) compared to control waters (Rs 18).

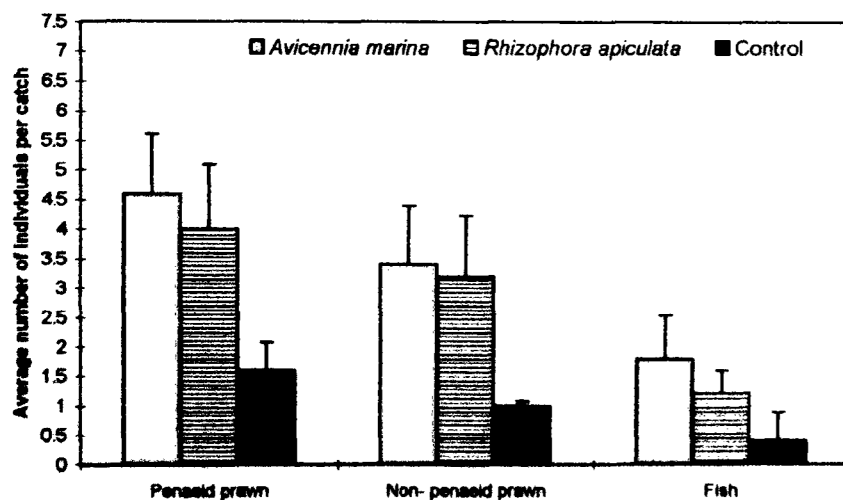


Figure 1. Average number of individuals ( $\pm$  standard error) collected for 5 days of experiment (10, 29, 46, 52, 59th days) around the 'mangrove vegetation trap'. The values among the treatments are significant ( $P < 0.01\%$ ).

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