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PRAWN SEED RESOURCES AND ITS FARMING POTENTIALITIES IN SUNKERI BACK WATERS (KALI ESTUARY — KARWAR)

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ABSTRACT

Prawn seed resources of Sunkeri Back Waters indicated the availability of *Penaeus indicus* (H. Milne Edwards), *Penaeus monodon* (Fabricius) *Metapenaeus dobsoni* (Miers), and *Metapenaeus monoceros* (Fabricius). The monthly variation in seed composition, its correlation with environmental parameters and the aquaculture potentialities are being reported.

INTRODUCTION

With the increasing demand for aquafarming, the need for production of quality seed has become a most vital factor. While this goal is attained to a good extent by induced breeding techniques in fresh water fishes, same amount of success is yet called for in the field of brackish water aquaculture.

It is a wellknown fact that the estuarine areas are the most potential nursery grounds for the young prawns. Consequently these water bodies form the most important prawn seed collecting centres. With this position in view, studies on the prawn seed resources were under taken in Sunkeri back waters which is a major fishing centre of the Kali estuary.

DESCRIPTION ON THE SITE

Kali estuary joins the Arabian sea at Karwar (14°51' N lat and 74°7' E long). The tidal influence of this estuary extends upto about 29 Kms (M. Nagaraj, personal communication) Back water system of this estuary is moderately well developed owing to the availability of the low lying areas.

The Sunkeri backwater lies on the southern side of the estuary and is about 3 kms away from the mouth of the estuary (Fig. 1). It is connected with Kali estuary through a narrow neck channel, which supports mangroves and grass land. The backwater is divided into two by a bund which serves as the road link between Sunkeri on the west and Kadwad on the east. The bund has a bridge provided with 29 wooden sluice gates, which control the water movement.

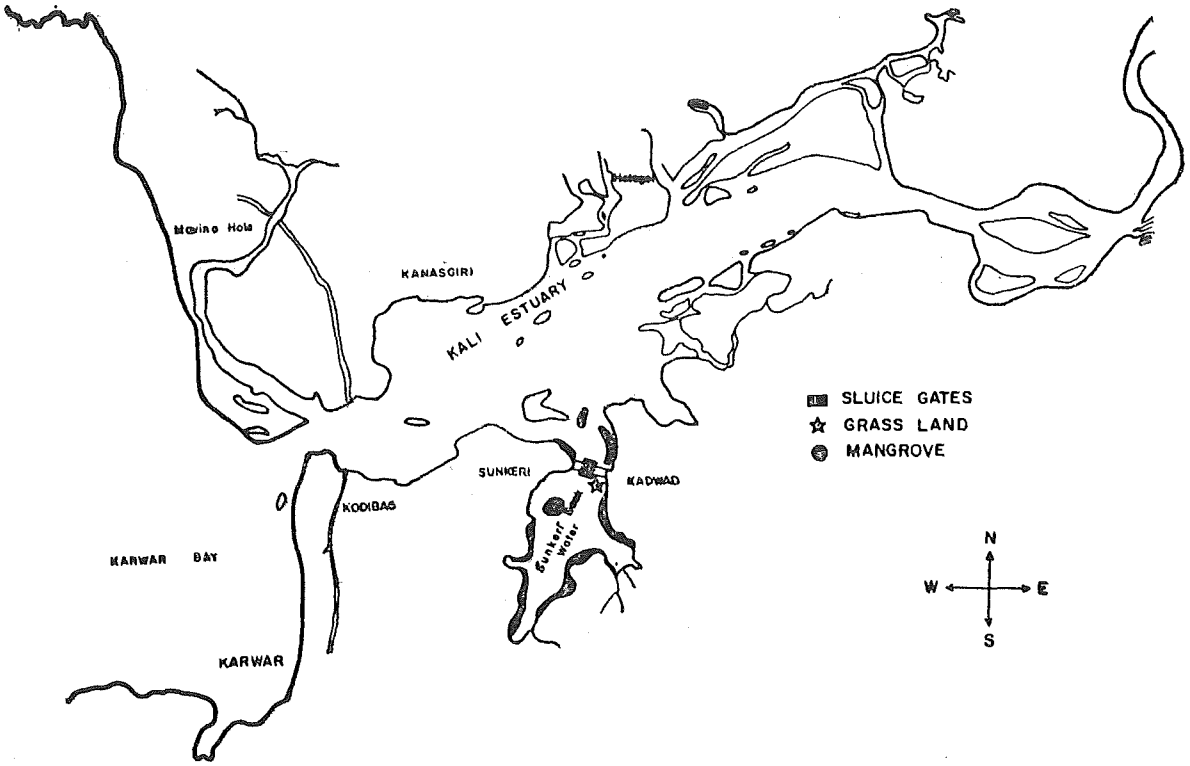

Fig. 1. Location of Sunkeri backwaters.

The backwater harbours different types of vegetation, on the southern side of the bund, at the eastern half there is a grassland which is submerged most of the time. The mangroves on the southern side of the bund are sparsely distributed, where as that on the northern side the concentration is considerably more. The depth of the water column increases gradually from the eastern side to the western side. Wave action is almost negligible through out the area.

MATERIALS AND METHODS

The period of observation was from November 1980 to April 1981. Water samples were collected from Sunkeri backwaters at fortnightly intervals. Water temperature was measured on the spot using thermometer. Water samples were analysed in the laboratory for salinity and dissolved oxygen following the standard methods given by Strickland and Parsons (1968). pH was measured using the pH meter.

Prawn seed collection was made at the same intervals during low tide from different places i.e. mangroves, lowlying area, and channel connecting the estuary, using a dragnet of 12' x 6' with a mesh size of 2mm. The net was dragged against the water current in shallow waters within 1 meter depth for a distance of two meters, each time. The total operation period in each locality was about one hour.

Identification and segregation of the seed were made in the laboratory following the standard key (Rao and Gopalkrishna, 1968; Rao, 1969). Prawn seed samples were measured for their total length (tip of the rostrum to tip of telson).

RESULTS AND DISCUSSION

The prawn seeds encountered during the study period were those of *penaeus indicus* (H. Milne Edwards), *Penaeus monodon* (Fabricius), *Meta-Penaeus dobsoni* (Miers), *Metapenaeus monoceros* (Fabricius).

All the above penaeid spp. migrate to the estuaries and backwaters where they are available in the mysis or early post larval stages. They spend a part of the life in these ecosystems before returning to the sea (Project report on assessment of cultivable penaeid prawns at selected centres in Kerala and Karnataka, 1980.) It is this phase of their life that constitutes the seed resources in the estuaries and backwaters.

Prawn Seed Composition :

The percentage composition data showed a gradual increase in the percentage composition of the seeds of *P. indicus* from November to March. During April it declined slightly, but maintaining relatively higher values than those of November to February months. (Table 1).

Table I : Prawn seed composition (Values given as percentage)

Species	Nov. 80	Dec.	Jan. 81	Feb.	Mar.	Apr.	Total average
P. indicus	22.22	25.00	25.00	25.64	41.66	32.25	28.63
P. monodon	5.55	8.33	6.18	7.64	—	—	4.63
M. dobsoni	33.33	33.33	40.90	38.46	22.22	48.38	36.10
M. monoceros	38.88	33.33	27.27	28.20	36.11	19.75	29.69

P. monodon seeds made their contribution during November to February to the total composition. During the months of December and February the values were higher but disappeared thereafter.

M. dobsoni seed composition steadily increased from November to January and then scaled down, but reached peak in the month of April, its contribution being about 48.88% of the total prawn seeds (Table 1).

The *M. monoceros* seeds contributed maximum during the months of November and March. Its least contribution was found in April. During the

months of November, *M. monoceros* seed constituted the major portion of prawn seeds (38.88%). During December *M. dobsoni* and *M. monoceros* took equal shares (33.33%). In January, February, and April the seed of *M. dobsoni* was dominent i.e. 40.90%, 38.46% and 48.38% respectively. In March, the seed of *P. indicus* formed the dominant species and its contribution to percentage composition was 41.66%.

On the whole, the percentage contribution of *M. dobsoni* was highest during November to April period (36.10%) followed by *M. monoceros* (29.69%), *P. indicus* (28.63%) and *P. monodon* (4.63%).

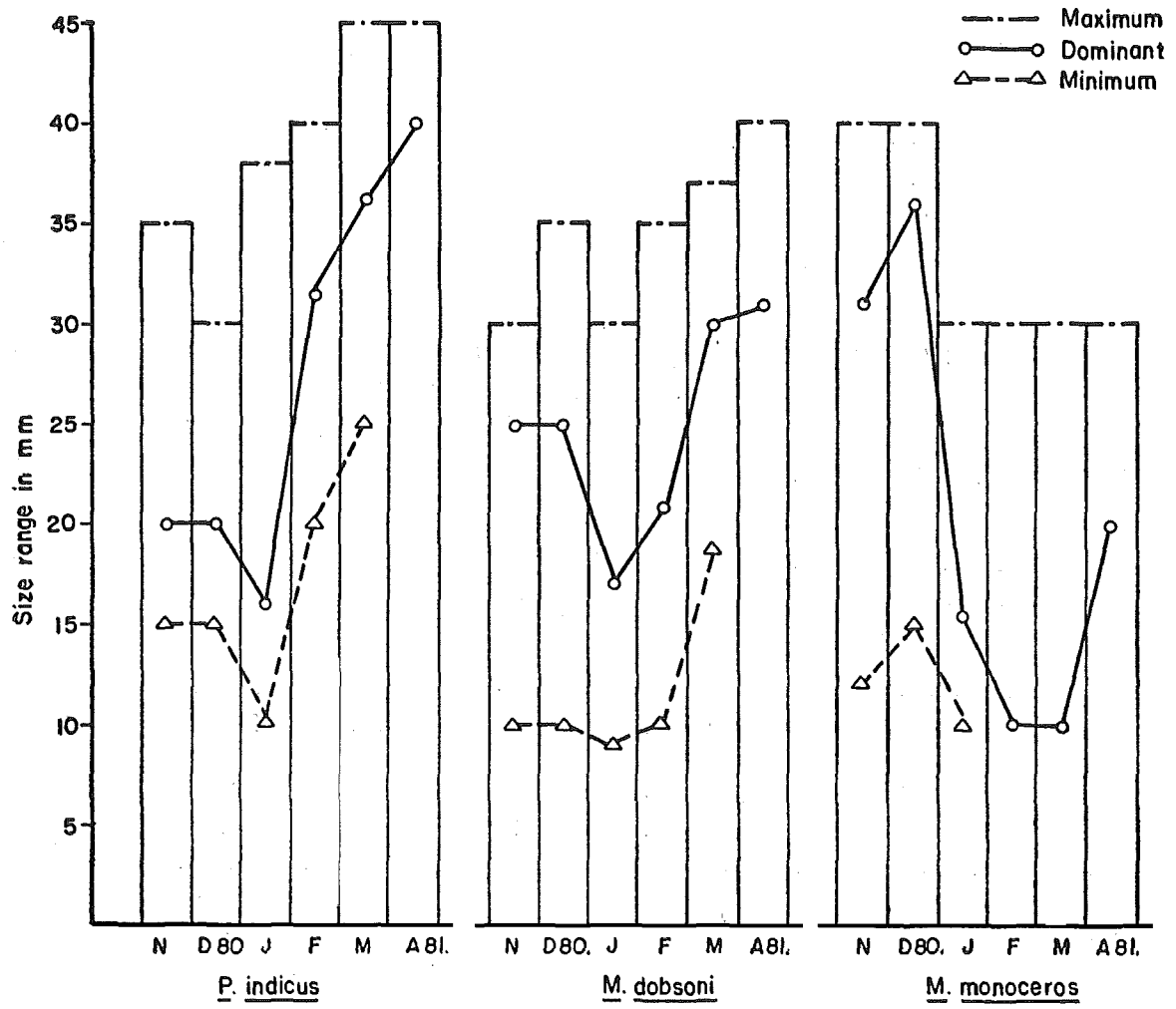

Fig. 2. Size Variation in different Species of prawn larvae

Size Ranges :

The seed of *P. indicus* obtained during the period of November to February had a size range of 10 to 40 mm and those obtained during March and April had 25 to 45mm size range.

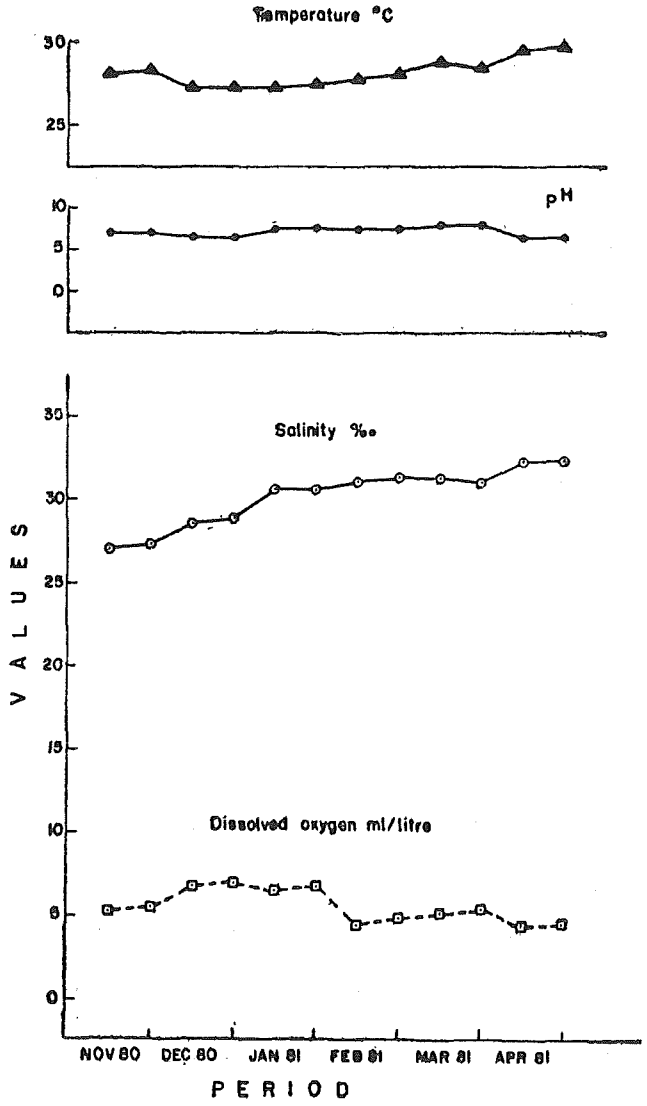

Fig. 3. Variations in some Physico Chemical parameters at Sunkeri backwater.

P. monodon seed obtained had a size range of 15-40mm. *M. dobsoni* seed collected during November to January period had a size range of 9 to 35mm and the ones collected in February and March had a size range of 10-37mm. The seed of *M. dobsoni* collected during April showed a size range of 30 to 40mm.

M. monoceros seeds obtained during November-December had a size range of 12-40 mm and during January to March the range was 10-30 mm. In April the size range of these was between 20-30 mm.

Environmental Parameters :

During the period of investigation the variations in temperature, salinity, dissolved oxygen and pH were respectively 27.2-29.5°C, 27-32‰, 4.59-6.91 ml/litre, and 6.8 to 8.0.

The variation in the salinity, temperature, dissolved oxygen during the study period falls with in the ideal range of parameters suggested by C.M.F.R.I. (Kartha and Nair, 1980).

However, it was observed that the maximum abundance of all species of prawns available was found in the months of December and January. During these two months salinity (28.5 to 30.5‰) and temperature (27.2°C to 27.4°C) were comparatively lower compared to the period from February to April (31-32‰ and 27.7-29.5°C). However, during December-January the dissolved oxygen content (5.45-6.91 ml/litre) was higher than that of February to April period (4.42 to 6.81 ml/litre). In case of *P. monodon* the seeds were totally absent during March to April when the salinity was comparatively higher than the previous 4 months.

Aquaculture potentialities :

The lowlying area extends to about 200 acres with water depth ranging from 1.5 to 7 feet. The variations in the environmental parameters during the study period fell with in the range that is ideal for aquafarming. However, among the different parameters, the pH needs special consideration before establishing commercial aquafarming in the area. The variation in pH is from 6.8 to 8.0 and the pH range between 7.5 to 8.5 is best suited for aquafarming (Kartha and Nair, 1980).

The problem of controlling this factor is being achieved by liming the farm before filling water (Jhingran, 1975). During the period of observation it was found that the availability of *P. monodon* was very poor and was totally absent during February to April period. The earlier studies carried out by Nagaraj and Neelakantan (1980) in the Kali estuary has indicated that the seed of *P. monodon* was more abundant during the early part of monsoon Hence consideration of this factor is very essential, if monoculture of *P. monodon* is to be undertaken in this area during the November to April period.

The distribution of mangroves on the margins is also advantageous since the mangrove leaves upon falling into the water get decayed by bacterial action, there by enriching the area with nutrients (Saundararaj 1978).

It has been observed that the area has seed potentiality for the finfishes like Mullet, *Etroplus suratensis, Scatophagus argus, Sillago sihama*.

The methods of prawn seed collection in this area are worth our attention since it is an important prerequisite for aquafarming. The most common method is by using a dragnet of a mesh size 2 to 6 mm This method is mainly used for the collection of seed ranging from 0.5 to 2 cm in length. However, seeds

of relatively bigger size i.e. upto 3 cm are usually preferred and as such cast net is also used for such collections.

Another common method under practice for the collection of seed is by constructing bunds in the shallow water areas forming small impoundments into which the seed enriched water gets entrapped at the time of high tide and this seed is scooped out during low tide. Further, some fishermen adopt the pit collection, where in small pits are made in the shallow intertidal area into which the seed enriched water enters and thus entraped seed is easily scooped out during low tide. However this method is not very common.

Though a variety of seed collecting methods are known from different parts of our country, the methods followed along the Kali estuary are rather simple and less efficient. The gear such as midnapore shooting net common along West Bengal and hapa nets are not used despite their high efficiency

At present the prawn culture is carried out at two places-Kadwad and Hottegali, adjacent to the Kali estuary. The total area under culture is about 200 acres when compared to the existing areas around Kali estuary, this is meagre. Since the stocking is done just by allowing the seed enriched waters during high tide into the farms, the need for actual collection of seed and then stocking is not actually felt. However, the seed collection is practiced to a little extent and this seed collection for stocking is usually restricted to *P. monodon* and *P. indicus*. It is thus clear that the present rate of exploitation of seed as a whole is not high, compared to the relative abundance of the seed and the vast scope for expanding the operations.

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