

**PRELIMINARY HYDROBIOLOGICAL STUDIES ON THE  
KANASGERI BACKWATERS**

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**ABSTRACT**

Preliminary hydrobiological investigations of the Kanasgeri backwater area adjacent to the Kali estuary in North Kanara carried out during September 1976-August 1977 revealed that the area could be utilised for aquaculture purposes.

North Kanara District in Karnataka has a coast line of 144 km with the drainage of five rivers, viz., the Kali, the Gangavali, the Aghanashini, the Shara-vati and the Venkatapur. The *Khar* land or *Gazani* land along the river banks are used for paddy cultivation during the rainy season. After the harvest in

October, these areas are utilised by the farmers for prawn culture purposes by the traditional filtration technique. At present, out of the available backwater areas of 5196 ha, about 1364 ha are being utilised for prawn culture (Kotbagi 1980). In Karwar taluk, about one-sixth of *gazani* lands are utilised for prawn culture by the traditional method. Only recently some aspects of the prospects of aquaculture in the Karwar region have been studied by Bopaiah and Neelakantan (1980) and Nagaraj and Neelakantan (1980 a & b). There are proposals to utilise the Kanasgeri backwater area for experimental studies on intensive prawn culture by the Department of Fisheries, Karnataka, and the Central Marine Fisheries Research Institute. As it is important to know the hydrobiological conditions of the area in this connection, the results of the preliminary investigations made during 1976-77 on these aspects are reported.

Kanasgeri backwater, located 7 km from Karwar on the northern bank of the Kali estuary, is a low-lying marshy area of 63.2 ha. It is surrounded by paddy fields on the northern and eastern sides and continuous with the Chittakula backwaters on the western side. It is 3 km away from the mouth of the estuary. During 1970, a granite bund of 1 m height and 1500 m length with 3 sluices was constructed under the government's *Khar* land Scheme on the southern side of Chittakula and Kanasgeri backwaters to check the incursion of the water from the estuary into the paddy fields. The bottom soil is clayey on the surface up to 5 cm, and admixture of clay and sand from 5 to 17 cm. The mud portion decreases beyond 18 cm. Dead shells and shell fragments of *Meretrix* spp., *Paphia* spp., *Telescopium telescopium*, *Cerithidea* spp. and *Crassostrea* spp. were also present in the bottom soil.

Regular collections of water samples and fish and prawn samples, using castnet, were made once a week during the period September 1976 to August 1977 in the backwater area from 4 stations (Fig. 1).

The hydrological conditions of the water for the period September 1976 to August 1977 are given in Table 1.

*Hydrological observations:* The average tidal amplitude was 0.72 m. The highest tidal amplitude of 0.99 m was observed in June and the lowest amplitude 0.59 m in April (Table 1). The surface temperature ranged between 27.6°C and 33.7°C. The maximum temperature was noticed from March to May. The monthly average pH of water was 8.4. At the end of the monsoon season, the pH value went down to 8.0. The salinity values ranged between 1.36 and 33.09‰ for the period under observation. The highest salinity range of 31.35 to 33.09 ‰ was observed during January-May with the maximum value in March 1977. During June, with the onset of monsoon, the salinity decreased to 20.97 ‰. In July, the speak period of monsoon, the salinity dropped down to 1.36‰. It increased to 4.70 ‰ in August. The dissolved oxygen varied between 3.23 ml/l and 5.15 ml/l. Low values were found during the period October-December. High values

were observed during the monsoon months June and July. The minimum phosphate content of 0.05 mg/l was observed in September 1976 and the maximum value 0.87 mg/l in February 1977. Nitrite content ranged between 0.56 mg/l and 2.61 mg/l. Silicate values in the backwaters were more during peak mon-

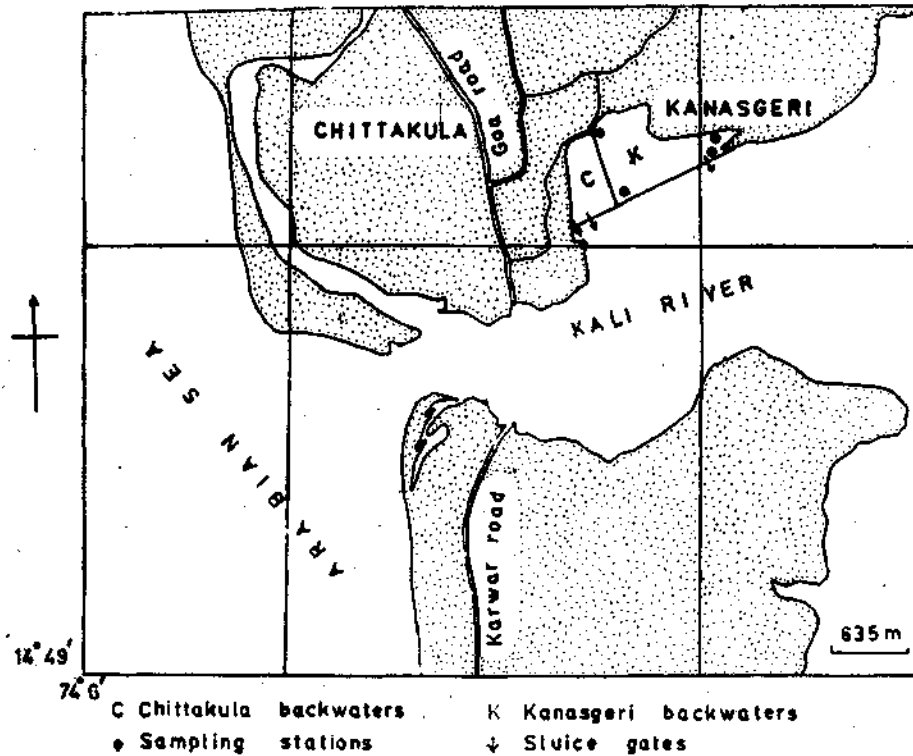


FIG. 1. Map showing the Kanasgeri backwaters.

soon months. They were 41.80 mg/l and 57.40 mg/l, respectively, for the months July and August 1977. During other months, the silicate content fluctuated between 13.30 mg/l in February and 24.13 mg/l in November 1976.

**Biological observations:** Monthwise catch composition and size range of prawns and fishes for the period September 1976 to August 1977 is shown in Table 2.

Juveniles of *Penaeus indicus* (31-101 mm) occurred in most of the months except in October, January and March. In May, the entire catch was that of *P. indicus*. During other months, their percentage composition varied between 3.00 (September) and 45.40 (February). Juveniles of *P. monodon* of size range 45-153 mm were noticed in the months of July, September, November and December. The highest percentage occurrence (12.90) was observed in July. The seed of *Metapenaeus monoceros* were available during June-December. The

TABLE 1. Hydrological conditions of Kanasgeri backwaters.

Months	Temperature °C	pH	Salinity ‰	Dissolved oxygen ml/l	Phos- phates mg/l	Nitr- ites mg/l	Sili- cates mg/l
September 1976	29.0	8.0	8.54	4.30	0.05	0.82	13.53
October	29.9	8.2	17.06	3.23	0.58	0.56	22.67
November	30.8	8.2	29.11	3.45	0.22	0.81	24.13
December	28.6	8.4	30.03	3.42	0.57	0.85	21.74
January 1977	29.3	8.6	32.15	3.97	0.68	1.05	18.15
February	30.7	8.6	32.46	4.52	0.87	0.97	13.30
March	33.2	8.5	33.09	4.99	0.81	0.85	15.06
April	33.6	8.5	32.43	4.64	0.38	2.61	15.84
May	33.2	8.5	31.35	4.92	0.57	1.71	14.72
June	32.4	8.4	20.97	5.04	0.46	1.25	22.56
July	27.6	8.4	1.36	5.15	0.75	2.28	41.80
August	30.1	8.4	4.70	3.47	0.65	1.30	57.40

size and percentage ranges in the sample were 28-79 mm and 0.75-15.08, respectively. The higher percentage of occurrence was noticed during October-December. The seed of *M. dobsoni* of size range 19-64 mm were present in the months of October (58.14%), November (28.37%), December (39.55%) and January (56.93%). Juveniles of *Macrobrachium* spp. (size range 18-110 mm) were observed from September to January and they formed between 1.20% (January) and 12.03% (September) of the catches.

The seed of *P. indicus* were available in large numbers in November, February, December and May, the order of abundance following the months. The seed of *P. monodon* were available in appreciable quantities in September and November. The period November-December was found to be the best for the collection of seed of *M. conoceros*. The period November to January was the best for *M. dobsoni* (Table 2).

Mullet fry (31-158 mm) were present almost throughout the year, the maximum percentage (34.59) of their occurrence being in June. During other months, the percentage composition varied between 2.98 (April) and 19.19 (January). Good concentrations of mullet fry were also observed in November, December, January and June. *Teuthis oramin* (34-94 mm) occurred in January-April and July. The seed of this species occurred relatively in larger proportion in February and March. The percentage of its occurrence was highest in July (74.20). During January-April, it formed between 3.77% and 44.80% in the castnet catches. Juveniles of *Sillago sihama* of size range 28-120 mm occurred

TABLE 2. Catch in numbers and size range in mm (in brackets) of prawn and fish from the Kanasgeri backwaters during Sept. 1976 to Jul. 1977 (no castnet operation in Aug.).

	1976				1977							NOTES
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	
<i>P. indicus</i>	4 (54-91)	—	379 (31-101)	103 (47-88)	—	153 (48-100)	—	7 (34-45)	61 (44-74)	28 (41-76)	2 (59-69)	
<i>P. monodon</i>	10 (54-130)	—	9 (45-153)	2 (70-104)	—	—	—	—	—	—	4 (61-106)	
<i>M. monoceros</i>	1 (68)	11 (35-46)	190 (28-56)	106 (33-61)	—	—	—	—	—	18 (37-79)	2 (65-66)	
<i>M. dobsoni</i>	—	50 (23-58)	377 (19-62)	278 (30-64)	181 (22-49)	—	—	—	—	—	—	
<i>Macrobrachium</i>	16 (40-110)	8 (18-53)	70 (21-79)	27 (21-59)	4 (20-63)	—	—	—	—	—	—	
<i>Mugil Spp.</i>	13 (64-157)	9 (70-93)	101 (31-133)	61 (42-140)	61 (42-140)	29 (40-85)	10 (52-89)	5 (82-158)	—	55 (50-143)	23 (22-45)	
<i>T. oramin</i>	—	—	—	—	12 (30-47)	100 (48-68)	112 (44-65)	30 (60-94)	—	—	—	
<i>Ambassis spp.</i>	12 (48-80)	6 (62-83)	99 (32-81)	32 (28-68)	7 (34-46)	10 (44-60)	28 (21-51)	59 (54-68)	—	13 (53-86)	—	
<i>Gerres spp.</i>	10 (57-82)	1 (80)	1 (80)	—	—	—	2 (28-35)	24 (51-70)	—	12 (51-95)	—	
<i>S. sihama</i>	3 (100-120)	—	3 (75-83)	1 (80)	1 (73)	—	2 (28-30)	1 (95)	—	—	—	
<i>Sardinella spp.</i>	17 (69-85)	—	—	—	3 (46-48)	5 (46-61)	6 (30-97)	7 (60-72)	—	—	—	

sporadically during the period of observation and formed between 0.4% and 2.26%. Juveniles of *Gerres* spp. (size range 28-95 mm) were available in the catches during September-November, March, April and June. The maximum numbers and the highest percentage of its occurrence were recorded in April. Young *Ambassis* spp. (size range 21-86 mm) were observed in the catches in all months except May. They were more abundant in April forming 35.12 % of the catches.

Thus, the Kanasgeri backwater, with its features, viz., (1) its being regularly fed by tidal flow, (2) the bottom soil an admixture of clay and sand, (3) the water temperature and salinity varying between 27.6 and 33.7°C and 29.1 and 33.1‰, respectively, during November-May with the minimum oxygen content above 3.23 ml/l, and (4) cultivable prawn and fish seed being available in fair concentrations during post-monsoon months, appear to be highly suitable for aquaculture.

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