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Density of distribution and habitat of black ruby barb (*Puntius nigrofasciatus*) in kuru Ganga - a branch of gkalu ganga.

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Abstract

Kukule Ganga south of Kuruwita town slowly meanders through a broad valley, and it flows fast north of it with rapids and pools. Both these regions sustained 12 species of freshwater fish of which *Puntius nigrofasciatus* is one, it's density of occurrence was about 2% in the southern part and about 10% in the northern part of town. Their density increased towards the hilly area and the populations are confined to pools with marginal vegetation of *Lagenandra ovata.*

Spawning is around March/April and November. Their commercially exploitable yield in the region is between 0.09-0.32/M^2. Dynamiting and river bed gem mining has severely affected the fish fauna.

Key words : Kuru Ganga, *P. nigrofasciatus,* commercial yield, habitat alteration.

1. Introduction:

Published information on freshwater fish of Sri Lanka is meager as no systematic work was ever carried out properly. However, it has been reported that there are about 65 species of fresh water fish in Sri Lanka, of which 63 and 37 species are inhabiting the rivers of wet and dry zones respectively (Pethiyagoda 1991). Five major rivers drain through the wet zone, namely Kelani, Kalu, Gin, Nilwala and Walawe, each with 52, 51,51 and 47 species of fish except for Walawe respectively. Mahaweli river drains through dry zone and sustains 44 species of fish (Pethiyagoda 19991). However, the above information is not available for Walawe river. Fish fauna of tributaries of major rivers are virtually unknown except for Kukule Ganga (Jinadasa 1998). In Kukule Ganga the density of *P. nigrofasciatus* ranged from 0.01 /M^2 in the lower part below its confluence with Pelang and Maguru rivers and 2.4/M^2 in the upper part of Koswatta Ganga and Wewe Ganga. in

the upper most region of Walawe Ganga namely. Huluoya, of Walawe Ganga above 600 M, the abundance of P. *nigrofasciatus* was 9.55% and their mean density of distribution was 0.24/M^2. (Jinadasa, Herath and Chandraratne 1999).

There is a great demand for freshwater ornamental fish among Sri Lankans as well as foreigners, specially there is a great demand for naturally occurring ornamental fish from the Western counties, such as European countries and the United States. There are a number of ornamental fish exporters in Sri Lanka, some of which are breeders as well. But the bulk of their catch for export market is collected from wild stocks in tributaries utilizing collectors.

Puntius nigrofasciatus is one of the species that has very high demand both in Sri Lankan and foreign markets. Therefore, exporters are frequently in search of fresh streams with stocks of P. *nigrofasciatus* to exploit and export to the market. Therefore, they frequently request fishery scientists for such information. Also some of the exporters have captive breeding programs for this species, they are also in search of naturally occurring wild brood stocks. The total value of ornamental fish exported in 1998 was Rs. 472.8 million (Fisheries Development, NARA Publication 1998). Thus, it is clear that a great Potential exists to develop an industry for naturally occurring colorful ornamental fish.

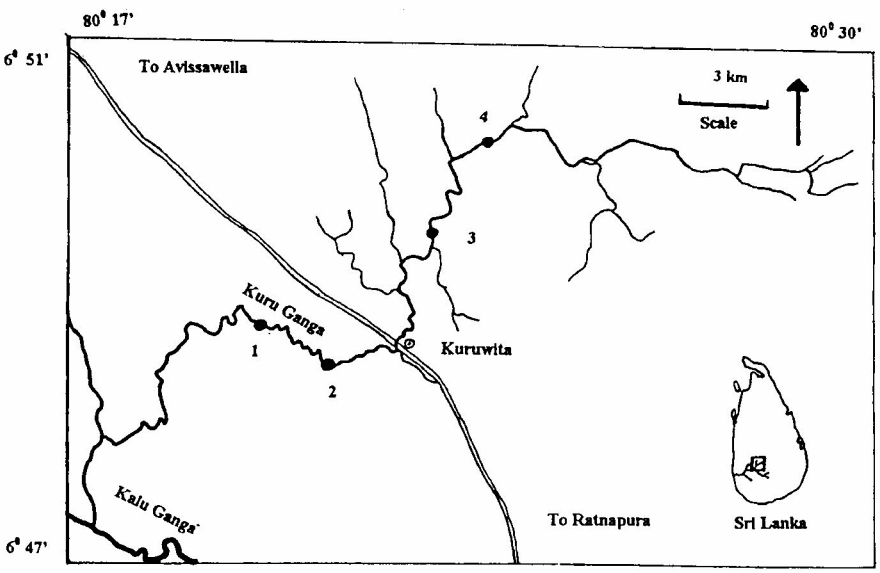

Figure 1 Study Area

• Sampling stations

The purpose of this study was to report the density of distribution and habitat of *P. nigrofasciatus* in Kuru Ganga, a branch of Kalu Ganga. So that the information will be useful for exporters as well as for conservationist.

2. Material and Methods

Fish were collected from four stations (fig 1), within a distance of 15 km. of Kuru Ganga Station 1 was situated 1 km west of Colombo - Ratnapura main road and the other three stations were 2 to 15 km to the north along Kuruwita - Adamspeak Road, main cart road. A distance of 50 m. at station 1 and 25m. at other stations was pre identified for the study. The width of the river at station 1 was 20 m. and therefore a cast net (bar mesh 0.75cm. and month diameter of 5m) was used to sample fish and five samples were collected within the 50 m. For other stations, where the width ranged from 5 to 7m, the upper and lower ends of a selected station of river, were blocked with fine mesh net and the area was seined using a seine net (bar mesh 0.75 cm., length 10 m.) Scoop nets were used in tiny pools where the area was also calculated. Fish samples were collected at regular intervals four times a year avoiding floods from 1995 to 1997. Fish were identified using Pethiyagoda (1991) and Mendis and Fernando (1962). The standard length of fish were measured at the site. Fish with bright red color head and tail was identified as mature fish. The nature of the river bed speed of water in pools and rapids were noted. Conductively and dissolved oxygen were measured using standard electronic meters. Speed of water was calculated according to floating method where a float was allowed to drift over a measured distances and the time taken was recorded.

3. Results

Table I. Species composition and percentage of occurrence of fish in Kuru Ganga

Species	Stations			
	1	2	3	4
Awaous grammepocus	39.1	27.4	15.5	13.2
Rasbora daniconius	6.8	8.2	10.3	9.2
Puntius filamentosus	20.3	8.2	5.2	92
Acanthocobitis uropthalmus	21.0	19.5	16.1	13.3
Xenentodon cencila	2.1	3.8	1.0	3.3
Danio malabaricus	4.20	10.30	26.2	20.5
P. nigrofasciatus	2.3	10.8	11.6	11.5
Belontia signata	3.2	2.2	2.0	1.6
Mastacembelus armatus	1.0	6.3	5.3	7.2
P. pleurotaenia	-	2.1	1.2	1.7
P. cumingi	-	1.2	3.6	5.1

River bed from station 1 to about 2 was generally flat, gravelly, flow speed of water was 0.5 m/sec, the depth of water ranged from 3 -4 m, the conductivity of water varied form 345 to 360 μ Scm^{1}. water was slightly acidic with pH values ranging from 6.3 - 6.5. River banks contained shrubs, therefore, the area was generally well exposed to the sun. Stations 3 to 4 which were situated in the hilly area, contained generally alternating reapids and pools. The area of pools ranged from 5-50M^{2}. The river bed contained bolders of different sizes banks of the river contained trees and aquatic visitation *Lagenandra ovata,* ketala, 40-60% of the river bed was shady. The conductivity of water ranged from 128-138 μ Scm^{1} and the pH from 7.3 -7.5. The mean speed of water ranged from 0.8-1.3m/sec^{1}.

There were 12 species of fish in the study area (Table I). However, there percentage occurrence varied from among the four stations studied. Four species, namely *A. grammiporus, P. filamontosus, A. uropthalmus and B. zignata* declined upstream towards the hilly area. Six species, namely, *R. daniconius, D. malabaricus, P. nigrofasciatus and G. cylonensis, M. gramatus and P. cumingi* increased with elevation. Other two specie, namely, *Z. dispar, P. pleurotaenia* were generally present in equal numbers throughout the area.

The abundance of *P. nigrofasciatus* was low in station 1 but gradually increases towards the hilly are a and formed about 10.5% of the total. They mostly inhabited the aquatic vegetation along the banks and pools. The density of distribution in the flat region was about. .002 M^{2} and that of the hilly region ranged from 0.72 to 0.9M^{2}. They were in small school and the number never exceeded 3-14, depending upon the size of the pool. Colorful large fish were mostly confined to feeding canals, streams and brooks with vegetation. The standard length of. *P nigrofasciatus* present in the region ranged from 2.3 to 5.1.

Male fish were larger and red in color than female fish, it was observed that a number of large male fish ranging from 3-4 were associated with one female, exhibiting chasing and courtship behavior during November and March/April. These periods could be the spawning periods in the study area., when mature fish-broad stock is avalable. Breeding was observed in feeding tributaries (plate 1). Based on the calculation principle adopted by Jinadasa et al (1999), the commercially exploitable yield per year could vary from 09 to 0.32/M^{2} in the hilly region up to distance of about 15 km from the town. Dynamiting has affeted all species, mostly bottom dwelling *Awaous gramepomus* (Plate 2).

4. Discussion

Information on population density of freshwater fish of Sri Lanka is hitherto not known except for the species of fish in the upper region of Walawe river in th second Pene plain.

Where the density of *P. nigrofasciatus* has ranged there from 0.64 to 35 m^2. However, these densities have varied heavily among different streams. Also the commercially exploitable stock ranged from 0.11 to 1.10/m2 (Jinadasa, Herath and Chandraratna (1999). When the two river systems are compared, it is clear that Kuru Ganga, specially the region studied has higher density than that of Walawe. However, the study area of Walawe Ganga was at a higher elevation, above 500 m, where as the present study area of Kuru Ganga was confined to a lower elevation, than 150 m, it could be that *P. nigrofasciatus* is largely concentrated to streams of low elevationor to first penaplain. This was the situation even in Kukule Ganga and Pelan Ganga, which is also located in the above penaplain (Jinadasa. 1998). Where P. *nigrofasciatus* was mosly confined to feeding streams of main Pelang Ganga. These findings further proves information shown by Pethiyagoda. (1991) in his distribution maps of fresh fish of Sri Lanka.

Dynamiting is a common practice to harvest fish in the lower part below town. Further, the river bed gem mining has destroyed the river bed and the banks, with the result that mountains of sand had built up in the middle of river, creating pools and dividing the river bed in to a number of narrow streams. This had resulted the fragmentation of the habitat, and therefore, small pools dried of during dry period of March and August/ September, which will eventually leads to the extinction of this species from the river due to human activities.

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Plate 1. Habitat of breeding areas in feeding tributaries of Kuru Ganga.

Plate 2 A wounded and damaged fish due to dynamiting.