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Living Habitat of Freshwater Fish Rasbora daniconus in Bindusara Basin, Beed.

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Abstract :

In the present communication habitat ecology, species diversity; distribution and different indices of fish biodiversity management were studied in the Bindusara Basin, Correlation between fish species richness with the hydrological attributes showed good relationship and water depth, dissolved oxygen and pH were found the most important variables in shaping fish assemblage.

Keyward:

Bindusara River, Habitat Ecology, Rasbora Daniconus. Trophic niche.

Introduction :

Over the last centrury, riverine ecosystems have suffered from intense human intervention resulting in habitat loss and degradation and as a consequence, many fish species have become highly endangered, particular in rivers where heavy demand is placed on freshwaters. The main causes are habitat destruction and defragmentation (Cuizhang and other 2003), water abstraction, industries and private use (Gibbs 2000; Dawsonand other 2003) exotic species introduction (Copp and others 2005), pollution and global climate change impact (Mas-Marti et al. 2010).

Freshwater fish are one of the most threatened taxonomic groups (Darwall and Vie 2005) because of their high sensitivity to the quantitative and qualitative alteration of aquatic habits (Kang et al. 2009; Sarkar et al. 2008). As a consequence, they are often used as bioindicator for the assessment of water quality, river network connectivity or flow regime (Chovance et al. 2003).

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Today the fish diversity and associated habitats management is a great challenge (Dudgeon et al. 2006). Conservation measures to mitigate the impact of the pressures have largely been slow and inadequate and as a result many of the species are declining rapidly.

In the tributaries of Bindusara river basin though supports rich biodiversity and offers livelihood and nutrition security has been less studied from conservation pointof view. Studies in some cases have been limited to scattered works on commercial fisheries based on catch data of some major groups and even these have been largely restricted to some of the major River systems (Mishra and Moza 1997; Payne et al. 2004).

Bindusara River and tributary support livelihood and nutritional security. The fish fauna of the River Bindusara is highly threatened due to presence of dams and water diversions resulting fragmentation of habitat and building another dam and diverting the water to the basin.

The review of literature shows that except for a single account of fish taxonomy (Adholia 1977), flow pattern and water use balance (Pandey et al. 2008; Chaube 1988), no informationis available on the pattern of fish species diversity, abundance, distribution, and fish habitat aspects at different spatial scales. Detailed studies required for conservation and management of the large Indian rives are very less except few (Sarkar et al. 2008). The aim of this study was to assess the present Living Habitat of fish community structure, abundance, diversity, distribution, richness, trophic ecology of the fishes, threats andto recommend conservation management measures.

Study area :

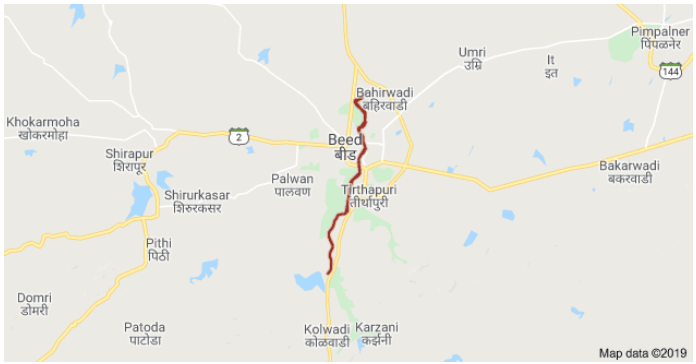

Fig.1 Bindusara River Catchment area

Bindusara also called Bendsurais a small river situated in the district of Beed in Maharashtra state of India. It is a tributary river of Sindphana and a sub-tributary of Godavari river.

Bindusara originates in the hills of Balaghat near the village Waghira, in south of district Beed in Patoda taluqa. It is a hilly area. Various small streams contributes to the river. The city of Beed is situated on the banks of Bindusara river.

Bendsura is a rapid and seasonal river. A reservoir; Bendsura Project (capacity 7.106 million cubic metres) was constructed on the river in 1955 near the village of Pāli, about 10 km south of Beed. Bendsura river flows from south to north and meets Sindphana river, about 10 km north of Beed town. Total length of the river is about 40 km.

Material and Method :

The present study encompassed of the Bindusara River conring entire stretch from upstream to downstream. The locations of sampling sites were documented by susing global positioning system. The habiat categorization method was followed as per Bain and Stevenson (1999) with little modifications.

Rasbora daniconus showed very restricted distribution and collected only from single location. Among migratory fishes, a total of seven species were captured. The distribution of migratory fishes was varied alogn the stretch. catla catla, channa gachua, ophiocephalus punctatus, Notopterus notopterus, Chitala chitala were recorded throughout the River.

Evaluation fo the commercial utilization fo fishes of Bindusara River indicated that rich in supporting many food fishes, ornamental fishes Among the fishes collected from entire stretch a uniform pattern of utilization fo trophic ecology was observed. Omnivorous fishes were dominated, carnivorous, herbivours and planktivorous respectively.

Result and discussion :

The present study revealed that the physical habitat variables play key role in the distribution of fishes in River Bindusara and the habitat alteration and fragmentation brought about significantly to the endangerment of freshwater fish fauna. We obseved that among habitat

attributes, water depth, dissolved oxygen and pH are key habitat features and positively correlated with the fish assemblages and found the most important variables in shaping fish distributions. The variations in the habitat attributes like pH, turbidity, total dissolved solids andconductivity across different sites was attributed to differences in land use pattern, which was responsiblefor variation of species diversity and distribution. Similar pattern of habitat attribute has been observed by Lobb and Orth (1991); and Shahnawaz et al. (2010). Recently, the significance of habitat was endorsed by Pares-Neto (2004) with evidence suggesting species occurrences are driven more by relationship with abiotic factor than species interaction.

The present Study revelas the comparative study of Bindusara and Upli water researve Upali is more trangular body than the Bendusara Project. The freshwater fish Rasbora daniconus found in more triangular water bodies.

The diversity recorded in the present study lesser than a recent report from other tributatries of River Ganga (Sarkar et al. 2009). Due to lack of previous information on fish diversity from this river it is not possible to quantify the rate of decline in fish diversity but the presnet study would be useful as baseline data for any future assessment after interlinking. Most importantly, our study indicate considerable share insupporting fish biodiversity in the region despite alterations like daming and habitat degradations.

Fish conmmunities in riverine system typically follow a pattern of increasing species richness, diversity and abundance from upstrream to downstream (Welcomme 1985; Bayley and Li 1994). However, the current pattern of species richness, diversity and abundance of fishes contrasts sharply with the typica pattern. Species diversity, species richness both were lowered in the lower area in this study compared with the upper area (Babit et al. 2006). This pattern is unlikely to result from sampling variation, because the same sampling gears were used in studies The pattern found in this river suggests cumulative temporal and spatial effects of habitat loss of environmental degradation in the lower zone (Wolter et al. 2000). Although the upper and middle stretch of the river is fragmented due to lack of water, damming, and multiple water use but supported more speices as compared to downstream might be due to positive influence of

reservoirs connected with the river in this region as well as due to existence of more open river, slow water and pool habitats along with macrophytes which might have importance in fish assmblage and aggregation (Raghavan et al. 2008 a, b). Open river habitat were the most preferred habitat for fishes inhabited in the tropical rivers (Lobb and Orth 1991).

Conclusion :

Variation in species diversity in Bindusara and Upali water reserve indicated that altered habitat support less biological communities while less distribed sites are characterized by a diverse fish fauna in a variety of habitat.

Our living habitat study shows that open river, shallow water and deep pools are the primary habitats contributing to the maximum diversity, therefore, these particular habitats is recommended for conservation and management of the freshwater fish Rasbora daniconus biodiversity.

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