Journal of the Kalash Science, Special Volume, 2013 : 69-71 ISSN : 2321-7634

Estimation of fish biodiversity from the middle stretch of the Ganga river, India

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Abstract
Present investigation was undertaken to study the fish biodiversity from the Ganga river at Allahabad. The samples were collected monthly during the period January 2008 to December 2009 from the middle stretch of the Ganga river at Allahabad. The fishery from the middle stretch of Ganga river was mainly represented by the species belonging to Cyprinidae and Siluridae family. On the basis of present studies fish biodiversity were estimated 69 fish species. Two exotic fish species (*C. carpio* var. *communis* and *Oreochromis niloticus*) were very frequently reported in the river at Allahabad.
Keywords: Fish biodiversity, Ganga river, Allahabad, Cyprinidae, Siluridae.

Introduction

The Ganga river is the largest river system in Asia that harbour rich fish diversity (Bilgrami *et al.* 1992, Rao 2001, De Silva *et. al.* 2006). The Ganga river form important exploiting centers in the states of Uttrakhand, Haryana, Delhi (Moza & Mishra 2001), Uttar Pradesh (Gupta & Tyagi, 1992, Singh *et al*. 1998), Bihar (Kumar 1996), West Bengal (Anon 2002). During past 40-50 years the riverine fisheries of the Ganga river and other major river systems of the country are facing serious threats, affecting both to fish stocks and ecosystem stability and a number of fishes have become extinct due to several anthropogenic factors and invasion of exotic species (Singh & Lakra 2011, Sarkar *et al.* 2012, Dwivedi & Nautiyal 2013). An exploratory survey of river Ganga during 1995-96 showed that major carps (*Cirrhinus mrigala, Catla catla, Labeo rohita*) and *Wallago attu* have declined considerably (Sinha *et al.* 1998). The catch was dominated by catfishes (*Mystus aor, M. seenghala, Rita rita, Clupisoma garua*) and miscellaneous species (Sinha *et al.* 1998). Maintaining the biodiversity of aquatic resources is a prerequisite for the preservation of ecological balance, increase increase in production and welfare of human beings. In the present study based on field studies an attempt has been made to give an overall scenario on the different fish species available in the river Ganga at Allahabad.

Materials and Methods

The samples of fish species were obtained from fishermen or from fish market at Teliarganj, Allahabad. It is a major landing centre for the Ganga river at Allahabad. Sampling was performed during the January 2008 to December 2009. Species composition was determined from the catch for individual fishes of commercial importance. Commercially important fishes are the species, which are in great demand owing to their quality of flesh or due to demand generated by market prices. Fishes were identified with the help of Day (1878), Talwar & Jhingran (1991) and Jayaram (2003).

Result and discussion

The catch was studied species wise like, *Catla catla* (Hamilton), *Labeo rohita* (Hamilton), *Cirrhinus mrigala* (Hamilton), *Labeo calbasu* (Hamilton), *Cyprinus carpio* var. *communis* Linnaeus, *Oreochromis niloticus* (Linnaeus), *Clupisoma garua* (Hamilton), *Eutropthiys vacha* (Hamilton), *Wallago attu* (Bloch & Schneider), *Bagarius bagarius* (Hamilton), *Rita rita* (Hamilton), *Sperata aor* (Hamilton), *S. seenghala* (Sykes) (Table 1) and miscellaneous fish species

(Table 2). In case of catfishes, *C. garua* was recorded maximum number compared to other catfishes while in case of important India carps, *Cirrhinus mrigala* reported frequently. *C. carpio* var. *communis* and *Oreochromis niloticus* were frequently recorded in the Ganga river at Allahabad. In landing, both species shared about 40%.

Table 1 Commercial component of the fish landings in the Ganga river at Rasoolabad

Important Indian carps	*Catla catla*
	Labeo rohita
	Cirrhinus mrigala
	Labeo calbasu
Exotic carps	*Cyprinus carpio* var. *communis*
	Oreochromis niloticus
Important catfishes	*Clupisoma garua*
	Eutropiichthys vacha
	Wallago attu
	Bagarius bagarius
	Rita rita
	Sperata aor
	Sperata seenghala

Table 2 Miscellaneous component of the fish landings in the rivers Ganga at Rasoolabad

Miscellaneous component	
Labeo bata	*Silonia silondia*
Cirrhinus reba	*Pangasius pangasius*
Puntius ticto	*Gagata cenio*
P. sophore	*Aborichthys elongatus*
P. chola	*Chagunius chagunio*
Barilius bola	*Chanda nama*
Barilius barila	*Channa striatus*
Barilius barna	*Channa marulius*
Osteobrama cotio cotio	*Eutropiichthys murius*
Aspidoparia morar	*Glyptothorax lineatus*
Aspidoparia jaya	*Crossochelius latius*
Mystus cavasius	*Glossogobius giuris*
M. vittatus	*Gudusia chapra*
M. bleekeri	*Johnius coitor*
Clarius batrachus	*Mastacembelus armatus*
Ailia coila	*Nangra viridescence*
Notopterus notopterus	*Chitala chitala*
Salmostroma bacaila	*Channa punctatus*
Securicula gora	*Setipinna phasa*
Osteobrama cotio	*Goniolosa manmina*
Sisor rhabdophora	*Labeo gonius*
Xenentodon cancila	*Rhinomugil corsula*
Bengala elonga	*Anabas testudineus*
Chela sldonii	*Gonialosa manmina*
Chela laubuca	*Macrognathus pancalus*
Chela cachius	*Ompok bimaculatus*
Colisa fasciatus	*Parambassis ranga*
Cyprinus carpio specularis	*Siacamugil cascasia*

The present studies revealed that the presence of 69 fish species. Among exotics, four species viz. *C. idella*, *C. carpio specularis*, *H. molitrix* and *H. nobilis* were rarely seen in catches. The river fish biodiversity are structured by environmental factors, especially physical habitats and water quality (Cooper 1993, Allan 2004, Griffth *et al.* 2009). Information on fish fauna from Uttar Pradesh is far from satisfactory. The Ganga river system harbors the richest fish fauna of India. Hamilton-Buchanan (1822) reported 271 fish species. Fishes from eastern U.P. have been reported by Srivastava (1958) who listed 87 fish species. Hora (1949) recorded 42 fish species from river Rihand. Motwani & David (1957) reported 95 fish species from river Sone and Srivastva *et al.* (1966) 55 species from river Ken. Joshi (1994) has given an account of the fish fauna of Kali river. Talwar & Jhingran (1991), Mohanta & Kapoor (1994) documented the presence of 375 species from the Ganga basin. Sinha (2006) reported that the Ganga river system harbour about 265 fish species. On the basis of an exploratory survey of river Ganga, Sinha *et al.* (2008) reported 46 species.

Reference

Allan, J.D. 2004. Landscapes and riverscapes: the influence of land use on stream ecosystem. *Annu. Rev. Ecol. Syst*., **35:** 257-284.

Anon, 2002. (Annual Report), Central Inland Fisheries Research Institute (ICAR), Barrackpore, Kolkata West Bengal, pp 16.

Bilgrami, K.S., J.S. Datta Munshi & S.K. Verma 1992. Bioconservation and biomonitoring of river Ganga in Bihar. *Final Technical Report*, Ganga project Directorate, New Delhi.

Cooper, C.M. 1993. Biological effects of agriculturally derived surface water pollutants on aquatic system- a review. *J. Environ. Qual.,* **22:** 402-408.

De Silva S.S., Nguyen T.T.T., Abery N.W., Amarasinghe U.S. 2006. An evaluation of the role and impacts of alien finfish in Asian inland aquaculture. *Aquaculture Research*, **37:** 1-17.

Dwivedi, A.C. & P. Nautiyal 2013. Alien fish species, *Cyrinus carpio* (common carp) as a invader in the Vindhyan region (Ken, Paisuni, Tons rivers), India. (In press).

Fishes of the river Sone with observation on the zoogeographical significance. *J. Zool. Soc. India*, **9(1):** 1-7.

Grifffth, M.B., F.B. Daniel, M.A. Morrison, M.E. Troyer, J.M. Lazorchak & J.P. schubaur- Berigan 2009. Linking excess nutrients, light and fine bedded sediments to impacts on faunal assemblages in headwater agricultural streams. *J. Am. Water Resour. Assoc.,* **45:** 1475-1492.

Gupta, R.A. & R.K. Tyagi 1992. Analytical approach to analysis of fish stock of Ganga river system. *J. Inland. Fish. Soc. India,* **24(2):** 20-27.

Hamilton- Buchanan, F. 1822. An account of fishes found in the river Ganges and its branches. Edinburgh and London: VII+405+39 pls.Srivastva, G.J. 1958. Fishes of Eastern Uttar Pradesh. *Vishwa Vidyalaya Prakashan, Varanasi*.

Hora, S.L. 1949. The fish fauna of the Rihand river and its zoogeographical significance. *J. Zool. Soc. India,* **1(1):** 1-6.Motwani, M.P. & A. David. 1957.

Joshi, K.D. 1994. Status of ichthyofauna of Kali river system, U.P. *In:* Proc.81st session of the Indian science congress Jaipur, 1994, Section Zoology, Entmology and Fisheries: 94.

Kumar, D. 1996. Fishery of river Ganga around Patna and its conservation. *J. Inland Fish. Soc. India,* **28(2):** 13-19.

Mohanta, P.C. & D. Kapoor 1994. Endangered and vulnerable and rare carp species of Ganga river system. *In:* Threatened fishes of India **Edited by** P.V. Dehadrai, P. Das and S.R. Verma, *Natcon Publication* No.4, Pp.21-24.

Moza, U. & D.N. Mishra 2001. Evaluation of fish biomass and community structure in the context of environmental modification in upper stretches of river Yamuna- part II. *Appl. Fish. & Aquac.,* **1(1):** 17-21.

Rao, R.J. 2001. Biological resources of the Ganga river, India. *Hydrobiologia*, **458 (1-3):** 159-168.

Sarkar, U.K., A.K.Pathak, R.K. Sinha, K. Sivakumar, A.K. Pandian, A. Pandey, V.K. Dubey & W.S. Lakra 2012.Fresh water fish biodiversity in the river Ganga India: changing pattern, threats and conservation perspectives. *Rev. Fish Biol. Fish*., **22**: 251-272.

Singh, A.K. & W.S. Lakra 2011. Risk and benefit assessment of alien fish species of the aquaculture and aquarium trade into India. *Rev. Aquacult*., **3**: 3-18.

Singh, H.R., A.I. Payne, S.K. Pandey & P.R. Singh 1998. Time scale changes in the catch structure of fishery in Allahabad. *Proc. Nat. Acad. Sci. India,* **68B:** 15-21.

Sinha, M. 2006 Riverine Fisheries of India. 142-157. *In:* Handbook of fisheries and aquaculture., ICAR publication New Delhi, Pp.755.

Sinha, M., D.K. De & B.C. Jha 1998. The Ganga-Envirnment and Fishery. *CIFRI publication, Barrackpore*: Pp.142.

Srivastva, C.B., R.Chandra & S.K. Wishard 1966. On a collection of fish from river Ken in Banda district, (U.P.). *Rec. Zool. Surv. India*. **64(1-4):** 131-134.

Talwar, P.K. & A.G. Jhingran 1991. Inland fishes of India and adjacent countries. Vol I & II, *Oxford & IBH Publishing House*, Calcutta.