

SHORT COMMUNICATION

DIVERSITY AND RELATIVE ABUNDANCE OF FISHES IN THE HEAD OF BLUE NILE RIVER, ETHIOPIA

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ABSTRACT: Diversity and relative abundance of fishes in the head of the Blue Nile River (from the outlet of Blue Nile River in Lake Tana to Tisisat Fall) were studied from fish samples collected in wet (October 2009) and dry (March 2010) seasons. Fish sampling was done using multifilament gillnets (6, 8, 10, 12 and 14 cm stretched mesh) and monofilament gillnets (5-55 mm stretched mesh), and hook and lines. A total of 929 fish specimens, belonging to three families and seventeen species, were identified from the river. From Index of Relative Importance (IRI) analysis, the four most dominant fish species in the river were *Labeobarbus intermedius* (62.4%), *L. crassibarbis* (11.8%), *Clarias gariepinus* (10.1%) and *Varicorhinus beso* (4.04%). The cyprinid fish, *L. intermedius*, was the most dominant fish during the two sampling seasons. Length-weight relationships for the dominant species were found to be curvilinear. Generally, there was no species composition difference between Lake Tana and the head of Blue Nile River.

Key words/phrases: Abundance, Conservation, Diversity, *Labeobarbus*, Species composition.

INTRODUCTION

Although Ethiopia has high production potential and diversity of fish fauna, satisfactory fishery investigations have been carried out only in a few of the numerous freshwater bodies. The territory of Ethiopia seems to be among the regions of the African continent which have been least explored for their ichthyofauna (Golubtsov *et al.*, 1995).

Substantial fish biology and fisheries information have appeared in different disciplines during the last three decades by different researchers, such as in Gumara River (Abebe Ameha, 2004), Dirma and Megech Rivers (Wassie Anteneh, 2005); Lake Tana (Nagelkerke, 1997; Zenebe Taddese, 1997; Tesfaye Wudneh, 1998; de Graaf *et al.*, 2000; Eshete Dejen, 2003). Abebe

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Getahun (2005 a, b) studied eco-regions, diversity and conservation of the freshwater fish fauna of Ethiopia. On the other hand, review on introduction and transplantation of freshwater fish species in Ethiopia was done by Shibus Tedla and Fisseha Hailemeskal (1981).

The study conducted so far on Lake Tana basin for the last three decades had focused only on the lake and inflowing rivers to the lake. However, adequate data have not been generated in the head of the Blue Nile River, the out-flowing river. The absence of fishery data on this part of the river was the basis for this study. Therefore, the purpose of this study was to generate baseline scientific information about diversity of fish species in the head of Blue Nile River which is very essential for the conservation and sustainable utilization of the fish resources. Moreover, this study aimed at testing the hypothesis that there is difference in fish species composition between Lake Tana and the head of the Blue Nile River.

MATERIALS AND METHODS

Description of the study area

The study area is the head of Blue Nile River (from the outlet of Blue Nile River to Tisisat Fall) located between 11⁰28'49"-11⁰38'29"N, and 37⁰23'28"-37⁰36'34"E. It lies within Bahir Dar Zuria Woreda and Bahir Dar city administration. It covers 30 kms from the lake outlet to the Tisisat fall.

A preliminary survey was conducted before setting the sampling stations. Four sampling sites were selected: Debremariam, Semaitat, Andasa and Gumare Bahir. Sampling sites were selected based on the velocity of water, habitat type, altitude, depth of water, substrate type and a sharp bend or point area.

RESULTS AND DISCUSSION

In the present study, a total of 17 species were identified and recorded during dry and wet seasons in the head of Blue Nile River (Table 1). *L. Intermedius* was the best represented genus with 13 species. The fish fauna of the study area contain highland East African type, like, *L. Intermedius*, *C. garipepinus* and *O. Niloticus*, and also endemic species.

L. intermedius was the most abundant species ($H' = 0.36$) (Table 2) and *L. crassibarbis* was the second most abundant species in the total catch ($H' = 0.24$). *C. garipepinus* was the third most abundant species ($H' = 0.23$), and *V. beso* was the fourth most abundant species in the total catch ($H' = 0.21$).

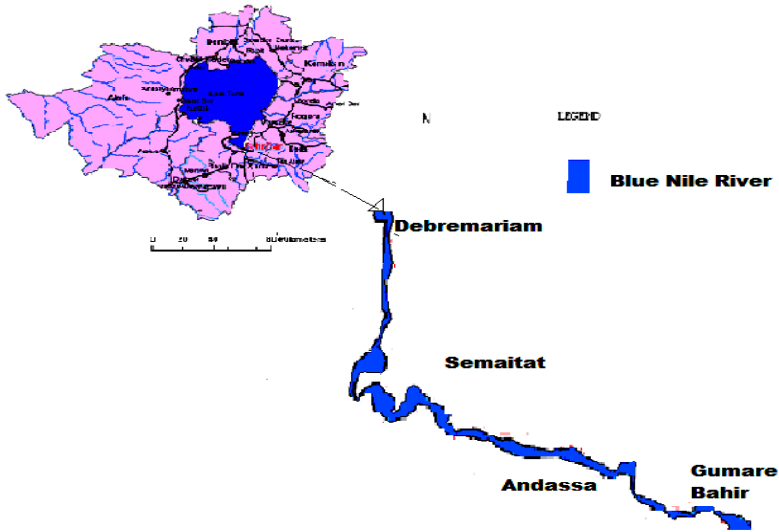


Fig. 1. Map of the study area

Table 1. Fish species composition of in the head of Blue Nile River.

No	Scientific name	Family	Order
1	<i>L. acutirostris</i>	Cyprinidae	Cypriniformes
2	<i>L. brevicephalus</i>		
3	<i>L. crassibarbis</i>		
4	<i>L. daineillii</i>		
5	<i>L. gorgorensis</i>		
6	<i>L. gorguari</i>		
7	<i>L. intermedius</i>		
8	<i>L. longissimus</i>		
9	<i>L. megastoma</i>		
10	<i>L. nedgia</i>		
11	<i>L. platydorsus</i>		
12	<i>L. surkis</i>		
13	<i>L. tsanensis</i>		
14	<i>V. beso</i>		
15	<i>Garra dembecha</i>		
16	<i>Clarias gariepinus</i>	Clariidae	Siluriformes
17	<i>O. niloticus</i>	Cichlidae	Perciformes

Table 2. Catch composition and index of relative importance (IRI) in the head of Blue Nile River.

Species	NO	%NO	W (kg)	%W	FRQ	%FRQ	IRI	%IRI	H'
<i>L. intermedius</i>	336	36.16	87.36	30.94	83	54.24	3641	62.38	0.36
<i>L. crassibarbis</i>	103	11.08	46.88	16.60	38	24.83	688	11.79	0.24
<i>L. nedgia</i>	64	6.88	15.7	5.56	25	16.33	203	3.49	0.18
<i>L. surki</i>	18	1.93	5.75	2.03	5	3.26	13	0.22	0.07
<i>L. dainellii</i>	3	0.32	1.83	0.64	1	0.65	1	0.01	0.01
<i>L. longissimus</i>	3	0.32	1.24	0.44	1	0.65	0	0.01	0.01
<i>L. brevicephalus</i>	54	5.81	6.28	2.22	21	13.72	110	1.89	0.16
<i>L. gorguari</i>	25	2.69	7.48	2.65	11	7.18	38	0.66	0.09
<i>L. gorgorensis</i>	54	5.81	30.46	10.78	21	13.72	228	3.90	0.16
<i>L. tsanensis</i>	6	0.64	1.78	0.63	2	1.30	2	0.03	0.03
<i>L. platydorsus</i>	16	1.72	8.11	2.87	7	4.57	21	0.36	0.06
<i>L. megastoma</i>	14	1.50	4.09	1.44	7	4.57	14	0.23	0.06
<i>L. acutirostris</i>	9	0.96	2.36	0.83	3	1.96	4	0.06	0.04
<i>C. gariepinus</i>	99	10.65	47.10	16.68	33	21.56	590	10.1	0.23
<i>O. niloticus</i>	38	4.09	3.34	1.18	14	9.15	48	0.83	0.13
<i>Garra dembecha</i>	4	0.43	0.03	0.01	1	0.65	0	0.00	0.02
<i>V. beso</i>	83	8.93	12.48	4.42	27	17.64	236	4.04	0.21
Total	929	100	282.32	100					2.16

The present study species composition was compared with the previous studies (Nagelkerke, 1997; de Graaf, 2003; Eshete Dejen, 2003 and Abebe Getahun, 2004) conducted on the lake and inflowing river.

Species diversity

Seventeen species of fishes were identified from the four sites (Debremariam, Semaitat, Andassa and Gumare Bahir). Relatively, a higher number of species were recorded from Debremariam (14 species) and Semaitat (10 species) whereas, seven and eight species were identified from Gumare Bahir and Andassa, respectively. Species diversity decreased as one moved to the lower catchment sites of the Blue Nile River due to decreasing vegetation cover, unprotected riparian corridors, and the high speed of waters.

Species composition pattern

L. intermedius, *L. crassibarbis*, *L. nedgia*, *L. surki*, *L. brevicephalus*, *L. gorguari*, *L. platydorsus*, *L. megastoma*, *C. gariepinus*, *O. niloticus* and *V. beso* were found in all sites during the dry and wet seasons.

CONCLUSION

The fish faunal diversity of the head of Blue Nile River is dominated by Cyprinids. Of the total 17 species, 15 are included in the family Cyprinidae. The rest are in the family Cichlidae and Clariidae. Almost all species of *Labeobarbus* that are found in Lake Tana were caught in the head of Blue Nile River except *L. macrophthalmus*, *L. truttiformis*, small *Barbus* spp., *Garra* spp., *Nemacheilus* spp. Among the *Labeobarbus* spp of Lake Tana, *L. macrophthalmus* and *L. truttiformis* were not found.

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