

Fish diversity of Lohandra River, Biratnagar, Morang, Eastern Nepal

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Abstract

Nepal has great water resources supporting diverged aquatic flora and fauna, including varieties of freshwater fishes. Lohandra river is one of the major perennial river of Morang district, eastern Nepal, originating from Mahabharat hill. Fishes of the river were collected from September, 2014 to August, 2015 using local gears and cast net with the help of local fishermen and the collected fishes were preserved in 70% alcohol facing their head downward for taxonomic identification. The present paper deals with 51 fish species belonging to 38 genera, 20 families of 7 orders. The notable ichthyofauna of the river were *Clarias batracus*, *Garra gotyla*, *Botia lohachata*, *Chagunius chagunio*, *Chaca chaca*, *Acanthocobotis botia*, *Lepidocephalus guntea*, *Colisa faciatus*, *Notopterus notopterus*, *Cirrhinus reba*, *C. mrigala*, *Labeo dero*, *L. cabasu*, *Salmostoma bacaila*, *Barilius bendelisis*, *B. barna*, *Crossocheilus latius latius*, *Mystus* species, *Ompok bimaculatus*, *Wallago attu*, *Chanda nama*, *Nandus nandus*, *Anabus testudineus*, *Channa orientalis*, *C. marulius*, *Catla catla*, *Monopterus cuchia*, *Clupisoma garua* and *Psilorhyncus sucatio*. As Lohandra river was rich with ichthyofauna, the investigation of ecology and fishes of the river is recommended for the conservation of these fishes.

Keywords: Fish fauna, Kerabari, Mahabharat, *Ompok bimaculatus*.

Introduction

Fishes, a better source of animal protein, are aquatic vertebrates including hag fish, lampreys and cartilaginous and bony fishes which utilized aquatic resources and are converted into animal protein. It is white meat, which is easily digestible so most of the people in the world use the fishes as their major food. Their production is comparatively high because they do not suffer from the loss of substantial amount of energy to maintain body temperature as compared to terrestrial animals.

Nepal, a landlocked country, located in the south of Himalayas in Asia. The Karnali in the west, the Gandaki in the central and the Koshi in eastern part are three major rivers of the country including more than 6,000 other rivers inhabiting 232 fish species (217 native species and 15 exotic species) (Shrestha, 2008), 108 species in Narayani river (Jha & Bhujel, 2014) and 30 species in Seti Gandaki river (Pokharel, 2012). The Koshi river is rich with aquatic fauna and flora. Shrestha (2008) and Gupta (2015) reported some game fish inhabiting in the river are *Bagarius bagarius*, *Channa marulius*, *Tor putitora*, *Tor tor*, *Chitala (Notopterus) chitala*, *Wallago attu*, *Aorichthys seenghala*, *Neolissochilus (Acrossocheilus) hexagonolepis*, *Clupisoma gaura*, *Anguilla bengalensis*, *Silonia silondia*, *Amphipnous (Monopterus) cuchia* and *Notopterus notopterus*.

Lohandra river is one of the perennial river of Morang district, Province No. 1, eastern Nepal. It originates from Bhogateni Village Development Committee lying between Mahabharat and Churia hill. It is formed by joining Dhobi Khola and Turke Khola of eighth Bhogateni VDC, then it takes its course of southwards through Kerabari, Belbari, Mohipur and Sidraha, where it joins Judi Khola forming Lohandra river. After crossing Bhathiganj VDC, the river enters in India where it joins with Kosh river.

As regard to itthyofauna, De Witt (1960) reported a contribution to the ichthyology of Nepal. Shrivastava (1968) gave a taxonomic handbook entitled "Fishes of eastern U.P., India", in which he mentioned a number of Nepalese fishes. Thapa and Rajbanshi (1968) worked on the few hill stream fishes of Nepal. Majumdar et al. (1972) has worked on fish fauna of Nepal. Shrestha (1981) published a book "Fishes of Nepal" describing scientific details of 120 fish species. Edds (1986) listed 107 and 111 fish species from the Royal Chitwan National Park and the Kali Gandaki/Narayani River of Nepal respectively. Shrestha (1990) published his book entitled "Resource ecology of the Himalayan water" reporting 74 fish species from Karnali river, 108 species from Trisuli, 102 species from Narayani and 69 species from Mahakali. He also described the swamp land ecology and fish management and conservation in his book. Shrestha (1994) reported 129 fish species belonging to 66 genera in Nepal. She also mentioned a report on Fishes, Fishing implements and Method practiced in the country. Shrestha (2001) published a paper entitled "Taxonomic Revision of Fishes of Nepal", a taxonomic revision of 186 fish species earlier reported (Shrestha, 1998). Shrestha (2008) published a pioneer book of taxonomy entitled "Ichthyology of Nepal" mentioning 232 fish species from Nepal. The rivers of Nepal are really rich in fish fauna which need to be explored scientifically for further conservation. An attempt, therefore, has been made to conduct a thorough survey of fish resources at Lohandra river.

Materials and Methods

The fish catching sites in the river were selected and were regularly visited. The study area was throughout the river from joining of Sidraha and Judi Khola (upstream) and Bhathiganj (downstream). Fishes from the river were collected with the help of local fisherman using local made fish gears and nets once usually last three days of every month for one year from September, 2014 to August, 2015. The habitat and color of the fishes were recorded on the spot at the time of collection. Alive fishes were killed in 40% formalin and then preserved in 70% alcohol facing their head downward. For large fishes, a longitude incisor was made to protect the gut contents. The taxonomic identification of preserved fishes was done with the help of the methods adopted from Shrivastava (1968), Shrestha (2001) and Shrestha (2008). After that the fishes were kept in separate specimen jars using tags and labels for further classification.

Results and discussion

The present list of fishes includes 51 species belonging to 38 genera, 20 families of 7 orders (Table 1 and Fig.1). There is every chance of over-lapping in fish habitat, which is difficult to be demarcated sharply.

Table 1. List of fishes found in Lohandra river.

No.	Indigenous species	Common name	Conservation status (IUCN)
	ORDER: CLUPEIFORMES; Family: Clupeidae		
1.	<i>Gadusia chapra</i> (Hamilton-Bachanan)	Suiya	C
	ORDER: OSTEOGLOSSIFORES; Family: Notopteridae		
2.	<i>Notopterus notopterus</i> (Palles)	Golhai	UN
	ORDER: CYPRINIFORMES; Family: Cyprinidae		
3.	<i>Catla cata</i> (Hamilton-Bachanan)	Vakur	C
4.	<i>Chagunius chagunio</i> (Hamilton-Bachanan)	Gelhari	VU
5.	<i>Cirrhinus mrigala</i> (Hamilton-Bachanan)	Naini	C
6.	<i>C. reba</i> (Hamilton-Bachanan)	Reba	UN
7.	<i>Labeo rohita</i> (Hamilton-Bachanan)	Rohu	C
8.	<i>L. dero</i> (Hamilton-Bachanan)	Gurdi	C
9.	<i>L. cabasu</i> (Hamilton-Bachanan)	Kalbasu	C
10.	<i>Puntius ticto</i> (Hamilton-Bachanan)	Tite pothi	UN
11.	<i>P. sarana</i> (Hamilton-Bachanan)	Thub pothi	UN
12.	<i>P. sophore</i> (Hamilton-Bachanan)	Sidra pothi	C
13.	<i>P. terio</i> (Hamilton-Bachanan)	Pothi	UN
14.	<i>Chela labuca</i> (Hamilton-Bachanan)	Chelwa	C
15.	<i>Salmostoma bacaila</i> (Hamilton-Bachanan)	Chilwa	C
16.	<i>Amblypharyngodon mola</i> (Hamilton-Bachanan)	Mola	C
17.	<i>Aspidoparis jaya</i> (Hamilton-Bachanan)	Mara	C
18.	<i>A. morar</i> (Hamilton-Bachanan)	Morar	C
19.	<i>Barilius bendelisis</i> (Hamilton-Bachanan)	Faketa	C
20.	<i>B. barna</i> (Hamilton-Bachanan)	Titarkane	C
21.	<i>Danio devario</i> (Hamilton-Bachanan)	Bhito	C
22.	<i>Esomus danricus</i> (Hamilton-Bachanan)	Dedhwa	C
23.	<i>Crossocheilus latius latius</i> (Hamilton-Bachanan)	Lohari Buduna	UN
24.	<i>Garra gotyla</i> (Gray)	Buduna	C
	Family: Cobitidae		
25.	<i>Acanthocobotis botia</i> (Hamilton-Bachanan)	Pate Gadela	PRO
26.	<i>Lepidocephalus guntea</i> (Hamilton-Bachanan)	Lata	CDR
27.	<i>Botia lohachata</i> (Chaudhuri)	Baghi	UN
	Family: Psilorhynchidae		
28.	<i>Psilorhynchus sucatio</i> (Hamilton-Bachanan)	Titae	CDR
	IV. ORDER: SILURIFORMES; Family: Bagridae		
29.	<i>Mystus cavasius</i> (Hamilton-Bachanan)	Tengara	C
30.	<i>M. bleekeri</i> (Day)	Tengra	C
31.	<i>M. tengara</i> (Hamilton-Bachanan)	Tengara	C
32.	<i>M. vittatus</i> (Bloch)	Kanti tengara	C
	Family: Siluridae	Papta machha	
33.	<i>Ompok bimaculatus</i> (Bloch)		C
34.	<i>Wallago attu</i> (Schneider)	Buhari	C
	Family: Schilbeidae		
35.	<i>Clupisoma garua</i> (Hamilton-Bachanan)	Jalkapoor	UN
	Family: Clariidae		
36.	<i>Clarias batrachus</i> (Linnaeus)	Mungri	C

	Family: Heteropneustidae		
37.	<i>Heteropneustes fossilis</i> (Bloch)	Singhi	C
	Family: Chacidae		
38.	<i>Chaca chaca</i> (Hamilton-Bachanan)	Datkitta	CDR
	V. ORDER: BELONIFORMES; Family: Belonidae		
39.	<i>Xenentodon cancila</i> (Hamilton-Bachanan)	Kauwai	C
	VI. ORDER: SYNBRANCHIFORMES; Family: Synbranchidae		UN
40.	<i>Monopterus cuchia</i> (Hamilton-Bachanan)	Anahibam	
	Family: Mastacembelidae		
41.	<i>Macrogathus aral</i> (Bloch & Schneider)	Gaichi	C
42.	<i>M. pancalus</i> (Hamilton-Bachanan)	Kathgaichi	C
43.	<i>Mastacembelus armatus</i> (Lacepale)	Chuche bam	C
	VII. ORDER: PERCIFORMES: Family: Ambassidae		
44.	<i>Chanda nama</i> (Hamilton-Bachanan)	Chaner bijuwa	C
45.	<i>Pseudambasis baculis</i> (Hamilton-Bachanan)	Chanari	C
	Family: Nandidae		
46.	<i>Nandus nandus</i> (Hamilton-Bachanan)	Dkhoke	C
	Family: Gobiidae		
47.	<i>Glossogobius giuris</i> (Hamilton-Bachanan)	Bhulle machha	C
	Family: Anabantidae		
48.	<i>Anabus testudineus</i> (Bloch)	Kabai	C
	Family: Belontiidae		
49.	<i>Colisa fasciatus</i> (bloch & Schneider)	Kothari	C
	Family: Channidae		
50.	<i>Channa orientalis</i> (Hamilton-Bachanan)	Garai	C
51.	<i>C. marulius</i> (Hamilton-Bachanan)	Saur	C

Some of the remarkable fish species of the Lohandra river are *Notopterus notopterus*, *Chagunius chagunio*, *Cirrhinus reba*, *Labeo dero*, *L. cabasu*, *Salmostoma bacaila*, *Barilius bendelisis*, *B. barna*, *Garra gotyla*, *Crossocheilus latius latius*, *Acanthocobotis botia*, *Botia lohachata*, *Mystus* species, *Ompok bimaculatus*, *Wallago attu*, *Chanda nama*, *Nandus nandus*, *Anabus testudineus*, *Channa orientalis* and *C. marulius*. Some game fishes under high fishing pressure reported in the river are *C. chagunio*, *Catla catla*, *L. dero*, *L. rohita*, *Cirrhinus mrigala*, *Monopterus cuchia*, *N. notopterus*, *Clupisoma garua*, *W. attu* and *C. marulius*. Similarly, hill stream fishes of the river are *G. gotyla*, *B. lohachata*, *C. chagunio*, *B. barna*, *Lepidocephalichthys guntea* and *Psilorhyncus sucatio*. Jalkapoor (*C. garua*), *B. bendelisis*, *B. barna*, *C. marulius*, *C. orientalis* and *W. attu* are some preferable and tasty fishes of the river having high demand on the different markets of Biratnagar. Fishes like *C. garua* and *C. marulius*, are suitable for fishery development in tras-himalayan areas, particularly Hindukush region (Shrestha, 2008). The important native freshwater fishes of the river are *C. garua* and *Chaca chaca*. Few examples of larvivorous fishes in the river are *B. barna*, *B. bendelisis*, *Danio devario*, *Puntius sarana*, *P. ticto*, *C. marulius*, *C. nama*, *Nandus nandus*, *A. testudineus*, *Colisa fasciatus* and *Glossogobius giuris*.

The threat status of the fishes are 37 common species, 9 uncommon species, 3 conservation dependent and rare, and one for each pristine rare ornamental species and vulnerable species (Fig. 2).

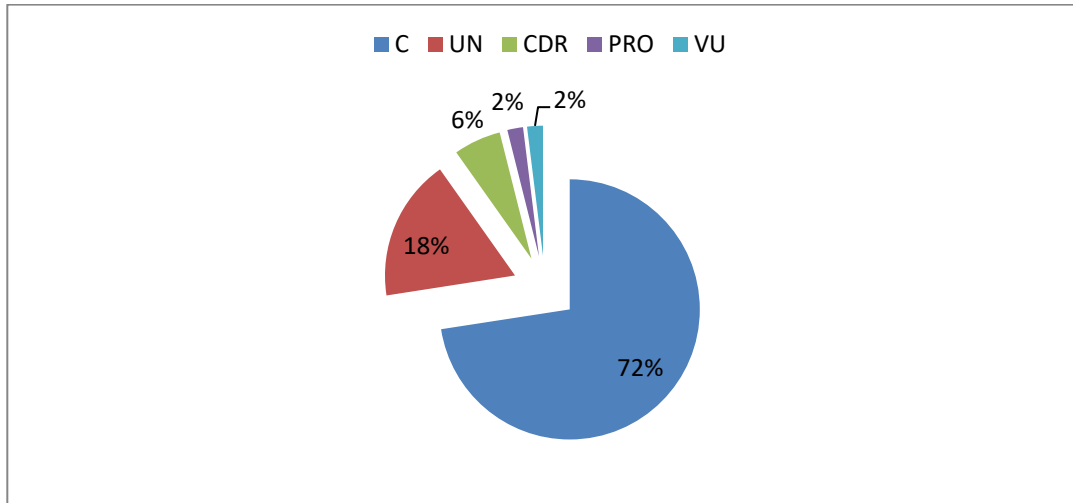


Figure 2. Conservation status (%) of the species (C= Common; UN= Uncommon; VU= Vulnerable; PRO= Pristine Rare Ornamental & CDR= Conservation Dependent and Rare).

The river has 26 species of Cypriniformes, 10 Siluriformes, 8 Perciformes, 4 Symbranchiformes and one for each of Clupiformes, Osteoglossiformes and Beloniformes (Fig. 3).

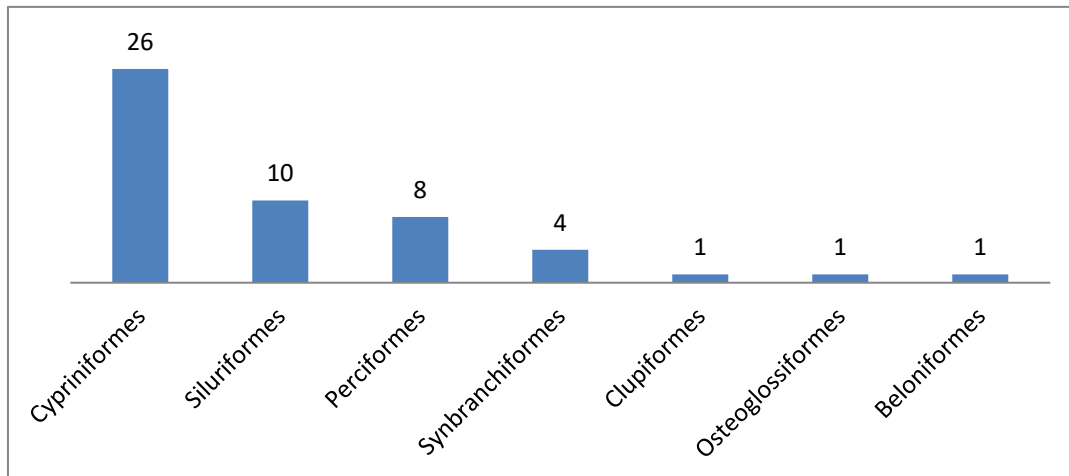


Figure 3. Fish species in different Orders

The occurrence of Cyprinidae in Lohandra river as a dominant species (22) favours the result of Nepal (Shrestha, 2008; Rajbanshi, 2012; Shrestha, 2013). They reported 86 Cyprinidae (Shrestha, 2008), 18 Balitoridae, 12 Bagriidae, 11 Cobitidae, 9 Schilbeidae, 2 Notopteridae, 40 Siroridae, 4 Siluridae and 4 Mastacembelidae. Families like Belonidae, Heteropneustidae, Chacidae and Gobiidae were represented by single species in the present study as well as the report made by Shrestha (2008) and Shrestha (2013). The present report had no any fish species belonging to families Balitoridae, Anguilloidae, Morungidae, Engrulididae, Pangasidae, Amblycipitidae, Sisoridae, Olyridae, Salmonidae, Hemiramphidae, Aplocheilidae, Poeciliidae, Sciaenidae, Cichlidae, Mugidae, Gobioididae

and Tetraodontidae. The report of fish species made by Shrestha (2013) also includes the fish species found in the present survey.

All fishes reported in Lohandra river in the survey period were also found in Koshi river and Karnali river but *C. faciatus* was not found in Gandaki river and Mahakali river (Rajbanshi, 2012). Fishes *A. testudineus*, *C. faciatus*, *M. cavasius*, *M. bleekeri*, *M. tengara*, *M. vittatus*, *X. cancila*, *C. nama*, *C. orientalis*, *C. marulius*, *G. giuris*, *O. bimaculatus*, *Heteropneustes fossilis*, *Mastacembelus armatus*, *Clarias batracus*, *W. attu*, *Puntius sophore*, *P. sarana*, *P. ticto*, *Labeo rohita*, *L. calbasu*, *B. lohachata*, *L. guntea*, *Aspidoparia jaya*, *A. morar*, *C. reba*, *C. mrigala*, *Amblypharyngodon mola*, *D. devario*, *Chela labuca*, *Esomus danricus*, *Crossocheilus latius* and *C. garua* were also reported in Koshi Tappu Wildlife Reserve and some fishes *C. chaca*, *Gadusia chapra*, *Salmostoma bacaila* and *N. notopterus* were described as unavailable fishes after the flood, 2008 (Limbu and Subba, 2011). Fishes like *X. cancila*, *A. botia*, *B. lohachata*, *L. guntea*, *Barilius barna*, *B. bendelinsis*, *A. jaya*, *A. morar*, *C. reba*, *C. mrigala*, *N. notopterus*, *Pseudambasis baculis*, *C. nama*, *C. orientalis*, *C. marulius*, *G. giuris*, *C. chaca*, *O. bimaculatus*, *H. fossilis*, *Macragnathus aral*, *M. puncalus*, *Mastacembelus armatus*, *C. batracus*, *W. attu*, *M. cuchia*, *C. chagunio*, *C. latius latius*, *D. devario*, *P. sophore*, *P. sarana*, *L. rohita* and *C. faciatus* were also mentioned in Koshi river but fishes *G. gotyla*, *G. chapra*, *C. catla*, *L. dero*, *L. calbasu*, *P. terio*, *P. ticto*, *C. labuca*, *Amblypharyngodon mola*, *E. danricus*, *Psilorhyncus sucatio*, *Mystus cavasius*, *M. bleekeri*, *M. tengara*, *M. vittatus*, *C. garua* and *A. testudineus* were not recorded (Rijal et al., 2014).

Fishes *Puntius sophore*, *P. ticto*, *P. sarana*, *S. bacaila*, *B. bendelinsis*, *B. barna*, *A. morar*, *A. mola*, *C. reba*, *C. mrigala*, *C. chagunio*, *G. gotyla*, *L. guntea*, *C. latius latius*, *D. devario*, *C. garua*, *C. chaca*, *M. cuchia*, *M. cavasius*, *M. bleekeri*, *M. tengara*, *M. vittatus*, *O. bimaculatus*, *H. fossilis*, *M. aral*, *M. puncalus*, *M. armatus*, *C. batracus*, *W. attu*, *A. botia*, *B. lohachata*, *E. danricus*, *N. notopterus*, *G. chapra*, *C. catla*, *L. rohita*, *L. dero*, *L. calbasu*, *Pseudambasis baculis*, *C. nama*, *Nandus nandus*, *A. testudineus*, *C. faciatus*, *C. orientalis*, *C. marulius*, and *G. giuris* were also reported in Narayani river but fishes *P. terio*, *C. labuca*, *A. jaya*, *P. sucatio* and *X. cancila* were not reported (Jha and Bhujel, 2014).

The river has also some threatened species like *C. chagunio*, *C. chaca*, *A. botia* and *L. guntea*. Domestication and captive breeding of some fishes like *C. batracus*, *L. dero*, *Garra gotyla*, *B. lohachata* and *C. chagunio*, are being practiced in Fishery Research Centre and Hatchery Centre in different part of the country like *C. chagunio*, *B. lohachata*, *G. gotyla* and *L. dero* (Kaligandaki Fish Hatchery, Syanja and Fisheries Research Centre, Pokhara) and *C. batracus* (Fisheries Research Centre, Pokhara). *C. chagunio*, a table fish, also inhabits in torrential rivers such as Trisuli and Tadi and it is also present in lake Phewa at an altitude of 742m. Jalkapoor (*C. garua*), a high demand fish in Biratnagar Markets, is also present in rivers Trisuli, Narayani and Karnali upto 1440 m (Shrestha, 1981).

Lohandra river has great biodiversity especially of ichthyofauna. Present study includes 51 species belonging to 38 genera, 20 families of 7 orders. Some of the remarkable fish species are *C. batracus*, *G. gotyla*, *B. lohachata*, *C. chagunio*, *C. chaca*, *A. botia*, *L. guntea*, *C. faciatus*, *N. notopterus*, *C. reba*, *C. mrigala*, *L. dero*, *L. cabasu*, *S. bacaila*, *B. bendelinsis*, *B. barna*, *C. latius latius*, *Mystus* species, *O. bimaculatus*, *W. attu*, *C. nama*, *N. nandus*, *A. testudineus*, *C. orientalis*, *C. marulius*, *C. catla*, *M. cuchia*, *C. garua* and *P.*

sucatio. In-depth investigation of ecology and fishes of Lohandra river is recommended for the conservation of these fish species.



Gadusia chapra



Notopterus notopterus



Catla catla



Chagunius chagunio



Cirrhinus mrigala



Cirrhinus reba



Labeo rohita



Labeo dero



Labeo calbasu



Puntius ticto



P. sarana



Puntius sophore



Puntius terio



Channa marulius



Salmostoma bacaila



Amblypharyngodon mola



Aspidoparis jaya



A. morar



Barilius bendelisis



B. barna



Danio devario



Esomus danricus



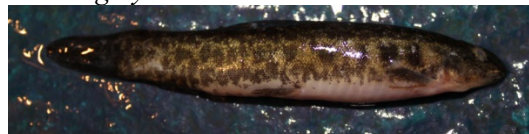
Crossocheilus latius latius



Garra gotyla



Acanthocobotis botia



Lepidocephalus guntea



Botia lohachata



Psilorhyncus sucatio



Mystus cavasius



M. bleekeri



M. tengara



M. vittatus



Ompok bimaculatus



Wallago attu



Clupisoma garua



Clarias batrachus



Heteropneustes fossilis



Chaca chaca



Xenentodon cancila



Monopterus albus



Macrogathus aral



Macrogathus pancalus



Mastacembelus armatus



Chanda nama



Pseudambassis baculis



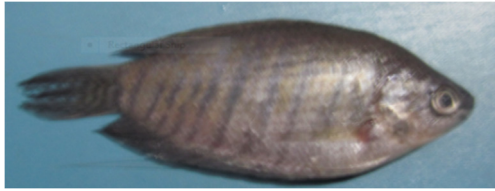
Nandus nandus



Glossogobius giuris



Anabus testudineus

*Colisa faciatius**Channa orientalis***Figure 4.** Fishes of Lohandra river.

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