



Fish diversity of Triyuga River, Udayapur District, Nepal

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Abstract

The present paper deals with a synopsis of 48 fish species under 35 genera belonging to 17 families and 6 orders from Triyuga River. Some interesting fish species reported from this river are *Barilus shacra*, *Garra annandalei*, *Psilorhynchoides pseudecheneis*, *Badis badis*, *Olyra longicoudata*, *Tor putitora*, *Labeo dero* and *Anguilla bengalensis*. Fish diversity of Triyuga river is rich, thus further extensive study is essential for their conservation.

Key words: *Barilus shacra*, Fish, Fattehpur, Mahabharat hill

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Introduction

Udayapur district (26°39'-27°22'N and 86°9'-87°10'E) is located in the eastern development region of Nepal. It is bounded by nine districts, Dhankuta and Sunsari in the east, Saptari and Siraha in the south, Dhanusa and Sindhuli in the west, Okhaldunga, Khotang and Bhojpur in the north. Triyuga River is one of the major rivers of the district (Fig. 1). It takes its origin from Rautahapokhari which is situated in Okhrene (2110 m) on the lap of Mahabharat hill.

Initially two small streams, in the form of drainage of the lake, take their form from two separate spots of the lake and both of them run down towards the south slope then confluence and become the river Triyuga. The river receives water from the several streams viz., Babiya, Lohale, Kalikhola, Duwar etc. on its way to the plain. Ultimately it flows to the Saptakoshi at Tapeswary (90 m) of Beluri Village Development Committee (VDC) of Saptari District, Nepal.



Figure 1. Map of Triyuga River showing study areas.

Fish are members of a paraphyletic group of organism that consists of all gills bearing aquatic craniates which lack limbs with digits. It includes living hag fish, lampreys and cartilaginous and bony fish. Most fish are ectothermic. They are considered as an important natural food resource, worldwide, especially that of animal protein. In Nepal, only bony fishes are there.

As regards to the information of ichthyofauna of Nepal, the contributive works of Berg (1947), De Witt (1962), Shrivastava (1968), Thapa and Rajbanshi (1968), Majumdar *et al.* (1972), Shrestha (1981), Edds (1986), Shrestha (1990), Shrestha (1994), Talwar and Jhingran (1991), Subba (1995), Subba and Ghosh (1996), Bhagat (1998), Shrestha (2001), and Shrestha (2008) deserve special mention.

The rivers of Nepal are really rich in fish fauna which need to be explored scientifically and conserved them. An attempt, therefore, has been made to conduct a thorough survey of fish diversity of Triyuga River.

Materials and methods

Fish catching sites in the river were selected. The main fishing sites of the river were regularly visited. The study area was

divided into three sites namely (the study area 1st Fattepur) around the weir across the river. The 2nd and 3rd were 3.0 km above Fattepur i.e., towards upstream and 3.0 km towards the Saptakoshi i.e., downstream (Fig. 1). Fishes from each fishing site were collected with the help of local fishermen for one year from March 1994 to February 1995. Local made fish traps, fishing nets were used to catch the fishes. Small fishes which were hard to collect by means of fishing tools, so diversions of the course of the river was done at some places. Colour and habitats of fishes were recorded at the time of collection. Photographs of fishes were taken before preserving them in formalin. Fishes were, at first, preserved in 40% formalin for eight hours then in 8% formalin making their head upside down so as to protect the caudal fin. To prevent natural color from fading, some fishes were preserved in 70% alcohol. Large fishes were incised longitudinally along their abdomen so that their gut might not get decayed. The morphometric as well as meristic studies of preserved fishes were done with the help of the methods adopted by Mishra (1976) and Shrivastava (1968). Then the fishes were kept in separate containers with tags and labels. The system of classification after Berg (1947) was followed to classify the fishes. The fishes have been kept in the Department of Zoology of Post Graduate Campus, Biratnagar, after their proper identification and classification.

In 2015 the river was resurveyed during two seasons (winter and summer) following the same method mentioned above to know whether any changes have taken place in fish diversity.

Results and discussion

The present list includes 48 species belonging to 35 genera, 17 families of 6 orders (Tab. 1; Plate figures). It is interesting to note that fishes of upstream and that of downstream showed distinguishing characters except a few species which migrate up and down. However, there lies every chance of over-lapping in fish habitat, which is difficult to be demarcated sharply. Some of the remarkable fish species of Triyuga River were *Barilus shacra*, *Garra anandalei*, *Psilorhynchoides pseudecheneis*, *Badis badis*, *Olyra longicoudata*, *Tor putitora*, *Labeo dero*, *Anguilla bengalensis* etc. The river also has some threatened species (vulnerable species) like *Psilorhynchoides pseudecheneis* and *Anguilla bengalensis*. Some species of fishes showed migratory behavior whereas other did not. Migrants were *Tor putitora*, *Barilius barna*, *Rasbora daniconius*, and *Anguilla bengalensis*. Common and resident species include *Lepidocephalichthyes guntea*, *Somileptes gongata*, *Ompok bimaculata*, *Wallago attu*, *Mystus spp*, *Channa spp*, *Macrogathus aral*, *Glossogobius giuris* and *Mastacembelus spp*.

In the latest survey *Chagunius chagunio*, *Labeo coeruleus*, *Osteobrama corio cortio*, *Barilius guttatus*, *Danio dangila*, *Esomus dandricus*, *Chela laubuca* and *Olyra longicaudata* could not be recorded. It might be due to over fishing, poisoning or habitat loss. Number of fish species belonging to each order and conservation status of each species are listed (Tab. 1).

The conservation status of the fishes is 35 common, 4 fairly common, 2 uncommon, 3 vulnerable, 3 occasional and 1 rare (Fig. 2).

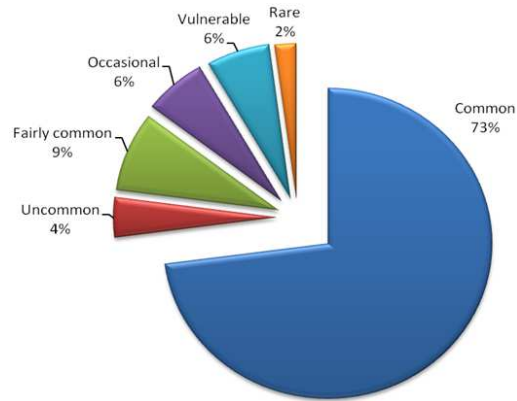


Figure 2. Percentage of conservation status of fishes.

Occurrence of Cyprinidae in Triyuga River as dominant species (23) favours the result of Nepal (Shrestha, 2008; 2013; Rajbanshi, 2012). They reported 86 Cyprinidae (Shrestha, 2008), 18 Balitoridae, 12 Bagridae, 11 Cobitidae, 9 Schilbeidae and 6 Psilorhynchidae. The report of fish species made by Shrestha, (2013) from Nepal also includes fish species reported in the present survey. Families Olyridae, Belonidae, Gobiidae and Synbranchidae were represented by single species in this study as well as in the report made by Shrestha (2008) and Shrestha (2013). None fish species belonging to families Clupeidae, Notopteridae, Moringuidae, Amblycipitidae, Pangasiidae, Siroridae, Chacidae, Heteropneustidae, Clariidae, Hemiramphidae, Poecilidae, Aplocheilidae, Nandidae, Anabantidae, Gobioidae, Mugilidae, and Tetraodontidae were recorded from Triyuga River. Fishes *Aspidoparia jaya*, *Psilorhynchus sucatio*, *Labeo caeruleus*, *Olyra longicaudata*, *Barilius bola*, *Barilius shacra*, *Barilius guttatus* and *Chela laubuca* which were not reported from Narayani River (Jha and Bhujel, 2014) but they were found in Triyuga Riv-

Table 1. Check list of fishes found in Triyuga River.

S.N.	Scientific name	Local name	English name	Cons. stat.
Order: Cypriniformes, Family: Cyprinidae				
1	<i>Chagunius chagunio</i> (Ham.-Buch.) 1822	Rewa, patherchatta	-	Fairly Common
2	<i>Labeo caeruleus</i> (Day) 1878	Rohu	-	Common
3	<i>Labeo dero</i> (Ham.-Buch.) 1822	Pausi/Gardi	-	Common
4	<i>Osteobrama cotio cotio</i> (Ham.-Buch.) 1822	Gardha	Cotio	Common
5	<i>Puntius conchoniis</i> (Ham.-Buch.) 1822	Sidra	Stigma barb	Common
6	<i>Puntius sophore</i> (Ham.-Buch.) 1822	Poti	Stigma barb	Common
7	<i>Puntius ticto</i> (Ham.-Buch.) 1822	Poti	Five fine barb	Common
8	<i>Tor putitora</i> (Ham.-Buch.) 1822	Sahar	Mahaseer	Fairly Common
9	<i>Aspidoparia jaya</i> (Ham.-Buch.) 1822	Soli	Aspidoparia	Common
10	<i>Barilius barna</i> (Ham.-Buch.) 1822	Phoktahi	Hill trout	Common
11	<i>Barilius bendelisis</i> (Ham.-Buch.) 1822	Poksa/tile	Hill trout	Common
12	<i>Barilius bola</i> (Ham.-Buch.) 1822	Goha	Hill trout	Fairly Common
13	<i>Barilius shacra</i> (Ham.-Buch.) 1822	Harka	Hill trout	Uncommon
14	<i>Barilius vagra</i> (Ham.-Buch.) 1822	Chelhi	Hill trout	Common
15	<i>Barilius guttatus</i> (Day) 1869	Jalkapoor	Hill trout	Vulnerable
16	<i>Danio dangila</i> (Ham.-Buch.) 1822	-	Danio	Uncommon
17	<i>Danio devario</i> (Ham.-Buch.) 1822	Chitari pothi	Danio	Common
18	<i>Esomus danricus</i> (Ham.-Buch.) 1822	Deduwa	Flying barb	Common
19	<i>Rasbora daniconius</i> (Ham.-Buch.) 1822	Deduwa	Common rasbora	Fairly Common
20	<i>Chela laubuca</i> (Ham.-Buch.) 1822	Deduwa	Winges rasbora	Common
21	<i>Salmostoma bacaila</i> (Ham.-Buch.) 1822	Chalwa	-	Common
22	<i>Garra annandalei</i> Hora 1921	Budhuna	Stone sucker	Common
23	<i>Garra gotyla gotyla</i> (Gray) 1832	Budhuna	Stone sucker	Common
Family: Psilorhynchidae				
24	<i>Psilorhynchus sucatio</i> (Ham.-Buch.) 1822	Pathar chatta	-	Occasional
25	<i>Psilorhynchoides pseudecheneis</i> (Menon and Datta) 1961	Tite machha	-	vulnerable
Family: Balitoridae				
26	<i>Acanthocobitis botia</i> (Ham.-Buch.) 1822	Golheni lata	-	Common
Family: Cobitidae				
27	<i>Botia lohachata</i> Chaudhari 1912	Bhage latta	Loach	Common

28	<i>Lepidocephalus guntae</i> (Ham.-Buch.) 1822	Latta	Loach	Common
29	<i>Somileptes gongota</i> (Ham.-Buch.) 1822	Kukur latta	-	Occasional
Order: Anguilliformes, Family: Anguillidae				
30	<i>Anguilla bengalensis</i> (Gray and Hardwicke) 1933-34	Rajbam	Long finned eel	Vulnerable
Order: Siluriformes, Family: Bagridae				
31	<i>Mystus bleekeri</i> (Day) 1978	Tengara	-	Common
32	<i>Mystus cavasius</i> (Ham.-Buch.) 1822	Tenagra	Dwarf catfish	Common
Family: Siluridae				
33	<i>Ompok bimaculatus</i> (Bloch) 1797	Pabata	Butter cat fish	Common
34	<i>Wallago attu</i> (Schneider) 1801	Buhari	Fresh water shark	Common
Family: Schilbeidae				
35	<i>Pseudeutropius atherinoids</i> Bloch 1794	Patasi	-	Occasional
Family: Olyridae				
36	<i>Olyra longicaudata</i> McClelland 1842	-	-	Rare
Order: Beloniformes, Family: Belonidae				
37	<i>Xenentodon cancila</i> (Ham.-Buch.) 1822	Kauwa machha	-	Common
Order: Perciformes, Family: Channidae				
38	<i>Channa orientalis</i> Bloch and Schneider 1801	Chenga	-	Common
39	<i>Channa punctatus</i> (Bloch) 1793	Hile	Green snake headed fish	Common
Family: Chandidae				
40	<i>Chanda nama</i> (Ham.-Buch.) 1822	Chuna	Classy perchief	Common
41	<i>Parambassis ranga</i> (Ham.-Buch.) 1822	Chuna	Badis	Common
Family: Sciaenidae				
42	<i>Badis badis</i> (Ham.-Buch.) 1822	-	Badis	Common
Family: Belontiidae				
43	<i>Colisa fasciatus</i> (Schneider) 1801	Khesara	Banded colisa	Common
Family: Gobiidae				
44	<i>Glossogobius giuris</i> (Ham.-Buch.) 1822	Bulla	Bar-eyed gody	Common
Order: Synbranchiformes, Family: Synbranchidae				
45	<i>Monopterusuchia</i> (Ham.-Buch.) 1822	Cuchia bam	Fresh water eel cuchia	Common
Family: Mastacembelidae				
46	<i>Macrogathus aral</i> (Bloch and schneider) 1822	Gainchi	Lesser spiny eel	Common
47	<i>Macrogathus pancalus</i> (Ham.-Buch.) 1822	Kath gainchi	-	Common
48	<i>Mastacembelus armatus</i> (Lacepede) 1800	Chucchae	Ban spiny eel	Common

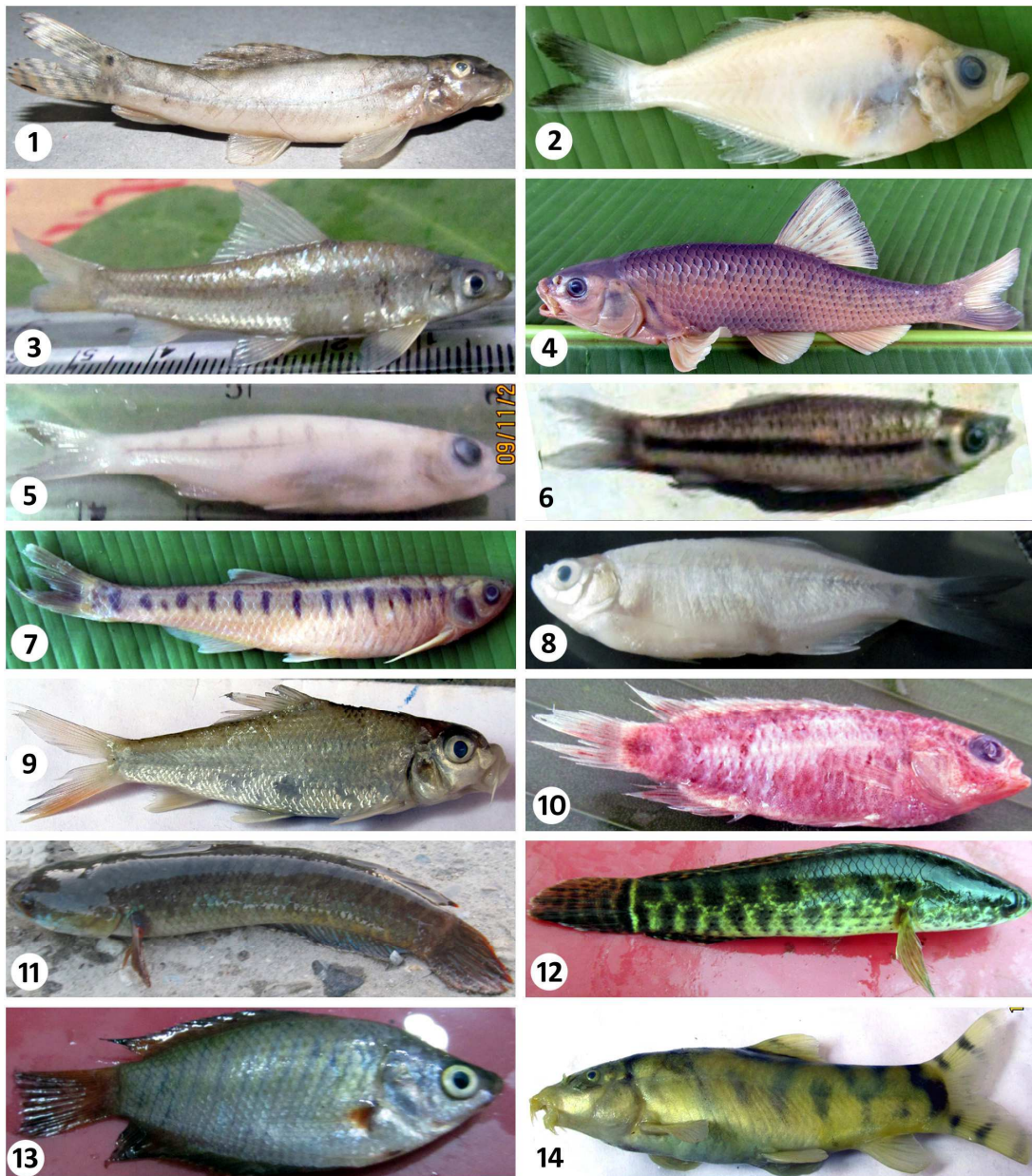
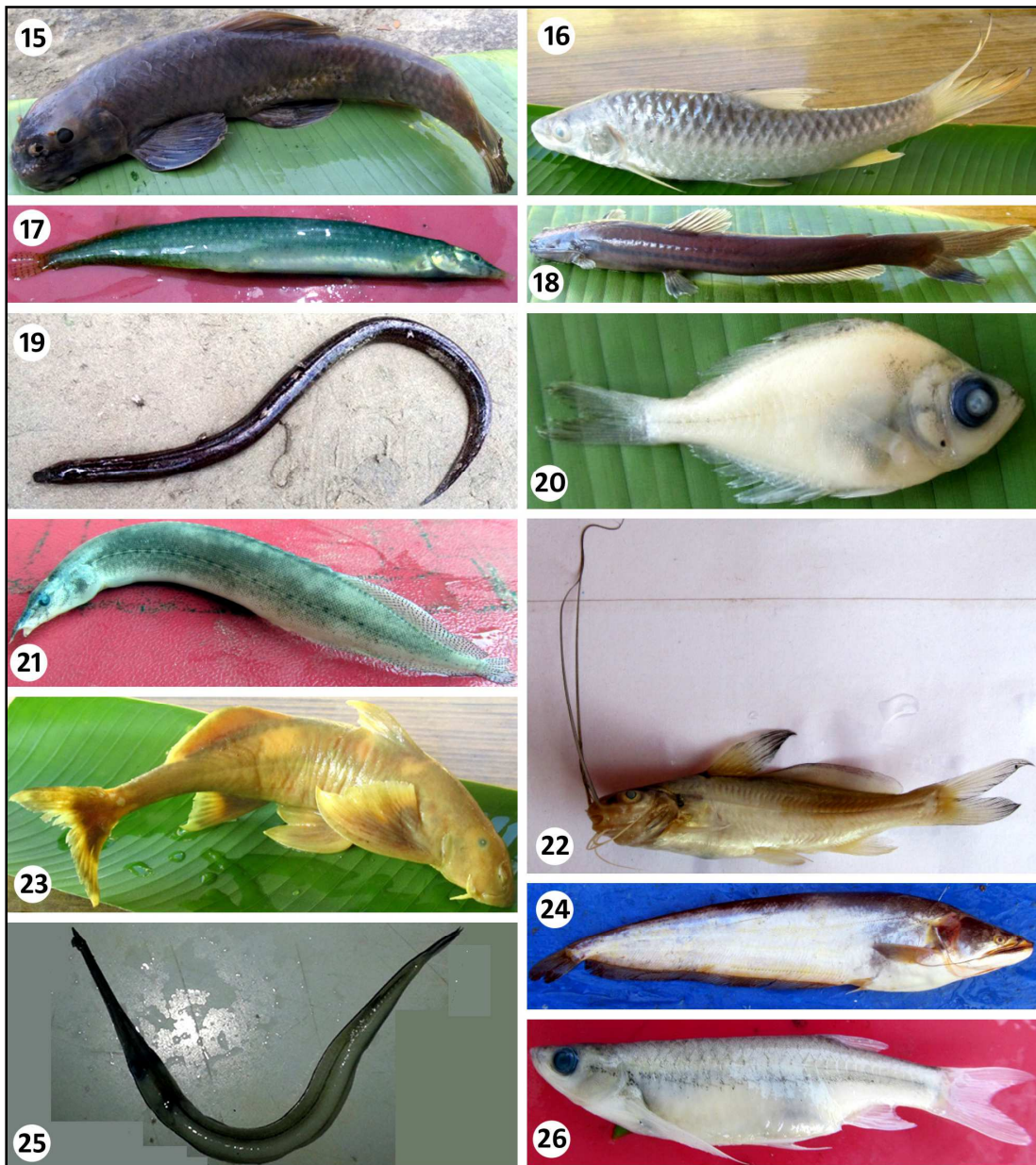
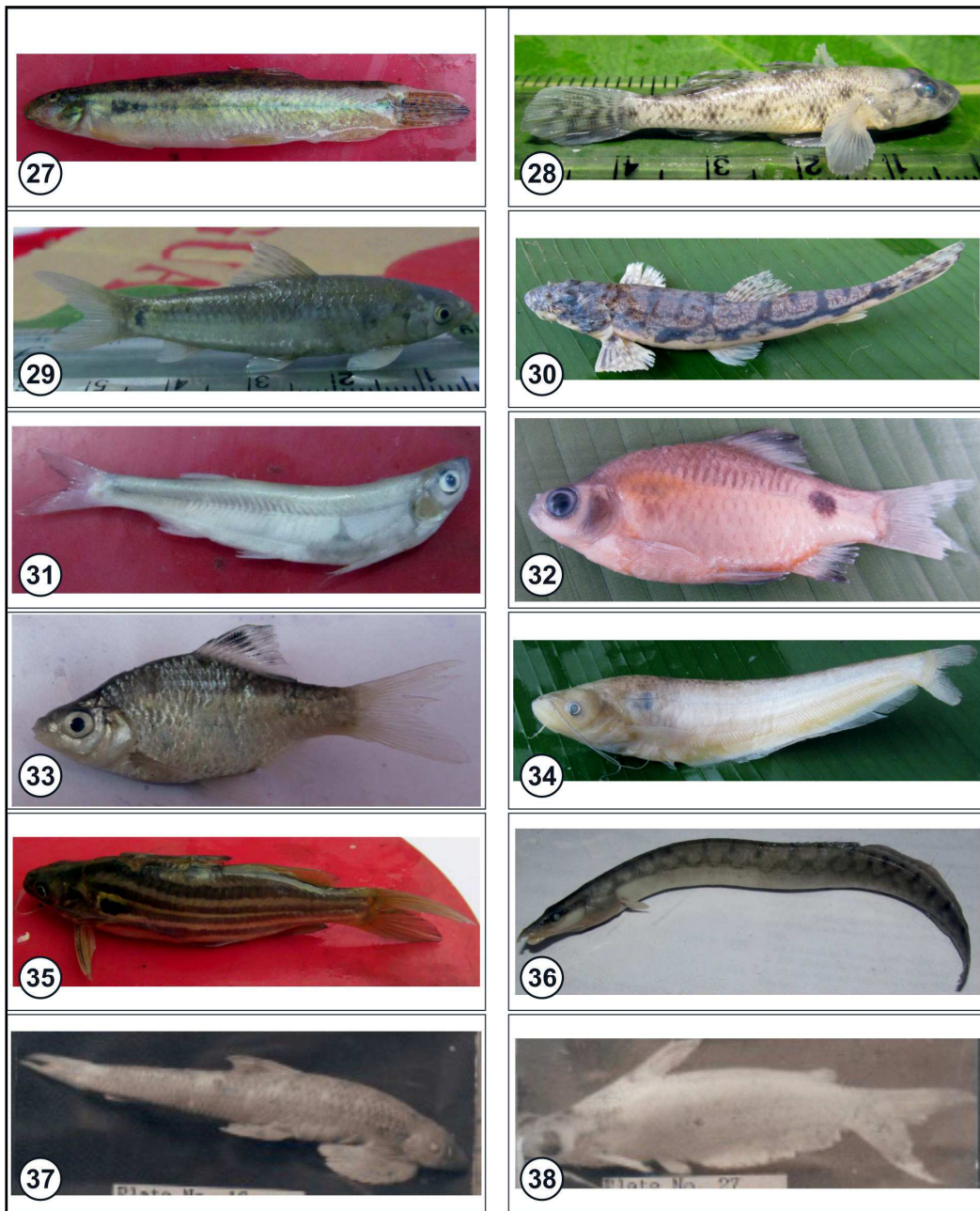


Plate figures: 1. *Acanthocobitis botia*, 2. *Chanda nama*, 3. *Aspidoparia jaya*, 4. *Barilius bendelisis*, 5. *Barilius barna*, 6. *Rasbora daniconius*, 7. *Barilius vagra*, 8. *Danio devario*, 9. *Chagunius chagunio*, 10. *Badis badis*, 11. *Channa orientalis*, 12. *Channa punctatus*, 13. *Colisa fasciatus*, 14. *Botia lohachata*.



Figures: 15. *Garra gotyla gotyla*, 16. *Tor putitora*, 17. *Macrogathus pancalus*, 18. *Olyra longicaudata*, 19. *Monopterus albus*, 20. *Parambassis ranga*, 21 *Macrogathus aral*, 22. *Mystus cavasius*, 23. *Psilorhynchus sucatio*, 24 *Wallago attu*, 25. *Xenentodon cancila*, 26. *Esomus danricus*.



Figures: 27. *Lepidocephalus guntae*, 28. *Glossogobius giuris*, 29. *Garra annandalei*, 30. *Somileptes gongota*, 31. *Salmostoma bacaila*, 32. *Puntius ticto*, 33. *Puntius sophore*, 34. *Ompok bimaculatus*, 35. *Mystus bleekeri*, 36. *Mastacembelus armatus*, 37. *Psilorhynchoides pseudecheneis*, 38. *Pseudeutropius atherinoids*.

er. Similarly, *Anguilla bengalensis*, *Chela laubuca*, *Esomus danricus*, *Osteobrama cotio cotio*, *Labeo dero*, *Labeo caeruleus* and *Pseudeutropius atherinoides* which were not reported from Koshi River (Rijal et al. 2014) were reported in the present study. All fish species reported in this study from Triyuga River also have been reported from the Koshi River (Rajbanshi, 2012).

Chagunius chagunio, *Puntius conchoni*, *Puntius sophore*, *Puntius ticto*, *Tor putitora*, *Aspidoparia jaya*, *Barilius barna*, *Barilius bendelisis*, *Barilius bola*, *Danio devario*, *Esomus danricus*, *Chela laubuca*, *Acanthocobitis botia*, *Lepidocephalus guntae*, *Somileptes gongota*, *Anguilla bengalensis*, *Mystus bleekeri*, *Mystus cavasius*, *Ompok bimaculatus*, *Wallago attu*, *Pseudeutropius atherinoids*, *Xenentodon cancila*, *Channa orientalis*, *Channa punctatus*, *Chanda nama*, *Parambassis ranga*, *Colisa fasciatus*, *Glossogobius giuris*, *Macrogna-thus aral* and *Mastacembelus armatus* were found in Triyuga River as well as in Koshi Tappu Wildlife Reserve but *Labeo caeruleus*, *Labeo dero* and *Osteobrama cotio cotio*, *Barilius shacra*, *Barilius vagra*, *Barilius guttatus*, *Danio dangila*, *Rasbora daniconius*, *Salmostoma bacaila*, *Garra annandalei*, *Garra gotyla gotyla*, *Psilorhynchus sucatio*, *Psilorhynchoides pseudocheneis*, *Botia lohachata*, *Olyra longicaudata*, *Badis badis*, *Monopterusuchia*, and *Macrogna-thus pancalus* recorded in the present study were not reported (Subba and Limbu, 2009).

Conclusion

Triyuga River is rich in fish diversity. The present study includes 48 fish species belonging to 35 genera, 17 families and 6 orders. Some of the remarkable fish species

are *Barilus shacra*, *Garra annandalei*, *Psilorhynchoides pseudocheneis*, *Badis badis*, *Olyra longicaudata*, *Tor putitora*, *Labeo dero*, *Anguilla bengalensis* etc. The river also has some migratory fishes (*Anguilla bengalensis*, *Barilius guttatus* and *Psilorhynchoides pseudocheneis*) which are threatened species (vulnerable species) to Nepal. The river is rich in fish resources and more ecologically important. Further detailed survey of fishes of Triyuga River is recommended for the conservation of threatened fish species.

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