



ICHTHYOFAUNA OF MAKLANG RIVER, CHINDWIN RIVER BASIN OF MANIPUR

Ersilia Jajo* Pettigrew College, Ukhrul-795142, Manipur. *Corresponding Author

L. Arunkumar Mayai Lambi College, Yumnam Huidrom-795009, Manipur

Wanglar Alphonsa Moyon South East Manipur College, Komlathabi-795135, Manipur

ABSTRACT Manipur, the north eastern state of India is one of the important Freshwater Biodiversity Hotspot. The region being drained by the Brahmaputra and the Chindwin drainages harbours potentially important freshwater fish resources. Abell et al (2008) stated that the north east region has a species richness consisting of around 500 fish species. The Maklang River, one of the major rivers, draining the Kamjong District of Manipur originates from the Kangkhui hills, enters Myanmar to meet the Yu River and finally drains into the Chindwin. A comprehensive study of the Maklang River reveals rich ichthyofaunal diversity. The study includes 106 species belonging to 69 genera and 26 families. The ichthyofaunal component comprises of a mixture of endemic hill stream, Burmese (or Myanmarese), Indochinese and widely distributed forms. Diversity with reference to special hill stream modifications viz., thoracic adhesive apparatus, labial folds, mental disc, proboscis in *Glyptothorax*, *Garra*, *Crossocheilus*, *Psilorhynchus*, *Schistura* and *Pseudecheneis* have been examined. The Maklang River is under anthropogenic pressure leading to habitat modification, degradation, pollution, flow modification which poses as threats to fish species. As such, the study assumes significant role not only from academic documentary point of view but also to initiate more detailed exploration and conservation strategy for the use of ichthyofaunal resources more sustainably.

KEYWORDS :Fish diversity, Maklang River, Kamjong District, Conservation, Manipur.

INTRODUCTION

Maklang River is one of the major rivers in the Ukhrul district of Manipur. After the creation of 7 new districts recently on 8th December, 2016 in Manipur, this river is now in the Kamjong district. The river rises from Nungou, flows downwards through Grihang, Ningchou, Kongpat, Kamtong, Charo, Tusom etc. in Kamjong District of Manipur and then join to the Yu river before finally join to the Chindwin River in Myanmar. In the later part of the 20th century and in the beginning of the 21st century, scientists from all over the world have focussed their research on the ichthyofaunal exploration in south-east Asia. Many new species have been discovered and many taxa have been reviewed. More than 75 research papers have been published and as many as 139 species of fishes have been described new from the region (Vishwanath, 2009). Vishwanath *et al* (1998) reported 72 species from Maklang river which belong to 17 families distributed into 44 genera from upper Maklang river. The present study reviewed the ichthyofaunal diversity of this river.

Material and Method:

Fish specimens were collected from the hill streams of Maklang River from four stations, namely Nungou, Grihang, Kangpat and Charo during 2015-17. All the specimens are preserved in 10% formalin and deposited in the Manipur University Central Museum (MUCM). Fishes were identified following Jayaram (1981), Talwar and Jhingran (1991), Vishwanath (2002) and other relevant literatures. The species were confirmed by comparing them with the type and non-type specimens in MUMF.

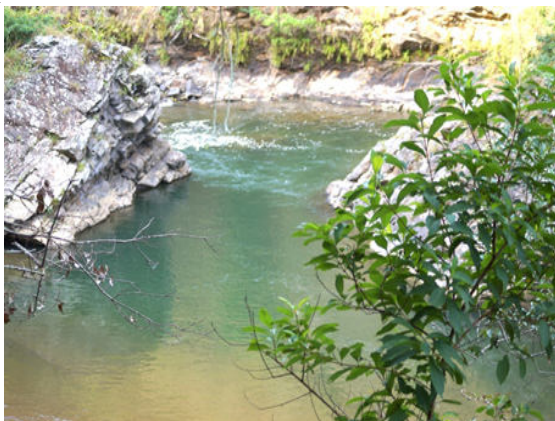


Fig. 1: Maklang River, Manipur

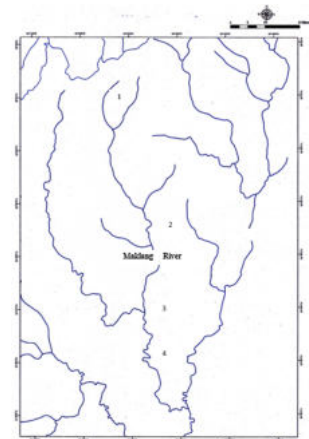
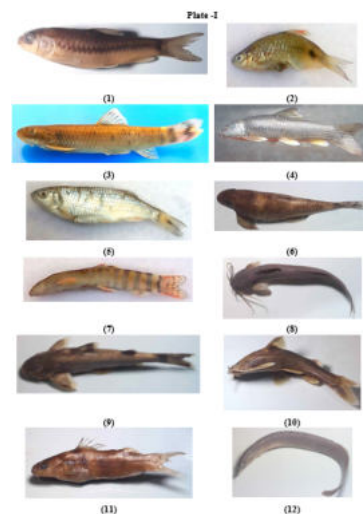


Fig.2: Map of Maklang river system, Manipur and showing fish collecting stations viz., 1. Nungou, 2. Grihang, 3. Kangpat and 4. Charo



(1) = *Neolissochilus hexagonolepis* (2)= *Pethia conchonius* (3) = *Garra ngatangka* (4)= *Garra moyonkhulleini* (5)= *Barilius lairokensis* (6)= *Psilorhynchus rowleyi* (7)= *Schistura reticulata*

(8)= *Amblyceps torrentis* (9)=*Glyptothorax chavomensis* (10)=*Glyptothorax trilineatus* (11)= *Batasio affinis* (12)=*Mastacembelus aramatus*

RESULTS

The present study includes 106 species under 69 genera, 26 families and 8 orders. The ichthyofaunal diversity of Maklang River is listed in Table 1 below.

Table 1. Ichthyofaunal diversity of Maklang River, Manipur

Phylum **CHORDATA**

Subphylum **VERTEBRATE (CRANIATA)**

Super class **GNATHOSTOMATA**

Class **ACTINOPTERYGII**

Division **TELEOSTEI**

Subdivision **OSTEOGLOSSOMORPHA**

Order **OSTEOGLOSSIFORMES**

Family NOTOPTERIDAE Bleeker, 1859

Sub-family Notopterinae

Genus *Notopterus* La Cepede, 1800

N. notopterus (Pallas, 1769)

Subdivision **ELOPOMORPHA**

Order **ANGUILLIFORMES**

Family ANGUILLIDAE Rafinesque, 1810

Genus *Anguilla* Garsault, 1764

A. bengalensis (Gray, 1831)

Subdivision **OSTARIOCLUPEOMORPHA**

Super order **OSTARIOPHYSI**

Order **CYPRINIFORMES**

Family CYPRINIDAE Rafinesque, 1815

Subfamily Cyprininae

Genus *Catla* Valenciennes, 1844

C. catla (Hamilton, 1822)

Genus *Chagunius* Smith, 1933

C. nicholsi (Myers, 1924)

Genus *Cyprinus* Linnaeus, 1758

C. carpio Linnaeus, 1758

Genus *Neolissochilus* Rainboth, 1985

N. hexagonolepis (McClelland, 1839)

N. strachevi (Day, 1871)

Genus *Osteobrama* Heckel, 1843

O. cumma (Day, 1888)

Genus *Poropuntius* Smith, 1931

P. burtoni (Mukerji, 1933)

Genus *Semiplotus* Bleeker 1960

S. manipurensis Vishwanath and Kosygin 2000

Genus *Tor* Gray, 1834

T. tor (Hamilton, 1822)

Sub family Barbinae

Genus *Pethia* Pethiyagoda, Meegaskumbura & Maduwage, 2012

P. conchoniensis (Hamilton, 1822)

P. manipurensis (Menon, Rema Devi & Vishwanath, 2000)

P. stoliczkana (Day, 1870)

P. meingangbii (Arunkumar & Tombi, 2003)

P. yuensis (Arunkumar & Tombi, 2003)

Genus *Systemus* McClelland, 1839

S. sewelli (Prashad and Mukerji, 1929)

Genus *Puntius* Hamilton, 1822

P. chola (Hamilton, 1822)

P. sophore (Hamilton, 1822)

Subfamily Oreininae

Genus *Schizothorax* Heckel 1838

S. chivae Arunkumar and Moyon, 2016

Subfamily Labeoninae

Genus *Bangana* Hamilton, 1822

B. devdevi (Hora, 1936)

B. chindwincus Arunkumar, 2008

Genus *Garra* Hamilton, 1822

G. abhoyai Hora, 1921

G. litanensis Vishwanath, 1993

G. moyonkhulleni Moyon and Arunkumar, 2018

G. namyaensis Shangningam and Vishwanath, 2012

G. ngatangkha Arunkumar and Moyon, 2019

G. triloba Shangningam & Vishwanath 2015

Genus *Crossocheilus* Kuhl and van Hasselt, 1823

C. burmanicus (Hora, 1936)

Genus *Labeo* Cuvier, 1816

L. calbasu (Hamilton, 1822)

L. dyocheilus (McClelland, 1839)

L. rohita (Hamilton, 1822)

Subfamily Squaliobarbinae

Genus *Ctenopharyngodon* Steindachner, 1866

C. idella (Valenciennes, 1844)

Subfamily Xenocyprinae

Genus *Hypophthalmichthys* Bleeker, 1860

H. molitrix (Valenciennes, 1844)

Subfamily Rasborinae / Danioninae

Genus *Amblypharyngodon* Bleeker, 1860

A. mola (Hamilton, 1822)

Genus *Barilius* Hamilton, 1822

B. lairokensis Arunkumar & Tombi, 2000

Genus *Cabdio* Hamilton, 1822

C. ukhrulensis Selim & Vishwanath, 2001

Genus *Devario* Heckel, 1843

D. acuticephalus (Hora, 1921)

D. nagaensis (Chaudhuri 1912)

D. yuensis (Arunkumar & Tombi, 1998)

Genus *Esomus* Swainson, 1839

E. danrica (Hamilton, 1822)

Genus *Laubuca* Bleeker, 1859

L. khujairokensis (Arunkumar, 2000)

Genus *Opsarius* McClelland, 1838

O. barnoides (Vinciguerra, 1890)

O. dogarsinghi (Hora, 1921)

Genus *Raiamas* Jordan, 1919

R. guttatus (Day, 1870)

Genus *Rasbora* Bleeker, 1859

R. ornata Vishwanath & Laishram, 2004

Family PSILORHYNCHIDAE Hora, 1925

Genus *Psilorhynchus* McClelland, 1838

P. rowleyi (Hora & Misra, 1941)

Family BOTIIDAE Berg, 1940

Genus *Botia* Gray, 1831

B. histronica Blyth, 1860

Genus *Synchrossus* Blyth, 1860

S. berdmorei (Blyth, 1860)

Family COBITIDAE Fitzinger, 1832

Genus *Acantopsis* van Hasselt, 1923

A. spectabilis (Blyth, 1860)

Genus *Lepidocephalichthys* Bleeker, 1863

L. berdmorei (Blyth, 1863)
L. micropagon (Blyth, 1860)

Genus *Pangio* Blyth, 1860
P. pangia (Hamilton, 1822)

Family BALITORIDAE Swainson, 1839.
Genus *Balitora* Gray, 1830
B. burmanica (Hora, 1932)

Genus *Homaloptera* Fowler, 1905
H. rupicola (Prasad & Mukherji, 1929)
H. manipurensis Arunkumar 1999

Family NEMACHEILIDAE Regan, 1911
Genus *Paracanthocobitis* Grant, 2007
P. zonalternans (Blyth, 1860)

Genus *Neonoemacheilus* Zhu & Guo, 1982
N. morehensis Arunkumar, 2000
N. peguensis (Hora, 1929)

Genus *Physoschistura* Banarescu & Nalbant, 1982
P. prasadi (Hora, 1921)
P. chindwinensis Lokeshwor & Vishwanath, 2012

Genus *Schistura* McClelland, 1838
• *S. kangjupkhulensis* (Hora, 1921)
• *S. manipurensis* (Chaudhuri, 1912)
• *S. reticulata* Vishwanath & Nebeshwar, 2004
• *S. sikmaiensis* (Hora, 1921)

Order SILURIFORMES

Family AMBLYCIPMDAE Day, 1873
Genus *Amblyceps* Blyth, 1858
A. torrentis Linthoingambi & Vishwanath, 2008

Family AKYSIDAE Gill, 1861
Genus *Akysis* Bleeker, 1858
A. manipurensis (Arunkumar, 2000)

Family SISORIDAE Bleeker, 1858
Genus *Bagarius* Bleeker, 1853
B. bagarius (Hamilton, 1822)

Genus *Gagata* Bleeker, 1858
G. dolichonema He, 1996

Subfamily Glyptosterninae

Genus *Glyptothorax* Blyth, 1860
• *G. burnianicus* Prasad & Mukerji, 1929
• *G. chavomensis* Arunkumar & Moyon, 2019
• *G. granulus* Vishwanath & Linthoingambi, 2007
• *G. trilineatus* Blyth, 1860

Genus *Myersglanis* Hora & Silas, 1952
M. jayarami Vishwanath & Kosygin, 1999

Genus *Pseudecheneis* Blyth, 1860
P. ukhrulensis Vishwanath & Darshan, 2007

Family SILURIDAE Cuvier, 1816
Genus *Ompok* La Cepede, 1803
O. pabo (Hamilton, 1822)

Genus *Pterocryptis* Peters, 1861
P. berdmorei (Blyth, 1860)

Genus *Wallago* Bleeker, 1851
W. attu. (Schneider, 1801)

Family CLARIIDAE Bonaparte, 1846
Genus *Clarias* Scopoli, 1763
C. magur (Hamilton, 1822)

Genus *Heteropneustes* Muller, 1840
H. fossilis (Bloch, 1794)

Family SCHILBEIDAE Bleeker, 1858

Genus *Eutropiichthys* Bleeker, 1862

E. burmannicus Day, 1877
Family BAGRIDAE Bleeker, 1858

Subfamily Bagrinae
Genus *Hemibagrus* Bleeker, 1862
• *H. microphthalmus* (Day, 1877)
• *H. peguensis* (Boulenger, 1894)

Genus *Mystus* Scopoli, 1777
• *M. falcarius* Chakrabarty & Ng, 2005
• *M. ngasep* Darshan, Vishwanath & Mahanta, 2011
• *M. pulcher* (Chaudhuri, 1911)

Genus *Sperata* Holly, 1939
S. acicularis Ferraris & Runge, 1999

Subfamily Batasinae

Genus *Batasio* Blyth, 1860
B. affinis Blyth, 1860

Subdivision EUTELEOSTEI
Superorder ACANTHOPTERYGII
Series ATHERINOMORPHA
Order BELONIFORMES

Family **BELONIDAE** Collette, 2003
Genus *Xenentodon* Regan, 1911
X. cancila (Hamilton, 1822)

Series PERCOMORPHA
Order SYNBRANCHIFORMES

Family SYNBRANCHIDAE Swainson, 1838
Genus *Monopterus* La Cepede, 1803
M. javanensis La Cepede, 1800

Family MASTACEMBELIDAE Swainson, 1839
Genus *Macrogathus* La Cepede, 1800
M. morehensis Arunkumar & Tombi, 2000

Genus *Mastacembelus* Scopoli, 1777
M. armatus (La Cepede, 1800)
Order PERCIFORMES

Family AMBASSIDAE Khunzinger, 1870
Genus *Chanda* Hamilton, 1822
C. nama Hamilton, 1822

Family BADIDAE Barlow, Liem & Wickler, 1968

Subfamily Badinae
Genus *Badis* Bleeker, 1653
B. ferrarisi Kullander & Britz, 2002

Family CICHLIDAE Bonaparte, 1835
Genus *Oreochromis* Gunther, 1889
O. mossambica (Peters, 1852)

Family GOBIIDAE Cuvier, 1816
Genus *Glossogobius* Gill, 1859
G. giurus (Hamilton, 1822)

Family ANABANTIDAE Bonaparte, 1831
Genus *Anabas* Cloquet, 1816
A. testudineus (Bloch, 1792)

Family OSPHRONEMIDAE van der Hoeven, 1830
Genus *Trichogaster* Bloch in Schneider, 1801
• *T. chuna* (Hamilton, 1822)
• *T. fasciata* Blotch, 1801
• *T. labiosa* Day, 1877

Family CHANNIDAE Fowler, 1934 (1831)
Genus *Channa* Scopoli, 1777
• *C. gachua* (Hamilton, 1822)
• *C. marulius* (Hamilton, 1822)
• *C. punctata* (Bloch, 1793)
• *C. striata* (Bloch, 1793)
Order TETRAODONTIFORMES

Family TETRAODONTIDAE Linnaeus, 1758Genus *Leiodon* Swainson, 1839*L. cutcutia* (Hamilton, 1822)**DISCUSSION**

Three *Garra* species namely *G. manipurensis* Vishwanath & Sarojnalini, 1988, *G. nasuta* (McClelland, 1838) *G. rupecula* (McClelland, 1839) reported earlier by Vishwanath *et al* (1998) from Maklang river were not found during the present collection. Bungdon & Waikhom (2015) also reported 153 species of 76 genera under 27 families and 9 orders from the Chindwin river basin of Manipur. Sharma *et al* (2018) reported that 138 fish species which belonged to 54 genera, 18 families and 6 orders, endemic to the north-east India. The maximum endemic fish was recorded from the Chindwin basin of Manipur with 91 species. 106 species of fishes belonging to 69 genera, 26 families and 8 orders are reported from the Maklang river, Chindwin basin of Manipur. One hydro-electric power project known as Maklang Tuyungbi Project (45 MW) was proposed to be taken up in Maklang Tuyungbi River in Ukhrul district in 2012. The Project was projected to be located at the confluence of river Maklang and Tuyungbi near Khonglo village under Kasom Khullen sub-division of Ukhrul district, now located under Kamjong district and envisaged construction of a 100m high dam to create storage of 179.55 M cum. by utilizing the inflow of the above rivers. The proposed power house will be having an installed capacity of 3 units of 15 MW each. The project site is approachable from Khonglo village on Phungyar Tengenoupal road. However, the construction work of the project is yet to be started. If the project comes up, the ichthyofaunal diversity of the area will be drastically affected.

REFERENCES

- Arunkumar, L. (1999): *Homaloptera manipurensis*, a new homalopterid fish from Manipur, India. Uttar Pradesh J. Zool. 19(3):201-205.
- Arunkumar, L. (2000): Fishes of the genus *Chela* Hamilton Buchanan (Cyprinidae: Cultrinae) from Manipur, India, with description of a new species. AQUACULT. An Intl. J. Fish. and Aquacult. 1(2):121-124.
- Arunkumar, L. (2000): *Laguvia manipurensis*, a new species of sisorid catfish (Pisces: Sisoridae) from the Yu-River system of Manipur. Indian J. Fish. 47(3):193-200.
- Arunkumar, L. (2000): *Neonoemacheilus morehensis*, a new species of nemacheiline loach (Balitoridae: Nemacheilinae) from the Yu-River system of Manipur. Indian J. Fish. 47(1):43-48.
- Arunkumar, L. (2008): *Bangana chindwinicus*, a new species of cyprinid fish (Cypriniformes: Cyprinidae) from Manipur. AQUACULT. An Intl. J. Fish. and Aquacult. 9(1):13-22.
- Arunkumar, L. and H. Tombi Singh (1997): On a collection of fishes from the headwaters of Yu-River system with four new records in Manipur. J. Freshwater Biol. 9(34):126-133.
- Arunkumar, L. and H. Tombi Singh (1997): *Silurus morehensis*, a new species of silurid catfish (Order: Siluriformes, Family: Diluridae) from Manipur, India. J. Freshwater Biol. 9(2):72-76.
- Arunkumar, L. and H. Tombi Singh (1998): First records of freshwater fishes of *Chogunius nicholsi* and *Mastacembelus alboguttatus* in India. J. Adv. Zool., 19(1):59-61.
- Arunkumar, L. and H. Tombi Singh (1998): Fishes of the genus *Danio* (Hamilton-Buchanan) from Manipur, with description of a new species. J. Natcon. 10(1):1-6.
- Arunkumar, L. and H. Tombi Singh (1998): *Puntius morehensis*, a new species of cyprinid fish (Pisces: Cyprinidae) from the Yu-River system of Manipur, India. J. Natcon. 10(2):253-257.
- Arunkumar, L. and H. Tombi Singh (2000): Barilinae fishes of Manipur India, with description of a new species: *Barilius lairokensis*. J. Bombay Nat. Hist. Soc. 97(2):247-252.
- Arunkumar, L. and H. Tombi Singh (2000): Spiny eels of the genus *Macrogynathus* Lacepede from Manipur, with description of a new species. J. Bombay Nat. Hist. Soc. 97(1):117-122.
- Arunkumar, L. and H. Tombi Singh (2002): Two new species of Puntiid fish from the Yu-River system of Manipur. J. Bombay Nat. Hist. Soc. 99(3):481-487.
- Arunkumar, L. and Moyon, W.A. (2016): *Schizothorax chivae*, a new Schizothoracid fish from Chindwin basin, Manipur, India (Teleostei: Cyprinidae). Intl. J. Fauna and Biol. Stud. 3(2):65-70.
- Arunkumar, L. and Moyon, W.A. (2017): *Glyptothorax chavomensis* sp. nov., (Teleostei: Sisoridae) with its congeners from Manipur, North-Eastern India. Intl. J. Zool. Stud. 2(5):242-254.
- Arunkumar, L. and Moyon, W.A. (2019): *Garra ngatangkha* a new labeonin species of *Lissorhynchus* complex (Teleostei: Cyprinidae) from Manipur, north eastern India. Intl. J. Fish. Aquatic Stud. 7(3):285-290.
- Bungdon, S. and Vishwanath, W. (2015): Fishes of the Chindwin River basin. Publisher: LAP (Lambert Academic Publishing), Pp. 480.
- Chakrabarty, P. and H.H.Ng. (2005): The identity of the Catfishes identified as *Mystus cavasius* (Hamilton, 1822) (Teleostei: Bagridae), with description of a new species from Myanmar. Zootaxa. 1093: 1-24.
- Darshan, A., W. Vishwanath, P.C. Mahanta and Barat, A. (2011): *Mystus ngasep*, a new catfish species (Teleostei: Bagridae) from the headwaters of Chindwin drainage in Manipur, India. J. Threatened Taxa. 3(11): 2177-2183.
- Hora S.L. (1921): Fish and fisheries of Manipur with some observations on those of the Naga Hills. Rec. Indian Mus. 22: 165-214.
- Hora S. L. & Mukerji, D. D. (1935): Fish of Naga Hills, Assam. Rec. Indian Mus. 36: 571-573.
- Jayaram K.C. (1979): Aid to the identification of the silurid fishes of India, Burma, Sri Lanka, Pakistan and Bangladesh, 3, Sisoridae. Occ. Papers zool. Surv. India. 14: 1-62.
- Kosygin, L. and Vishwanath, W. (2005): Hill stream fishes of the northern part of Ukhrul district, Manipur. J. Bombay Nat. Hist. Soc. 102(1): 56-60.
- Kottelat, M. (2013): The Fishes of the Inland waters of Southeast Asia: A catalogue and core Bibliography of the Fishes known to occur in Freshwaters, Mangrooves and Estuaries. Raff. Bull Zool. 27: 1-663.
- Lokeshwor, Y. & Vishwanath, W. (2012): *Physoschistura chindwinensis*, a new balitorid

- loach from Chindwin basin, Manipur, India (Teleostei: Balitoridae). Ichthyol. Res. 59(3): 230-234.
- Menon A.G.K. (1954): Further observations on the fish fauna of Manipur State. Rec. Indian Mus., 52. 21-26.
- Moyon, W.A. and Arunkumar, L. (2018): *Garra moyonkhulleni*, a new labeonine species (Cyprinidae: Labeoninae) from Manipur, Northeastern India. Intl. J. Fish. Aquatic Stud., 6(5):105-115.
- Ng.H.H. and Kottelat, M. (1998): The Catfish genus *Akysis* Bleeker (Teleostei: Akysidae) in Indochina, with description of six new species. J. Nat. Hist. 32(7): 1057-1097.
- Ng.H.H. and Kottelat, M. (2013): Revision of the Indian Catfish genus *Hemibagrus* Bleeker, 1862 (Teleostei: Siluriformes: Bagridae) Raff. Bull. Zool. 61(1): 205-291.
- Pethiyagoda, R., Meegaskumbura and Maduwage, K. (2012): A synopsis of the South Asian fishes referred to *Puntius* (Pisces: Cyprinidae). Ichthyol. Explor. Freshwaters. 23(1): 69-95.
- Sharma, D., Singh, A.K. and Baruah, D. (2018): Checklist of endemic ichthyofauna of North-East India. Indian J. Fish. 65(3): 1-15.
- Talwar P.K. and Jhingran, A.G. (1991): Inland fishes of Indian and adjacent countries. Oxford-IBH Publishing Co. Pvt. Ltd., New Delhi., 1158 pp.
- Vishwanath, W. (2002): Fishes of North East India: A field Guide to Species Identification. Department of Life Sciences, Manipur University., NATP, pp 194.
- Vishwanath, W. (2014): The king fishes of the Eastern Himalaya. Min. 02:5-7.
- Vishwanath, W. and Kosygin, L. (2000): Fishes of the cyprinid genus *Semiplotus* Bleeker, 1859 with description of a new species from Manipur, India. J. Bombay Nat. Hist. Soc. 97(1): 92-102.
- Vishwanath, W., Manojkumar, W., Kosygin, L. and Selim, K.S. (1998): Biodiversity of freshwater fishes of Manipur, India. Italian J. Zool. 65 (1): 321-324.
- Vishwanath, W. and Darshan, A. (2007): Two new catfishes species of the genus *Pseudecheneis* Blyth (Teleostei: Siluriformes) from northeastern India. Zoo's Print J. 20(4):1833-1834.