International Journal of Fauna and Biological Studies
Available online at www.faunajournal.com

IJFBS
International Journal of Fauna And Biological Studies

ISSN 2347-2677
IJFBS 2015; 2 (1): 25-29

Received: 02-11-2014
Accepted: 22-12-2014

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Checklist and economic classification of freshwater fishes of the Madduvalasa reservoir in Palakonda division, Srikakulam district, A.P, India

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Abstract
The present study deals with the freshwater fishes in the madduvalasa reservoir was studied from January 2014 to June 2014. Samples were collected monthly with the help of local fishermen by using fishing nets. A total of 22 species of fishes belonging to 5 orders such as Cypriniformes with 10 species, Siluriformes with 6 species, Perciformes, with 4 species Anguilliformes with 1 species osteoglossiformes with 1 species.

Keywords: Madduvalasa reservoir, checklist, fishes, commercial, fine food, coarse, aquarium, forage.

1. Introduction
A reservoir (etymology: from French reservoir a "storehouse") is a natural or artificial lake, storage pond, or impoundment from a dam which is used to store water. Reservoirs may be created in river valleys by the construction of a dam or may be built by excavation in the ground or by conventional construction techniques such as brickwork or cast concrete.
The number of reservoirs is increasing all over the world. There are 19,370 reservoirs are present in Indian soil with a surface area of 3.15 million hectors. Reservoir is created primarily for irrigation and power generation, but in India they are almost invariably utilized for fisheries. Fishes form a rich source of food. They provide many products and bye products. Fishing is a major source of livelihood of many fishermen in the area. About 450 families of freshwater fishes have been recorded in the world.
Kar.D estimated about 2500 species of fishes which 930 freshwater and 1,570 marine in India. Jayaram listed 742 freshwater fish species of India region. Talwar and Jhingran estimated 2546 fish species of India and adjacent countries. Devi and Indra reported the checklist of 667 fresh water fish species of India. The fish fauna of Andhra Pradesh has been reported by several workers. Present investigations were under taken to study the checklist and economic classification of freshwater fishes of the madduvalasa reservoir in the palakonda division of srikakulam district and their status was evaluated.

2. Materials and Methods
Madduvalas Reservoir (fig 1) is located in madduvalasa village, vangaramandal of palakonda division on 180 10′ 38.19″ N latitude, 83^0 48′ 22.79″ E longitude. Madduvalasa reservoir is the major man made wetland, constructed on the rivers Vegavati and Swarnamukhi, in the hilly area of the district. Its construction was completed in 2002. It is in the Vangara Mandal of Palakonda Division. Madduvalasa dam and its immediate environs are habitats for rich biodiversity.
The fishes were collected with the help of local fishermen by using different types of nets viz. hand nets, cast nets, stake nets, drag nets and gill nets. A Collection of catch and statistics based on regular surveys to make an assessment of the stock of the different species and the important varieties. February onwards water in the shallow areas which are likely to be exposed in the immediate future is bailed out and cross bunds are raised across the wetland areas, so that fish get congregated near the shore into pits. The fish are caught by dragnets or hand picking. The fishes caught were examined for their colour bands or spots present on the body and recorded in the field.

Fig 1: Study area

They were brought to laboratory noting down the colour and other morphological features and the specimens were preserved in 4% formalin. Seasonal collections were made from January 2014 to June 2014 spanning over a period of six months.

The specimens brought to the, laboratory were further studied for their species identification. The species were ascertained on the basis of various morphometric characters and meristic counts following criteria given by Jayaram (2002) and Talwar and Jhingran (1991). Standard identification keys were used for identification of specimen's upto species level (Das and Srivastava, 1956, Misra 1962, Dutta Munshi and Srivastva1968, Dutta and Malhotra 1984, Dutta etal., 1987, Jhingran 1982 and Nath 1986). The classification of fishes based on economic importance (Lagler, 1956).

3. Results and Discussion

The inventory of ichthyic fauna collected from the madduvalasa reservoir and their population status and general status are presented in table. The total number of 22 species (check list, table 1, images a, b) belongs to 5 orders, 9 families and 15 genera were recorded during the present study. Order Cypriniformes was the dominant in termers of species abundance with 10 species followed by Siluriformes with 6 species, Perciformes, with 4 species, Anguilliformes, Osteoglossiformes were represented by 1 species each. In the view of the economic impartance Out of the 22 species 12 were commercial, 6 were coarse food, 5 were aquarium, 3 were fine food and 3 were medicinal value.

The order-wise percentage of fishes composition, Cypriniformes with 45.4%, Siluriformes with 27.2%, Perciformes with 18.1%, Anguilliformes 4.5%, Osteoglossiformes 4.5% Seasonal dynamics of the fish population showed that high value of fish diversity during rainy season and lowest values in summer and winter seasons [17].

The Madduvalasa reservoir is concerned poor attention has been paid towards systematic investigation on diversity of fish fauna. So it is felt that there is a need to generate information diversity the present investigation was undertaken to prepare a checklist and economic classification of fishes from Madduvalasa reservoir and it is the first effort in this direction. Thirupathaiah has reported ictyo fauna of lower manair reservoir in karimnagr 44 species, Babu Rao has reported the fish fauna in Himayatsagar Lake in Hyderabad 32 fish species belonging to six orders with 11 families. Uchchariya has reported the fish fauna in Tighra reservoir in Gwalior in Madhya Pradesh 40 fishes. Jadhav reported 58 species of fishes in Koyna River. The Cyprinidae species were found to be the more dominant family than others which is supported by Rao C.A.N. *et al*, Gohil Mahendrasinh *et al,* Rebert T.R., Nyanti and Leh reported that approximately 66% and 46% of the fish collections in Sarawak were from the Cyprinidae family.

Seasonal dynamics of the fish population showed that the high value of fish diversity during rainy season, which implied that reservoir receive a large volume of less polluted and high oxygenated water, which favoring the improvement of fish growth and most of the fishes migrate for breeding. The lowest diversity values of fish in summer and winter seasons. During summer and winter when water flows is greatly reduced in to reservoir appears to be devoid fish.

I was recorded; out of the22 species 9 species were considered as food value (fine, coarse) as well as 5 species were aquarium, 12 as commercially important fish as well as food fish, 3 species were medicinal valued. Biwas & Sugunan reported 151 species of fishes in Brahmaputra River and 73 ornamental fish as well as food fish, 21 as commercially important food fish as well as ornamental, seven commercially important exotic food fish.

Check – List of Fishes

Grade: Pisces
Class: Osteichthyes
Sub – Class: Actinopterygii
Sub-division: Teleosti
Order: Osteoglossiformes
Family: Notopteridae

(**Feather backs)**
Genus: Notopterus Lacepede

1. *Notopterus notopterus* (Pallas)
Order: Cypriniformes
Family: Cyprinidae (Carps)
Sub- family: Cyprininae
Genus: Catla Valenciennes

2. *Catla catla* (Hamilton-Buchanan)

(Catla)
Genus: Cirrhinus Cuvier

3. *Cirrhinus mrigala* (Hamilton-Buchanan)
Genus: Ctenopharyngodon Steindachner

**4. *Ctenopharyngodon idellus* (Valenciennes)
Genus: Cyprinus Linnaeus

**5. *Cyprinus carpio Linnaeus*

(Common Carps)
Genus: Labeo Cuvier

6. *Labeo rohita* (Hamilton-Buchanan)
Genus: Puntius Hamilton-Buchanan

7. *Puntius amphibius* (Valenciennes)

8. *Puntius chola* (Hamilton-Buchanan)

9. *Puntius sarana* (Hamilton-Buchanan)

10. *Puntius ticto* (Hamilton-Buchanan)
Sub- family: Leuciscinae
Genus: Hypophthalmichthys bleeker

** 11. *Hypophthalmichthys molitrix* (Valenciennes)
Order: Siluriforme
Family: Bagridae

(Bagrid Catfishes)
Genus: Mystus Scopoli

12. *Mystus bleekeri* (Day)

13. *Mystus gulio* (Hamilton-Buchanan)

14. *Mystus Vittatus* (Bloch)
Family: Siluridae

(Eurasian catfishes, Sheat fishes)
Genus: Wallago Bleeker

15. *Wallago Attu* (Schneider)
Family: Clariidae

(Air- breathing catfishes)
Genus: Clarias Scopoli
16. *Clarias batrachus* (Hamilton-Buchanan)
Family: Heteropneustidae

(Stinging catfishes)
Genus: Heteropneustes Muller

17. *Heteropneustes fossilis* (Bloch)
Family: Anabantidae

(Climbing perches)
Genus: Anabas Cuvier & Cloquet

18. *Anabas testudineus* (Bloch)
Family: Channidae

(Snake- heads/ Murrels)
Genus: Channa Scopoli

19. *Channa marulius* (Hamilton-Buchanan)

20. *Channa punctatus* (Bloch)

21. *Channa striatus* (Bloch)
Order: Anguilliformes
Family: Angullidae

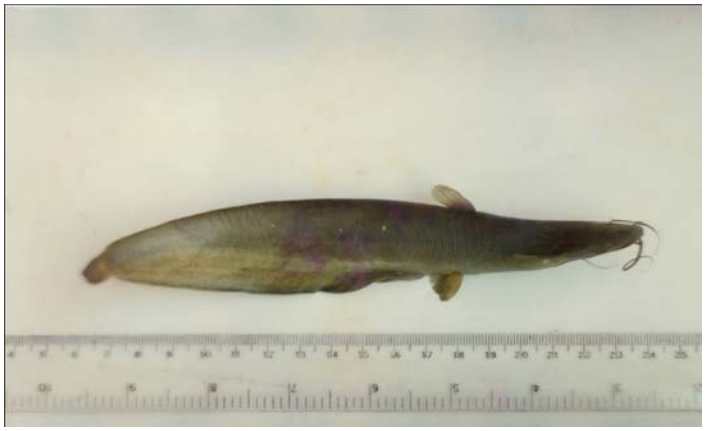
(Freshwater eels)
Genus: Anguilla schrank

22. *Anguilla nebulosa* McClelland
**Introduced fishes; ***Invasive alien species

Table 1: Economic classification of fishes of Srikakulam wetlands

S. No	Name of the fish	Commercial	Fine food	Coarse food	Aquarium fish	Forage fish	Others
1	*Notopterus notopterus*	-	-	X	-	-	MV
2	*Anguilla nebulosa*	-	-	X	X	-	-
3	*Catla catla*	X	-	-	-	-	C
4	*Cirrhinus mrigala*	X	-	-	-	-	C
5	*Ctenopharymgodon idellus*	X	-	-	-	-	C
6	*Cyprinus carpio*	X	-	-	-	-	C
7	*L. rohita*	X	-	-	-	-	C
8	*Puntius amphibious*	-	-	-	X	-	-
9	*P. chola*	-	-	X	X	-	-
10	*P. sophore*	-	-	-	X	-	B&MV
11	*P. ticto*	-	-	-	X	-	B
12	*Hypophthalmichthys molitrix*	X	-	-	-	-	C
13	*Mystus bleekeri*	-	-	X	-	-	
14	*M. gulio*	-	X	-	-	-	
15	*M. vittatus*	-	-	X	-	-	
16	*Wallago attu*	X	-	-	-	-	
17	*Clarias batrachus*	X	X	-	-	-	BP&SV
18	*Heteropneustes fossilis*	X	X	-	-	-	MV
19	*Anabas testudineus*	-	-	X	-	-	-
20	*Channa marulius*	X	-	-	-	-	C
21	*C. punctatus*	X	-	-	-	-	C
22	*C. striatus*	X	-	-	-	-	C

Key to Table: X-Use, - - Not in use, **Commercial** - Species which are prolific breeders, can be cultured and have market value**, Fine food** - Having good taste and protein value, **Coarse food** - Have less food value and preferred as a food by the poor people, **Aquarium fish** - Can be maintained in aquarium for aesthetic and recreational value, **Forage fish** - Food for predatory fishes**, Others** - Having some extra qualities such as **MV** - Medicinal value, **B** - Bait, **SV** - Scientific value, **BP** - By-product, **PH** - Public Health, **LV** - Larvivorous, **C** – Cultivable



a. Heteropneustes fossilis

b. ***Channa striatus***

Images: Images of fishes in study area, (a, b)

4. Conclusion

The diversity of fish fauna is healthy in Madduvalasas reservoir. It is further recommended that the reservoir can be considered being in good condition for fish production. There is hence an urgent need to create awareness among local peoples on the importance of the reservoir habitat and its fish fauna and the need to conserve them for future generations.

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