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PRESENT ICHTHYOFAUNAL STATUS OF EXOTIC FISHES FROM MARATHWADA REGION, MAHARASHTRA, INDIA

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Abstract:-In the present study we have to generated a database information and attempted to give an over –all scenario on the different exotic fish species from Marathwada Region. During the study period May 2009 to April 2011, 08 fish species under 05 genus, 03 family and 03 order were recorded, Cyprinidae family dominant with 06 species beside Cichlidae and Poecilidae, contribute 01 species each. Site I contribute 03 species (38 %), site II contribute 05 species (63 %) site III contribute 06 species (75 %) site IV contribute 07 species (88 %) site V and site VI contribute 08 species (100 %) each. Introduction of exotic fish species into a country for the purpose of culture belongs to three category food fishes, game fishes and larvicidal species.

Key Words: Exotic fish, Marathwada Region, Cyprinidae, Game fish, Larvicidal.Innovation

INTRODUCTION:

Species of fishes imported and introduced into a country for the purpose of culture are called exotic species. The purpose of culture in many parts of world belongs to three category food fishes, game fishes and larvicidal species. 1) Improving local fishery potential 2) Sport fishing 3) For aquarium keeping 4) Controlling of unwanted organisms (mosquitoes). More than 300 exotic species have been introduced into a country so far (Jhingran,1989a) while a vast majority of them are ornamental fishes, some have been introduced in aquaculture and open water system . Exotic fishes introduced in one country may find their way to the neighboring countries

India is one of the mega-biodiversity countries in the world and occupies the 9th position in term of freshwater mega-biodiversity (Mittermeier and Mittermeier, 2000). Two biodiversity "hotspots" namely The Eastern Himalayas and Western Ghats have been recognized by the World Conservation Monitoring Center (WCMC, 1998).

Maharashtra is the third largest state of the Indian union, both in population and geographical area, surrounded by the Arabian Sea in the west, Andra Pradesh in the south east, and Karnataka in the south, Gujarat in the north west and Madhya Pradesh in the north. The state has three district physiographical regions viz., the costal belt (Konkan), the Western Ghats and the eastern plateau.

The Western Ghat is an important biogeographic zone of India and one of the 34 global hotspots. The north Western Ghats give rise to three major east flowing rivers like Godavari, Krishna and Kaveri as well as west flowing rivers and their tributaries, which are major source of fish fauna and one of the richest regions of diversity specially the fish diversity. 5 major water basins i.e. Painganga-Vardha-Vainganga, Tapi-Purna, Bhima, Godavari, & Krishna are the freshwater fish resource of Maharashtra which constitutes 6 orders, 25 families, and 160 species all under the inland water. Sakhare, (2001); Hiware, (2005); Talwar and Jhingran (1991); Jayaram (1981 and 1999), Day (1878); Datta Munshi and Srivastava, (1988).

Marathwada region is one of the six divisions of Maharashtra state comprises of eight districts, viz. Aurangabad, Beed, Hingoli, Jalna, Latur, Nanded, Osmanabad and Parbhani. The location of Marathwada is on 19°20' 56.76" E longitude and 76°14' 44.62" N latitude (Google Earth, 2013) forms the part of the vast Deccan plateau of India. The total area of Marathwada region is 64,813 km. and is bounded by Vidarbha region on the north, by Andhra Pradesh on the east and south east, Karnataka on the south and by Western Maharashtra on the west. The entire region is situated at an average height of about 300-650 m. above mean Sea level gradually sloping from west to east

Where the large number of hilly regions gives rise to number of hill streams which lead to the major rivers like Godavari and its tributaries which support the exotic fish diversity and their species abundance from Marathwada region.

MATERIAL AND METHODS

To study the diversity of exotic fish from Marathwada Region , the study period May 2009 to April 2011, fish samples were collected from six sampling sites site I (Ambadi Dam, Aurangabad), site II (Upper Dudna Dam, Jalna), site III (Manjra Dam, Beed), site IV(Jeevrekha Dam, Jalna), site V(Yeldari Dam, Parbhani) and site VI (Vishnupuri Dam, Nanded) of five districts (Aurangabad, Jalna, Parbhani, Nanded and Beed) which represent the ichthyofaunal composition of exotic fishes from Marathwada Region.

Fish samples were collected every week during the study period from the fish landing centers with the help of skilled local fishermen by various fishing crafts, gears with variable mesh size. Sampling points were distributed throughout the site to cover its whole area and location was changed for the collection of fish fauna according to the season.

Identification of fishes was done up to species level at fish landing center to get its natural colour, pattern of scales, fins, mouth pattern, identification marks like black spot, bloach on operculum, paired and unpaired fins and body parts with the help of standard literature by Datta Munshi and Srivastava, (1988); Hamilton (1822); Talwar and Jhingran, (1991); Francis Day vol I &II, (1986); Jayaram (1981); Jayaram, (1991); Jayaram, (1999); Menon (1987); Jayaram and Jeyachandra Das, (2000); Yazdani, (1985); Menon, (1987); Jyoti and Arti Sharma (2006) and etc.

Fish species which were not identified on the field (landing center) were preserved in 10 % formalin or 5cc of formalin was injected in the belly of fish with disposable syringe and packed in polythene bags. These fish samples were brought to Fishery research laboratory, Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad for further identification.

Specimen with doubtful identifying characters was sent to Zoological Survey of India (ZSI) Pune, regional branch (ZSI) Kolkata for identification.

EXOTIC FISHES FROM MARATHWADA REGION

Sr. No	Name of Exotic fish	Site I	Site II	Site III	Site IV	Site V	Site VI
01	*Cyprinus carpio nudus*	—	—	—		+	+
02	*Cyprinus carpio specularis*	—	—	—	+	+	+
03	*Cyprinus carpio communis*	+	+	+	+	+	+
04	*Oreochromis mossambica*	+	+	+	+	+	+
05	*Ctenopharyngodon idellus*	—	+	+	+	+	+
06	*Hypothalmichthys molitrix*	—	+	+	+	+	+
07	*Hypothalmichthys nobilis*	—	—	+	+	+	+
08	*Poecilia reticulate*	+	+	+	+	+	+

RESULTS AND DUSCUSSION:

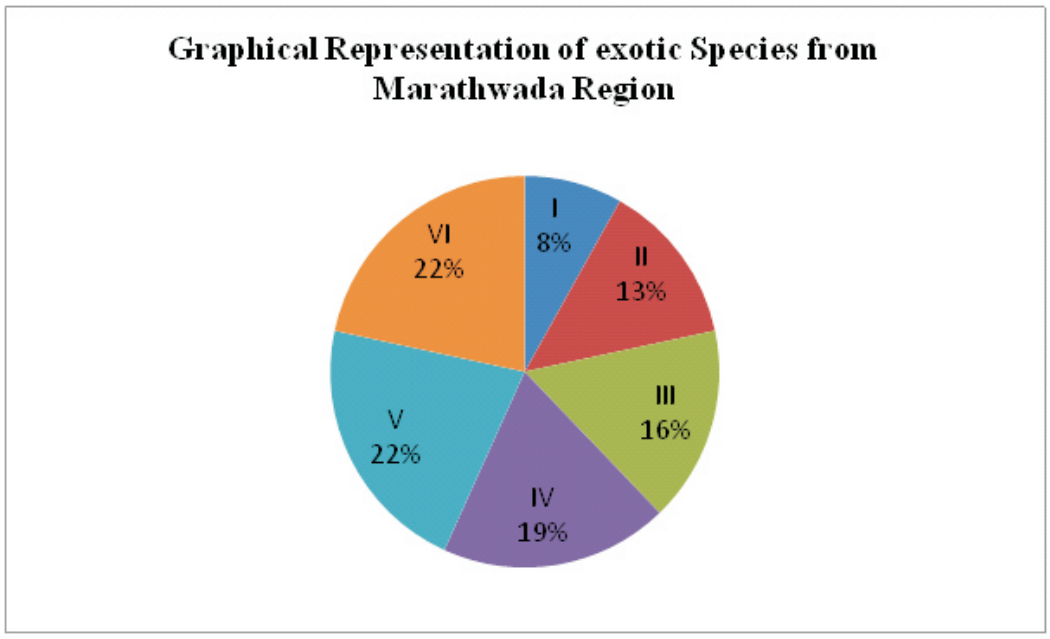
Durring the study period May 2009 to April 2011, 08 fish species under 05 genus 03 family and 03 order were recorded, Cyprinidae family dominant with 06 species beside Cichlidae and Poecilidae, contribute 01 species each. Where species like Cyprinus carpio communis, Oreochromis mossambica and Poecilia reticulate found in all the sites.

The minimum species were recorded at site I (02) and maximum species were recorded at site V and VI (08) each Site I contribute 03 species (38 %), Site II contribute 05 species (63 %) Site III contribute 06 species (75 %) Site IV contribute 07 species (88 %) Site V contribute 08 species (100 %) Site VI contribute 08 species (100 %) site I is a small irrigation project where V and VI situated on Purna as well as Godavari River and large irrigation project. Species like Poecilia reticulate is only use for mosquito control. Exotic fish species shows negative impact on the indigenous fish species because by utilizing their better adaptability. Similar results were reported by A. Biju kumar (2000) exotic fishes of India and their impact on freshwater biodiversity. Thirumala et al., (2011) recorded 04 genus and 04 species of exotic fishes from Bhadra reservoir of Karnataka, India where cyprinadie family was dominant with 03 species. Bhakta, J. N. and Bandyopadhyay, P. K. (2008) reported 04 genus and 06 species of exotic fishes from freshwater perennial water bodies in East Midnapore district of West Bengal, India where cyprinidae family dominant with 04 species. J. Chandra et al., (2013) reported 03 species exotic fishes from River Champavathi, Vizianagaram district (AP) India . S.E. Shinde, et al.,(2009) investigate 03 exotic fish species from Harsool Savangi dam, district Aurangabad. Nagma and M Afzal Khan (2013) reported 03 species of exotic fishes from district bijnor in Western Uttar Pradesh India. G.K Wagh and H.V Ghate(2002) reported 03 species of exotic fishes from freshwater fish fauna of the rivers Mula and Mutha Pune Maharashtra. A.S. Kumar Naik et al.,(2013): reported 07 species of exotic fishes under 04

genus where cyprinidae family was dominant with 05 species from Tunga River, Karnataka, India .

CONCLUSION :

Exotic fish species were introduced and successfully culture all over the world as well as in India from 1950 for the purpose of pond fish farming and sports fisheries and partly for scientific considerations, it is only apparent because the decrease in population of local species may be over fishing, water pollution, unscientific methods of fishing and construction of dams on large rivers and their tributaries thus the exotic species fill the emptied place of local fish species by utilizing their better adaptability. Exotic fishes are mostly omnivorous or carnivorous and capable of exerting direct adverse impacts on a wide range of native fish population. People made aware about the unauthorized introduction of exotic fishes and to stop the negative impact of exotic fish species on the indigenous fish species population we will require stringent regulations should be framed regarding the import of non-native fishes with in government , people related to fisheries and private sector.



STATUS OF EXOTIC FISHES TRANSPLANTED IN INDIA

Sr. No	Name of Species	Home Country	Year Of Introduction	Purpose
01	*Cyprinus carpio nudus*	Sri-Lanka	1939	For planning streams, lakes and reservoirs, Food and experimental purpose
02	*Cyprinus carpio specularis*	Sri-Lanka	1939	For planning streams, lakes and reservoirs, Food and experimental purpose
03	*Cyprinus carpio communis*	Sri-Lanka	1939	For planning streams, lakes and reservoirs, Food and experimental purpose
04	*Oreochromis mossambica*	Africa	1952	Food and Experimental purpose
05	*Ctenopharyngodon idellus*	Japan	1957	Food and Experimental purpose
06	*Hypothalmichthys molitrix*	Hongkon	1959	Food and Experimental purpose
07	*Hypothalmichthys nobilis*	Nepal	1981	Food and Experimental purpose
08	*Poecilia reticulate*	South America	1908	Mosquito Control

Ref: A.Biju Kumar (2000)

EXOTIC FISHES FROM MARATHWADA REGION

Oreochromis mossambica

Cyprinus carpio nudus

Ctenopharyngodon idellus

Hypothalmichthys molitrix

Cyprinus carpio specularis

Cyprinus carpio communis

Poecilia reticulata

Hypothalmichthys nobilis

FOLLOWING EXOTIC FISH SPECIES WERE OBSERVED AND IDENTIFIED IN THE PRESENT STUDY FROM MARATHWADA REGION

Family	Cyprinidae (Minnows & carp)	Genus	*Cyprinus* (Linnaeus, 1758)	Species	*Cyprinus carpio nudus* (Bloch, 1784)
First Record	1758, *Cyprinus Linnaeus*, *Systema nature.Ed* .10, 1, P.320.				
Diagnostic characters	Body almost without scales except for a single row of degenerate ones along base of dorsal fin occasionally extending as far as tail even head to caudal fin. Base of other fins may also be covered with small scales, (Jayaram 1999).				
Fin formula	D iii-iv, 18-20; Aiii 5, Pi 15, Vi 8, (Srivastava, 1985).				
Distribution	**India-** Throughout freshwater of India, (Jayaram, 1999).				
	Abroad – Europe, Russia, China, India and south East Asia, (Jayaram, 1999).				
Habit	Omnivorous				

Family	Cyprinidae (Minnows & carp)	Genus	*Cyprinus* (Linnaeus, 1758)	Species	*Cyprinus carpio communis* (Lacepede, 1803)
First Record	1758, *Cyprinus Linnaeus*, *Systema naturae* .Ed .10, 1, P.320.				
Diagnostic characters	Body fully covered by regularly arranged rows of scales. This is supposed to be the original. (Jayaram, 1999).				
Fin formula	D iii-iv, 18-20; Aiii 5, Pi 15, Vi 8, (Srivastava, 1985).				
Distribution	**India-** Throughout freshwater of India**,** (Jayaram, 1999).				
	Abroad – Europe, Russia, China, India and south East Asia, (Jayaram, 1999).				
Habit	**Omnivorous**				

Family	Cyprinidae (Minnows & carp)	Genus	*Cyprinus* (Linnaeus, 1758)	Species	*Cyprinus carpio specularis* (Lacepede 1803)
First Record	1758, *Cyprinus Linnaeus*, *Systema naturae* .Ed .10, 1, P.320.				
Diagnostic characters	Body covered unevenly with a few large and bright scales .A large area of the body however is without scales, (Jayaram, 1999).				
Fin formula	D iii-iv, 18-20; Aiii 5, Pi 15, Vi 8, (Srivastava, 1985).				
Distribution	**India-** Throughout freshwater of India, (Jayaram, 1999).				
	Abroad – Europe, Russia, China, India and south East Asia, (Jayaram, 1999).				
Habit	**Omnivorous**				

Family	Cyprinidae (Minnows & Carp)	Genus	*Ctenopharyngodon* (Steindachner, 1866)	Species	*idellus* (Valenciennes, 1841)
First Record	1841.*Leuciscus idella* Valenciennes, *Hist. Nat. Poiss*., 17:342				
Diagnostic characters	No Barbels, dorsal fin inserted slightly ahead of pelvic fins nearer tip tip of snout then caudal fin base with ten rays (three simple, seven branched) and without a spine, (Jayaram, 1999).				
Fin formula	D.10, P.18, A.10 -11, V.9, LL.40 -42.				
Distribution	**India: -** Throughout India, (Jayaram, 1999).				
	Abroad – Naturally found in Amur region of Syberia and Manchuria, north to south China, U.S.S.S.R, lower riches of R.Amur, (Jayaram, 1999).				
Habit	**Herbivorous**				

Family	Cyprinidae (Minnows and Carps)	Genus	*Hypothalmichthys* (Bleeker, 1859)	Species	*molitix* (Valenciennes, 1844)
First Record	1859. *Hypopthalmichthys* Bleeker. *Nat Tijdschr. Ned .Indie*, 20, P.433.				
Diagnostic characters	Entire abdominal edge keeled. Gill rakers continuous, forming a crecentic horny membrane, (Jayaram, 1999).				
Fin formula	D.10-11, P.20-21, A.14-15, V.8, LL.115 -120.				
Distribution	**India: -** Throughout India, (Jayaram, 1981).				
	Abroad – U.S.S.R, China, Yangtze, West river, Kwangsi Kwangtu ng in south and cenral China, (Jayaram, 1981).				
Habit	**Herbivorous**				

Family	Cyprinidae (Minnows and Carps)	Genus	*Hypothalmichthys* (Richardson, 1845)	Species	*nobilis* (Richardson, 1845)
First Record	1859; *Hypopthalmichthys* Bleeker, *Nat Tijdschr. Ned .Indie*, 20, P.434.				
Diagnostic characters	Only part of abdomen keeled gill rakers not continuous, (Jayaram, 1999).				
Fin formula	D.10, P.20, A.14, V.8, LL.115.				
Distribution	**India: -** Throughout India, (Jayaram, 1981).				
	Abroad – U.S.S.R, China, Yangtze, West river, Kwangsi Kwangtung in south and central China, (Jayaram, 1981).				
Habit	**Omnivorous**				

Family	Poecilidae	Genus	*Poecilia*(Bloch & Schneider, 1801)	Species	*reticulata* (Peters, 1859)
First Record	1801. *Poecilia* Bloch and Schneider,*Syst.Icth.* 2, p, 452.				
Diagnostic characters	Teeth spatuliform and movable. Dorsal fin inserted in front of anal fin. (Jayaram, 1999).				
Fin formula	D.ii 5, P.ii 11, V.i 5, A.ii 7, C.19, LL.27-28.				
Distribution	**India –**Throughout India, (Jayaram, 1999).				
	Abroad – Tropical America, (Jayaram, 1999).				
Habit	**Carnivorous**				

Family	Cichlidae (Minnows & Carps)	Genus	*Oreochromis* (Peters, 1852)	Species	*mossambicus*(Peters , 1852)
First Record	1852. *Tilapia mossambica* Peters, *Monatsb Akad. Wiss. Berlin*: 681.				
Diagnostic characters	Scales are cycloid, anal fin with three or four spines, (Jayaram, 1999)				
Fin formula	D.xv-xvi, 10-12, P.14 -15, V.i5, A.iii 10 -11, C.17, LL.30-32.				
Distribution	**India-** Through out freshwater of India, (Kapoor, Dayal and Ponniah, 2002).				
	Abroad –East Asia to Nepal, Bangladesh, Pakistan and Shri lanka, (Kapoor, Dayal and Ponniah, 2002)				
Habit	**Omnivorous**				

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