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Assessment of cultural uses of Mrigal carp (*Cirrhinus mrigala*) in Gujranwala division, Pakistan

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ABSTRACT

Introduction: *Cirrhinus mrigala* belongs to carps family Cyprinidae. It is commonly known as mori, nani or morakhi in Pakistan. Mrigal carp is consumed all around the globe because it has large benefits to health. Protein that is extracted from the flesh of fish is of high quality and easily digestible as compared to protein obtained from other animal sources.

Materials and Methods: The data collected through questionnaire about the cultural uses of the *Cirrhinus mrigala* from the inhabitants of the selected cities from Gujranwala district, Pakistan. Questionnaire was consist of following points i.e. is *Cirrhinus mrigala* used for food? Is *the species* used for medicine?

Results: *Cirrhinus mrigala* has medicinal values. During the surveys noted that *Cirrhinus mrigala* are used in medicine against different diseases i.e. meat is used orally to reduce weight, enhance sexual power, brain is used to enhance memory and oil of this species is used against cold. This fish meat is used as food.

Conclusion: During the research noted this species of fish has high medicinal and food in the Division Gujranwala.

Key words: Food, Ethnomedicine, Gujranwala, Health

INTRODUCTION

Fish is consumed all around the globe because it has large benefits to health. Protein that is extracted from the flesh of fish is of high quality and easily digestible as compared to protein obtained from other animal sources (Louka *et al.*, 2004). Fish protein reduces the concentration of triacylglycerides from blood (Boberg, 1990) and also involved in minimizing cardiovascular diseases (Ahmed, 2011). Among fish species, carps are consumed worldwide especially in Asian countries. *Cirrhinus mrigala* is among the Indian major carps (Rohu, Catla, Mrigal and Kalbasu). In the Indian Sub-Continent polyculture of the three fish species viz., *Labeo rohita*, *Cirrhinus mrigala* and *Catla catla* is common and these fish species are reared in semi-intensive and intensive aquaculture systems. *C. mrigala* is preferred by consumers due to its high quality meat and taste. It has acquired great attention of aqua-culturists globally, due to its high yield and meat quality (FAO, 2007).

C. mrigala belongs to carps family Cyprinidae. It is commonly known as mori, nani or morakhi in Pakistan. It is widely distributed in the Asiatic region including Pakistan, India, Nepal and Bangladesh. But now this specie is also successfully introduced in neighboring countries of Asia and Europe (Chondar, 1999; Froese and Pauly, 2006). According to the IUCN red list 2010 this specie is stated as Least Concern (L.C). The body of this fish is extended in a stream line and is narrower in the posterior region. As reported by different regions of the world, it can range in size from 17-99 cm (Bhuiyan, 1964; Rahman, 1989; Talwar and Jhingran, 1991; Hussain, 1999). It ranges in weight upto 12.7 kg (Rahman, 1989; Talwar and Jhingran, 1991). It is a detritus feeder and feeds with narrow range of food variety (Talwar and Jhingran, 1991). During rainy seasons, the breeding of this specie takes place in shallow waters (Bhuiyan, 1964). Breeding takes place in areas where water depth is about 0.5-1.0 m (Talwar and Jhingran, 1991).

C. mrigala is commercially valuable fish. Induced breeding of this specie in hatcheries was successfully done by hypophysation technique. Many hybrids of mrigal carp has been prepared by central In-land Fisheries Research Institute of India and in other parts of the world which included Catla-Mrigal, Rohu-Mrigal and Mrigal-Calbasu (Talwar and Jhingran, 1991). Mrigal carp is vital specie of polyculture in Pakistan, India and Bangladesh. During 2010-2011 total fish production in Pakistan was 712,000 tons (Anderson *et al.,* 1969).

Globally biodiversity loss is mainly happened through devastation and damage of natural ecosystems. Major cause of biodiversity extinction is habitat fragmentation (Simberloff, 2000). As the original habitat becomes constrained and fragmented then species are bound in fragmented site. This may ultimately resulted in the form of genetic bottleneck, inbreeding and restricted gene flow (Kruess and Tscharntke, 1994). Habitat fragmentation cause hybridization and ultimately leads toward species extinction (Carney *et al.,* 2000). The genetic makeup of organisms in a population is very useful as it provides the information about isolation and life histories (Avise, 2000; Wilson *et al.,* 2004). Phylogenetic analysis of diversity is very necessary for conservation purpose. Genetic variations within populations or groups are ignored but they can be very beneficial regarding the management of different stocks within species (Barker, 1999). Risk for the loss of diversity becomes very high when vulnerable species have low genetic relationship to species that are surviving (Caballero and Miguel, 2002). According to conservation genetics theory, populations that have small value of viable population size (Ne) lose genetic variety more rapidly than populations that have large value of viable population size (Ne) (Allendorf and Luikart, 2007). Genetic variations are at one of the three levels that IUCN has recommended for conservation of biodiversity (Mcneely *et al.,* 1990). The loss of adaptive variations and inbreeding depression turn the wild populations into increased risk of extinction

(Reed and Frankhan, 2003). Genetic variation is essential element of species that should be preserved to maintain fitness and adaptability of populations (Vandewoestijne *et al.,* 2008).

Identification of fish stock is prerequisite for any fisheries research. Measurement of fish stocks depends on the morphological and phenotypic characters rather than genetic differentiation. Separate fish stocks are identified based upon their morphology and morphometric properties (Cadrin *et al.,* 2005). Morphometric counts are described as counting of external length of body parts of fish species while in meristics analysis is successive counting of body elements (Talwar and Jhingran, 1992). This method depends upon the assumption that growth and maturation of individuals from the different populations may vary in the terms of their morphological characters (Cadrin and Silva, 2005; Saunders and Mayfield, 2008). Meristic and morphomertic parameters are beneficial in determining the sex, species identification, and helpful in verification of cultivable fish species (Dynes *et al.,* 1999).

MATERIALS AND METHODS

Study Area*:* Sampling was done at four selected cities from Gujranwala division, Pakistan; data were collected from June 2016 to May 2017. Four cities Gujranwala, Gujrat, Mandi bahauddin and Sialkot were selected as shown in figure1. Gujranwala climatic is mainly consisting of summer (Upto 45^{o}C), autumn, winter (upto 3^{o}C) and spring (Altaf, 2016).

Ethno-cultural uses: The data collected through questionnaire about the cultural uses of the *Cirrhinus mrigala* from the inhabitants of the selected cities from Gujranwala district, Pakistan. Questionnaire was consist of following points i.e. is *Cirrhinus mrigala* used for food? is *Cirrhinus mrigala* used for medicine?

Figure 1: Selected sampling sites (Gujranwala, Gujrat, Mandi bahauddin and Sialkot districts) of Punjab, Pakistan.

RESULTS AND DISCUSSION

Cirrhinus mrigala has medicinal values. During the surveys noted that *Cirrhinus mrigala* are used in medicine against different diseases i.e. meat is used orally to reduce weight, enhance sexual power, brain is used to enhance memory and oil of this species is used against cold. This fish meat is used as food (Table 2). Protein that is extracted from the flesh of fish is of high quality and easily digestible as compared to protein obtained from other animal sources (Louka *et al.*, 2004). Fish protein reduces the concentration of triacylglycerides from blood (Boberg, 1990) and also involved in minimizing cardiovascular diseases (Ahmed, 2011).

Table 2: Cultural uses of *Cirrhinus mrigala* in the study areas.

Sr.	Cultural importance	Uses
1	**Medicinal use**	Meat is used orally to reduce weight, enhance sexual power, brain is used to enhance memory and oil of this species is used against cold.
2	**Food Use**	This fish meat is used as food.

Conclusion: During the research noted this species of fish has high medicinal and food use in the Division Gujranwala.

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Availability of data: We have included all data in the manuscript that were collected during the field survey.

Authors' contributions: Muhammad designed this study and also performed the research; Umair and Khan write this article; Khan and Khan critically analysis article and approved as final manuscript.

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