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Assessment of distribution and ethnocultural uses of the Baringo tilapia (*Oreochromis niloticus*) in Punjab, Pakistan

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ABSTRACT

Introduction: Baringo tilapia is present in freshwater habitats i.e. irrigation channels, lakes, rivers and sewage canals. *Oreochromis niloticus* is freshwater species and also recorded from brackish water. The fry are omnivorous. Fishes are used for the different purposes and experiment use, because species may decline due to cultural and medicine uses and efficient tradition medicine methods may be eliminated. Therefore this study was designed to assess the distribution of sol and interaction with human in Punjab.

Materials and Methods: Data were collected by using direct and indirect methods (interviews from fisher man). Duration of research was two years and started in January 2015 and end December 2016.

Results: During study recorded that highest relative abundance (RA) of *O. niloticus* was recorded from the head Qadirabad (0.285714). During the research recorded that skin of *Oreochromis niloticus* is used to treat skin burn and meat used against cold; used as food and trade in the all study areas

Conclusion: It is concluded that the *Oreochromis niloticus* is present in all rivers of Punjab and people of the area use this species for medicine, trade and food.

Key words: River, Trade, Barrage, Freshwater, Head

INTRODUCTION

Baringo tilapia is recorded in different types of freshwater habitats i.e. irrigation channels, lakes, rivers and sewage canals. This species is euryhaline and eurythermal. It is freshwater species and also recorded from brackish water. It is diurnal in behavior and herbivore in feeding behavior (Trewavas, 1983). The fry are omnivorous and feed on aquatic as well as terrestrial insect larvae, aufwuchs, copepods and detritus (De Moor and Bruton, 1998). *Oreochromis niloticus* males build nests in sand and female is mouth brooder (Trewavas, 1983; De Moor and Bruton, 1998).

This species is native in Zambia, Uganda, Togo, Tanzania, Sudan, South Sudan, Senegal, Rwanda, Nigeria, Niger, Mauritania, Mali, Kenya, Israel, Guinea, Ghana, Gambia, Ethiopia, Egypt, Congo, Chad, Cameroon, Burundi, Burkina Faso and Benin. The species is introduced in Bangladesh, Zimbabwe, Viet Nam, United States, United Kingdom, Tunisia, Thailand, Taiwan, Sri Lanka, South Africa, Slovakia, Singapore, Saudi Arabia, Saint Lucia, Réunion, Philippines, Peru, Panama, Pakistan, Nicaragua, Nepal, Myanmar, Mexico, Mauritius, Malaysia, Madagascar, Korea, Kiribati, Japan, Jamaica, Italy, Iran, Indonesia, India, Hong Kong, Honduras, Haiti, Guyana, Guatemala, Grenada, Gabon, Fiji, Eritrea, Ecuador (Galápagos), Cyprus, Cuba, Costa Rica, Congo, Comoros, Colombia, China, Cambodia, Brunei Darussalam, Brazil, Botswana, Bolivia and Belgium (Snoeks *et al.*, 2018).

Fishes are used for the potentials drugs, traditional medicines and pharmaceutical industries (Close *et al.*, 2002; Alves and Rosa, 2007a; Deb and Emdad Haque, 2011; Vallejo and González, 2014; Altaf *et al.*, 2018); there is significant and urgent need to note ecological, magical, entertainment, social, religion, trade and experiment use, because species may decline due to cultural and medicine uses and efficient tradition medicine methods may be eliminated (Alves and Rosa, 2007b; Alonso-Castro *et al.*, 2011; Alves *et al.*, 2012; Arshad *et al.*, 2014;

Altaf *et al.*, 2017). So this study is designed to assess the distribution of sol and interaction with human in Punjab.

MATERIALS AND METHODS

***Study Area**:* Data were recorded from the following rivers of the Punjab i.e. river Jehlum (Rasul barrage, Jehlum bridge); river Chenab (head Marala, head Qadirabad, head Khanki); river Ravi (Head Baloki, Ravi bridge); river Sutlej (Head Islam); and Indus river (Chashma barrage and Taunsa barrage) (Figure 1).

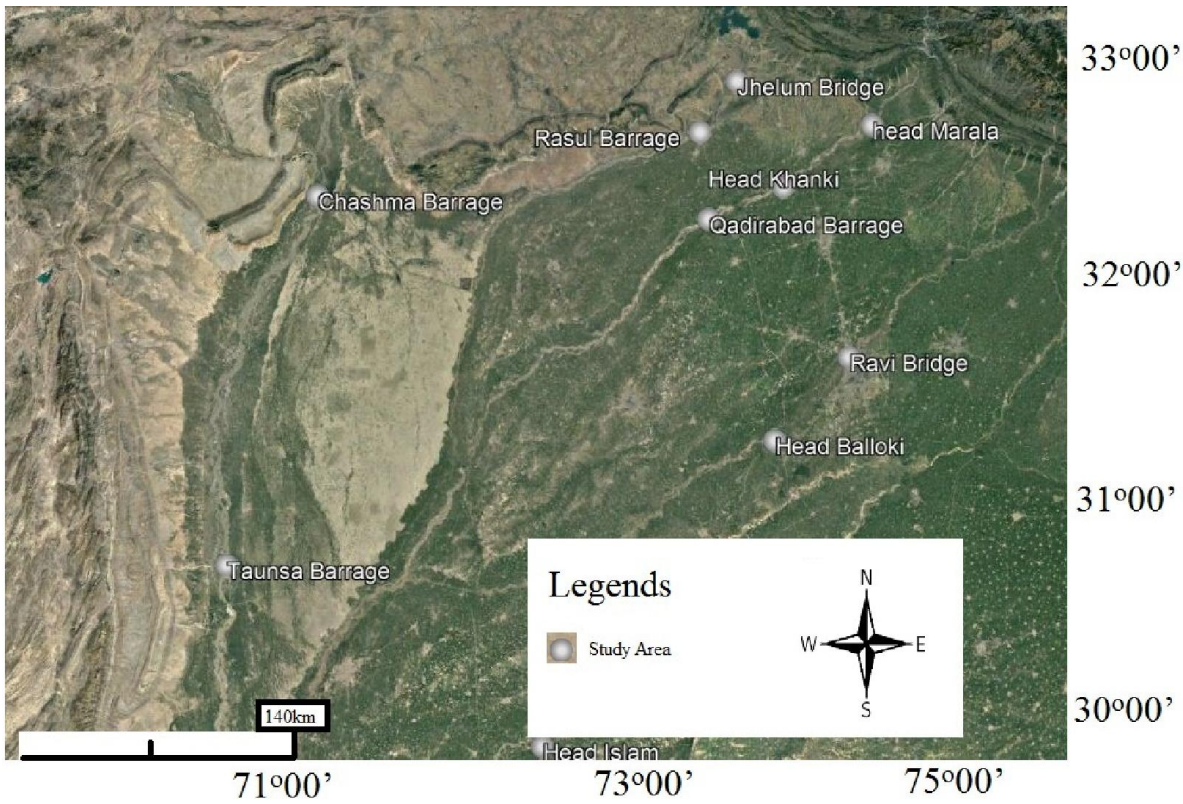

Figure 1: Map of Study areas.

Sample Collection: Data were collected by using direct (dip net, cast net and hand nets etc) and indirect methods (questionnaire from local people and fisherman). Duration of research was 5 years as from January 2015 to December 2016.

Ethno-medicinal data: The data were collected through questionnaire (n=150) about the medicinal and cultural uses of this species from the local people and fisherman of the selected sites of the Punjab.

RESULTS AND DISCUSSION

This species is locally known as chirra machhli. During the study noted that highest Relative abundance of this species was recorded from the head Qadirabad (R.A. = 0.285714) followed by head Marala (R.A. = 0.042857) Taunsa barrage (R.A. = 0.142857), head Islam (R.A. = 0.128571), Chashma barrage (R.A. = 0.057143), head Baloki (R.A. = 0.057143), Rasul Barrage (R.A. = 0.028571), Jehlum Bridge (R.A. = 0.042857), Head Khanki (R.A. = 0.071429) and Ravi bridge (R.A. = 0.042857) as shown in table 1. Tilapia is noted by Altaf *et al.* (2011) from head Qadirabad and Altaf et al. (2015) from river Chenab; while Hussain *et al.* (2015) also noted tilapia from river Ravi.

Table 1: Distribution of *Oreochromis niloticus* in the Punjab, Pakistan.

Study area	**Relative Abundance**
Rasul Barrage	0.028571
Jehlum Bridge	0.042857
Head Marala	0.142857
Head Qadirabad	0.285714
Head Khanki	0.071429
Head Baloki	0.057143
Ravi bridge	0.042857
Head Islam	0.128571
Chashma Barrage	0.057143
Taunsa Barrage	0.142857

During the research recorded that skin of *Oreochromis niloticus* is used to treat skin burn and meat used against cold; used as food and trade in the all study areas (Table 2). Muhammad *et al.* (2017a) and (Muhammad *et al.*, 2017b) documented that sol and carps are used for cultural and medicinal use respectively.

Table 2: Cultural uses of *Oreochromis niloticus* in the Punjab, Pakistan.

Medicinal uses	Skin is used to treat skin burn and meat used against cold.
Food	*O. niloticus* is used as food in local area.
Trade	*O. niloticus* is captured from the rivers and sold to all parts of Pakistan.

Conclusion: The ***Oreochromis niloticus*** is recorded in all the rivers of Punjab and also utilized for cultural and medicine as well as food.

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Availability of data: Authors have included all collected data in research article that were collected during the field survey.

Author's contribution: Study is designed and data are collected by Muhammad and critically analyzed by all authors.

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