

## Ecobiology of *Tilapia Mossambicus* at Rani Talab, Rewa (M.P.): A Review



### Zoology

**KEYWORDS :** Eco biology, *Tilapia*, *Oreochromis mossambicus*.

**R.K. Singh**

Department of Zoology, Govt. Science College Rewa -486001 (M.P.), India

**S.N. Shukla**

Department of Zoology, Govt. Science College Rewa -486001 (M.P.), India

### ABSTRACT

*The Tilapia (*Tilapia mossambicus*) is widely distributed in fresh water bodies of Rewa district especially Rani Talab of Rewa. The investigation covers a survey on Tilapia (*Tilapia mossambicus*) in relation to its biology, ecology and fishery at home. It's aimed at furnishing as much information as possible on various aspects eg. feeding habit, and reproductive behaviour etc.*

### INTRODUCTION

Need of the present & future for human food, which includes carbohydrates, fats and above all protein (Body building food). It is well known fact that population of the world is increasing in geometrical ratio whereas food production in arithmetic ratio hence, poverty prevails (Malthusian Theory), which leads to shortage of food materials. To overcome this problem, green revolution took place in India. Now aquaculture in on the front-line to meetout food shortage. Protein is available in cereals and in animal flesh. Cereals being costly affair while animal protein (fish protein) is cheaper and abundant. The need of the day thus is that agriculturist should start aquaculture, so that more fish protein can be provided to maximum people, especially poor people. Thus to compete 'Population Explosion', 'Aquaplosion' is required.

### Geographic position and physical feature of the study area –

The geographical position and effects of environment greatly influence the nature and pattern of population of a locality. The importance of such information is immense in studying the biological aspects of any fish species.

1. **Location**– Rewa town lies almost in North East part of M.P. having cardinal point as 24°32', North Latitude 81°15' East Longitude with altitude of 316 MSL (Mean Sea Level).

2. **Topography**– Rewa town is surrounded from three sides by hills and the ground is gently sloping towards north. The highest hillock in the vicinity of Rani Talab in the Mahal Plateau which is adjacent the Rani Talab.

3. **Climate**– Rewa lies in a semi tropical zone and has moderate climate. The mean maximum temperature varies between 40° to 48°C during summer and mean minimum temperature of 10°C during winter. At Rewa, most rainfall occurs during south-west monsoon in the Months of July, August and September.

4. **Salient feature of the Rani Talab –**

Period of constructing	18 <sup>th</sup> Century A.D.,
Catchments Area	0.68 Sq./Mile
Total Area of Rani Talab	37.54 Acres
Sub merged Area at FTL	22.86 Acres
Average distance from Bund to Centre of Pond	137 Meters
Average distance from back to centre of the Pond	130 Meters
Average depth of water in the Pond.	3.53 Meter
Average volume of Pond water	3518337 Cu. Feet
Source of water	Rain Water + Drainage
Main use of water	Bathing, Washing & Fish farming
Inflow points	One

### Selection of *Tilapia mossambicus*

The study area falls under semi tropical zone, the average temperature except December and January remain towards higher side. Since, the *Tilapia mossambicus* is polybreeder and temperature is one of the most important factors which influence the breeding. In spite of climatic condition of the study area, the trophic status and organic loading of Rani Talab encourage me to select the *Tilapia mossambicus* for detail study.

The flesh of this fish is tastier and is important food fish for slum people living around the Rani Talab. Hence, this fish can be called as Poor Man's fish.

### Identification and Taxonomic Position:-

Valid name *Tilapia mossambicus*, Local name-Tilapia, Latin Thiapi = Fish the genus name and term was first introduced by Scottish Zoologist Andrew Smith in 1840. In Tamil it is called Jilaebi.

Kingdom	: Animalia
Sub-kingdom	: Metazoa
Phylum	: Chordata
Sub-Phylum	: Vertebrate
Division	: Gnathostomata
Super-Class	: Pisces
Class	: Osteichthyes
Sub-Class	: Actinopterygii
Super order	: Teleostei
Order	: Perciformes
Sub order	: Percoidei
Family	: Cichlidae
Genus	: <i>Tilapia</i>
Species	: <i>mossambicus</i>

### Synonyms –

*Oreochromis*, *Serotherodon*, *Tilapia*

### External Morphology –

Fin Formula –  $D_{27(16/11)} P_{11} V_6(1/5) A_{10(3/7)} C_{19} LL_{32} Ltr. 4\frac{1}{2} / 15\frac{1}{2}$

### Diagnosis –

Body more or less elongate. Abdomen–rounded. Head compressed with concave upper profile. Caudal fin truncate with coloured strips. Dark band present over body about 9 in number with a gap of 1 c.m. A Dark spot present on the operculum. Scales are cycloid covering all body extended up to head, except snout, scales present on the operculum. Eyes-large. Dorsal fin inserted above base of pectoral fin, with 16 spine and 11 soft rays. Pectoral fin with 11 rays. Pelvic fin has first 3 spines and 7 soft rays. Caudal fin has 19 rays. Lateral line incomplete.

### Habitat & Distribution –

The natural habitat of *Tilapia mossambicus* is along the east coast of Africa, but is has been transported to several countries and reared in Indian ponds also. In India, it was brought by Center Marin Fisheries Research Institute, Mandapam (TN) from Bangkok in 1952 (Panikkar & Tampi, 1954) and by the fisheries department Madras from Ceylon (Devadas and Chacko, 1963). Thus *Tilapia mossambicus* in an exotic fish/

It has spread all over by different rivers system and also reached Rani Talab pond, Rewa.

#### Food & Feeding Habit –

The feeding behaviour of fishes is influenced by many factors, such as characteristics of environment etc. Moyle & Cech (2000) studied the seasonal pattern of feeding habits of *Tilapia nilotica* and found the seasonal variation activity. The feeding activity was higher in summer than in winter. Mustafa et.al. (1982) observed the same in *Colisa fasciata*. According to Hora & Pillay (1962) the fry of *Tilapia mossambicus* feeds on Zoo and Phytoplankton but, the adult are chiefly herbivorous (Vass & Hofstede, 1952). During the present study it has been found that after the termination of winter, feeding intensity increased with rise of water temperature. It was also observed that the medium sized specimens ranging from 20 to 25 mm long being more active feeder than larger ones. It also feeds on mosquito larvae. Pannikar & Tampi (1954) reported this feeding habit which, makes this fish useful in bio control of malaria.

#### Reproductive Biology –

*Tilapia mossambicus* is a prolific breeder that breeds throughout the year easily in ponds with an interval of about 16-25 days between successive spawning. Most other fishes like Catla & Rohu breeds only once or twice in the year. Tilapia according to Vaas & Hofstede (1952) reaches its first maturity when about 2 month old. There is behavioural change in male & female Tilapia before breeding. The male prepares a shallow circular nest in the bottom sand and the eggs are laid by the female after brief courtship. The eggs are fertilized by the male and soon the female picks up the eggs in her mouth. Thus exhibiting buccal incubation. Tilapia shows parental care. Hatching takes place in 3-4 days and 8 m.m. fry are liberated from the mouth. Hence, it is a Mouth Brooder fish.

Tilapia is a fast growing hardy fish but does not survive at a temperature lower than 10°C. The main breeding takes place in warmer waters, where the temperature is over 20°C.

#### Spawning Behaviour–

Spawning may also be of relevance if, harvest requires or utiliz-

es the natural fertilization (Pankhurst, 1998). Spawning behaviour is caused by physical environmental factors. Social interactions and in many species sexual pheromones (Stacey et.al., 1997). There are several broad patterns of spawning behaviour found in different fish in different habitat i.e. group spawning & pair spawning. In *Tilapia mossambicus* it is pair spawning. The species which show pair spawning, spawning behaviour is characterized by some degree of mate selection and behavioural interaction (Courtship and Sexual display), before spawning. Alternatively, pair formation may be permanent as shown in some cichlids (Mackaye, 1984).

#### ECONOMIC IMPORTANCE –

##### i) Weed control by Tilapia

Tilapia has also demonstrated its suitability for weed control in ponds. In India, ponds heavily stocked with *Tilapia mossambicus* have been found generally free from soft submerged vegetation and filamentous algae (Phillipose, 1968).

##### ii) Bio control of Malaria

In Kenya, Tilapia were introduced to control mosquito which were causing malaria. The Tilapia consumes mosquito larvae hence reducing number of adult female mosquitoes, which are the vectors of malaria and other disease (Peter, 2000). Thus Tilapia may be a valuable weapon against malarial mosquitoes.

##### iii) Negative aspects of Tilapia

Tilapia multiply rapidly, grow quickly, breed fast and can live in sewage water conditions. The presence of Tilapia in carp nurseries, seriously affect the survival and growth of carp fries, because Tilapia feeds extensively on carp fry. Under Indian conditions, Tilapia is unsuitable for culture along with Indian major carps. This problem can be removed by continuous harvesting and monosex culture of Tilapia.

#### ACKNOWLEDGEMENT

Authors are thankful to Dr. (Smt.) Usha Awasthi, Principal, Govt. Science College, Rewa for her guidance & support. Our thanks also are extended to staff members of Zoology Department, Govt. Science College, Rewa for their support.

## REFERENCE

- Devadas, D.D. P & Chacko P.L., 1963, Introduction of the exotic cichlid Fish, *Tilapia mossambica*, Peter in Madma, Curr. Sc. 22(1):29. | Dewan S. and S.N. Saha, 1979, Food and feeding habit of *Tilapia nilotica* (L) II. Diel and Seasonal pattern of feeding. Bangladesh J. Zool. 7: 75-80. | Hora S.L. & Pillay I.V.R., 1962, Handbook on fish culture in the Indo pacific region, FAO, Fish Biol. Tech. Pap.(14) : 204P | Mackaye, K.R., 1984, Behavioural aspects of cichlids reproductive strategies. Patterns of Territoriality and Brood defense in central American substratum spawners and African mouth brooder. In : fish reproduction : Strategies and tactics (Eds-G.W. Pottsw R.J. Woofan) Academic press London, pp. 245-274. | Mustafa, G., K.R. Islam, S. Ali and AKMA Alam, 1982, Some aspects of the biology of *Puntius sarana*(Hamilton). I. Food and feeding habit in relation to fish size & fecundity. Bangladesh J. Zool. 10: pp. 92-100. | Myole, P.B. and J.J. Cech, 2000, Reproduction in fishes and introduction to ichthyology. 4th Edn. Prentice Hall. Inc. pp. 123-144. | Pannikar N.K. and Tampi P.R.S. 1954. On the mouth breeding cichlid *Tilapia mossambica*, Peter. Indian J. Fish-I (182):217-230. | Pankhurst N.W., 1998, Reproduction : In biology of farmed fish edited by Kenneth Black and Alam D. Pickering. Sheffield Academic Press, England, pp. 1-26. | | Peter,T, 2000, Interaction between fish & aquatic macrophytes in inland water, A review FAO fisheries technical paper. Pp. 396. | Phillipose M.J., 1968, Present trends in the control of weeds in fresh cultured water of Asia and the far east FAO Fish Rep. (44) S:26-52. | Stacey, N.E., I.R. Candwell, N.R. Liley, A.P. Scott and P.W. Sorensen, 1994, Hormones as sex pheromones in fish in perspective in comparative endocrinology (Eds. Davey, K.G., R.E. Peter and S.S. Tove) National Research Council of Canada. Pp. 438-448. | Vass, K. F. & Hofstede A.E., 1952 Studies on *Tilapia mossambica*, Peters in Indonesia. Cent. Int. Fish Res. Stu. Bogor : 1-68. |