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**AN INVESTIGATION ON SOME
ASPECTS OF THE BIOLOGY OF MAHSEERS
FROM THE NORTH-EASTERN INDIA**

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A B S T R A C T

There is a paucity of information on the biology of indigenous fishes in the highlands of the North-Eastern Hill Regions of the country. Such a knowledge, is of utmost importance not only from the academic view point, but also in its utility in increasing technological efficiencies of the fishery entrepreneurs for evolving judicious management measures. Keeping in view, the basic necessity to have a knowledge on the biology of fishes and hence, on a virtual absence of such informations, a study has been undertaken to elucidate on the Biology of Mahseers (Cypriniformes: Cyprinidae) viz., Acrossocheilus hexagonolepis (McClelland), Tor tor (Hamilton) and Tor putitora (Hamilton) from the highlands of Meghalaya (India).

The study pertains to the specimens of these fishes, collected during the period from August 1978 to July 1980 mainly from Simsang River situated at an altitude of 500 feet in Garo Hills (27°40'N latitude and 91°28'E longitude), India.

The results obtained during the present study has been presented in the thesis entitled "An investigation on some aspects of the biology of Mahseers from the North-Eastern India." The dissertation containing 148 pages, with 38 Tables and 41 Figures, has been divided into 5 chapters. The first chapter deals with an introduction to the biological

studies of fishes, followed by a short review of the available literature on the biology of Mahseers. This is further followed by the taxonomical status, diagnostic characters, synonyms and vernacular names of the species. In the second chapter the materials and methods adopted for the present study have been presented. This is further followed by the third chapter, dealing with the results obtained on morphometric and meristic characters, length/mass relationship, condition factor, maturity and spawning, fecundity and food and feeding habits of these fishes. The fourth chapter contains the discussion on the results obtained during the present study. In the fifth and final chapter, a summary and conclusion of the entire study have been presented, which is followed by list of literature cited in the dissertation.

The following are the important results obtained during the present investigations and embodied in the thesis:

- 1) An intra-specific variation has been observed in various morphometric characters viz., head depth, eye diameter and rostral-barbel length of A. hexagonolepis. These characters were found to be higher in the specimens from the Pagladia River population, whereas the characters viz., snout length, gape and number of lateral line scales, were found to be significantly higher in the specimens from the Simsang River. Considerable differences in various morphometric parameters between T. tor and T. putitora have also been observed in the present study.

2) The length-weight regression and parabolic equations for A. hexagonolepis, T. tor and T. putitora are derived to be as follows:

A. hexagonolepis:

$$\text{Log } W = - 5.1971 + 3.0640 \text{ Log } T_1$$

$$W = 0.000001005 L^{3.0640}$$

T. tor:

$$\text{Log } W = - 5.1252 + 3.0284 \text{ Log } T_1$$

$$W = 0.000007479 L^{3.0284}$$

T. putitora:

$$\text{Log } W = - 4.8308 + 2.8863 \text{ Log } T_1$$

$$W = 0.00001476 L^{2.8863}$$

The regression equations of A. hexagonolepis and T. tor during different seasons viz., summer, monsoon and winter have been found to be:

A. hexagonolepis:

Summer $\text{Log } W = - 5.2230 + 3.0392 \text{ Log } T_1$

Monsoon $\text{Log } W = - 3.6863 + 2.9132 \text{ Log } T_1$

Winter $\text{Log } W = - 4.9479 + 2.9840 \text{ Log } T_1$

T. tor:

Summer $\text{Log } W = - 4.9846 + 2.9993 \text{ Log } T_1$

Monsoon $\text{Log } W = - 4.9686 + 2.9793 \text{ Log } T_1$

Winter $\text{Log } W = - 5.1252 + 3.0284 \text{ Log } T_1$

- 3) Condition factor (K) varied from 0.695 to 1.180 in A. hexagonolepis, 0.802 to 1.060 in T. tor and 0.776 to 0.845 in T. putitora. Variations in the condition factor have been attributed to be different factors such as environmental condition, food availability and gonadal maturity.
- 4) Maturity studies, indicated that A. hexagonolepis has a prolonged spawning season, extending from March/April to October/November.
- 5) It has been found that the males of A. hexagonolepis were immature below 91 mm in total length, whereas the females were found to be immature below 201 mm in total length. The 50% maturity (M_{50}) in males of the species were recorded at 191-250 mm length group, whereas the same has been recorded for females at 211-220 mm length group.
- 6) The values of Gonado-somatic index indicated the spawning season of the species from March/April to October/November, supporting the inference drawn from the studies concerning spawning season. It is also indicated that there is a tendency for the Gn.S.I. to increase with increase in length.
- 7) It has been recorded in the present study that the fecundity of A. hexagonolepis ranges from 533 in the specimen measuring 196.00 mm and 74.4 gm in total length and total weight respectively to 11660 in the specimen measuring 442.0 mm and 1000.00 gm in total length and total weight respectively.

The regression equations between fecundity and various parameters, derived are as follows:-

(i) Fecundity Vs. total length:

$$\text{Log F} = - 2.0725 + 0.5278 \text{ Log Tl } (r = 0.4506)$$

(ii) Fecundity Vs. total weight:

$$\text{Log F} = - 2.3040 + 2.3226 \text{ Log W } (r = 0.6293)$$

(iii) Fecundity Vs. ovary weight:

$$\text{Log F} = - 2.9282 + 0.4720 \text{ Log O.W. } (r = 0.8417)$$

(iv) Ovary weight Vs. total length:

$$\text{Log O.W.} = - 1.1675 + 0.6565 \text{ Log Tl } (r = 0.6568).$$

8) The results of the food and feeding habits of A. hexagonolepis and T. tor indicate that the basic food are algal and vegetable matters. However, animal matters were also encountered, hence can be regarded as secondary food of these species. In the case of T. putitora, vegetable matter, algae and insect can be regarded as primary food.

The high values of G.S.I. (3.960 - 8.131) recorded for A. hexagonolepis reflects towards the voracious feeding nature of the species. The percentage of vegetable matter was found to increase with the increase in length in all the three species, which indicate the change in the diet preference with the increase in length.

It has also been observed that R.L.G. values of all the three species studied, increase with the increase in length. The average R.L.G. values were found to be 2.4, 2.1

and 1.3 in A. hexagonolepis, T. tor and T. putitora ly. Hence, the results obtained with the food and habits of the fishes reveal that the Mahseers of th are purely omnivorous.

The present study further suggest that the M be considered as a culturable species particularly North-Eastern Region and can further be included in "Land" programme.



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