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"Studies On The Relationship Between Different Spawning Periods And Haematocrit In Labeo rohita."

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Abstract :

The relationship between different spawning periods and haematocrit in Labeorohita– *Haematological indices are important parameters for the evaluation of fish physiological status. Their changes depends on the fish species, age, the cycle of sexual maturity and health conditions. The studies of haematological parameters of fishes is gaining a recognition as a valuable tool for monitoring the health of the fish and to provide the fisheries biologist with the physiological response to environmental stress, Information which is specially relevant when comparing studies of different fish species living in contrasted habitats. The determination of haematological values of fishes are carried out for a variety of purposes.*

In this study of Labeorohita, we analysed the relationship between different spawning periods and haematocrit and found that haematocrit value was higher at the beginning of maturation, it then decreased when the fish started to spawn and increased slightly in the past spawnig period, Pre and past spawning periods had a higher Ht-level than the spawning period.

***Keywords* : Haematocrit, Labeorohita, Spawning periods, Males and Females**

Introduction

Haematological indices are important parameters for the evaluation of fish physiological status. Their changes depends on the fish species, age, the cycle of sexual maturity (different spawning periods) and health condition (Blaxhall, 1972; Wedemeyer et al., 1983; Golovina and Trombicky, 1989; Zhiteneva et al., 1989; Bielek and Strauss, 1993; Golovina, 1966; Luskova, 1997; Vosyliene, Hrubec et al., 2001). Das (1965) stated that both the red cell number and haemoglobin concentration tend to increase with length and age. Increased in haemotocrit have been observed for male fishes approaching spawning, but this increase seems to be of a limited and transient nature (Poston, 1966; Summerfelt, 1967). Raizada and Singh (1981) studied seasonal variations in the haemoglobin content of fresh water major carp-*Cirrhinusmrigala*. They observed its lower value during spawning (June) and winter (December to February) periods and higher value after spawning period (July to November). A good knowledge of haematocrit-spawning periods relationship of fishes are important in ichthyology because they allow the estimation of the average Ht value of the fish of a given spawning period by establishing a mathematical relation between the two. In the present study the Ht value was higher in pre-spawning period and decreased in spawning period and increased slightly in the post-spawning period.

Materials and Methods:

Live specimens of the *Labeorohita*were obtained from various ponds such as pond Inai, Rauza pond, Rajendra sarovar and local market in Chapra and transported in aerated containers to the laboratory. The fishes acclimatize to the laboratory conditions for at least 20 days prior to the experiment in a glass aquarium filled with declorinated water. The weight of fish varied from 100 to 1500 gm in weight. Both sexes were used. The blood samples obtained from the coudal circulation with the aid of a heparinised 2cm disposable plastic syringe and a 21 gauge disposable hypodermic needle. Haematocrit (Ht/PCV) was determined by micro-haematocrit centrifugation technique. The haematocrit value or the packed cell volume were estimated by centrifuging it for 5 minutes at 10,000 rotation per minute (rpm). Differences in haematological parameters between male and female fish were statistically analyzed by student's t – test.

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Observations :

Table - 1

Blood haematocrit (Ht%) in different spawning periods of male **Labeorohita**: Pre-Sp. Pre-spawning period; Sp. Spawning period; Pst-Sp. Post-spawning period.

Sl. No.	Ht%		
	Pre-Sp	Sp	Pst-Sp
1	41.60	38.20	39.60
2	41.90	38.05	39.35
3	42.80	39.05	40.45
4	41.90	38.25	39.85
5	42.00	38.40	39.90
6	39.50	38.35	38.95
7	42.80	38.45	39.95
8	42.40	38.30	39.65
9	41.95	38.95	39.15
10	42.90	40.45	40.65
11	42.80	39.40	40.85
12	42.50	39.35	40.90
13	42.00	40.85	41.15
14	42.05	39.60	39.95
15	42.35	39.90	40.40
16	42.15	40.85	41.10
17	41.95	38.65	39.80
18	41.60	38.30	39.65
19	42.35	39.80	40.05
20	40.85	38.90	39.25
21	42.05	40.40	40.65
22	40.95	40.60	40.75
23	41.80	40.05	41.15
24	41.95	40.65	41.80
25	42.35	40.90	42.05
26	41.95	40.85	41.05
27	42.30	40.90	41.15
28	41.90	40.05	40.25
29	42.65	40.10	40.35
30	42.55	40.35	41.65
31	41.70	40.95	41.30
32	42.75	40.35	40.75
33	42.30	40.70	41.00
34	42.10	40.60	40.95
35	41.95	40.80	41.15
36	39.60	36.75	37.85
37	42.55	40.05	40.65
38	42.20	39.90	40.35
39	41.95	39.60	39.95
40	42.70	41.50	42.10
Mean Ht%	**42.015 ± 0.1154**	**39.703 ± 0.1729**	**40.438 ± 0.1401**

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Table - 2

Blood haematocrit (Ht%) in different spawning periods of female **Labeorohita**: Pre-Sp. Pre-spawning period; Sp. Spawning period; Pst-Sp. Post-spawning period.

Sl. No.	Ht%		
	Pre-Sp	Sp	Pst-Sp
1	40.00	39.00	38.95
2	42.00	37.85	38.65
3	40.50	39.90	38.20
4	42.30	38.50	40.05
5	42.00	38.90	40.00
6	40.90	39.00	39.75
7	41.60	36.10	39.95
8	40.30	38.80	38.90
9	41.20	38.90	40.95
10	41.95	39.90	40.05
11	41.60	38.95	40.15
12	42.00	38.35	40.25
13	41.85	39.85	40.75
14	40.95	36.20	40.30
15	40.65	38.40	39.95
16	41.65	39.50	40.10
17	41.90	35.80	40.55
18	40.60	37.85	39.65
19	42.25	36.60	40.80
20	41.80	38.50	38.00
21	40.60	38.25	37.85
22	41.95	39.35	40.60
23	42.05	39.95	40.35
24	41.95	38.90	40.25
25	41.35	37.60	40.10
26	39.80	37.30	37.55
27	41.05	38.55	38.65
28	42.25	39.50	40.90
29	40.80	38.90	38.95
30	40.65	38.60	38.60
31	42.45	39.65	40.50
32	41.75	39.30	40.75
33	40.70	39.00	38.70
34	40.95	38.95	38.95
35	40.80	37.00	38.50
Mean Ht%	**41.346± 0.1213**	**38.504± 0.1875**	**39.633± 0.1644**

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Table - 3

Blood haematocrit (Ht%), fish sex and different spawning periods of *Labeorohita* : Pre-Sp. Pre-Spawning period; Sp. Spawning period;Pst-Sp. Post-spawning period. N. Number of fishes.

Sex	N	Ht%		
		Pre-Sp	Sp	Pst-Sp
Male	40	42.015 ± 0.1154	39.703 ± 0.1729	40.438 ± 0.1401
Female	35	41.346 ± 0.1213	38.504 ± 0.1875	39.633 ± 0.1644

Result & Discussion

The haematocrit values in male Labeorohita during pre-spawing, spawning and post-spawning period were 42.015 ±0.1154 , 39.703 ± 0.1729 and 40.438 ± 0.1401 respectively(Table-1).

The haematocrit values in female *Labeorohita* during pre-spawning, spawning and post-spawning period were 41.346 ±0.1213 , 38.504 ± 0.1875 and 39.633 ± 0.1644 respectively(Table-2).

Haematocrit value was higher at the beginning of maturation, it then decreased when the fish started to spawn, and increased slightly in the post spawning period (Tables-3).

Pre and past-spawning periods had a higher Ht level than the spawning period (Tables-1, 2 and 3).

It is generally stated that the blood haematocrit value in fish increases during the spawning season (Joshi & Tandon, 1977; Khan, 1977; Leanoard& Mc Cormick, 1999). This increase has been interpreted in relation to high-energy requirements of fish during the breeding season. On the other hand, Sano (1963) and Einszporn-Orecka (1970) reported a marked reduction in haematocrit during gonadal development in both sexes of cultured front interpreted as a result of the depletion of nutritive substances during spawning. This agrees with the finding in the present study in *Labeorohita.*

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