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REVIEW OF RESEARCH

HAEMATOLOGICAL IN *ANABUS TESTUDINEUS*(BLOCH) WITH RESPONSE TO NEMATODE INFECTION

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ABSTRACT :

The haematological parameters are influenced by a number of physical chemical and biological factors. Nematode (Round worm) infection in Anabas testudineus caused haematological changes. Hemoglobin content and the volume of packaged cells (PCV) were decreased and erythropacnia and leucocytoses induced. Parasite diseases contribute to a decline in the quality of haemoglobin and erythropenia of PCV. Leucocytosis was, however, due to infestation of nematodes.

KEYWORDS : *Haematological, AnabusTestudineus ,AnabusTestudineus (Bloch), Nematode Infection*

INTRODUCTION :

There are a variety of studies on the effects of differential parasites on the histological and histopathological aspects of various fish species (Omeji et al . , 2018; Abdul et al . , 2009; Okpasuo et al . 2016 and Mahmoud et al., 2011)[6,8,11,12], respectively. Some staff suggested that 6 species of parasite are distributed in 5 species of fish due to fluctuation and the impact on endoparasites of biotic and abiotic factors (Deeker et al. 2001). A parasite fauna of some Kabara lake fish has been clarified by Omprakash et al .(2002). Similarly, the haematological changes in H of Jha and Akela (2003) are clarified. The effect of nematode inflammation on haematological parameters of Anabas testudineus (Bloch) was explained by Fosilis and Sinha and Mishra (2011). More awareness of the effects of nematode infection on haematological parameters of selected fish has also been undertaken in the present study[5].

METHODOLOGY:

The experimental fish Anabas testudineus was captured and brought to the laboratory from local paddy fields. For a fortnight they had been acclimatised. Population dynamics of endoparasites, particularly nematodes, have been done after blood sampling of experimental fish. Blood from completely lean, dry plastic syringe caudas is measured directly from the cauda dorsalis. EDTA was used as an anticoagulant in the syringen, so fish yelled so often at the time of blood clotting.

The Sahli Acid-Haematin (1954) and regular haematological methods for use in fish blood by Blaxhall and Diasley (1973) are estimated at haemoglobin concentration (gm/100-ml of blood).

RESULT:

1. Gill

The Anabas testudineus arches in the control group displayed typical primary and secondary lamellae arrangement patterns. The secondary lamellae are projected on the lateral sides of primary lambs. A sensitive layer of a simple spiny epithelium, the active pillary-exchange cells, was covered on the surface of the secondary lamellas. A rigid mass of cartilaginous tissues surrounding traces of vascular channels was located at the heart of the major lamellae (Figure 3A & B).

2. Muscle

There were bundles of muscle fibres in a transversal portion of Anabas'stestudineus skeleton. It consists of long, multi-nucleated, somatic nerve-infected muscle fibres with peripheral oval nucles. Due to alternate combinations of light and dark bands, the striated appearance of muscle was. There was a thick attachment sheath covering the entire muscle (epimysium), while the bundle of muscular fibre perimysium and individual endomycium muscle fibre was present in the control fish (Figure 3E & F). The control fish contained Muscle fibres have been degenerated in pollutant fish and mononuclear cell infiltration was observed (Figure 3 G & H).

3. Liver

The general histology of the organ of the control group was seen in a segment of the liver under the microscope. The usual parenchymatic appearance was seen. Each tube has a very thin connective tissue capsule that extends to the body of the lobes and divides it into irregular lobules. The hepatocytes of the liver were polygonal with a central spherical nucleus. The cells in the segment divided by sinusoids have been arranged as an irregular cord-like structure (Figure 3I & J). Diffuse modifications to Anabas testudineus hepatic parenchyma had been found in the past of the liver specimens that had been exposed to aquatic toxicants in the Buckingham canal. In the cytoplasm, the cell membrane degeneration resulted in massive vacuums. There have also been haemorrhages that cause severe liver cell necrosis (Figure 3 K & L)

4. Intestine

Anabas testudineushistoropathological analysis showed degenerative changes in the serose, mucous membranes, layers of the longitudinal and circular muscles and the submucosa. At the base and tips of the villi the columnaryepithel cell was degenerated and a syncytial mass was created. Cautious cell secretion showed that their size was growing. Mucus plug was attached to the intestine's lumen (Figure 3 M & N). In contrast to control fish the villi also showed degeneration and necrosis at the tips (Figure 3O&P).

5. Kidney

Lesions of the affected Anabas testudineus kidney were found in histological studies. Renal cell hypertrophy and modifications were observed in the nuclear structure, vacuol formation, necrosis and renal part degeneration. The tubular epithelium (Figure 3Q & R) has demonstrated hyperplasia. Severe oedema and congestion of sinusoids was observed in the parenchymatic cells. Hypertrophy and reduced intertubular space were presented in the renal tubules. Tubular epithelium necrotic changes were seen in the nuclei of the cells affected by karyorrhexis and karyolysis. The tubular lumen has always been dilated. The interstitium in comparison with control fish was substantially infiltrated with mononuclear cells (Figure 3S & T)

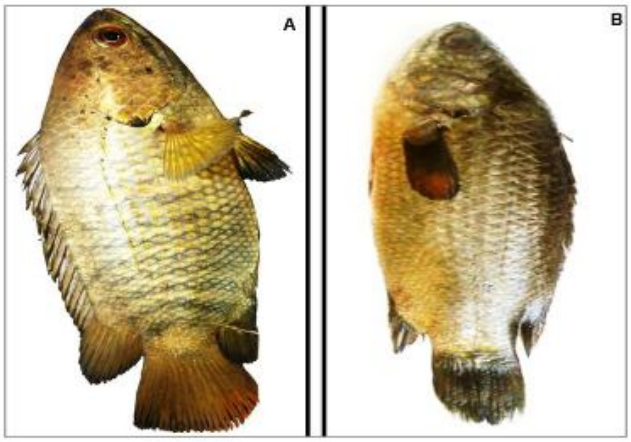

Figure 1:Testudineus Anabas. A: check; B: experimental

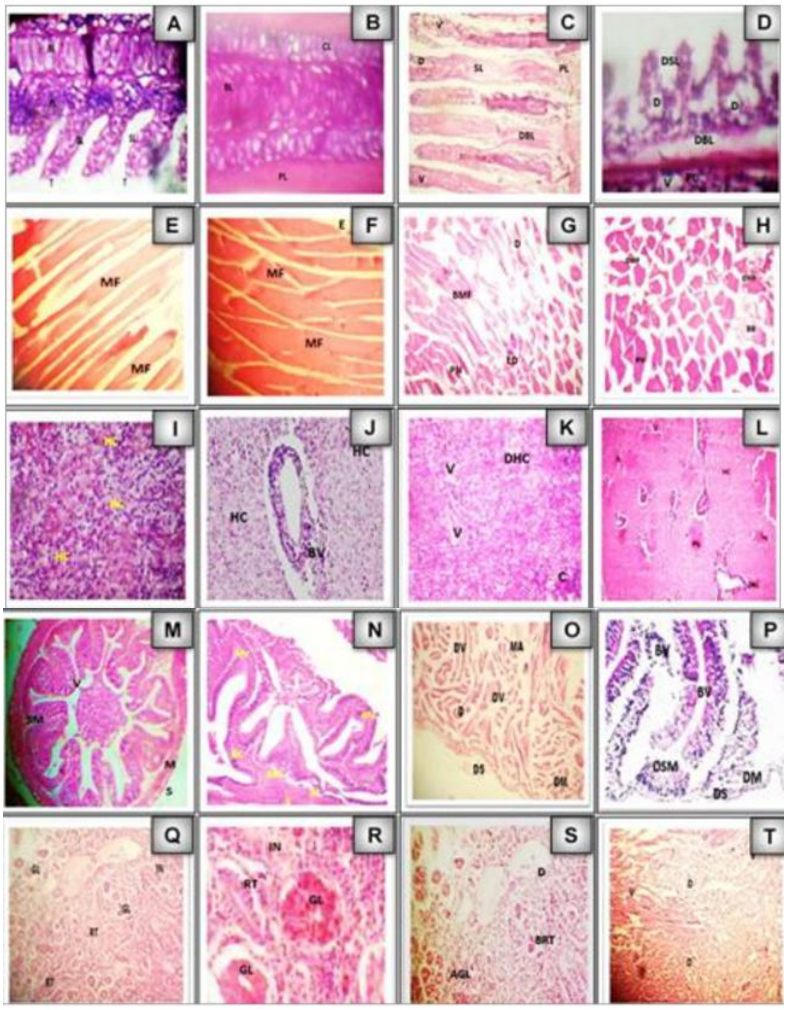

Figure 2: Testudineus anabas. A & B: Gill power, C & D: Gill care. Gill-control. PL-Primary Lamellae, Lamellae SL-Secundary, Bl-Blood Vessel, Secondary Lamellae Tip, Degeneration D, Blood vessel DBL-Degeneration, V-A vacuolation, Secondary Lamellae DSL-Degeneration. E & F: Regulation of muscles, G&H:

Controlling of muscles. D-degree degeneration, MF-muscle fiber, edoema, pyknotic nuclear Nuclei, muscle fibre. MF-muscle degeneration. I & J: Liver-control, K & L: Liver-treated. HC-Hepatocytes, DHC Hepatocyte degeneration, V-Vacuolation, N-Necrosis, PN-Pyknotic Center and DBL Blood vessel degeneration. M & N: Management of Instine, O & P: Handled with Instine. S-Serosa, GC-Goblet Cell, SM-Sub-Mucosa, GC-Suba, Villi DV-Degeneration and NV-Necrosis, M-Mucosa. Q & R: Renal function, S&T: Kidney treatment: GL-glomerulus, RT-Renal Tubule, IN-Interstititium, D-degeneration, DRT-degeneration, AGL-affected glomerulus, V-Vacuolation.

DISCUSSION:

In both healthy and nematode infected classes, including both sexes, haemoglobin was quantitatively disrupted in Testudineus Anabas. The average body weight of monitored male fish was 71,49 €per 1,296 gms compared to 77,75 €per 1,823 gms for infected fish. Hemoglobin was found to be a minimum and a maximum of 13.8 gm percent for healthy male fish and 16.5 gm percent for all 10 experimental fishes, compared with the mean haemoglobin concentration of 14.89 µl/0.306 gm percent for the 10 experimental fish. Infection of nematodes has contributed to a sharp decrease in haemoglobin concentration in fish. In the contaminated group of fish, the largest and the least volume of haemoglobin was 12.50 gm% and 6.40 gm%, while the average value was 8.76 gm per 0.747 gm%. It was calculated the severity of the infection. Infection intensity was respectively maximum and minimum of 16 and 2.The severity of infection and the concentration of haemoglobin in fishes were negatively and directly associated, i.e. a rise in the severity of an infection triggered a decrease of haemoglobin level (Table 1).

In this study, a percentage of falls in nematode infections in males and females were recorded at 41% and 33%. (Table 1 and Table 2, respectively). The severity of the infection and the haemoglobin content in both sexes of Anabas testudineus were found to be adverse and straightforward. Nematodic infections with haemoglobin content are reported with scanty results. In various countries, however, some works by different writers have been traced. Abdul et al. 2009; Mahmoud et al. 2011; Okpasuo et al . 2016 and Omeji et al. 2018).[4] Abdul et al. 2009; Mahmoud et al. 2011.

Table 1Impact of nematode strength on male Anabas testudineushaemoglobin content

S.No.	Healthy Fish		Infected Fish		Intensity of Infection
	Body Wt. (in gms.)	Haemoglobin(in gms %)	Body Wt. (in gms.)	Haemoglobin(in gms %)	
1	65.40	14.40	80.50	12.30	02
2	65.50	14.10	80.00	12.00	03
3	68.10	14.00	79.10	8.50	04
4	70.60	16.50	80.00	8.50	07
5	70.00	16.10	80.00	7.60	10
6	72.20	15.50	79.10	7.20	11
7	74.15	13.80	76.20	7.10	13
8	75.40	14.10	75.00	7.50	10
9	75.80	14.40	74.10	6.50	15
10	77.75	16.00	73.50	6.40	16
Mean	71.49	14.89	77.75	8.76	9.1
SD ±	4.100048	0.967905	2.602786	2.363979	4.7
SE ±	1.296549	0.306088	0.823073	0.747556	1.486270
F. Value = 51.82**					

Table 2 Impact of the severity of nematode infection on female Anabas testudineushaemoglobin content

S.No.	Healthy Fish		Infected Fish		Intensity of Infection
	Body Wt. (in gms.)	Haemoglobin (in gms %)	Body Wt. (in gms.)	Haemoglobin (in gms %)	
1	74.00	14.00	81.40	11.40	01
2	73.50	13.20	80.50	10.00	02
3	73.00	13.00	80.00	8.70	03
4	72.30	12.60	78.00	8.50	05
5	71.00	11.70	76.10	7.50	07
6	69.40	11.30	75.20	7.00	09
7	67.00	11.10	73.00	6.80	11
8	64.00	10.80	73.70	6.60	12
9	64.50	10.00	73.00	6.20	14
10	64.70	10.00	72.50	6.00	18
Mean	69.34	11.77	76.34	7.87	8.2
SD ±	3.78	1.307707	3.2317796	1.673947	5.306599
SE ±	1.19534	0.413533	1.02197849	0.529348	1.678094
F.Value = 30.3**					

In female specimens, the severity of the infection was also determined. It ranged from 1 to 18. The average body weight was 69.34 to 1,195 gms for healthy women and was 76.34 to 1,021 gms for infected fish. The haemoglobin content in control fish ranged between 10,0 percent and 14,0 gm percent, while the average value of the nematode infection was 11.77 to 0.413 gm. percent, a decline of the hemologlobin concentration in females Anabas testudineus was found to be significant (P<0.01). In infected fish, the content of haemoglobin ranged from 11.40 to 6.0 gm%. The mean value of 7.87 €per 0.529 gm percent was observed. Hemoglobin concentration was significantly influenced by the severity of infection. Increased infection severity led to a reduction in the amount of haemoglobin. Therefore, the amount of haemoglobin with the severity of nematode infection has been directly and negatively linked (Table 2).

The decline in haemoglobin in certain Kabara lake fishes was explained by Omprakash et al. (2002)[14]. The nematode infection effects on haematological parameters of H were clarified by Jha and Akela (2003). Fossilis. Fossilis. The decreased haemoglobin content in H was explained by Hussain (2006). Fossilis. Fossilis. Sinha (2010)[16] explained similar declines in the haemoglobin contents under Calotesversicolare helminth infection in nearby Patna, while Sinha and Mishra (2011) explained similar declines in male / female haemoglobin infection of fish Anabas testudineus.

CONCLUSION:

The toxicants' pathologic effects are not uniform throughout the population but vary with the concentrations of substances in the test organism, their age and health which contribute to their seriousness. The findings show that over the exposure duration, the toxic buildup increases steadily.

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