Effect of *Melia azedarach* Extract on Some Selected Hematological Parameters of *Catla, (Catla catla)*

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**Abstract:** The present study has been carried out the haematological parameters such as; RBCs, WBCs and Haemoglobin content were studied using medicinal plant *Melia azedarach* on different concentrations (1.0g, 1.5g and 2.0g) of formulated diet against 0.1 ml of CFU/ml 10^9 cells *Aeromonas hydrophila* on *Catla catla*. The 1.5 g of plant extract formulated diet showed maximum WBCs, RBCs and Haemoglobin content than the control and other experimental groups. 1.5g formulated diet treated fishes found to be more efficient compared with other experimental and control group. However the fish showed significant (P<0.05) increased when compared with control groups.

**Key words:** *Aeromonas hydrophila* • Hemoglobin • RBCs • WBCs • *Catla catla*

**INTRODUCTION**

Aquaculture has been a growing activity for the last twenty years worldwide and this impressive development has been attended by some practices potentially damaging to animal health. The continuous use of antimicrobial agents in aquaculture has resulted in more resistant bacterial strains in aquatic environment [1]. Fish culture is an important industry and its production is increasing worldwide every year. Some countries have sought to improve productivity and profitability by intensification of fish production methods, which can adversely affect fish health and, poor environment will lead to an increasing susceptibility to infection [2]. Aquaculture has been a tradition in several parts of Asia and according to FAO statistics, over 80% of fish produced by aquaculture come from Asia, where the production was 31.07 million metric tons valued at $ 38.855 billion [3]. Aquaculture productivity constitutes significant portion of national income in many countries of Asia. Large scale mortalities of fish often occur in ponds and loss is due to environmental pollution stress followed by microbial infection [4]. *Aeromonas hydrophila* is gram negative motile bacteria. The ulcerative disease is mostly caused by gram negative bacterium. *Aeromonas hydrophila* which is pathogenic only to fishes but also to amphibian, reptiles and mammals including man [5]. *Aeromonas hydrophila* was most important pathogens of warm water fish and other vertebrates including man. *A. hydrophila* cause hemorrhagic septicaemia in fish and account for heavy loss in intensive aquaculture systems.

It was also reported by Rajeswari et al. [6] that the isolation of *A. hydrophila* from dropsy-infected common carp Catla catla and Cirrhinus mrigala has shown the symptoms of distended abdomen, loose scales and deep ulcers on the dorsal surface and extensive hemorrhages on the ventral part of the fishes

*Melia azedarach* is a well known ethno medicinal tree used in Ayurveda, its use in the traditional folk medicine. Different parts of *M. azedarach* in traditional system of medicine. Hence, the present study has been carried out the Haematological studies on disease induced Indian major carp; *Catla catla* (L) fed with *Melia azedarach* formulated diet of plant extract.

**MATERIALS AND METHODS**

A live fish (12± 1g) were collected from High-tech fish farm, Madurai, Tamil Nadu, India . The fishes were maintained in non-chlorinated water in 20 day. The ground nut oil cake, fish meal and rice bran, tapioca, soybean, were mixed and sterilized. Add a multivitamin tablet. The above mixed foods were added with different
concentrations (1.0g, 1.5g and 2.0g) of *Melia azedarach* extract used for experimental fishes and without plant extract diet for control fish. The food was made into small pellets. 0.1 ml of 10^5 CFU/ml of *Aeromonas hydrophila* was injected intraperitoneally both for control and experimental. In every seven days following haematological studies such as, red and white blood cell counts were determined using neubauer counting chamber and haemoglobin (Hb) content was analysed by Blaxhall and Daisley [7]. The statistical significance between control and experimental groups were tested by ‘t’ test.

**RESULTS AND DISCUSSION**

In the present study the hemoglobin content, RBCs and WBCs were studied in disease induced *Catla catla* using different concentrations of *Melia azedarach*, formulated diet against *Aeromonas hydrophila*. The RBCs count in the control groups was found to be 4.70 ± 1.00x10^6 cells/ml. The plant extract treated fishes showed the RBCs 6.03±1.52x10^6 cells /ml (1.0g) 6.50±1.00x10^6 cells /ml (1.5g) and 5.50±1.00x10^6 cells /ml (2.0g) in the initial day (0 day) (Table 1). The RBCs count was increased with increasing concentration of plant extract formulated diet in different day of treatment (7, 14, 21 28 and 35) .Similarly result are also observed by the Harikrishnan et al. [8] herbal extract supplementation diets altered the hematological parameters and triggered the innate immune system of goldfish [9] reported that herbal fish diet showed significantly higher WBCs and RBCs counts compared to the control. Similarly it was reported that WBCs and RBCs counts were higher in *Labeo rohita* fingerlings fed with *Magnifera indica* kernel when compared to control [10]. In the present study the WBCs count was varied from both experimental and control fishes. The WBCs count in the control fishes showed 2.40±1.00x10^6 cells /ml and the plant extract formulated diet treated fishes showed maximum number of WBCs was observed. In 1.5g plant extract formulated diet found to be 3.00±1.00x10^3 cells /ml in the initial day (0day) and 3.96 ±1.52x10^3 cells /ml (35 day). Similar results were observed by Innocent et al. [11] The WBCs count was increased with increasing concentrations of leaf extract of *Plumbago rosea* formulated diet treated with disease induced *Catla catla*. White blood cells afford protection against infectious agent caused by microbial and chemical factors. Data [12] reported that White blood cell counts were significantly higher in herbal growth promoter feed additive in fish meal on the performance of Nile Tilapia, *Oreochromis niloticus* (L.).

Hemoglobin content on disease induced India major carp *Catla catla* fed with *Melia azedarach* formulated diet were studied in different days of treatment (0 day to 35 day). In the control fishes showed low level of hemoglobin content (5.60±0.1g/dl) when compared to negative control fish (5.50±0.06g/dl). Different concentrations of plant extract formulated diet treated fishes showed gradual increase in hemoglobin content after different days of treatment [13].

[13]. Rao et al. [14] reported that herbal immunostimulant diet showed significant increase in hemoglobin content in disease induced common carp, *Cyprinus carpio*. Binukumari and Subisha [15] demonstrated that dietary supplementation of *Achyranthus aspera* to *Aeromonas hydrophila* infection of *Labeo rohita* fingerlings. Who observed that fingerlings of *Oreochromis niloticus* exposed to lethal concentration of *Moringa oleifera* showed an increase in hemoglobin,

Table 1: Hematological changes of *Catla, Catla catla* fed with different concentration of *Melia azedarach* and intraperitoneally injected with 0.1 ml of 10^5 CFU / ml of *Aeromonas hydrophila*

<table>
<thead>
<tr>
<th>Dose (g)</th>
<th>RBCs x10^6 cells/ml</th>
<th>WBCs 10^6 cells/ml</th>
<th>Haemoglobin 1g/dl</th>
</tr>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>1.0</td>
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<td>2.0</td>
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Each value (Mean±SD) represents the average of 3 treatments. * Statistically significant at <0.05,* 't' test
RBCs and WBCs count when compared with control fishes. Oral administration of the medical plant, *Eclipta alba*, on the non-specific immune responses and disease resistance of tilapia (*Oreochromis mossambicus*) has been investigated.

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**REFERENCES**