

considerably improved the specific growth rate of *Cyprinus caprio* compared to fish that were fed a control diet. They also observed that the levamisole supplementation enhanced the FCR.

Siwicki and Korwin-Kossakowski (1988) demonstrated that levamisole enhances the growth of *Cyprinus caprio* larvae while having no impact on their survival or developmental pace. Mulero et al. (1988) found that *Sparus aurata* fish that received levamisole exhibited greater size and weight at the end of the trial when compared to the control group. Alvarez Pellitero et al. (2006) reported that *Scophthalmus maximus* treated with the 500 mg/kg supplemented levamisole diet exhibited a greater specific growth rate compared to the control group. Similarly, Niki et al. (1991) demonstrated that levamisole has a substantial impact on the specific growth rate of fish, resulting in a significant rise when compared with the control group. Bhatnagar and Lamba (2016) reported a statistically significant increase in the growth and feed efficiency of *C. mrigala* after 60 days of ingesting a diet with varying concentrations of levamisole. The results of this study indicate that adding levamisole to the diet of *Catla catla* significantly improves their innate immune response, boosts their resistance to disease, reduces mortality, and promotes fish growth.

Haematology is the branch of science that focuses on the examination of the fundamental elements including blood cells, and the identification of anomalies in the normal functioning of these cells. Pathology intricately connects with haematology to assess the physical condition of fish, determining whether they are in a state of health or disease. The composition of the blood will undergo alterations, particularly if it becomes contaminated. Alterations in the fish's physiology are indicated by variations in the blood composition, including measurements of haematocrit levels, haemoglobin levels, and blood cell counts.

Esepeid et al. (1987) assert that alterations in the blood composition of fish can serve as reliable markers for both infection and stress-related circumstances. Hence, blood measures play a vital role in assessing the nutritional adequacy, level of substances, and potential harm to the circulatory system in aquatic animals (Dash et al., 2015). Immunostimulants are critical in enhancing aquatic organisms' growth productivity by increasing their ability for feed digestion, utilisation, and haematological, as well as Immunological responses (Ringo et al., 2012).

Therefore, the objective of this study was to investigate the impact of several immunostimulants on the haematological parameters of *Catla catla* in both normal and *Aeromonas* infected conditions. The blood parameters were measured by assessing the concentration of haemoglobin, total RBC count, total WBC count, differential count, and erythrocyte sedimentation ratio. Ramesh et al. (2015) found that the haematological parameters were enhanced during the experiment due to the influence of feed additives.

Haemoglobin consists of polypeptide chains, referred to as globins, each of which contains a prosthetic group called heme. Globins are present in all organisms and tissues, displaying a wide range of quaternary structures and multiple functions in addition to transporting and storing oxygen, as demonstrated by cytoglobins and neuroglobins (Fago et al., 2004). Haemoglobin, found in red blood cells, enable the solubility of large amounts of gas and carry it to the tissues. Within the tissues, oxygen acts as the final recipient of electrons produced by oxidative catabolic reactions (Giardina et al., 2004).

Haemoglobin primarily serves the purpose of transporting oxygen from the gas-exchange organs to the peripheral tissues. Depending on the partial pressure of the gas, it must have the capacity to both firmly bind oxygen and release it when needed (Perutz, 1978). Riggs (1976) observed that haemoglobin appears to adapt to the diverse metabolic requirements of animals and the consistent fluctuations in their environment. According to Landini et al. (2002) haemoglobin play a crucial role in fish adaptation by serving as a connection between the organism and its surroundings. Fish, in comparison to terrestrial species, encounter a highly fluctuating environment with frequent changes in oxygen levels, both in terms of time and space.

Multiple studies have documented alterations in haemoglobin levels in fish in response to varying environmental conditions. For instance, Bastiawan et al. (1995) documented that stress in fish resulted in alterations in various blood parameters such as haemoglobin, hematocrit, RBC and WBC count. There is a noticeable rise in haemoglobin