

and hematocrit levels in Nile tilapia, *O. niloticus*, when they are fed with *Bacillus amyloliquefaciens* supplemented feed (Reda and Selim, 2015). Similarly, Kumar et al. (2008) reported an increase in WBC count in *Labeo rohita* when fed with *Bacillus subtilis* supplemented diets.

In the present study, the mean haemoglobin concentration in healthy fish fed with various immunostimulant supplemented diets varied between 6.86 ± 0.37 and 14.61 ± 0.35 gm/dL. The haemoglobin concentrations in fish infected with *Aeromonas* and fed with different immunostimulant mixed feeds ranged from 5.99 ± 0.66 to 13.04 ± 0.19 gm/dL. These results demonstrated that the fish fed with immunostimulant mixed feed exhibited significantly greater haemoglobin content in both healthy and *Aeromonas* infected fish when compared to fish fed with control feed.

Furthermore, the vitamin E mixed feeds induce greater haemoglobin content in both normal and *Aeromonas* infected conditions than the other immunostimulants. The current results are consistent with the findings of Wu et al. (2013) who reported that the haemoglobin percentage was elevated ($p > 0.05$) in the C0.5 group on days 28 and 42 and in the C1.0 group on days 14, 28, and 42 when compared to the control with the treatment of *Coriolus versicolor* polysaccharides in all gynogenetic crucian carp.

The present study found that healthy fish treated with immunostimulant mixed feeds had an average total RBC count ranging from 1.24 ± 0.08 to $2.85 \pm 2.09 \times 10^6/\text{mm}^3$. *Aeromonas* infected fish had a total RBC count ranging from 1.16 ± 0.05 to $2.25 \pm 0.08 \times 10^6/\text{mm}^3$ when fed immunostimulant mixed diets. The current findings showed that fish fed with immunostimulant mixed feed had considerably higher RBC counts in both healthy and *Aeromonas* infected fish as compared to fish given control feed.

Furthermore, vitamin E mixed feed significantly enhances the RBC count in both normal and *Aeromonas* infected fish. Ahmad (1982) reported that the reference fish had a mean RBC count of 2.2×10^6 cells/ mm^3 of blood. The current findings are consistent with those of Zhou et al. (2012) who found a considerably greater RBC number in *Rachycentron canadum* fed with vitamin-C supplemented feed. Similarly, Burrells et al. (2001) found enhanced RBC number in Atlantic salmon fed with a nucleotide supplemented diet; however, the difference was not statistically significant. These findings suggest that the ingredients of the experimental feed might have an influence on haematocrit levels.

In accordance with the present study, Rairakhwada et al. (2007) found that channel catfish fed with β -1,3/1,6 glucan had a higher RBC count. Muahiddah and Diamahesa (2023) found that prechallenged *Cyprinus carpio* had a maximum RBC count of $2.63 \pm 0.034 \times 10^6$ cells/ mm^3 when treated with 25 g of *Euphorbia hirta* leaf extract per Kg. Following infection with the pathogen, a maximal RBC count of $1.93 \pm 0.012 \times 10^6$ cells/ mm^3 was observed on the 5th day with 25 g of *E. hirta* leaf extract per Kg and 50, 20, 10, and 5 g leaf extracts.

In contrast to the current findings, Kumar et al. (2006) discovered that supplanting with dietary starch fails to improve RBC count or haemoglobin concentration. Furthermore, *Aeromonas* infected fish had significantly fewer RBC than control fish. Pulungan et al. (2022) stated that hemolysin produced by the *A. hydrophila* bacterium can cause red blood cell lysis.

The total white blood cell count provides insight into the immunological condition of the fish, as WBC are the primary constituents of the immune system. Leukocytes, often known as blood cells, are responsible for targeting and destroying infections by engulfing them through a process called phagocytosis. The application of immunostimulants in the diet resulted in a rise in the total number of leukocytes, indicating an enhancement of cellular defence mechanisms.

According to Zainun (2007) leukocytes are a kind of blood cells that serve as non-specific defences by localising and eliminating infections. The reduction in leukocyte count following an infection is due to the migration of active leukocytes from blood vessels into the diseased tissue. The study conducted by Nuryati et al. (2010) demonstrates the ability of fish to identify and remember various types of infections that invade their bodies.