

Implications of *Hermetia illucens* Larvae on Fish Histomorphology, Gut microbiota and Haematology: A Review

MKC Priyadarshana*, CN Walpita, HAD Ruwandeepika and MPS Magamage
Department of Livestock Production, Faculty of Agricultural Sciences,
Sabaragamuwa University of Sri Lanka, Sri Lanka
*kasunc@agri.sab.ac.lk

Role of aquaculture in ensuring a sustainable protein supply could be bolstered by introducing dependable feed ingredients to reduce feed costs. By evaluating growth performance, histopathology, gut microbiota and haematology of various fish species, fish nutritionists have demonstrated *Hermetia illucens* as a potent protein source. However, a comprehensive review would be essential to gather existing knowledge on histopathological, gut microbial and haematological impacts of *H. illucens* on different fish species, for further improvements. Up to 100% incorporation of *H. illucens* larvae was evidenced in extremely diversified microbial populations. An increment in population sizes was exceptional for lactic acid bacteria and *Clostridium spp* among most fish species and, consequently, suppression of harmful microbial (Shewanellaceae, Enterobacteriaceae families) activities were observed. With the inclusion of *H. illucens* larvae, remarkably reduced plasma cholesterol levels were observed among most fish species. It was also revealed that the Haemoglobin content, Erythrocyte (RBC) count, Mean Corpuscular Volume (MCV), Packed Cell Volume (PCV), White Blood Cell (WBC) count, lymphocytes, monocytes and neutrophils like blood parameters were within the acceptable limits. Histological changes have not been reported in many cases even for the inclusion of 100% except for few findings. Studies with fish spp. Atlantic salmon, Jian carp, Zebra fish and etc. have shown the possibility of incorporating *H. illucens* larvae to the fish feed. However, mild intestinal inflammation was reported, in some fish spp with inclusion of *H. illucens* larvae to the feed. Chitin, a prominent compound in *H. illucens* larvae, was identified as the possible reason behind the histopathological, gut microbial and haematological impacts.

Keywords: *Fish Feeds, Haematology, Histopathology, Microbiota, Protein Source*