

Black Soldier Fly (*Hermetia illucens*) Larvae as a Feed Ingredient for Commercial Fish Culture

M.K.C. Priyadarshana¹, C.N. Walpita^{1*}, H.A.D. Ruwandeepika¹,
M.P.S. Magamage¹, and P.M. Withanage²

¹*Department of Livestock Production, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*

²*National Aquaculture Development Authority, Sri Lanka*

**chaminda.walpita@gmail.com*

Use of insect-based protein sources in feed industry have come of age as an alternative to the highly expensive fishmeal. Black soldier fly (BSF) *Hermetia illucens* larvae is a dipteran with promising results as a fishmeal replacer in livestock industry, the potential of BSF in Sri Lankan commercial aquaculture is yet to be evaluated. It is also not clear as to how a crude protein (CP) and crude fat (CF) rich larvae (29-32% and 35-39% respectively) should be processed to a meal rich enough to provide high protein and low fat levels as a meal. Present study is therefore aimed at developing a BSF larval meal to be used in aquaculture. BSF larvae grown on domestic waste was harvested at 5th in star stage before reaching prepupae-a stage with high chitin content. Harvested larvae was then purified and defatted using a mechanical oil extraction machine. After oven-drying at 50 °C larvae was grounded and sieved to a fine powder with 0.01 mm particle size. Prepared BSF larvae meal had low CP level (34%) and high CF level (39%) where rendering the meal useless as a protein source. Therefore, an additional grinding step was performed followed by steaming step to make the structural lipids available for extraction. As a result, CP levels rose up to 41.29% while crude fat, gross energy, crude ash and dry matter were at 33.09%, 4668 kcal kg⁻¹, 5.93% and 94.97%. Hence, proximate composition of the meal prepared using additional grinding was therefore suited as a fishmeal replacer. Four dietary treatments were prepared by replacing different levels i.e. 0%, 25%, 50% and 75% of fish meal with a developed BSF larvae meal. Feed formulation was done to match the requirement of Rohu (*Labeo rohita*). Diet was prepared to be isonitrogenous, isolipid and isocaloric at 35%, 11% and 3149 kcal kg⁻¹ respectively. In conclusion, the protocol used here is effective in developing a BSF larval meal to be used in feeding fish for aquaculture.

Keywords: *Black soldier fly, Chitin, Defatted, Dipteran, Fish meal*

Acknowledgement: *This research was funded by AHEAD/RIC grant*