An indigenous system for collection of Black soldierfly pupae and its nutritional evaluation for making fish feeds

Sanal Ebeneezar[1]*, D. Linga Prabu[2], S. Chandrasekar [3], Adnan Hussain Gora[4], P. Sayooj [1] and P. Vijayagopal[1]
[1] ICAR-Central Marine Fisheries Research Institute, Kochi - 682 018, Kerala
[2] Tuticorin Research Centre of ICAR-Central Marine Fisheries Research Institute, Thoothukudi - 628 001, Tamil Nadu
[3]Mandapam Regional Centre of ICAR-Central Marine Fisheries Research Institute, Mandapam Camp - 623 520, Tamil Nadu
[4] Chennai Research Centre of ICAR-Central Marine Fisheries Research Institute, Chennai - 600 028, Tamil Nadu

*E-mail: sanalebeneezar@gmail.com

Black soldierfly (BSF) pupae can be utilized as an excellent means for the bioconversion of organic wastes into high value sustainable protein and lipid ingredient for aquaculture. The life cycle of this insect begins with eggs laid in clutches of approximately 500 numbers. The eggs are about 1 mm in size and hatch into larvae within 4 days to two weeks. The larva feeds on organic waste and metamorphose into a pre-pupa, normally within 2 weeks which is the most nutrient rich stage in the BSF life cycle. At this stage it can be harvested periodically and converted into a feed ingredient for aquaculture. An indigenous small-scale system for the production of BSF by utilizing waste food from the departmental canteen of ICAR-CMFRI was attempted. The eggs of BSF were observed after about 2 weeks in the food waste filled up to a quarter in the unit kept in an open area to attract the flies. Subsequently, metamorphosis from the larval and prepupal stages, pupal stage was observed in the 10th week. The BSF pupae samples were collected, dried in hot air oven and analysed for nutritional composition which revealed a composition (on % dry matter basis) of crude protein (40.42 $\pm$ 0.89), crude lipid (39.89 $\pm$ 1.74), crude fibre (8.16 $\pm$ 1.64), total ash (10.71 $\pm$ 2.04) and nitrogen free extract (NFE) of 0.82 $\pm$ 0.04. Further research on the variation in nutritional profiles based on the organic waste provided and a cost effective culture system is in progress. This is for promoting it as an effective organic bioconversion model for generation of an alternative protein ingredient for incorporation in fish feeds.