

Towards Identification of Alternative Feeds for Mariculture; Preliminary Evaluation of Polychaete Based Giant Tiger Prawn Meal

**C. M. Kihia^{1*}, A. Muthumbi², J. Munguti³, B. M. Muli⁴, S. T. Ombati⁴
and E. Kanyeki⁴**

¹Department of Biological Sciences, Egerton University, P. O. Box 536 Egerton, Kenya; ²Department of Biological Sciences, University of Nairobi,

P.O. Box 30197-00100 Nairobi Kenya, ³Kenya Marine & Fisheries Research Institute, P. O. Box 451, Sagana, Kenya, ⁴KWETU Training institute, P. O. Box 6856, Mombasa.

Corresponding Author: charles.kihia@gmail.com

Aquaculture development in Kenya and elsewhere, is frequently hampered by lack of suitable, affordable and sustainable feed sources. This is especially so for mariculture, where cultured organisms are commonly at higher trophic levels, requiring protein and lipid dense formulations. Fish meal and oils are frequently incorporated into mariculture feeds contributing to overfishing and unsustainability. Marine intertidal polychaetes, have been explored as suitable mariculture feeds and cultured as superior alternative feeds for critical growth stages. *Marphysa mosambica* is a tropical intertidal polychaete, commonly exploited as a bait in artisanal fishery. This study compares nutritional content of known quantities of cultured and wild polychaete, with locally available feeds (catfish & tilapia meals, Kamuthanga growers & pellets, Skretting) and feed ingredients (earthworm, soya). Subsequently, efficacy of polychaete based feed formulations on hapa net cultured giant black tiger prawn (*Penaeus monodon*), growth is compared to commercial feeds. Preliminary results suggest cultured polychaete protein content (79.96%) is comparable to earthworm meal, but significantly ($P < 0.001$) higher than the commercial feeds (38.75%) and soya (42.02%). Similarly cultured polychaete lipid content (6.78%) was also comparable earthworm and commercial meal, but significantly ($P < 0.05$) higher than soya (2.59%) or wild polychaetes (1.92%). Differences were attributed to variation in quantity and quality of feed ingredients available to local formulators. Significantly ($P < 0.001$) higher shrimp weight, were recorded on polychaete meal formulation (3.40 ± 0.09 g), with correspondingly higher growth rate (0.22 g.d^{-1}) than on either commercial (0.15 g.d^{-1}) or mix diet (0.13 g.d^{-1}). Despite bottlenecks in the culture of this tropical marine polychaetes, they are superior alternative tiger prawn feed sources compared to locally available commercial feed. However, earthworm based meals require further evaluation as mariculture feeds. Nonetheless, further elaboration of polychaete amino and fatty acid profiles, is recommended.

Keywords: Commercial feeds, growth rate, lipid, *Marphysa* meal, protein