

ORAL PRESENTATION

The search for an appropriate alternative marine fishing bait and mariculture feed; preliminary results on the culture of the Eunicid polychaete

Kihia CM^{1*}, Muthumbi AW², Munguti JM³, Muli BM⁴

1. Department of Biological Sciences Egerton University
2. School of Biological Sciences, University of Nairobi,
3. Kenya Marine and Fisheries Research Institute, Sagana, Kenya
4. KWETU Centre, Mtwapa, Kenya

*Corresponding author; charles.kihia@gmail.com

ABSTRACT

Since time immemorial, tropical artisanal hook and line fishers harvest a variety of organisms, such as polychaete, for use in marine bait fishery. However, despite a paucity of reliable documentation, regulation or monitoring, this continued proliferation of this practice precipitates unintended cascades with consequences on wetland resources and ecosystem integrity. Furthermore, lack of appropriate feeds formulations for mariculture has been blamed as a major deterrent to growth of the industry, especially in this region. Notably, the suitability of these organisms as fishing bait, hints at their appropriateness as superior dietary items for marine finfish and crustacea. Consequently, identification of alternative appropriate and sustainable bait sources is critical to sustainable livelihood in the region. Temperate polychaetes, such as Nereids, have been successfully reared on a spinach diet in circulating systems, but appropriate protocols for tropical Eunicid polychaetes, are lacking. This study intended to investigate the efficacy of cultured polychaete (*Marphysa mossambica*) and other locally available invertebrates, as alternative fishfeed and bait. The polychaetes culture trials were done in intensive and semi-intensive systems, fed on a variety of diets and their survival, growth and recruitment monitored. Polychaetes obtained, were subsequently incorporated into tiger shrimp feed formulation at full and partial replacement and growth performance and survival, compared to commercial feed formulations (~30CP). Similarly, cultured polychaetes were tested for fishing performance by attaching known quantity of cultured bait (polychaete, earthworm, Black Soldier Fly larvae) to hooks and soaking time and landings, compared with wild polychaete. Cultured earthworm and BSF were obtained from adjacent enterprises for use in the current study. Preliminary results obtained show the polychaetes perform poorly under intensive, compared to semi-intensive culture system, where limited recruitment occurred. The poor performance was largely attributed to deterioration in physicochemical conditions in the regimes. Both cultured polychaetes and earthworm, have superior nutritional profile (CP<50, Lipid <3%), compared to most plant based fish meal formulations. Shrimps grown on full polychaete replacement formulation, achieved higher growth (<2.2 g.week⁻¹) and survival than other formulations. Thus cultured and wild polychaete are superior replacement for locally available feed ingredients. Similarly, cultured polychaete and earthworm were highly attractive to fish (soaking time >3.55 min), achieving comparable landings (<189 g.d⁻¹), as wild polychaete bait. We recommend that further refining of marine polychaete culture protocols to enhance yield and cost-effectiveness be

pursued. Additionally, further evaluation of local earthworm guild for incorporation into multitrophic mariculture systems are also needed.