



## The effects of different diets on survival of marine oligochaetes worm (Oligochaeta: Tubificidae)

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**Abstract.** This experiment is designed to observe the suitability of different diets on survival rate of marine oligochaetes worm in laboratory scale using flowing water system. The oligochaetes worms were cultured in five different diet treatments (commercial pellet, seaweed, goat dung, soybean meal and combination diet) each having triplicates. The oligochaetes were cultured for 90 days. The highest survival rate of oligochaetes culture were found significant ( $p < 0.001$ ) in the combined diet containing goat dung (20%), seaweed (*Gracilaria* sp.: 20%) and soybean meal (20%). Results of the present study suggest that the combination diet is the best compared to single diet in order to obtain the maximum survival rate of marine oligochaetes worm. The present finding is important in providing the baseline data for marine oligochaetes culture. Further study might be extended in detail to investigate the reproductive cycle since marine oligochaetes is highly potential in mass culture production.

**Key Words:** marine oligochaetes, Tubificidae, diet, culture, survival rate.

**Introduction.** The oligochaetes worm belongs to the Phylum Annelida with 1700 species identified (Erseus 2002). However, 600 species which are reported from marine or estuarine species belong mostly from family Tubificidae, Enchytraeidae and Naididae (Brinkhurst 1982). Compared to terrestrial and freshwater species, marine oligochaetes are very small having a length ranging from 1 mm to 4 cm (Erseus 2002). Ecologically, oligochaetes worms serve as prey component in the marine food webs and are involved in sediment purification processes in marine ecosystem via bioturbation activities (Seys et al 1999; Mermillod-Blondin 2011; Pignieret et al 2016).

In recent years, ongoing researches are done for enhancing protein intake to be used in feed ingredients for finfish and shell fish aquaculture industries. One of the growing aspect of aqua-feed development is focusing on the use of aquatic oligochaetes worms as an approach to meet the nutrient requirements for cultured species (Marian & Pandian 1984; Bonacina et al 1987; Lietz 1987; Hossain et al 2011; Mollah et al 2012; Das et al 2012; Mariom & Mollah 2013; Vineetha & Maheswarudu 2013). This approach has been used extensively in terrestrial oligochaetes (Ghabbour 1966; Sogbesan et al 2007; Istiqomah et al 2009; Egbunu & Solomon 2012; Dedek et al 2013; Monebi & Ugwumba 2013) and has been increasingly applied in freshwater and marine oligochaetes both as a complete live feed or supplement. The culture of aquatic oligochaetes was developed for several reasons including life cycle and ecology study (Moore 1978; Poddubnaya 1980; Adreani et al 1984; White et al 1987; Nascimento & Alves 2008, 2009; Lobo & Alves 2011; Mischke & Griffin 2011), live feed for aquaculture (Hilton 1983; Lietz 1987; Ahamed & Mollah 1992; Bouguenec 1992; Watanabe & Kiron 1994; Evangelista et al 2005), toxicological studies (Reynoldson et al 1991; Filipowicz et al 2007; Weinstein 2003; Ng & Wood 2008; Rodriguez & Reynoldson 2011) and for water treatment (Ratsak & Verkuijlen 2006; Wei & Liu 2006; Hendrickx et al 2009; Hendrickx et al 2010). Most widely used aquatic oligochaetes for aquaculture feed are contributed by freshwater oligochaetes, *Tubifex* sp. (Lietz 1987; Mollah et al 2012), *Branchiura sowerbyi* and *Enchytraeus* sp. (Watanabe & Kiron 1994; Memis et al 2009; Hossain et al