

THE NEED FOR RESEARCH ON MARINE WORMS (ANNELIDA: POLYCHAETA) IN THAILAND, INCLUDING APPLIED ASPECTS

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Introduction

Taxonomic studies on the polychaetes of Thailand can be summarized with reference to the following papers: Eibye-Jacobsen 1997; Hylleberg and Nateewathana 1988, 1991a, 1991b, 1991c; Hylleberg *et al.* 1986; Licher and Westheide 1997; Meyer and Westheide 1997; Nateewathana 1988, 1992; Nateewathana and Hylleberg 1986, 1991a, 1991b; Phasuk 1992; Westheide 1990, 1992. Presently, little polychaete research is conducted by Thai scientists, though there are several reasons stated below for the need to promote and support work on the polychaete fauna of Thailand.

The abundant and useful polychaetes

The polychaete worms are among the most numerous and diversified marine invertebrates. They have a world-wide distribution, living on the bottom or dug into the sediment, from the intertidal zone to the greatest depths, and in the pelagic system of all oceans.

The role of polychaetes in marine ecosystems is relatively well documented. Polychaetes serve as the main food source for many commercial fish species and are an especially important factor in the evaluation of fishing grounds (Uschakov 1965). Nevertheless, polychaetes have been poorly studied in most areas, particularly in tropical waters (Fauchald 1976).

Some polychaete species are useful as bioindicators of polluted areas. Many species of *Capitella* are known for their tolerance to anoxic conditions associated with high organic enrichment (Pocklington *et al.* 1994). Monitoring of the

biodiversity in general and of selected species, such as *Capitella*, in particular may give the relevant authorities early warnings so action can be taken. It is no secret that pollution of coastal areas is difficult to avoid in the wake of rapidly developing industrial communities in Thailand and often there is much discussion about the impact of a given pollution. However, the problems are difficult to solve without solid scientific evidence which includes knowledge of the polychaete fauna and how worms react to pollution.

The use of polychaetes as bait or feed for commercially cultured shrimp and fish is a common practice in many countries. Certain polychaete species have high value as bait in the angling sport and leisure-industry, *e.g.*, *Nereis virens* (Gambi *et al.* 1994; Olive 1994, 1999). The value of various common species of polychaetes being used as food items for the culture of crustaceans and juvenile fish was also reported by Gambi *et al.* (1994).

More significantly, it has proven particularly beneficial to supply specific species of polychaetes as food for shrimp broodstock because they can provide certain polyunsaturated fatty acids (Lytle *et al.* 1990) or important minerals (Croz *et al.* 1988), which are essential for egg maturation in cultured prawns. This is especially important in Thailand, where the economic viability of shrimp culture is being seriously considered.

A preliminary study in Thailand by Hylleberg *et al.* (1986) indicated that appropriate polychaete species for crustaceans in aquaculture could be obtained locally, at least in the Phuket area. During the last few years, worms have been collected for commercial purposes, especially from sandy

beaches in Phuket, but this practice must be carefully considered in terms of sustainability. In Europe there is increasing concern about the effects of such *ad hoc* bait digging on beaches that are either used for other recreational purposes or located in conservation areas (Olive 1994).

Polychaete farming is carried out in many parts of the world. *Nereis virens* is grown in culture in England and the United States. They are also grown in culture in Ireland and the Netherlands for export to England, France, Italy, and Spain. Other cultured species of polychaete worms are *Nereis diversicolor* and *Perinereis cultrifera*, which are grown and used mainly in Italy. *Perinereis nuntia* is grown in China and exported to Japan. *Perinereis brevicirrus* is grown in Korea and exported to Japan, the United States and Europe. *Glycera dibranchiata* is grown and used in the United States. *Marphysa sanguinea* is grown in Korea, Italy and Portugal and exported to Japan, Europe and the United States. *Arenicola marina* is grown in England, the Netherlands, France and Ireland and exported to Europe. An excellent review of the use of polychaete species for bait was given in Olive (1994).

However, no attempt has yet been made in Thailand to secure a commercially viable source of polychaetes for these purposes. One obstacle is an insufficient knowledge of the biology of polychaetes under laboratory conditions. Therefore, apart from polychaete taxonomy, it is important to study the biology (particularly growth and reproduction) of local polychaete species which could potentially be used for commercial culture in Thailand.

On-going research in Thailand involving polychaetes

A brief overview of current research in Thailand involving polychaetes is provided here:

Department of Fisheries

- **Phuket Marine Biological Center, Phuket** (Ms. Charatsee Aungtonya): The phylogeny and systematics of Sigalionidae (Annelida: Polychaeta) with a taxonomic study of species found in the Andaman Sea, Thailand (PhD Project) (see Aungtonya 2002)
- **Fisheries Museum of Natural History, Bangkok** (Mr. Bamroongsak Chatonanthawej): Ecological studies on benthic polychaetes with respect to organic enrichment conditions in Kung Krabaen Bay, Thailand (PhD Project)

Universities

- **Kasetsart University**
Department of Marine Science: Biodiversity of the marine fauna at Surin Island, Ranong
Coastal Resources Research Station: Biodiversity of the marine benthic fauna at Prapad Beach and vicinity (EU and Darwin initiative)
- **Prince of Songkla University**
Department of Aquatic Resources: Biodiversity of the benthic fauna in Songkla Lake (see Angsupanich and Kuwabara 1995, 1999)
- **Walailak University**
Faculty of Science: Biodiversity of the marine fauna at Pak Panang, Nokorn Sri Thammarat

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