CHAPTER 1

Symbiotic polychaetes from Nhatrang Bay, Vietnam

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ABSTRACT. Shallow-water polychaete fauna associated with benthic invertebrates in Nhatrang Bay, Vietnam was studied based on extensive sampling surveys performed from 1985 to 2012. As a result, 24 polychaete species belonging to four families were found. A check list of all these species including synonymies, list of material examined, extended diagnosis, taxonomic and ecological notes, and distribution is here presented. Most reports include *in situ* colour photos of representative specimens. The vast majority of symbionts belong to Polynoidae (13 species), followed by Syllidae (5 species), Hesionidae (5 species), and Spionidae (1 species), which were associated with echinoderms (53.8%), cnidarians (23.0%), sponges (11.5%), crustaceans (7.7%), and other polychaetes (3.8%). The number of symbiotic polychaetes occurring in Vietnamese coastal waters is here increased from 10 up to 26 species. The Vietnamese fauna of symbiotic polychaetes differs considerably from the Australian one. However, further studies on poorly investigated or even overlooked hosts (e.g. sponges, octocorals, tube dwelling polychaetes, echinoids and ophiuroids) will certainly lead to an increase in our knowledge on the diversity of symbiotic polychaetes of Vietnam.

The establishment of specialized symbiotic associations involving polychaetes is a rather common phenomenon in the World Oceans. According to the most recent review [Martin, Britayev 1998] there are ca. 370 symbiotic species of polychaetes, either obligate or facultative. Although their world distribution patterns have not been formally analyzed, it seems likely that there may be a latitudinal gradient, with a relatively low diversity in cold and temperate waters that tends to increase towards tropical areas. Conversely, the symbiotic polychaete fauna is relatively well known in the cold and temperate European waters, as well as along both coasts of North America [Barel, Kramers 1977; Pettibone 1993], while tropical areas are still poorly investigated. There are no publications focusing on these organisms from any particular tropical area, with a few exceptions [e.g. Gibbs 1969; Britayev *et al*. 1999]. In turn, most data on symbiotic species are usually scattered in faunistic, taxonomic, or, more rarely, in ecological papers [e.g. Devaney 1967; Hanley 1989; Britayev, Zamyschliak 1996; Barnich *et al*. 2004], and the Vietnamese fauna is not an exception.

Various polychaete families have been previously studied in Vietnam [e.g. Fauvel 1939; Uschakov 1972; Fauchald 1968; Gallardo 1967; Strelzov 1968, 1972]. However, only ten symbiotic species are known to date. Most of them belong to the Polynoidae (8 species), while the Syllidae and the Spionidae were represented by only one species, respectively [Fauvel 1939; Gallardo 1967; Radashevsky 1996; Britayev, Zamyschliak 1996; Britayev, Fauchald 2005; Britayev, Martin 2005; Martin *et al*. 2009; Antokhina,

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Ophthalmonoe pettiboneae Petersen et Britayev, 1997
(Pl. 4 A, B)

Ophthalmonoe pettiboneae Petersen, Britayev 1997: 266–272, figs 1–3; Britayev, Martin 2005: 4091–4096, figs 7–8.

Material examined. Nhatrang Bay: Mun Island, 15 m, sand, in tubes of *Chaetopterus* sp., coll. Marin, 16.06.2004 – 2 specimens (af and pf) and 2 mf; 11 m, sand, in tubes of *Chaetopterus* sp., coll. Savinkin – 1 cs; western point of Tre Island, 8–12 m, sandy silt, in tubes of *Chaetopterus* sp., coll. Marin, 29.06.2004 – 2 cs.

Diagnosis. Body flattened, relatively short and wide, truncate anteriorly and gradually tapering posteriorly. With 19 pairs of elytra on chaetigers 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 26, 29, 32, 35, 38, 41, 42. Last two to four segments cirrigerous, without elytra. Elytra relatively large, overlapping antero-posteriorly, basically oval, but markedly irregular in outline, folded along external margin, delicate, smooth except for some scarce irregularly distributed micropapillae. Prostomium slightly wider than long, without cephalic peaks, with two pairs of large dark eyes, with anterior pair slightly larger than posterior one, directed anteriorly, both pairs with conspicuous oval lenses; lateral antennae inserted slightly ventral to median antenna, short, cylindrical, ceratophores short, converging mid-ventrally. Tentaculophores relatively short, thick, achaetous, but with acicula. Dorsal cirri alternating in length along body. Notopodia, small, conical; neuropodia longer and wider than notopodia, with row of cilia along ventral side, prechaetal lobe elongated, nearly digitiform, substantially longer than triangular postchaetal lobe. Notochaetae arranged in a fan-shaped bundle orientated nearly horizontally, numerous, from 70 to more than 150 per bundle, slender than neurochaetae, long, capillaries, smooth. Neurochaetae numerous, from more than 80 to more than 240 per bundle, stout, with tips hooded, blunt and nearly rounded, with rows of narrow petaloid spines.

Measurements. Body with 44–46 chaetigers, L – 19–27 mm, WW – 2.6–3.8 mm, WP – 9.0–9.8 mm, WC – 11.2–12.3 mm.

Coloration. The body is basically light brownish and has a conspicuous transverse dark brown or black band crossing each segment. On segment 5, there is an additional characteristic oval, mid-dorsal, black spot posterior to the transverse band (Pl. 4 A, B). The longest dorsal cirri have more intense dark pigmentation than the smaller ones. The ventral body surface is always non-pigmented [Britayev, Martin 2005].

Taxonomic notes. Our specimens agree completely with description provided by Britayev and Martin [2005].

Ecological notes. Found at 8–15 m in tubes of the polychaete *Chaetopterus* sp. (Polychaeta: Chaetopteridae).

Distribution in Nhatrang Bay. Mun and Tre Islands.

General distribution. Vietnam [Britayev, Martin 2005], coasts of Ambon Island, Indonesia, Banda Sea [Petersen, Britayev 1997].

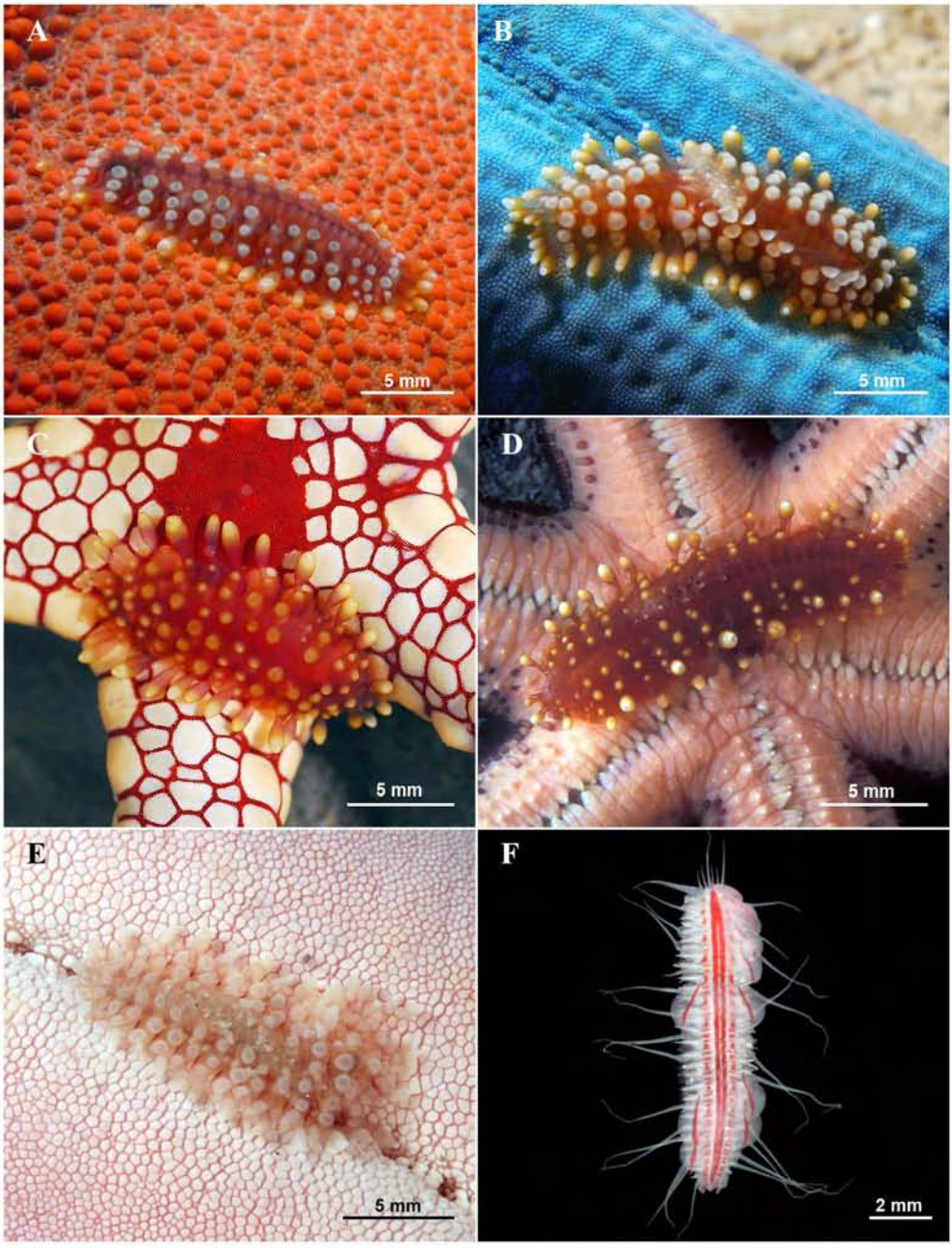

Plate 1. **A** – *Asterophilia culcitae* on the oral surface of starfish *Culcita novaeguineae* (*in situ*), **B** – *A. culcitae* on the arm of starfish *Linckia laevigata* (*in situ*), **C** – *A. culcitae* on the aboral surface of starfish *Fromia monilis* (in lab), **D** – *A. culcitae* on the oral surface of starfish *Echinaster luzonicus* (in lab), **E** – *A. culcitae* on the oral surface of starfish *Choriaster granulatus* (*in situ*), **F** – *Australaugeneria rutilans* (in lab).

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