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Serpulidae (Annelida: Polychaeta) from Hong Kong

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Abstract

Serpulidae (Sabellida, Annelida) is a large group of sedentary polychaetes that live in the calcareous tubes they secrete. In addition to being an important component of marine hard-bottom benthic communities, serpulids include several economically important invasive and/or fouling species. In this paper we describe the serpulids from Hong Kong, based on specimens collected from a coral community, a fish farm, a public pier and a shipping channel. Seventeen serpulid taxa belonging to five genera are recorded. The most diverse genus in the present material is *Hydroides* (9 species), followed by *Spirobranchus* (5 taxa). The highest diversity (13 taxa) is found on dead coral skeleton. One species, *Spirobranchus tetraceros*, is associated with live corals in high density. For each taxon, the habitat, distribution and morphological features are described. Including literature records, 20 taxa of serpulids have been reported from Hong Kong. An identification key to all these recorded taxa is provided.

Key words: Polychaeta, Serpulidae, *Hydroides*, *Spirobranchus*, Hong Kong

Introduction

Among polychaetes, species in Serpulidae can be recognized easily by their calcareous tube, characteristic operculum (in most cases) and colourful radiolar crown. Serpulids have been reported from many habitats from the intertidal to abyssal zone (Kupriyanova & Badyaev 1998; ten Hove & Kupriyanova 2009; Kupriyanova & Nishi 2010; Kupriyanova *et al*. 2011). In shallow locations, serpulids occur widely on various underwater solid substrates such as rocks, mooring buoys, ship hulls, aquaculture nets and marine water intake pipes (Ben-Eliahu & ten Hove 1992; Relini *et al.* 1999; Bastida-Zavala 2008; ten Hove & Kupriyanova 2009). They are also a common component of coral communities, with their tube either adhered to or embedded in coral skeleton (Bailey-Brock 1976, 1985, 1991; Mak 1982). Some serpulids have been reported to cause bio-invasion through transportation by ocean-going vessels, resulting in changes in community structure and a loss in biodiversity (Arakawa 1971; Thorp *et al*. 1987; Lewis *et al*. 2006). Their presence on various underwater man-made structures is especially problematic as it decreases ship speed, increases the weight of buoys and blocks water intake pipes and aquaculture nets (Ben-Eliahu & ten Hove 1992; Wang & Huang 1993; Chandra Mohan & Aruna 1994; Relini *et al.* 1999). However, not all serpulids are pests. Some species have a magnificent colourful tentacle (radiolar) crown and are collected for the marine aquarium trade (Murray *et al.* 2012). Other species may be beneficial to the health of hard corals, as their tentacle crown creates water currents while they feed, which may improve circulation on coral surface (Mokady *et al*. 1998; Nakamura *et al*. 2003; Ben-Tzvi *et al*. 2006) or protect corals against predation by *Acanthaster* due to the sharply pointed opercular tooth (Devantier *et al*. 1986).

Traditionally, identification of serpulids is based on the morphology of the tube, operculum, chaetae and uncini. A recent review by ten Hove and Kupriyanova (2009) has provided up-to-date information on Serpulidae *sensu lato* worldwide including 46 genera with detailed generic diagnoses and a list of 350 nominal species. Systematic studies in recent decades have been conducted for serpulids from several coastal regions in the Pacific. Among them, Bailey-Brock (1991), Knight-Jones and Knight-Jones (1991), Bastida-Zavala (1993, 1995, 2008) and Bastida-Zavala and ten Hove (2003) reported species from eastern Pacific and Hawaii; ten Hove and Smith (1990), ten Hove (1994), Pillai and ten Hove (1994), Nishi and Asakura (1996), ten Hove and Nishi (1996), Fiege and Sun (1999), Fiege and ten Hove (1999), Sun and Yang (2000, 2001a, b) and Pillai (2009) reported species from the Indo-West Pacific; Kupriyanova and Nishi (2010, 2011) and Kupriyanova *et al*. (2010, 2011) described serpulids from the deep sea of the Pacific. In southern China, there have been several recent studies (Fiege & Sun 1999; Sun & Yang 2000, 2001a–b), which in total reported 63 species of serpulids in 15 genera from the Chinese coasts, especially Hainan Island and adjacent waters of the South China Sea, but species from Hong Kong were not included.

Hong Kong is situated approximately 150 km south of the Tropic of Cancer (22°9′–22°33′N, 113°5′–114°26′E) on the southeast coast of China. The marine fauna is diverse and composed of both tropical and subtropical species (Morton & Morton 1983). Although serpulids are known to be common in both the fouling (Morton & Morton 1983; Scott 1984; Wang & Huang 1993; Qiu & Qian 1997) and coral (Mak 1982) communities, there is only one systematic account of serpulids (Mak 1982), which reported 15 species belonging to 6 genera. However, the serpulids in Mak (1982) were recorded with only brief text descriptions, without figures showing their key characters. The identity of some of the species listed in the paper must be questioned as they are mentioned under species