



Pycnoclavella stolonialis n. sp. (Tunicata: Ascidiacea), with phylogenetic and distributional remarks on the genus in Europe

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Abstract

Morphological and molecular data based on the COI gene were used to describe a new species of the colonial ascidian genus *Pycnoclavella*. The new species, *P. stolonialis*, is widespread sublittorally in the Irish Sea and also occurs on the western Irish coast, Wales and eastern England and may be locally common. It has been commonly known as the 'pin head' sea squirt since first recorded from Northern Ireland in 1984 but has not yet been formally described. *P. stolonialis* is the only described species of *Pycnoclavella* combining the presence of stolons, peribranchial incubation mode and a larva lacking an otolith. In addition, it features ca. 10% sequence divergence with the closest species of the genus in our phylogenetic trees. *P. stolonialis* showed intermediate characters between two groups of *Pycnoclavella*; the *stanleyi* and the *aurilucens* groups. Larval morphology and molecular data supported the inclusion of *P. stolonialis* within the *aurilucens* group, but the stolonial colony structure is characteristic of the *stanleyi* group. This implies that colony structure may not be a good character for separating these two groups. New information on distribution is given for *P. atlantica*, *P. aurilucens* and *P. communis*.

Key words: Colonial ascidians, larval morphology, COI, biogeography, biological cycles, "pin head" sea squirt

Introduction

The genus *Pycnoclavella* Garstang, 1891 (Aplousobranchia) is a diverse ascidian group including more than 20 small colonial species (Kott 1990; Kott 2005; Pérez-Portela & Turon 2008). This genus, widely distributed in the Atlantic, Indian, Pacific Ocean and Mediterranean Sea (Garstang 1891; Millar 1953; Trason 1963; Goodbody 1996; Kott 1990, 2003, 2005; Pérez-Portela *et al.* 2007a; Pérez-Portela & Turon 2008), has been intensely studied in the temperate, subtropical and tropical waters of Australia, western Pacific and Indian Oceans. However, despite being an abundant group in European sublittoral rocky communities, its diversity and distribution has been scarcely explored in the Atlantic. Previous studies of *Pycnoclavella* species from the Iberian Peninsula have demonstrated that the genus is more diverse than originally expected in these latitudes and three new species were recently described (Pérez-Portela *et al.* 2007a; Pérez-Portela *et al.* 2007b; Pérez-Portela & Turon 2008). However, these studies covered just a small portion of the southern European coast and almost nothing is known about the specific richness of the genus in Northern areas of Europe, with the only available records from the British Islands. Moreover, there is also a general lack of information on species distribution since only scattered point records of the described species have been published, and detailed distributional information is not available for most species of the genus. It should be also noted that taxonomic confusion between European species renders many previous reports unreliable (Pérez-Portela *et al.* 2007a).