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Description of *Ascidia paulayi* sp. nov. (Phlebobranchia: Ascidiidae) from French Polynesia, with a discussion about the *Ascidia sydneyensis* Stimpson, 1855 group

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Abstract

In the last decade, new surveys were made in French Polynesia as part of the Moorea Biocode project to improve the knowledge about the regional fauna. Here we describe *Ascidia paulayi* sp. nov., a new species of Ascidiidae. Due its similarity with *A. sydneyensis*, a discussion about the species of this group complements the study.

Key words: Ascidiacea, Moorea Biocode, taxonomy, Tunicata

Introduction

French Polynesia is composed by 118 volcanic or coral islands and atolls, with approximately 3660 km² of total land area in the South Pacific Ocean. The territory is divided into five groups: Society, Tuamotu, Gambier, Marquesas and Austral Islands. The Society Islands are the most famous of them, due to three touristic islands: Tahiti, Moorea and Bora-Bora.

The first studies of ascidians from French Polynesia were published in the end of the 1980's and revealed a total of 92 species, with the description of 39 new species (Monniot *et al.* 1985, Monniot & Monniot 1987). Among them, they identified four species of Ascidiidae, including only one new species: *A. archaia* Sluiter, 1890, *A. melanostoma* Sluiter, 1885, *A. tapuni* Monniot & Monniot, 1987, and *A. sydneyensis* Stimpson, 1855 (Monniot & Monniot 1987). Although somewhat punctual, it is a very complete study for the region, covering Moorea and Tahiti, in the Society Islands, and the atoll of Tikehau, in Tuamotu. In 2009, a new effort of collection was made in Moorea as part of the Moorea Biocode project, an ambitious endeavor intended to provide an inventory of all life forms in Moorea, marine and terrestrial, with their respective DNA barcoding.

Here we present a new species of Ascidiidae from Moorea, easily confounded with *A. sydneyensis* due to the pattern of body muscles and the presence of dilation in the distal part of the gut. We complement this study with a discussion about the problems to identify ascidians with these characters, and provide a key for identification of species with the *A. sydneyensis* muscles pattern.

Material and methods

Specimens were collected manually through snorkeling and SCUBA diving in shallow waters between 1.0 and 7.0 m deep. Photos of the living specimens were taken in the field whenever possible. The animals were kept in jars and plastic bags and brought to the Richard B. Gump South Pacific Research Station (UC Berkeley), where they were anesthetized with tricaine, and a small piece of the atrial siphon was cut and immediately processed for DNA extraction. The remaining was fixed in formalin 10% and later preserved in ethanol 75%.