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A new solar powered species of the genus *Phyllodesmium* Ehrenberg, 1831 (Mollusca: Nudibranchia: Aeolidoidea) from Indonesia with analysis of its photosynthetic activity and notes on biology

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Abstract

A new *Phyllodesmium* species, *P. jakobsenae* nov. sp., is described from North Sulawesi, Indonesia. The new species is associated with the octocoral *Xenia* sp. Its external morphology is similar to other *Phyllodesmium* species inhabiting *Xenia* colonies, especially to *P. hyalinum* Ehrenberg, 1831, but cerata morphology and color, tooth and jaw morphology as well as the digestive glandular branching system within the cerata clearly distinguishes this new species. Behavioural notes are given and spawning is described. Active photosynthesis due to zooxanthellae (Dinophyceae of the genus *Symbiodinium*) in the digestive gland was measured *in situ* with a Diving-PAM (Pulse Amplitude Modulated Fluorometer). Experiments with *P. jakobsenae* indicate a symbiotic relationship with zooxanthellae at least for some days. These results are discussed in comparison to another *Xenia* inhabiting species, *Phyllodesmium crypticum* Rudman, 1981. Histological investigation of the digestive diverticula within the cerata of the new species also indicate a high effectiveness of the symbiosis.

Key words: *Phyllodesmium*, zooxanthellae, *Symbiodinium*, *Xenia*, solar powered, mutualistic symbiosis, Diving-PAM, photosynthesis, Sulawesi

Introduction

Up to now 15 species of the genus *Phyllodesmium* Ehrenberg, 1831 (Facelinidae, Aeolidoidea) have been described, (see Rudman 1981, 1991, Baba 1949, 1991, Avila et al. 1998, Ortiz & Gosliner 2003). For additional 11 undescribed species from the Indopacific, information is available in the Internet (Rudman 2004, Seaslugforum: www.seaslugforum.net). The first author found another undescribed species during a stay on Sulawesi (Indopacific) in summer 2003. Compared to other genera of the Facelinidae, *Phyllodes-*

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