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Phyllodesmium rudmani (Mollusca: Nudibranchia: Aeolidoidea), a new solar powered species from the Indo-West Pacific with data on its symbiosis with zooxanthellae

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Abstract

A new *Phyllodesmium* species, *P. rudmani* sp. nov., is described from North Sulawesi, Indonesia and from Luzon Island, the Philippines. The new species is associated with the octocoral *Xenia* sp. Its external morphology is similar to other *Xenia* associated *Phyllodesmium* species, except the unique morphology of the cerata, that mimic closed polyps of *Xenia*. The digestive glandular branching system within the cerata is similar to that of *P. jakobsenae* Burghardt & Wägele, 2004, a species that was found associated with the same species of *Xenia* and at the same locality in Indonesia as *P. rudmani*. The masticatory border of the jaw with a few large denticles is similar to several other species of *Phyllodemium* that feed on *Xenia*, as are the radular teeth with numerous small denticles. The lobate receptaculum seminis is similar to that described for *P. magnum* Rudman, 1991, whereas the remaining species have a smooth pyriform receptaculum. Behavioural notes of the new species are given and 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. rudmani* indicate a symbiotic relationship with zooxanthellae, at least for three weeks. These results are compared to the ones of *P. jakobsenae*. Histological investigation of the cerata of *P. rudmani* suggests relatively high efficiency of the symbiosis for the new species because of the high grade of branching of the digestive gland.

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

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