



## On a new *Ercolania* Trinchese, 1872 (Opisthobranchia, Sacoglossa, Limapontiidae) living within *Boergesenia* Feldmann, 1950 (Cladophorales), with notes on anatomy, histology and biology

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### Abstract

A new sacoglossan species, belonging to the genus *Ercolania* Trinchese, 1872 is described. *E. kencelesi* sp. nov. has a similar biology as *E. endophytophaga* Jensen, 1999. Both are living within syncytial algal tubes of members of the Siphonocladales, *E. kencelesi* sp. nov. in *Boergesenia forbesii* and *E. endophytophaga* in *Struvea plumosa*. Assignment to the genus *Ercolania* is possible on the base of the cerata, which are round in cross-section, the digitiform rhinophores, sabot-shaped teeth and the presence of a penial stylet. The new species can be easily distinguished from *E. endophytophaga*, by the teeth with a prominent cusp, as well as other *Ercolania* species, by its unique colouration and its peculiar association to the food alga *Boergesenia*. Feeding, copulation, egg masses and development are noted. Differences in development further strengthen the distinction of *E. kencelesi* to *E. endophytophaga*. Measurement of photosynthetic activity of incorporated chloroplasts during several days clearly shows that chloroplasts are digested.

**Key words:** *Ercolania kencelesi* sp. nov., Australia, histology, feeding, photosynthesis, PAM, reproduction, development

### Introduction

The opisthobranchiate taxon Sacoglossa is characterized by its unique feeding strategy. The slugs pierce algal cells with their single row of teeth and suck out the cell contents. This suctorial feeding mode is reflected in morphology; sacoglossans have a uniseriate radula with sickle-shaped teeth apt for piercing cell walls. Sometimes, the chloroplasts of the food algae are incorporated into the digestive gland and retain their ability to perform photosynthesis for a period of time ranging from hours to months (e.g., Rumpho *et al.* 2001; Wägele & Johnsen 2001; Evertsen *et al.* 2007). Usually sacoglossans have a close affinity to their food algae, which mainly belong to the Caulerpales and Bryopsidales (e.g., Jensen 1993a, 1997; Williams & Walker 1999).

According to Jensen (1985), the distinction between *Ercolania* Trinchese, 1872, *Stiliger* Ehrenberg, 1831 and *Placida* Trinchese, 1876 is difficult due to the scanty original descriptions. Du Bois-Reymond Marcus (1982) even synonymised *Ercolania* with *Stiliger* since she could not find characters delineating described species to one of these genera. Jensen (1985) diagnosed the genus *Ercolania* by the following characters: the presence of cerata, which are round in cross-section; digitiform rhinophores; presence of sabot-shaped teeth, presence of a curved penial stylet. Up to now, nearly 20 species have been described and probably meet this generic diagnosis. Atlantic species are *Ercolania cricetus* Marcus & Marcus, 1970, *E. fuscata* (Gould, 1870), *E. nigra* (Lemche, 1935), *E. talis* (Marcus, 1956), *E. vanellus* (Marcus, 1957) and *E. viridis* (A. Costa, 1866).