

Taxonomic studies in the Schizymeniaceae (Nemastomatales, Rhodophyta): on the identity of *Schizymenia* sp. in the Azores and the generic placement of *Nemastoma confusum*

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Comparative *rbcL* sequence analysis indicates that the species going under the name *Schizymenia dubyi* in the Azores should be referred to as *S. apoda*. Sequences of *Schizymenia* specimens from China and Namibia were also identified as *S. apoda*, of which the type locality is the Cape Province in South Africa. *Schizymenia dubyi*, described from Atlantic France, is clearly a distinct species that we here report for Japan and Sicily in the Mediterranean Sea. Both *Schizymenia* species, along with an unreported species from Japan, are distinct from *S. pacifica* described from Washington, in the Pacific Coast of North America. Secondary pit connections were observed in gametophytes of *S. apoda* from the Azores, a previously unknown character for the Nemastomatales. Examination of type material of *Nemastoma confusum* indicates that this species, currently placed in the Nemastomataceae, should be transferred to the genus *Platoma* in the Schizymeniaceae. A morphological comparison between *Platoma confusum* (Kraft & John) comb. nov. with descriptions of *P. cyclocolpum* and *P. chrysymenioides* suggests that the three species are closely related.

KEY WORDS: Azores, *Nemastoma*, Nemastomatales, *Platoma*, *rbcL*, Rhodophyta, *Schizymenia*, Schizymeniaceae, Systematics, Taxonomy

INTRODUCTION

Schizymenia J. Agardh (Schizymeniaceae) has the largest geographical distribution of all nemastomatalean genera. The 10 species of *Schizymenia* that are currently recognised are found in temperate, subtropical and tropical waters, ranging from the subantarctic islands to Alaska (Guiry & Guiry 2009). The genus *Schizymenia* is distinguished from other genera in the Schizymeniaceae by the presence of diagnostic gland cells resembling large, inverted tears, located terminally on cortical filaments (Dixon & Irvine 1977).

The type of the genus, *Schizymenia dubyi* (Chauvin ex Duby) J. Agardh, was established by Agardh based on *Halymenia dubyi* Chauvin ex Duby from Atlantic France, and it is the most studied and best-characterised member of the Schizymeniaceae. The genus also contains the only known tetrasporophyte of Schizymeniaceae found in nature (Masuda & Guiry 1994). Extensive culture studies performed on *S. dubyi* (Ardre 1977, 1980) and *S. pacifica*

(Kylin) Kylin (DeCew *et al.* 1992) revealed a heteromorphic life history where the tetrasporophytic phase was identified as a crustose species originally attributed to the generitype of *Haematocelis*, *H. rubens* J. Agardh.

Kylin (1956) circumscribed the genus *Schizymenia* as follows: ‘with blade-like thalli that bear gland cells in the cortex, produce carpospores towards the exterior of the thallus, with the base of the carposporophyte lying deep inside the medulla, and in which nearly all cells of the gonimoblasts become carpospores. Additional characters include weakly developed sterile filaments, or lack thereof, surrounding the carposporophyte, and a weakly defined but distinct ostiole located above the slightly raised carposporangial mass’. The shape and size of the blades, along with vegetative features such as short cortical branch systems with subspherical inner cells, may also serve to distinguish species (Abbott 1967; Womersley 1994).

The species of *Schizymenia* occurring in the Azores were originally reported by Trelease (1897) as *S. undulata* J. Agardh (Terceira Island) and *S. obovata* J. Agardh (Corvo Island), both species currently regarded as synonyms of *S. dubyi*, described from Atlantic France, and *S. apoda* (J. Agardh) J. Agardh described from Atlantic South Africa,

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