

First record of tetrasporangia in *Herposiphoniella plurisegmenta* Womersley (Rhodomelaceae: Rhodophyta)

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Abstract – Tetrasporangia are recorded for the first time in the recently described genus and species *Herposiphoniella plurisegmenta* Womersley. The fertile specimens were collected from subtidal habitats in the Recherche Archipelago, Western Australia. Sporangia were tetrahedrally divided and borne in series in lateral determinate branches. The Recherche specimens differ slightly from the type description, primarily in substratum type and lack of trichoblasts, but these differences are regarded as minor and do not warrant the erection of a new species.

Key words: *Herposiphoniella*, tetrasporangia, Western Australia

INTRODUCTION

H.B.S. Womersley, in 'The Marine Benthic Flora of Southern Australia – Part IIID' (2003), described a new genus and species *Herposiphoniella plurisegmenta* for specimens that were similar in vegetative morphology to the genus *Herposiphonia* Nägeli, but displayed a branching sequence of 5–7 (13) determinate laterals between indeterminate laterals, rather than the regular 3 determinate laterals found in *Herposiphonia*. The epiphytic species' known distribution is from Fremantle, Western Australia, eastward to Cape Northumberland, South Australia. Unfortunately the original material included no reproductive specimens, so it was of interest when, during a survey of the marine macroalgae of the Recherche Archipelago, Western Australia, specimens bearing tetrasporangia were collected. This paper reports on the habitat, morphology and reproduction of the new material.

MATERIALS AND OBSERVATIONS

Specimens examined

(1) Mondrain Island (34°08.35, 122°14.03), granitic reef exposed to swell in depths 10–20 m, growing along a vertical wall (UWARA-269; October 30, 2003; *G. Kendrick*). (2) Middle Island (34°05.40, 123°10.40, granitic reef sheltered from swell in depths <10 m, growing on a horizontal platform (October 27, 2003; *N. Goldberg, J. Heine*).

Habitat

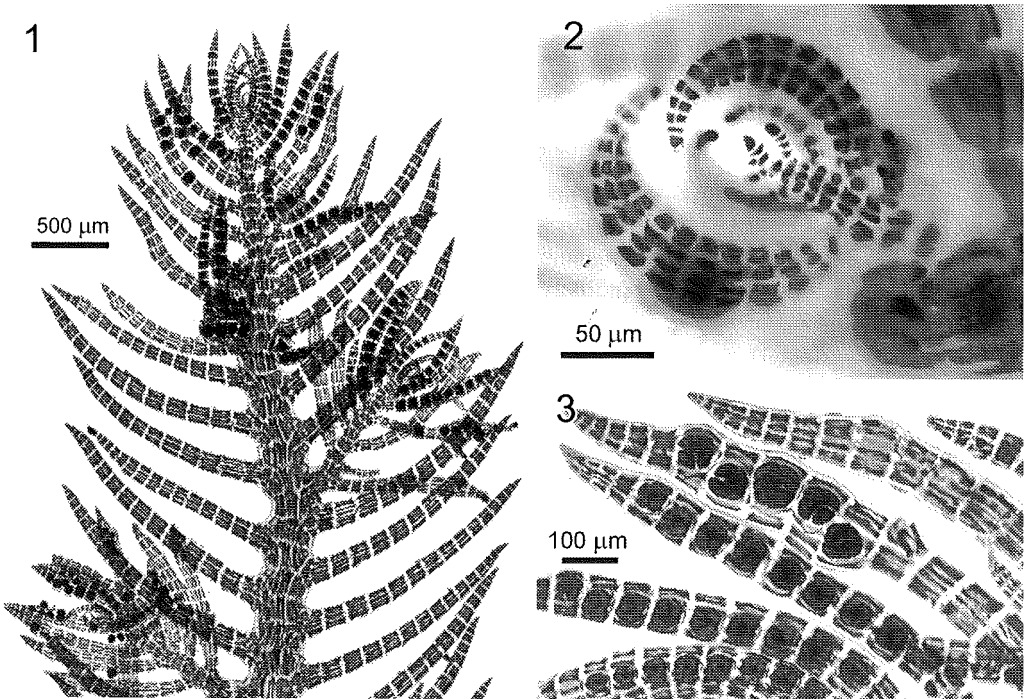
Unlike the South Australian specimens recorded by Womersley (2003: 301), the Recherche specimens of *H. plurisegmenta* were not epiphytic on other macroalgae. The alga was found attached to encrusting sponge growing on granite reefs. Associated attached organisms included juvenile *Rhodymenia*, *Jania*, hydroids, and bryozoans (*Orthoscuticella* sp).

Habit and Vegetative Morphology

Thalli (Figure 1) were red-brown, 1–3 cm long, prostrate, and attached by rhizoids to the substratum. Axial segments were 250–350 μm in diameter and ecorticate, with 11–13 pericentral cells. Branching was mostly complanate, with 5–7 determinate laterals (each with 9–11 pericentral cells) distichously and laterally arranged between indeterminate laterals (Figure 1). Determinate laterals were 110–140 μm broad. Apical cells were hemispherical to conical and 6–8 μm in diameter. Young branches were distinctly curved in the direction of the apex (Figure 2). Trichoblasts were not observed.

Tetrasporangia

Tetrasporangia were borne in determinate laterals, commonly those near the apices of indeterminate laterals (Figure 1). They occurred in straight or slightly displaced series of 2–9



Figures 1–3 *Herposiphoniella plurisegmenta* Womersley. 1, Habit showing branching pattern with alternation of determinate and indeterminate branches. 2, Apex of indeterminate branch, selectively focused to show apical cell with curved lateral determinate branches. 3, Tetrahedrally divided tetrasporangia arising in series in determinate branches.

sporangia per lateral, one per segment, and often caused a moderate swelling of the bearing branch such that it became slightly moniliform (Figure 3). Tetrasporangia were cut off from pericentral cells that also bore 2 cover cells, were spherical, 60–100 µm in diameter (swelling the diameter of the lateral to 80–110 µm) and tetrahedrally divided (Figure 3).

DISCUSSION

The Recherche Archipelago specimens display the distinctive vegetative architecture of *Herposiphoniella* (Womersley 2003) and can therefore confidently be included in the genus. Virtually all features also agree with *H. plurisegmenta*, the type and only species of the genus. Pericentral cell numbers were slightly higher than those reported by Womersley, but this may be a function of the specimens being reproductive. Womersley also recorded the presence of trichoblasts, and these were not observed in the Recherche collection. Trichoblasts are typically evanescent, however, and may have been shed from our specimens. We believe that the overwhelming similarities of the Recherche specimens with *H. plurisegmenta* suggest conspecificity, and that the novel epizoic habitat and slight morphological differences require, at most, an emendation of the description.

The discovery and description of tetrasporangial material of *Herposiphoniella* contributes to our understanding of this genus, but unfortunately gametophytic specimens remain unknown. The arrangement of the tetrasporangia is typical of many members of the Rhodomelaceae (including *Herposiphonia*, the genus with possibly the closest affinities to *Herposiphoniella*), and confirms Womersley's familial placement of the genus. The Rhodomelaceae is both vegetatively and reproductively distinct, and is one of only a few families of red algae to which assignment can be made confidently with sterile material, based on the presence of monopodial growth and regular tiers of pericentral cells. The observations presented here, while adding to our suite of knowledge and supporting the familial placement of *Herposiphoniella*, are also typical of many of the Rhodomelaceae and do not permit any further taxonomic deliberations concerning this relatively reproductively conservative group.

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