

## A new *Zygnemopsis* species (Zygnemataceae, Zygnematophyceae), with mature zygospores, from Australia

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### Abstract

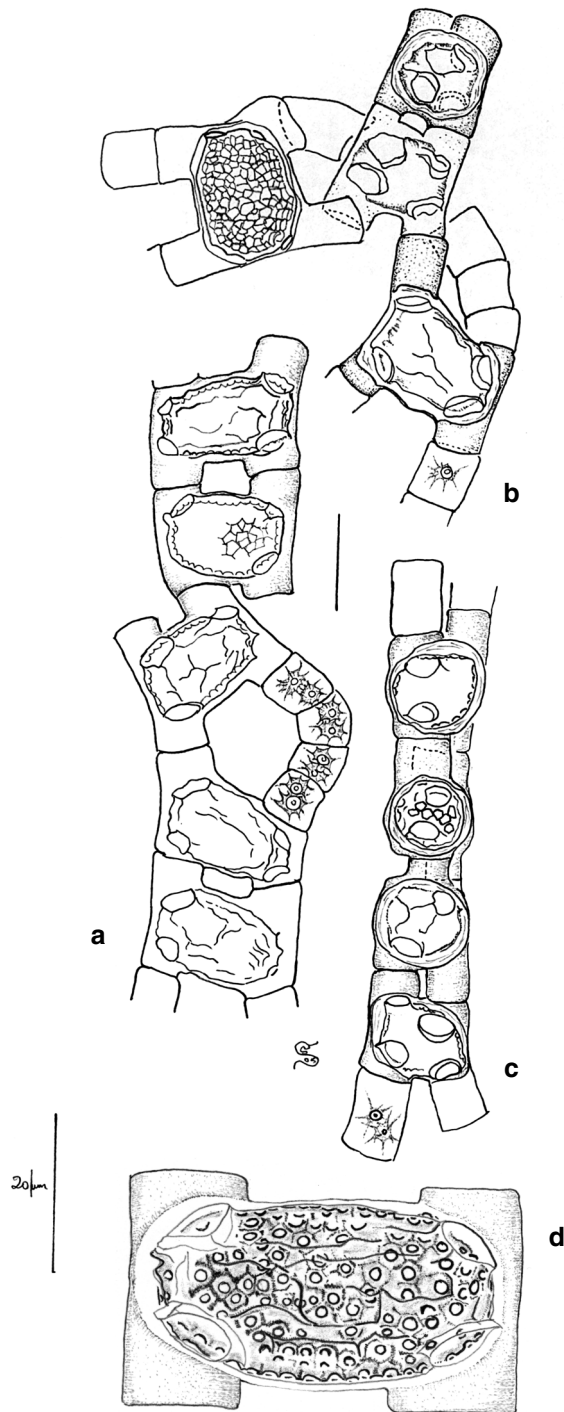
A species of *Zygnemopsis*, *Zygnemopsis faveosrobiculata*, with a distinctive cup-like concave horn in the exospore at each corner of the zygospore is reported from the Dumaresq River. It is similar in other respects to *Z. quadrata* and *Z. areolata* from China in vegetative dimensions and mesospore sculpturing, but there is little or no separation between the exospore and mesospore in the Australian material.

### Introduction

As part of a recent survey of macroalgae of the Dumaresq, Macintyre, Severn and Gwydir Rivers in northern New South Wales adjacent to the Queensland border, the authors made numerous collections of various Zygnemataceae. Among these we found a *Zygnemopsis* species as the dominant macroalga in riffle banks in the Dumaresq at the point where the low-level bridge marks the border between the states, two kilometres north-east of Mingoola. Here it formed numerous yellowish to apple green rafts, especially in the pools between the larger cobblestones, and among the *Azolla pinnata* and *Ludwigia peploides* ssp. *montevidensis* plants in the same shallow, warm-water pools. It was notable, not only as the dominant species, fertile and so distinguishable from *Zygnema*, but also in that many of the zygospores in most conjugation ladders were mature. There have been eleven collections of *Zygnemopsis* lodged at NSW from Western Australia, Northern Territory, New South Wales and Queensland but these have rarely contained sufficient mature zygospores to distinguish them with confidence to more than genus. No descriptions of taxa from this genus have been published from Australian material (Kadłubowska 1984).

*Zygnemopsis faveosrobiculata* Skinner, H. McPherson & Towler *sp. nov.*

Type: NSW: North Western Slopes: Dumaresq R., at low level bridge on NSW-Qld border, north of Mingoola, *Skinner 0684, McPherson & Towler*, 7 Oct 2004 (holo NSW 910473).



**Fig. 1 a–d.** *Zygnemopsis faveoscrobiculata*, Skinner 0684, McPherson & Towler (NSW). a–c, various stages of maturity of zygospores, top and side views; d, mature zygospore and gametangia. Scales = 20 µm.

*Zygnemopsis areolatae* similis sed membrana exosporae ad mesosporae adiacenta cornuibusque concavatis, atque mesospora aspectu laterali globosa.

Vegetative cells narrow cylindrical, 11–14 µm diam, L/D 1.2–3, endwall plane; chloroplasts stellate, (1–)2(–3), each with central pyrenoid; basal attachment of filament not seen. Conjugation scalariform, zygospore filling conjugation canal and reaching outer walls of both gametangia; gametangia pectin-filled post-zygote, not markedly laminate. Zygospore rectangular ovoid in face view, subglobose in side view, 34–42 µm long, 25–27 µm diam., 20–25(–27) µm thick, with pectinate halo (most visible in side view); exospore wall clear, close-fitting, wrinkled with four concave corners, mesospore wall thick, faveolate-scrobiculate, golden brown, scrobiculae 2–2.8 µm diam. Fig. 1 a–d.

**Etymology:** the name derives from the honeycomb patterns of dimples on the mesospore.

**Distribution:** New South Wales–Queensland border, in river riffle banks.

**Other specimen examined:** New South Wales: North Western Slopes: Bakers Creek, near Bundara, Skinner 0790, McPherson & Towler, 13 Oct 2004 (NSW).

**Notes:** The four cup-like concave horns of the exospore clearly distinguish this taxon from similar species including *Zygnemopsis stephaniae* Transeau (Transeau et al. 1934), *Z. quadrata* Jao (Jao 1935), and *Z. areolata* Zhu (Zhu 1980). *Zygnemopsis stephaniae* has a more quadrate zygospore, without distinctive corners on the exospore. *Zygnemopsis quadrata* has an exospore which is widely separate from the mesospore, and which has convex corner processes (or horns) and the mesospore has an equatorial ridge. *Zygnemopsis areolata* has a wide separation between mesospore and exospore, and is more narrow, and lozenge-like in side view. The significance and developmental origin of these remarkable features are unknown.

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