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Evidence of external gametophores in puzzling Late Triassic–Early Jurassic dasycladalean green algae

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The mineralized cover preserving soft parts of the Dasycladales, as an external mould, is the only tool allowing to deduce the anatomical parts of these algae. Problems arise when voids within the calcareous skeleton do not reflect accurately the original soft parts due to a loss of mineralization. Based on a rich material collected from the type locality in Languedoc (France), a detailed study was carried out on *Chinianella ellenbergeri*, the type species of *Chinianella*. Previous interpretation of voids in the calcified fossil considered the alga to be made of an alternation of fertile and further ramified sterile whorls. Our study shows that large cavities previously interpreted as corresponding to fertile whorls, actually denote empty spaces. Therefore, the alga essentially consists of spaced-out whorls of sterile primary laterals, distally bearing a tuft of three-four phloiophorous secondary laterals. A small number of specimens show the presence of calcified structures interpreted as corresponding to external, subterminal reproductive organs. Consequently, an emended diagnosis is proposed for *C. ellenbergeri* and for the *Chinianella*. Present interpretation of *Chinianella* adds a new step to the understanding of the emergence of external reproductive organs during the geological history of this group of green algae. *Chinianella ellenbergeri* shows that choristosporate reproduction sensu lato was already well represented and diversified in the Early Jurassic. Other Late Triassic–earliest Jurassic species formerly attributed to *Chinianella* (namely *C. carpatica, C. crosii, C. zanklii, C. micropora,* and *C. macropora*) reveal that the large, fertile primary lateral is a compound pore with a structure like in *Cymopolia* , i.e., made of a short primary lateral with a terminal gametophore embraced by secondary laterals. Therefore, these species have been referred to the new genus *Distefanopolia*.

Key words: Dasycladales, *Chinianella ellenbergeri, Distefanopolia* , green algae, systematic revision, France, Italy, Sicily.

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