



Publications

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The difference between *Chlorella vulgaris* and *Chlorella pyrenoidosa*

On the position of the taxa "*Chlorella pyrenoidosa*" CHICK and *Chlorella vulgaris* BEIJERINCK within the Chlorophyta (green algae)

The algae known as Chlorellaceae belong within the Chlorophyta (green algae) of the Trebouxiophyceae group. Chlorellaceae are in turn divided into two sister groups, the Parachlorella group and the Chlorella group to which *Chlorella vulgaris* belongs (Krienitz et al.; 2004). These are coccal green algae with small spherical green cells which is why *Chlorella* is sometimes described as "the green ball". There are a wide variety of algae from various groups with the same appearance. This is known as convergent morphology (comparable to the convergent morphology of certain succulent euphorbias and cacti). In brief, *Chlorella* is difficult to distinguish and to classify and this remains the preserve of specialists. These are species which closely resemble one another in most characteristics and yet can vary considerably (morphologically and physiologically) in these characteristics. Naturally this makes determination and classification difficult, with the result that some have been classified wrongly or twice. More than 100 *Chlorella* species have been described, most of which have had to be revised. To distinguish the individual species from one another, various characteristics were (and are) examined: e.g. the ultrastructure of the cell wall, the ultrastructure of the pyrenoids, the chemical composition of the cell wall, serological cross-reactions, physiological, biochemical, morphological and molecular biological. In 1992 various pieces of evidence of algal cultures labelled as "*C.pyrenoidosa*" were examined. It was discovered from this that the algal cultures labelled as *C. pyrenoidosa* had to be classified as completely different species. For example, strains of *C. vulgaris* were identified which were recorded under the name "*C. pyrenoidosa*". A large proportion of the *C.pyrenoidosa* – algal cultures belonged, however, to the species *C. sorokiniana* and "*C. fusca*", which is now not even classified as the genus *Chlorella*, but the closely related genus *Scenedesmus* (Kessler & Huss; 1992). This means that, **according to the latest findings, there is no species "*Chlorella pyrenoidosa*". Rather this is an outdated term under which species and strains of various algal groups were recorded.** The *Chlorella* group currently consists of three species: *C. vulgaris*, *C. lobophora* and *C. sorokiniana* (Krienitz et al.; 2004). Back in 1999 the genus *Chlorella* consisted of just these three species and *C. kessleri* (Huss et al.; 1999). *Chlorella vulgaris* BEIJERINCK is the species giving the genus its name and deposited in official strain collections as the type species. It was isolated and first described by Prof. M.W. Beijerinck in 1889 in Delft (Netherlands).

Kessler E. & Huss V.A.R. 1992. Comparative physiology and Biochemistry and taxonomic assignment of the Chlorella (Chlorophyceae) strains of the culture collection of the University of Texas at Austin. *Journal of Phycology* 28: 550-553.

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Krienitz L.; Hegewald E.H.; Hepperle D.; Huss V.A.R.; Rohr T. & Wolf M. 2004. Phylogenetic relationship of *Chlorella* and *Parachlorella* gen. nov. (Chlorophyta, Trebouxiophyceae). *Phycologia* 43: 529-542.