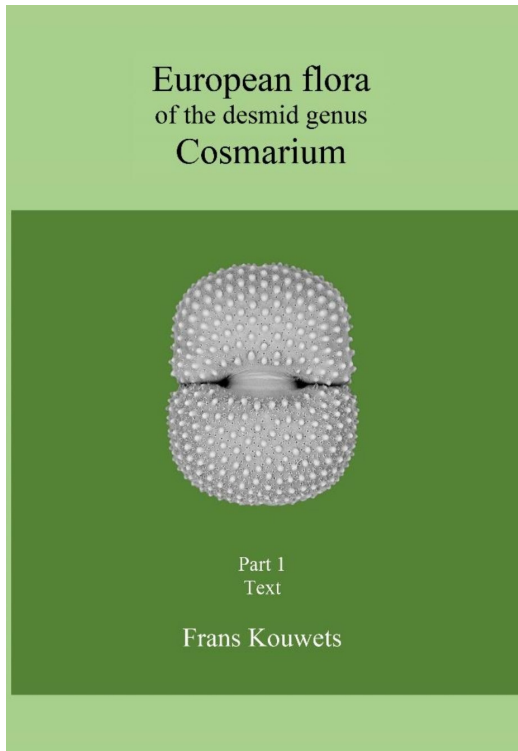


Review: European flora of the desmid genus *Cosmarium*

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Kouwets, F., 2025. European flora of the desmid genus *Cosmarium*, Part 1 Text and Part 2 Plates. 24bookprint, Rotterdam, NL, pp 1-761 (Part 1) and pp 1-307 (Part 2). 24bookprint.com. ISBN 9789403785776 and 9789403785783, € 65,- and € 35,-.



Kouwets' comprehensive treatise on *Cosmarium* will undoubtedly become one of the foremost taxonomic references for this difficult genus of desmids. At the current price of less than 100 euros, not including shipping, these print-on-demand books are well within the price range for most researchers.

This new *Cosmarium* flora includes species reported from the Western Palaearctic Region, an expansive geographic area that includes Europe, Iceland, North Africa, the northern portion of the Arabian Peninsula, and the temperate regions of Asia. The flora, which is written in English, is separated into two parts: Part 1 contains an Introduction with information about the approach used in the book, and a detailed Systematics section that describes the species and varieties reported from the region; Part 2 is primarily dedicated to illustrations of the taxa, but also includes a helpful list of references. All illustrations are hand drawn by the author, either from preserved samples or redrawn from cited sources.

In the Introduction, Kouwets discusses the complexity of working with *Cosmarium*, stating that the group does not yet form "a well-defined genus but rather a collection of biradial forms that cannot be clearly attributed to one of the other desmid genera described." Perhaps, because of this, Kouwets includes a key to desmid genera in the Introduction. This will be particularly useful to students learning to identify desmids. They can start by eliminating the "easier" genera, and what remains is likely to be *Cosmarium*. Interestingly, Kouwets does not include a key to *Cosmarium* species, on the grounds that many species are so similar that creating a useful key is nearly impossible. Instead, similar species are arranged in groups on the plates in Part 2. Other useful features of Part 1 include detailed examples of the terminology used in his book and a glossary of morphological terms. In my experience teaching algal taxonomy, my students were often overwhelmed by the rich, and sometimes variable, descriptive terms used to describe morphological features in desmids.

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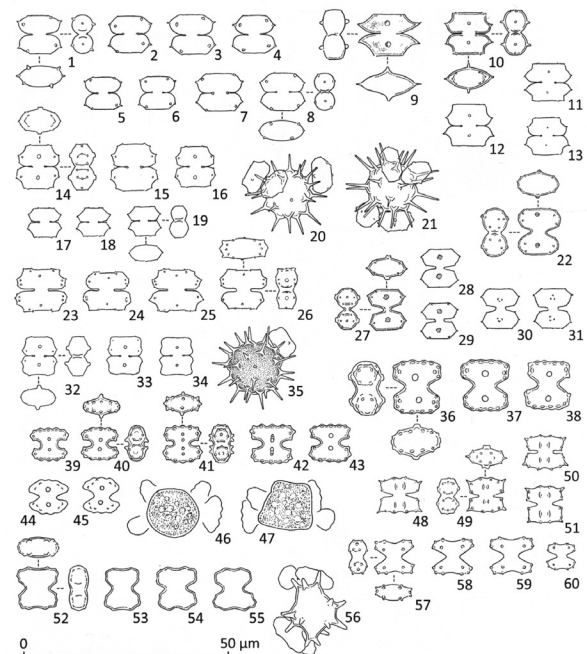
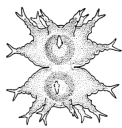


Plate 108 — 1–8: *Cosmarium pseudoheimerlii*; 9: *C. sinostegos* var. *sinostegos* f. *sinostegos*; 10–13: *C. sinostegiforme*; 14–21: *C. obtusius* (20–21: zygospores); 22: *C. paucigramulatum*; 23–26: *C. ausseeanum*; 27–31: *C. hexagoniforme*; 32–35: *C. pseudonorimbergense* (35: zygospore); 36–38: *C. cymatonophorum* var. *cymatonophorum* f. *cymatonophorum*; 39–47: *C. carinthiacum* (46–47: zygospores); 48–51: *C. neodilatatum*; 52–56: *C. tritum* (56: zygospore); 57–60: *C. regnesiforme*.
9: Redrawn from Schaarschmidt 1883 (as *C. sinostegos*); 14–21: Redrawn from Kouwets 1988a (as *C. sinostegos* var. *obtusius*, slightly adapted); 22: Copied from Kouwets 2001 (Caption continued on p. 235)



Kouwets discusses the likely future effect of molecular research on *Cosmarium* taxonomy, but argues quite effectively that molecular based taxonomy is still in its infancy for complex groups like *Cosmarium*. His classification is based on differences in cell morphology following International Code of Nomenclature standards. Kouwets has a strong preference of avoiding excessive use of infraspecific varieties or forms. As a result, many *Cosmarium* taxa that have been listed as varieties in previous publications were listed as being synonymous with the nominate variety or elevated to newly described species. Kouwets includes a detailed index at the end of Part 2 that helps readers locate revised or newly named species using older species names.

relevant plate; a detailed citation to the original description, homotypic and heterotypic synonyms; cell dimensions; habitat/occurrence in the region; detailed notes from historical records of the species; and citations for doubtful or rejected infraspecific taxa from both within and outside the Western Palaearctic Region.

Overall, I found Kouwets' books remarkably easy to use, despite the difficult subject matter. I highly recommend it for desmid enthusiasts, regardless of their level of taxonomic proficiency. Novice taxonomists will appreciate the consistency in species descriptions and the helpful organization of similar morphological forms on the same or adjacent plates, while advanced taxonomists will enjoy the detailed historical nomenclature analysis. Even taxonomists working outside the Western Palaearctic Region, like me, will find this flora useful for evaluating regional similarities and differences in *Cosmarium* species.

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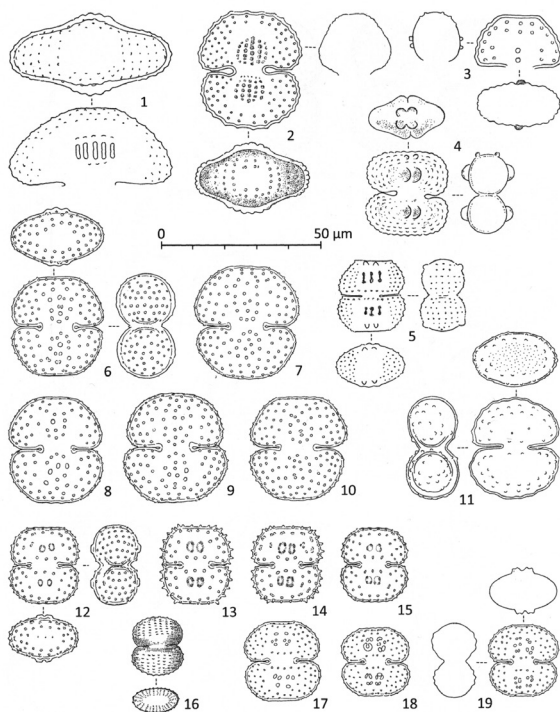



Plate 146 — 1: *Cosmarium freystadtense*; 2: *C. subreniforme*; 3: *C. bipapillatum*; 4: *C. humyadyanum*; 5: *C. bivertex*; 6–10: *C. anisochondroides*; 11: *C. compressum*; 12–15: *C. vogesiacum* f. *vogesiacum*; 16: *C. striatigranulatum*; 17–19: *C. mandosii*.
1: Redrawn from Grünblad 1926; 2: Redrawn from Nordstedt 1875; 3: Redrawn from W. West 1892a (as *C. boeckii* subsp. *bipapillatum*); 4: Redrawn from Schaarschmidt 1883; 5: Redrawn from Raciborski 1889b; 11: Redrawn from Williamson & Carter 2016 (as *C. didymochondrum* var. *compressum*); 16: Redrawn from Schmidle 1898b.

One of the most impressive and useful features in Kouwets' book is his detailed analysis of the taxonomic history for *Cosmarium* species reported from the Western Palaearctic Region. Species that he considers questionable are listed as "species dubia et inquirenda" with citations to the original literature source(s) and an explanation as to why the species needs further study. Valid species are described in a uniform format that includes: diagnostic features and reference to the

The taxonomy of the desmid genus *Cosmarium* – currently considered the largest genus of this group of green algae world-wide – is confused by problematic species identification. Poor original descriptions and figures (if any) that are inadequate for a reliable determination have resulted in on the one hand many misidentifications and misinterpretations, and on the other hand in a large series of infraspecific taxa, either differing in minor detail or not related to the species in question at all.

Desmids are excellent indicators of environmental conditions and hence frequently used for water quality and nature value assessment. However, for such applications correct species identification (or at least discrimination) is a prerequisite. To improve this critical floras are indispensable, but up till now for the genus *Cosmarium* in particular no such flora had been published. The present flora aims to meet this need. It presents a taxonomical treatment of the *Cosmarium* taxa reportedly occurring in the Western Palaearctic Region (which is covering an area slightly more extensive than Europe alone) and includes nearly 900 species and many more infraspecific taxa. All the relevant literature has been carefully studied and opinions of other authors are discussed. In addition, details on morphology, ecology and distribution are given. Finally, every accepted, well established species is illustrated with detailed drawings, for the greater part from the authors own hand.



Frans Kouwets (1954) devoted his entire professional career to the study of ultrastructure, morphology, taxonomy and distribution of various groups of micro-algae. In the late 1970's, being a msc student in biology at the University of Amsterdam, he became fascinated by desmids through the lectures of his teacher Dr. Peter Coesel. In his spare time, he wrote a series of papers on the taxonomy of this group based on the many samples he collected in various regions of France. These collections and the thousands of drawings he made of the species encountered formed the basis of the present flora, also entirely written in his spare time.

