

C₃ *Cyperus* (Cyperaceae)

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Cyperaceae contribute significantly to the botanical diversity of wetlands. In Cyperaceae, the *Cyperus* clade (Cypereae tribe) includes ca. 950 species of grass-like plants with complex inflorescences. In this study both nuclear ribosomal and plastid DNA markers are used to create a molecular phylogenetic hypothesis of the *Cyperus* clade. The molecular phylogenetic data are combined with embryology, anatomy, carbon isotope analysis ($\delta^{13}\text{C}$), morphology, ontogeny of flowers and spikelets, and biogeography. The *Cyperus* clade consists of a paraphyletic genus *Cyperus* s.s. (ca. 700 spp.) as core genus, in which 13 segregate genera are nested. Species of this clade either use C₃ photosynthesis (eucyperoid anatomy) or C₄ photosynthesis (chlorocyperoid anatomy). The C₃ species form a grade at the basis of the *Cyperus* clade (C₃ photosynthesis is the plesiomorphic state for the *Cyperus* clade), in which a well-supported monophyletic clade is nested encompassing all C₄ species. *Cyperus* C₃ species (ca. 150 spp.) are less species rich and less diverse than *Cyperus* C₄ species (ca. 800 spp.). The *Cyperus* C₃ group includes the small genera *Courtoisina*, *Oxycaryum* and *Kyllingiella*, while *Androtrichum* is either sister to the *Cyperus* clade or its most basal taxon. These taxa are recognised at genus level due to specific characteristics which differentiate them from *Cyperus* s.s. The currently recognised supraspecific taxa in C₃ *Cyperus* are generally well-supported in the molecular phylogeny. The previously recognised C₄ *Cyperus* section *Elegantes* (*Glutinosi*, *Viscosi*) was proven to be heterogeneous as it includes both C₃ and C₄ species. Ultimately, we aim to provide a detailed revision of the *Cyperus* C₃ group and propose a new classification with clearly characterised monophyletic groups.