

Phylogeny of the Moss Family Bryaceae Inferred from Chloroplast DNA Sequences and Morphology

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Abstract

Phylogenetic relationships within the moss family Bryaceae were studied using chloroplast DNA sequences (*atpB-rbcL*, *rpl16* intron, *rps4*, and *trnL-trnF* region) and anatomical and morphological data. Phylogenetic analyses using maximum parsimony, maximum likelihood, and Bayesian methods indicate that the genera *Brachymenium*, *Bryum*, and *Rhodobryum* are not monophyletic. A clade including *Acidodontium*, *Anomobryum*, *Brachymenium acuminatum*, *Bryum* species, *Haplodontium*, *Mielichhoferia himalayana*, and *Plagiobryum* is robustly supported in all analyses. The sections *Brachymenium*, *Globosa*, and *Leptostomopsis* of *Brachymenium* occur in a basal grade also including *Bryum billarderi* and *Rhodobryum*. The total evidence analysis supports *Acidodontium* as a monophyletic genus. In general, the results are congruent with previous molecular analyses. Features of the reduced peristome are homoplastic within the Bryaceae, and it is obvious that circumscriptions of taxa based on sporophytic characters alone may unite taxa that are distantly related. The rosulate growth condition is homoplastic within the family, which suggests that the genus *Rosulabryum* is not monophyletic. Based on present phylogenetic evidence, no morphological synapomorphies can be detected for the Bryaceae.

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