

Phylogenetic relationships in the tribe Trichocereae (Cactaceae) inferred from cpDNA sequence data analyses

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Cacti are remarkable for their large diversity of growth-forms, ranging from trees and shrubs to caespitose or single globular stems. The tribe Trichocereae of subfamily Cactoideae comprises about 25 genera and some 250 to 300 distinct species, including some of the most diverse and attractive cacti from southern South America (i.e. *Cleistocactus*, *Echinopsis*, *Rebutia*). This tribe is particularly diverse in habit and related morphological characteristics. The phylogenetic relationships within the tribe Trichocereae and its closest relatives from the tribes Browningieae and Cereeae are reconstructed based on chloroplast DNA sequences from the *trnK* intron (including the *matK* gene) and the *rps16* intron. Overall, 38 taxa of Trichocereae and 28 outgroup taxa of Cactoideae are used for parsimony and Bayesian analyses. The tribe Trichocereae as traditionally circumscribed does not form a monophyletic group. *Brachycereus* and *Jasminocereus*, the two monotypic genera endemic to the Galápagos Islands form a well-supported clade sister to the Ecuadorian genus *Armatocereus*, and are nested in the HLP clade (name derived from initials of the tribes Hylocereeae, Leptocereeae and Pachycereeae). *Discocactus*, *Espositoopsis*, *Facheiroa*, *Gymnocalycium*, *Lasiocereus*, and *Leocereus* are not part of core Trichocereae, but show relationships with other representatives of the BCT clade (name derived from initials of the tribes Browningieae, Cereeae and Trichocereae). Furthermore, there is no support for the monophyly of *Rebutia* s.l. Within the BCT clade, a subclade of core Trichocereae including genera such as *Acanthocalycium*, *Cleistocactus*, *Echinopsis*, *Espositoa* and *Weberbauerocereus* receives fairly good statistical support, though, they largely form a polytomy. An exception is a well-supported clade comprising representatives of predominantly west Andean genera characterized by producing flowers near the stem-apices (i.e., *Haageocereus*, *Mila*, *Matucana*, *Oreocereus*, *Oroya* and *Pygmaeocereus*) whose relationships are clearly resolved. Aspects of growth-form evolution in core Trichocereae will be discussed based on the available phylogeny.