

# Phylogenetics and predictive distribution modeling provide insights into the geographic divergence of *Eriosyce* subgen. *Neoporteria* (Cactaceae)

Guerrero, Pablo C.

Arroyo, Mary T.K.

Bustamante, Ramiro O.

Duarte, Milén

Hagemann, Thomas K.

Walter, Helmut E.

The classification of *Eriosyce* subgenus *Neoporteria* ("subsection" in the sense of Kattermann) and the role of allopatry/sympatry in the diversification of the group were studied by use of cladistic and predictive distribution modeling methods. We reconstructed the phylogenetic relationships of subgenus *Neoporteria* by analyzing 38 morphological characters and DNA sequences from two chloroplast regions of 21 taxa from the Chilean subsections of *Eriosyce* using a Bayesian and maximum likelihood phylogenetic framework. Also, we attempted to find out if the divergence between the sister taxa in the *Neoporteria* group had been caused by allopatric or sympatric mechanisms. The morphology-based analysis placed *E. chilensis* basal within the *Neoporteria* clade and suggested a further broadening of the group by including *E. taltalensis* var. *taltalensis*, formerly considered a member of subsection *Horridocactus*. However, the combined DNA data placed *E. sociabilis* and *E. taltalensis* var. *taltalensis* wi