

LI, JIANHUA^{1,2*} and DONGLIN ZHANG². ¹Arnold Arboretum, 125 Arborway, Jamaica Plain, MA 02130; ²Landscape Horticultural Program, University of Maine, 5722 Deering Hall, Orono, ME 04469-5722. - Phylogeny and biogeography of eastern Asian-North American disjunct genera *Thuja* and *Chamaecyparis* (Cupressaceae) inferred from sequences of nrDNA ITS region.

Disjunct genera between eastern Asia and North America (EA-NA) have been recently used as a model system to study relationships of species diversification and ecological diversity based on the assumption that species from either side of the Pacific Ocean form their own clades. This is indeed the case for some disjunct genera such as *Stewartia*, *Boykinia*, *Torreya*, and section *Aralia*. In some other disjunct genera, however, we have seen different biogeographic patterns. In *Hamamelis*, Japanese species is more closely related to North American species than to another Asian species. Therefore, it is important to study more disjunct genera phylogenetically for achieving a better understanding of phylogenetic patterns and pathways of migration of these disjuncts. In this study we conducted phylogenetic analyses of two EA-NA genera, *Thuja* and *Chamaecyparis*, using sequences of nrDNA ITS. Also included in our analyses were species from other genera of the Cupressoideae clade, including *Cupressus*, *Juniperus*, *Calocedrus*, *Thujopsis*, and *Microbiota*. These two disjunct genera show different phylogenetic and biogeographic patterns. Two North American species of *Thuja* (*T. plicata* and *T. occidentalis*) formed a well-supported clade that was derived from eastern Asian grade, whereas two North America species of *Chamaecyparis* (*C. thyoides* and *C. lawsoniana*) did not form a clade. Our other results are consistent with previous phylogenetic analyses based on chloroplast DNA sequences. *Thujopsis* was sister to *Thuja*, and *Cupressus* and *Juniperus* formed a clade, while *Chamaecyparis nootkatensis* was allied with species of *Cupressus*, not *Chamaecyparis*. We also employed dispersal vicariance analysis (DIVA) to examine ancestral areas and biogeography of *Thuja* and *Chamaecyparis*. Fossil data were also considered in our analyses. Our results led us to the conclusion that it is critical to evaluate phylogenetic relationships of individual disjunct genera and that it may be inaccurate to assume that EA-NA species have a sister relationship.

Key words: biogeography, *Chamaecyparis*, eastern Asian-North American disjunct, Phylogeny, *Thuja*