

RECONSIDERING THE PALEORANGE OF *FAGUS GRANDIFOLIA*

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ABSTRACT

One of the major consequences of forecasted future climate change is the redistribution of plant life due to species migrations and extinctions in response to these changes. This has caused many scientists to look at the history of vegetation migrations to help understand future vegetation management strategies and biodiversity concerns. Our knowledge and understanding of past long-term species range changes is best understood from interpretations of the palynological record.

This study reexamines paleopollen data from the World Data Center in conjunction with a recent chloroplastic DNA study of one temperate woody vegetation species, *Fagus grandifolia*. The pollen percentage level of 0.5 percent of total pollen is used to infer the presence of *Fagus grandifolia* at palynological sites. When assumptions about the suitability of this threshold are challenged, a different late-Pleistocene geography emerges for *Fagus grandifolia*.

A survey of all palynological sites in the North American pollen database for *Fagus grandifolia* pollen, in conjunction with supporting DNA evidence, indicates consistent patterns of more northerly refugial locations and different migration routes for *Fagus grandifolia* than currently accepted. Patterns of pollen deposition and DNA evidence reveal a possible refuge in the area of the northern Mississippi Embayment. There is as well evidence of refugia for and expansion of *Fagus grandifolia* mixed with boreal forest elements along the Appalachian Plateau, closer to the ice sheet margin than the Gulf Coastal Plain.