The emerging Patagonian fossil record of Cunoniaceae and its biogeographical significance

María A. Gandolfo[1], Elizabeth J. Hermsen[1,2]

[1] *L.H. Bailey Hortorium, Department of Plant Biology, Cornell University, Ithaca, NY, USA,* *mag4@cornell.edu*
[2] *Department of Environmental and Plant Biology, Ohio University, Athens, Ohio, USA*

Iconic families considered fundamental for understanding the origin of Southern Hemisphere floras include Nothofagaceae, Myrtaceae, and Proteaceae. These three families have an extensive "Gondwanan" fossil record supporting the connection among Australia, Antarctica and South America. Recent paleobotanical studies are providing evidence, however, that several other Southern Hemisphere families are well-represented in the fossil record and may yield new biogeographic insights. This contribution is based on new evidence concerning the fossil record of one of these lesser-studied families, Cunoniaceae. Cunoniaceae include approximately 26 genera and 300 species that are found predominantely in tropical montane and wet temperate regions of the Southern Hemisphere, with a center of diversity in Australasia. The fossil record of Cunoniaceae reflects the extant distribution: they are well known from Australian fossil pollen, fruits, flowers, and leaves, but scarce in South America and Antarctica. In Patagonia, the oldest records are pollen from the Danian Salamanca Formation, and the only macrofossils previously attributed to Cunoniaceae include *Weinmannioxylon* wood and leaves of questionable affinities. Newly discovered macrofossils collected from caldera-lake deposits of the early Eocene Laguna del Hunco flora, Patagonia, Argentina, now definitively support the presence of the family in ancient Patagonia on the basis of reproductive macrofossil evidence, including impression fossils of infructescences and isolated fruits. The infructescences are similar to *Caldcluvia* and *Weinmannia*; they are characterized by a main axis bearing pedicellate capsules with two valves dehiscing septicidally. Extant species of both genera are found today in wet temperate forests of the Patagonian Andes. Isolated indehiscent fruits (pseudosamaras) with enlarged sepals exhibit a calycine venation pattern similar to that of extant *Ceratopetalum*, a genus with six to eight extant species found primarily in Australasia and four extinct species represented by Australian Cenozoic fossils. These fossils are not only important for understanding the morphological evolution of the groups they represent, but also for understanding the biogeographic evolution of the floras of the Southern Hemisphere. We will explore these themes in addition to the structural evidence for the affinities of the fossils in this presentation.

Keywords: infructescences, isolated fruits, Southern Hemisphere, Eocene.