
COOPER AWARD

The William S. Cooper Award is given by the Society in honor of one of the founders of modern plant ecology, in recognition of an outstanding contribution in geobotany, physiographic ecology, plant succession, or the distribution of organisms along environmental gradients. This year's award goes to Kevin Boyce, Jung-Eun Lee, Taylor S. Feild, Tim J. Brodribb, and Maciej A. Zwieniecki for their 2010 paper "Angiosperms helped put the rain in the rainforests: the impact of plant physiological evolution on tropical biodiversity," published in the *Annals of the Missouri Botanical Garden*.



Most recipients of the Cooper Award have explored the ways in which vegetation distribution, composition, and function is governed by various abiotic and biotic processes. This innovative paper takes the opposite tack. Boyce et al. (2010) compellingly argue that the evolutionary rise to dominance of angiosperms, roughly 100 million years ago, fundamentally transformed the global hydrological cycle and led to the formation of tropical rain forests as we know them today. The key evolutionary innovation was a higher transpiration capacity, caused by leaf vein densities that are typically four times that of other living and extinct plant groups. This enhanced transpiration capacity accelerates a positive feedback loop in which angiosperm evolution increased rates of moisture recycling and precipitation over the tropical rain forests, which may have further fostered angiosperm radiation. This exciting hypothesis is based on a clever synthesis of climate model sensitivity experiments and the evolutionary history of leaf venation as revealed in the fossil plant record. Thus, Boyce et al. tie the evolution of a key innovation with the formation of a new biome, explicitly linking the evolving ecological landscape with a changing evolutionary one.