B·DEBATE International Center for Scientific Debate BARCELONA

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DOUG SOLTIS

CV

PARTICIPANT AT:

EVOLUTION OF PLANT PHENOTYPES

FROM GENOMES TO TRAITS

March, 17th-18th, 2015, Barcelona

Doug Soltis, Distinguished Professor, University of Florida, Gainesville, USA

Doug Soltis has more than 30 years of experience in the field and he has aproximately 400 publications. After a long career, he became Professor for the University of Florida in 2000 and after different periods he finally was Distinguished Professor of the University of Florida in 2008, position which he still possess. His major research interests are the investigation of speciational mechanisms, evolutionary relationships, and character evolution in flowering plants utilizing a variety of experimental approaches. His current major interests include the study of higher level phylogenetic relationships and evolution in the angiosperms, the evolution and early diversification of the flower (floral developmental genetics), the ancestral angiosperm genome and subsequent genome evolution, the genetic and genomic consequences of polyploid speciation, conservation genetics of rare plant species, and phylogeography.

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ABSTRACT

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Polyploidy, Shifts in Diversification and Associated Changes in Characters in Angiosperm Evolution

The strong framework and depth of coverage of the plant tree of life provides an important opportunity to elucidate features that have promoted angiosperm diversity. Polyploidy or genome doubling has been frequent in angiosperm history. Using a time-calibrated densely sampled phylogeny for many thousands of angiosperms, it is possible to examine lineage diversification across the angiosperm tree of life and test the impact of whole-genome duplication (WGD) on angiosperm radiations. Across the angiosperms, nested shifts in diversification have resulted in an overall increased rate of net diversification and declining relative extinction rates through time. But, these shifts in diversification seldom correspond perfectly with WGD events. We found support, however, for a lag-time WGD radiation hypothesis, which suggests that increases in diversification follow closely behind WGD events. With this in mind we can begin to search for key morphological traits that might be associated with these important diversification events. For example, at a deep scale, the mesangiosperm radiation (which yielded all angiosperms after the basalmost lineages) is associated with major morphological changes, including the evolution of sealed carpels, vessel elements, and changes in perianth phyllotaxy and merosity. The eudicot radiation is associated with WGD as well as changes in chemistry and floral morphology. At shallower scales, WGD and diversification in Brassicales appears correlated with the chemical diversification in glucosinolates. Nodulation is associated with WGD and diversification in legumes. Other ancient WGDs and subsequent diversification events should be more closely examined to ascertain possible associated changes in morphological and chemical features, as well as to investigate the underlying genetic and genomic causes of these attributes.

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