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Evolutionary Developmental Biology (Evo-Devo)

Han, Jiahong [1], Berger, Brent [2], Ricigliano, Vincent [3], Gardner, Andy [4], Shepherd, Kelly A. [5], Jabaily, Rachel Schmidt [6], Howarth, Dianella [7].

Phylogenetics and expression of *CYCLOIDEA*-like genes in Goodeniaceae.

Floral symmetry is of special interest in understanding angiosperm evolution and ecology. Shifts in floral symmetry have been common between radial symmetry and bilateral symmetry within angiosperms. Growing evidence from transcription factors in the TCP gene family, *CYC*-like genes, indicate that dorsal restriction of expression in the corolla and gene duplication are correlated with a shift to bilateral symmetry. In this study, we examined the duplication events around the diversification of Goodeniaceae, a predominately Australian and Pacific Island plant group, which contains both radially and bilaterally symmetrical flowered species. We found the three core eudicot specific clades of *CYC*-like genes (*CYC1*, *CYC2*, and *CYC3*) in Goodeniaceae. Also we found additional duplications within two clades (*CYC2* and *CYC3*) clades in Goodeniaceae. Additionally, there are additional copies of *CYC3* (within *CYC3A* and *CYC3B*) in most species of Goodeniaceae with bilaterally symmetrical flowers. Using realtime qPCR, we showed that most of these copies are expressed across floral tissue in the Goodenicaceae species *Scaevola aemula*. One copy, *SaeCYC2* was expressed in a dorsal-ventral pattern as has been found in *CYC2* paralogs in other groups. *SaeCYC2* was expressed much higher in dorsal petals than in the ventral petals. Conversely, a *SaeCYC3* paralog has the highest expression in ventral petals in *S. aemula*. Taken together, these results indicate that *SaeCYC2* may be expressed in a similar pattern to that is other groups, but that *SaeCYC3* may have the opposite expression pattern, being more highly expressed ventrally. Based on our phylogeny and expression analyses, we suggest that gene duplication and asymmetry expression have played a major role in diversification of the Goodeniaceae *CYC* gene family.

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Date: Monday, August 1st, 2016
Time: 5:30 PM This poster will be presented at 5:30 pm. The Poster Session runs from 5:30 pm to 7:00 pm. Posters with odd poster numbers are presented at 5:30 pm, and posters with even poster numbers are presented at 6:15 pm.
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