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ON THE COVER



Diversification of MADS box genes has been proposed as a major driving force for floral diversity in land plants. Yamaguchi et al. (pages 15–28) investigate the functions of rice *OSMADS3* and *OSMADS58*, homologs of *Arabidopsis* *AGAMOUS*, a C-class MADS box gene that regulates stamen and carpel identity and floral meristem determinacy. The authors show that disruption of *OSMADS3* in a T-DNA insertion line results in homeotic transformation of stamens into lodicules and the ectopic development of lodicules in the second whorl. By contrast, RNA-silenced lines of *OSMADS58* developed flowers that reiterate lodicules, stamens, and carpel-like organs, suggesting loss of determinacy in the floral meristem. The results suggest that functions regulated by *AGAMOUS* in *Arabidopsis* have been partially subfunctionalized during the evolution of rice into two paralogous genes, *OSMADS3* and *OSMADS58*, which arose from a recent gene duplication event. In addition, the development of ectopic lodicules in *OSMADS3* loss-of-function mutants points to a role for C-class genes in the asymmetric distribution of lodicules in the rice flower.

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