[The Collaborated Seminar by 5 Graduated Schools]announcement

Mechanisms of flattened unifacial leaf morphogenesis in *Juncus prismatocarpus*

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Tuesday, September 18th, 2018 at 14:00
Room C301, Graduate School of Biosphere Science
Hiroshima University, Higashi-Hiroshima campus

Abstract

Bifacial leaves, such as those of the model plants *Arabidopsis*, rice, and maize, have both adaxial and abaxial identities which determine leaf flatness. Unifacial leaves, on the other hand, partially lack the adaxial identity on their leaf blade. Despite this, a flattened (thickened) leaf blade can develop in some species. Using *Juncus prismatocarpus* as a model, we revealed its flattened leaf blade morphogenesis at the molecular and cellular levels. At the molecular level, we showed that *DROOPING LEAF* (*DL*), a YABBY transcriptional factor, is the key gene for its leaf blade flattening (Yamaguchi *et al*., 2010. *Plant Cell*). At the cellular level, analyzing cell division orientation is traditionally a major hindrance in studying morphogenesis. We first developed a method to detect the cell division direction (Yin & Tsukaya, 2016. *New Phytol*.). We then applied this method to *J. prismatocarpus* and found that thickening cell divisions are the most abundant (> 45.0%) in various developmental stages. Moreover, we are able to map such thickening cell divisions on the leaf blade and showed that their distribution on the leaf blade was quite diffused instead of restricted in a certain domain. This is in sharp contrast to the expression pattern of *DL* and indicated that *DL* works in a non-cell-autonomous manner in terms of promoting thickening cell divisions. Together, our data suggest a model of flattened unifacial leaf morphogenesis (Yin & Tsukaya, submitted).

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