Elucidation of Developmental Phase Transition Mechanisms and Breeding Technologies in *Artemisia princeps*

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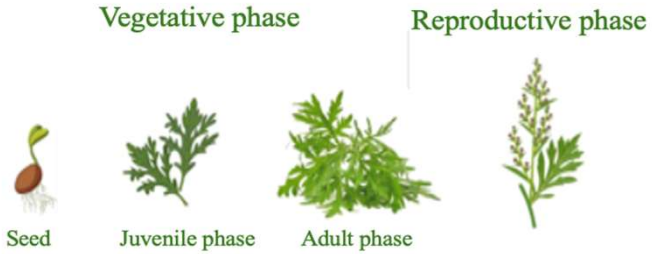


➢ Background

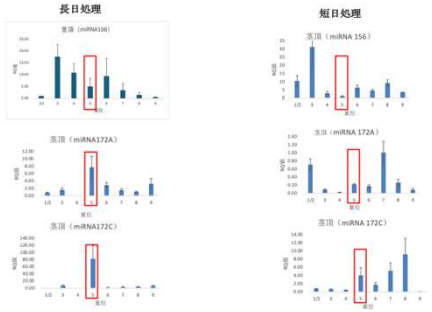
- Developmental phase transition remains unclear in *Artemisia princeps*.
- Molecular mechanisms underlying flowering competence are unknown.
- Flowering control and emasculation techniques are lacking for efficient breeding.

Juvenile-to-Adult Phase Transition

Short-day: 8 h light / 16 h dark
Long-day: 16 h light / 8 h dark

- Morphological changes
  leaf shape index and DI

- Expression pattern of miR156 and miR172

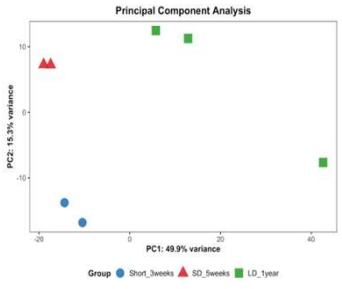


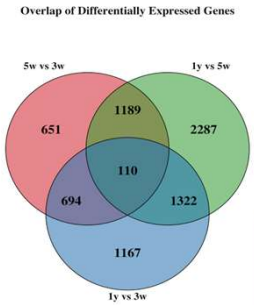
Results

Photoperiod	Trichome Development	miRNA Expression Change	Dissection Index
Long-day	4th leaf stage	5th leaf stage	5th leaf stage
Short-day	4th leaf stage	5th leaf stage	5th leaf stage

Transcriptome Analysis

- RNA-seq analysis of shoot apices





Candidate Genes Identified by RNA-seq

Category	Candidate genes
Phase transition	SPL2, SPL13A
Photoperiod	COL2, COL5, COL16
GA signaling	GID1B, GID2
Meristem development	STM, KNAT6

Flowering Induction

- Long-day to short-day transfer experiments
- Flowering responses are currently being evaluated.
- Photoperiodic regulation may control flowering in *A. princeps*.

Future Work

- Validation of SPL pathway genes
- Identification of juvenile-to-adult markers
- Optimization of flowering induction systems
- Development of breeding techniques

Conclusions

- Juvenile-to-adult markers were identified.
- SPL genes are candidate regulators.
- Photoperiod may regulate flowering.