Proceedings of the 52nd Italian Society of Agricultural Genetics Annual Congress
Padova, Italy – 14/17 September, 2008
ISBN **978-88-900622-8-5**

Oral Communication Abstract – 4.03

VERNALIZATION DOWN-REGULATES FLC TRANSCRIPTS AND MEDIATED TRANSITION TO FLOWERING IN *CICHORIUM INTYBUS*

LOCASCIO A., VANNOZZI A., PARRINI P., LUCCHIN M., VAROTTO S.

Department of Environmental Agronomy and Plant Production, University of Padova,
Viale dell'Università 16, 35020 Legnaro (PD) (Italy)

flowering transition, vernalization, inflorescence, FLC, chicory

The transition from vegetative to reproductive development for a plant is a highly regulated process sensitive to endogenous and environmental cues. In Arabidopsis thaliana, the ability to flower is mainly related with the silencing of a floral repressor, named Flowering Locus C. Repression of the MADS box transcription factor FLC, through vernalization or the autonomous pathway results in the acceleration of flowering.

Interestingly, for the light-dependent, autonomous and GA integration and meristematic pathways, comparative genetic approaches show that flowering time genes are conserved between Arabidopsis and a large range of crop species. By contrast, the vernalization pathway seems to be only partially conserved, since FLC and FRI were not characterized in dicots other than Brassicaceae.

Cichorium intybus is a biennial species belonging to Asteraceae family, which requires vernalization to flower. In Italy different types of chicory have been selected by farmers as leafy vegetable. These types show quite different behaviour in relation to flowering. The knowledge of the genetic regulation of flowering in cultivated chicory will be useful to control the time of flowering and increase the uniformity and yield of the crop.

We investigated the molecular basis that regulates the switch from the vegetative to reproductive phase in chicory. *Ci*FLC sequences were isolated and their expression patterns characterized during plant development and in response to vernalization in different light condition. A vernalization-mediated decrease of FLC was related with changes in SAM morphology and transition to flowering. The biological function of *Ci*FLC was analyzed by the complementation of the AtFRIflc3 mutant and chicory transgenic plants with up and down-regulation of *Ci*FLC were generated. Up to now, our results indicate that regulation of *Ci*FLC expression, both in time and space, is only partially shared between arabidopsis and chicory and we propose a novel function for FLC regarding leaf organization in *C. intybus*.