Proceedings of the 50th Italian Society of Agricultural Genetics Annual Congress
Ischia, Italy – 10/14 September, 2006
ISBN **88-900622-7-4**

Poster Abstract – D.18

HtKNOT1, A CLASS I *KNOX* GENE IS HIGHLY EXPRESSED DURING THE DEVELOPMENT OF INFLORESCENCES IN *HELIANTHUS*

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floral meristems, Helianthus annuus, Helianthus tuberosus, Knotted1-like genes

The first identified plant homeobox gene, *KNOTTED1* (*KN1*; Vollbrecht *et al.*, 1991), isolated from maize, provided evidence that plant homeobox genes, similar to those of animals play important role in regulating developmental processes. *KN1*-like homeobox (*KNOX*) genes have been grouped into two classes, I and II, based on sequence similarity and expression patterns. The overexpression of class I *KNOX* genes induces disparate, species-specific phenotypes including ectopic meristem formation, delayed cell-fate acquisition, indeterminate growth patterns, increased leaf lobbing and super-compound leaf morphology. Null mutations of *KNOX* genes may abort the development and/or maintenance of shoot apical meristems (SAMs). Recently, we have isolated a cDNA full-length sequence of class I *KNOX* gene from *Helianthus tuberosus* (*HtKNOT1*). *HtKNOT1* mRNA transcripts were detected in vegetative shoot apices and stem internodes, while leaves (blades and veins) and petioles did not accumulate any detectable *HtKNOT1* transcripts (Chiappetta *et al.*, 2006). Here, we have investigating the possible role of *HtKNOT1* in controlling development of the inflorescence in *Helianthus*. The inflorescence of sunflower is heterogamous. Ray flowers are characterized by three elongated petals fused to form strap-like structures surmounting a short corolla tube. They are located in the outermost whorl of the head and are sterile, retaining only filamentous remnants of the aborted stamens and/or style and large flat ovaries with no ovules. Disk flowers are hermaphrodite, carrying both male and female organs. Each disk flower is subtended by a sharp-pointed chaffy bract, and it consists of an inferior ovary carrying a single ovule, two pappus scales and a five-lobed tubular-like corolla. The five anthers are joined together to form a tube, with separate filaments attached to the base of the corolla tube. Inside the anther tube is the style, terminating in a divided stigma with receptive surfaces in close contact in the bud stage before the flower opens. Inflorescence meristems of *H. annuus* and *H. tuberosus* showed *HtKNOT1* expression in the region of the floret meristem, in the developing organ primordia (i.e. floral bracts, petals, stamens and carpels). In older florets strong expression of *HtKNOT1* is seen in developing ovule. Notably, in the anthers of *Helianthus HtKNOT1* expression is also seen in pollen mother cells, in the tapetum and in the first and second mitotic division of developing pollen. Several class I *KNOX* genes are known to be involved in carpel development (Janssen *et al.*, 1998; Pautot *et al.*, 2001; Tioni *et al.*, 2003). By contrast, involvement of *KNOX* genes in stamen development is limited to primordia initiation (Janssen *et al.*, 1998; Sentoku *et al.*,

1999). If *HtKNOT1* is indeed involved in microsporogenesis then that a new function of the class I *KNOX* genes will be identified.

Acknowledgements: This work was supported by grants from PRIN 2004-2005

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