*Proceedings of the XLIX Italian Society of Agricultural Genetics Annual Congress*
*Potenza, Italy – 12/15 September, 2005*
ISBN **88-900622-6-6**

**Poster Abstract - B.15**

# IS *SERK* RESPONSIBLE FOR THE CELL FATE OF APOSPOROUS INITIALS IN APOMICT *POA PRATENSIS* L.?

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*apomixis, SERK, sporogenesis, gametogenesis, Kentucky bluegrass*

Seed production generally requires the mating of opposite sex gametes. Apomixis, an asexual mode of reproduction, avoids both meiotic reduction and egg fertilization. The essential feature of apomixis is that an embryo is formed autonomously by parthenogenesis from an unreduced egg cell of an embryo sac generated through apomeiosis. If apomixis were well understood and harnessed, it could be exploited to indefinitely propagate superior hybrids or specific genotypes bearing complex gene sets. A more profound knowledge of the mechanisms that regulate reproductive events would contribute fundamentally to understanding the genetic control of the apomictic pathway. We previously used the cDNA-AFLP transcriptional profiling technique to isolate messengers from developmentally staged inflorescences in *Poa pratensis* L. More than two thousand transcript-derived fragments were visualized and 179 of them were differentially expressed in apomictic and sexual genotypes. We now report the isolation and characterization of two alleles/members (*PpSERK*1 and *PpSERK*2), starting from an EST clone previously isolated. In apospory, a cell of the nucellus becomes an "aposporous initial" and then develops into a non-reduced embryo sac which gives rise to a viable embryo through parthenogenesis. How and why somatic cells of the ovule change their developmental fate and gain embryogenic potency is not known. Whereas the zygote, formed as a consequence of egg cell fertilization is clearly predetermined to follow the embryogenic cell fate, in other forms of plant embryogenesis, including apomixis, there is a transition phase during which competent and embryogenic cell types are formed. The transition phase is clearly very complex, but an understanding of its underlying mechanisms should lead to a deeper appreciation of the developmental strategy adopted by apomictic plants. The changing fate/acquisition of embryogenic competence mainly relies on dedifferentiation, a process whereby existing transcriptional and translational profiles are erased or altered so that the cell can set a new developmental program. Some authors hypothesized that while most elements concerned with the origin and target processes of cell-to-cell communication in early plant embryogenesis are lacking, the *SERK* gene may be significant component in the mechanism essential for formation of plant cells destined to become embryos. The expression of the *AtSERK*1 homolog gene in *Hieracium* was studied and the pattern between sexual and apomictic plants was shown to be conserved. Our *In Situ Hybridization* data revealed that *PpSERK* is expressed the megaspore mother cell (MMC) of sexual genotypes, but not in that of apomictically reproducing plants. In contrast, the strong signals detected in single nucellar cells neighboring the MMC suggest that *PpSERK* is involved in embryo sac development from nucellar cells. We also report the genomic organization, the characterization through temporal and spatial expression analysis of transcripts in reproductive tissues. Moreover, the putative role of the SERK gene in the process of ovule development and somatic embryo induction is also presented and discussed.