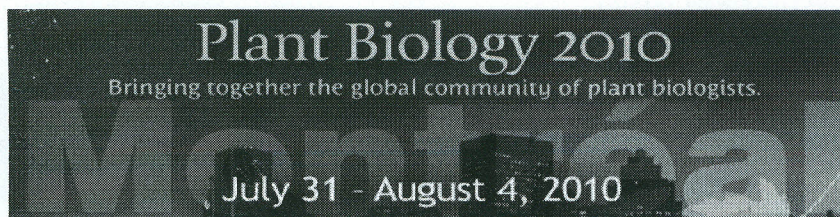


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Poster: Cell Biology

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Abs # P03092: Sorbitol dehydrogenase affects reproductive development in maize

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In maize, sorbitol biosynthesis is mediated primarily by sorbitol dehydrogenase (SDH) (Fructose + NADH \leftrightarrow Sorbitol + NAD), and preliminary data indicated that the *sdh1* mutant could affect kernel-row number per ear. Work here further tested field responses of mutant and wild-type siblings, after backcrossing four times into the W22 maize inbred. The initial *sdh1* mutant was isolated from the Uniform Mu population (which has a uniform W22 background), but additional backcrosses were employed to further clarify potential relationships between the mutant gene and phenotype. Seeds from segregating F2 families were grown in fall 2009 and from F3 progeny in spring 2010. In both seasons, a staggered field design was used, with each family planted at two intervals in at least two sites. All plants were genotyped and self-pollinated two days after anthesis. No difference was evident in field emergence of *sdh1* and wild-type plants, regardless of planting date or field location. Capacity to produce an ear was also similar for all plants (81 in 2009 and 71 in 2010). However, flowering time for the *sdh1* mutant was consistently one day earlier (measured from anthesis). Also, kernel-row number per ear was greater for the *sdh1* mutant, with an average of 0.7 (+/- 0.05) and 0.6 (+/- 0.06) in fall 2009 and spring 2010, respectively. Previous work prior to backcrossing showed two more kernel-rows for *sdh1* mutant ears in 2007 and 2008. Analyses also confirmed earlier observations of elevated hexose and sucrose levels in *sdh1* mutant kernels at 20 to 25 days after pollination. The potential for SDH to affect hexose and redox metabolism is consistent with its apparently broader roles in reproductive development.

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