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Induction and differential expression of dehydrine (*dhn*) genes in wild barley (*hordeum spontaneum*) in response to drought stress.

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Dehydrine genes (*Dhn*) are associated with tolerance to dehydration, and most of the *Dhn* genes are up-regulated by dehydration in barley (Choi et al., 1999, TAG 98:1234-1247). Previous sequence analysis of *Dhn*4 showed allelic variation in wild barley from Israel. Our objectives were to ~~We~~ study the time course of induction and differential expression of eight *Dhn* genes (*Dhn 1,3,4,5,6,7,9,10*) in response to dehydration, between drought-tolerant and drought-susceptible wild barley (*Hordeum spontaneum*) originating from xeric and mesic regions in Israel. Seedlings of desert (Sede Boker) and mesic (Maalot) genotypes were grown in Hogland solution for 10 days, and subjected to drought stress by draining the solution. Leaves were harvested in intervals of 0 (control), 30min, 1, 3, 6, and 24 hours after draining. Northern-blot hybridizations were performed using eight *Dhn* probes. Seven *Dhn* genes were not expressed under normal growth conditions (time 0), except for *Dhn*5, which was expressed at low level in the desert plant. All *Dhn* genes were up-regulated by dehydration in both genotypes, but major differences were observed, both in the time of induction and in the level of expression. Namely, *earlier* induction and *higher* levels of expressions were obtained, at all time courses, in the *desert* genotype than the *mesic* genotype. We demonstrate here that there is functional differences in the expression of *Dhn* genes in response to dehydration, that may have a role in the unique resistance of desert *Hordeum spontaneum* to water stress. Further studies are underway to reveal the mechanism underlying this trait.