OE-01

Large-scale analysis of the cold stress related genes by barley gene chip array

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In order to address spring freezing tolerance among cultivar, we have taken a cold sensitive (cv Keunal) and a cold tolerant (cv Dicktoo) barley (*Hordeum vulgare*) variety. Dicktoo was capable of survival at -3℃ for 30 hours. The varieties were subjected to cold acclimation (4℃ for two days), cold acclimation plus freezing (4℃ for two days followed by -3℃ for 6 hours), freezing treatment without prior cold acclimation (-3℃ for 6 hours), and control treatments. Our objective was to identify genes and their pathways from the Dicktoo variety with transcript changes associated with freezing tolerance. Treatments were applied and RNA extracted at the booting stages, and the barley gene chip (Affymetrix; 22,820 prove sets) was used to survey for variable transcript levels. From the gene pool, 29 genes, which are known to involved in cold-related or other stress metabolism or unknown, were identified in varying .transcript levels. From clustering analysis, freezing treatment was different from both acclimation treatment and acclimation + freezing treatment in expression patterns of the most genes, suggesting that different mechanisms operate between winter and spring freezing stress. Five main expression patterns were detected in both varieties.

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Automatic measurement of Class A Pan evaporation and its numerical interpretation

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Class A Evaporation Pan has been used throughout the world to measure free water evaporation but it requires repetitive manual observations once a day. We introduce a new water level measurement method with higher accuracy and resolution compare with other methods used in commercial instruments. Field observation of evaporation was conducted at a small forest located in Catholic University of Daegu. Meteorological elements were observed at a 1 m height level from the ground surface along with measurements of the temperature and level of water inside the Class A Evaporation Pan. Recorded evaporation rate by the Class A Pan was lower than 0.18 mm/h during the observation period (from 4 August 2006 to 13 August 2006), making the total amount of evaporation 20.9 mm. Relationship between the wind speed and the vapor pressure difference (i.e., between water surface in Class A Pan and 1 meter above it) was derived as : Epan (mm/h) = (0.0063Vwind + 0.0146)(Ewater - Eair)". This equation is very similar to Empirical Dalton Type Function. Total amount of evaporation was estimated to be 20.4 mm from the former equation. There was a close similarity between the observations and the estimations. More observational studies are necessary to fully understand the equation of Empirical Dalton Type Function.