Feibo Wu et al., J Food Process Technol 2017, 8:1(Suppl)
http://dx.doi.org/10.4172/2157-7110.C1.059

Tolerance to combined stress of drought and salinity in Tibetan wild barley

Feibo Wu, Imrul Mosaddek Ahmed and **Umme Aktari Nadira**
Zhejiang University, China

Drought and salinity are the major abiotic stresses that limit agricultural production and dramatically threaten the food supply worldwide. Development of barley for improved drought and salinity resistance requires the knowledge of physiological mechanisms and genetic control of the contributing traits. Tibetan annual wild barley is rich in genetic variation. Here, we demonstrate the physiological and molecular differences between Tibetan wild (XZ5, drought-tolerant; XZ16, salinity/aluminum-tolerant) and cv. CM72 (salinity tolerant cultivar) in response to individual and combined stresses (D+S) of drought (4% soil moisture, D) and salinity (S). Tibetan wild barley XZ5/XZ16 showed to be more tolerant to combined stress of drought and salinity than cv. CM72. The stress tolerance mechanism of wild barley is partially attributed to lower Na+/K+ ratio, improved water use efficiency (WUE), increased capacity of anti-oxidative enzymes to scavenge reactive oxygen species (ROS), increased activities of the carbohydrate and secondary metabolism related enzymes relative to cv. CM72. Comparative proteomic analysis identified 34 differentially expressed proteins (DEPs) related tolerance to drought and salinity alone or a combination. Differentially regulated proteins predominantly had functions in photosynthesis, but also in detoxification, energy metabolism, and protein biosynthesis. Importantly, identification of stress responsive proteins and higher expression of their related genes i.e. *SAM3, BSA1, PDX11 and TUFA* in Tibetan wild barley represents the stress adaption mechanisms. Our findings add knowledge that wild barley is a treasure trove of useful genes and offer rich sources of genetic variation which can be exploited in future efforts for breeding barley for multiple stress tolerance.

Biography

Feibo Wu completed her PhD in 2003 at Zhejiang University (ZJU). She is the Deputy Director of Crop Science Institute-Zhejiang University. Her main research interest includes "Evaluation and identification of plant germplasm, mainly in barley, tolerant to abiotic stresses and its molecular physiology, and phytoremediation of metal-contaminated environments and safe crop production". She has published 97 papers in reputed SCI-journals and has been serving as an Editorial Board Member of *Plant Growth Regulation*.

wufeibo@zju.edu.cn

Notes: