June 24-26, 2014
Seattle, Washington, USA

Program and Abstracts

WASHINGTON STATE UNIVERSITY

Functional characterization of a SAP protein expressed in dormant buds of peach

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Abstract:
The meristems of many perennial plants in temperate and boreal climates remain in a cyclic quiescent state within buds during the cold period of autumn and winter, which ensures protection against the effects of cold and water stress. Photoperiod and temperature control growth cessation and bud dormancy induction, whereas dormancy release requires the quantitative perception of chilling. We performed two transcriptomic approaches for the identification of differently expressed transcripts in reproductive buds of peach (*Prunus persica* [L.] Batsch). Among different genes involved in transcriptional regulation of dormancy, pollen development and stress tolerance, we identified a gene coding for a protein similar to Stress Associated Proteins (SAP) containing two specific Zn-finger domains named A20 and AN1 (PpSAP). SAPs have been described as regulators of the abiotic stress response in plant species, emerging as potential candidates for improvement of stress tolerance in plants. We have studied the developmental and stress dependent expression of PpSAP in reproductive buds and vegetative tissues. PpSAP was highly expressed in leaves and dormant buds, being down-regulated after the release of bud dormancy and before bud break. PpSAP strongly interacted with ubiquitin proteins in the yeast two-hybrid system, in accordance with previous works supporting an E3 ubiquitin ligase activity for SAP proteins. PpSAP was constitutively expressed in transgenic plum plants under the control of CaMV 35S promoter. PpSAP over-expression led to alterations in leaf shape and an increased tolerance to leaf desiccation, which conferred to this gene a high interest for the manipulation of abiotic stress tolerance in plants.

Keywords: stress associated proteins, PpSAP overexpression, transgenic plums, abiotic stress, dormancy