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Gene expression profiling and physiological characterization of the *Panax ginseng* at seedling stage in response to heat stress**Ick-Hyun Jo, Chi Eun Hong, Jang Uk Kim, Jung Woo Lee and Kyong Hwan Bang**
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Ginseng is a valuable crop that is grown by long-term cultivation in the same field. As it prefers a cool climate for optimal growth, new sites of cultivation can be adversely affected by rising temperatures due to global warming. Ginseng is sensitive to high temperature induced injury that can affect both quality and yield of the crop. Although selection of ginseng varieties that are resistant to high temperatures is important, it is not possible to use genetic methods for such selection as molecular markers associated with responses to high temperature stress are largely unknown. Here, we used full-length transcripts of ginseng marker genes to identify those involved in photosynthesis rates in ginseng seedlings and, subsequently, monitored their expression in response to a high temperature stress. Initially, the changes in chlorophyll fluorescence induction kinetics (OJIP) and FV/FM values were monitored. The results showed a reduction in photosynthetic efficiency on heat treatment (35°C) starting at 48 hr. At 35°C for 48 hr, ginseng seedlings showed low photosynthetic efficiency as evidenced by changes in chlorophyll fluorescence induction kinetics (OJIP) and Fv/Fm in comparison to a control plant (25°C). The FV/FM value of the control was 0.768, whereas that of the high-temperature treated plants ranged from 0.501 to 0.718. Transcript levels for 20 heat shock related genes were more strongly expressed in high-temperature treated ginseng leaves compared to 21 Arabidopsis genes expressing after heat stress. Overall, our results identified 5 genes in ginseng showing strongly altered expression levels, KG_ISO_015287, KG_ISO_022801, KG_ISO_038129, KG_ISO_045346, and KG_ISO_093311; these genes will be of value for use as selection markers in breeding strategies to develop high-temperature resistance in ginseng.

Biography

Ick-Hyun Jo has completed his PhD at the age of 34 years from Chungbuk National University and postdoctoral studies from National Institute of Horticultural and Herbal Science (NIHHS) in Republic of Korea. He is the public agricultural research worker, a Rural Development Administration (RDA). He has published more than 48 papers in reputed journals and serving as an editorial board member for Medical Crop Science Journal.

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