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Effects of transient silencing of heat shock proteins on photosystem II efficiency during adaptation to salinity stress in plantsMansour Shariati¹, Zohreh Elmi Anaraki¹ and Sayed Ali Hosseini Tafreshi²¹University of Isfahan, Iran²University of Kashan, Iran

Heat shock proteins (HSPs) have vital roles in plant adaptation to biotic and abiotic stresses. These chaperon molecules expressed in almost all kinds of stresses in plants and are well known to be contributed in facilitating protein refolding, preventing protein dysfunctions and eventually reestablishing of cellular homeostasis under severe condition. Genome wide analysis revealed that HSPs are classified into 5 families based on their molecular weights and evolutionary conservation including HSP100 (Clp), HSP90, HSP70 (DnaK), HSP60 (GroEL) and small heat shock proteins (sHSPs). In this study, we used VIGS (virus induced gene silencing) to investigate the role of HSPs during stress in *Nicotiana benthamiana*. For this aim, we cloned the gene fragments of smHSP, HSP70 and HSP90 from *Capparis spinosa* L. plant into the tobacco rattle virus vector, pTRV2 to heterologously suppress the corresponding endogenes of *N. benthamiana*. Silenced plants were exposed to salt stress (100 mM NaCl) for 21 days and Chl, a fluorescence induction kinetics was analysed by using the OJIP-test, various parameters like FV/FO (Oxygen evolving complex activity), FV/FM (The maximal PSII photochemistry efficiency), ϕ PO (Maximum quantum yield for primary photochemistry), ψ O (Probability that an electron moves further than QA), ϕ EO (Quantum yield for electron transport), DIO/RC (Dissipation per active reaction center), ϕ PO/(1- ϕ PO) (the efficiency of light reaction), ψ O/(1- ψ O) (the efficiency of biochemical reaction) and PI_{ABS} (Performance index). Compared to smHSP and HSP90, silencing of HSP70 was found to have stronger negative effect especially after salinity on some parameters related to the donor site of electron in PSII [Fv/Fo, and ϕ PO/(1- ϕ PO)] and, the parameters dependent on the acceptor site of the electron such as ϕ EO, ψ O and ψ O/(1- ψ O). It was also represented that simultaneous silencing of gene of HSP70 and salinity treatment resulted in a significant decrease PIABS and DIO/RC. So these results reflecting among the HSPs tested in the present study, HSP70 silencing cause severe injuries in photosynthetic machinery especially after salt stress.

BiographyMansour Shariati has more than 23 years' experience in plant physiology and physiology and biotechnology of unicellular green alga, *Dunaliella*.mansour_shariati@yahoo.com
mansour@sci.ui.ac.ir**Notes:**