

PROTEOME AND PHOSPHOPROTEOME ANALYSIS OF BUTENOLIDE ARABIDOPSIS THALIANA TREATED PLANTS

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ABSTRACT

Butenolide/karrikins constitute a chemically defined family of plant growth regulators. They were first discovered in 2003 in smoke from wildfires (Flematti et al. 2004 and Van Staden et al. 2004). Wildfire smoke can positively affect germination and post-germination stage(s) resulting in increased seedling vigour (Soós et al. 2009). To date, six members of butenolide/karrikin family have been found in smoke, KAR₁ and its five naturally occurring analogues (KAR₁–KAR₆), (Flematti et al. 2009). Smoke stimulates germination of numerous plant species including *Arabidopsis thaliana*. In this work we decided to use *A. thaliana* plants treated with butenolide to analyse changes on the protein and phosphoprotein levels. We employed total protein TCA-acetone precipitation for total protein extraction (Méchin et al. 2006) and the PhosphoProtein Purification Kit (QIAGEN) was used to obtain phosphoproteins. We then employed 2D electrophoresis using SDS polyacrylamide gels and gel image analysis (Decodon delta 2D) to analyse protein expression changes. Chosen spots with significant changes underwent in-gel tryptic digestion and identification by MALDI-TOF/TOF MS and MASCOT peptide mass fingerprint search. We identified 32 spots with changed protein expression from phosphoproteome analysis and 42 spots from total proteome analysis. Our work was focused on investigation of responses to butenolide on expression of phosphoproteins and total proteins in *Arabidopsis thaliana*. Our aim is to reveal the possible target(s) of butenolide action and further to understand the mechanism(s) of its action.

Key words: butenolide, proteome, phosphoproteome, *Arabidopsis thaliana*