

The effect of perchloric acid as an oxidative stress trigger for protein threonine phosphatase in *Arachis hypogaea* L.

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ABSTRACT : The protein threonine phosphatases (PThPases) catalyze the reversible phosphorylation of threonine residues in proteins. They also regulate a large number of cellular processes including developmental and signaling pathways in eukaryotes. This study was conducted to determine the activity of PThPases as affected by different oxidizing agents in peanut (*Arachis hypogaea* L.) seedlings. In present work, the peanut seedlings were grown in dark on moistened whatman filter paper at $28 \pm 2^\circ\text{C}$ and it was observed that the activity of PThPase increased several folds in 6-8 days growing seedlings (without stressed). The eight days growing seedlings were then further treated with 2 per cent solution of different oxidizing agents (Hydrogen peroxide, Nitric acid, Potassium dichromate, Perchloric acid, Potassium permagnate, Magnese dioxide, Lead dioxide and Ammonium persulphate). It was observed that the specific activity of PThPase got an appreciable reduction by perchloric acid (HClO_4). After treating the 8 days growing seedlings with different % HClO_4 (0.5-5%), it was observed that 3% HClO_4 shows a pronounced effect on PThPase activity and the specific activity was reduced upto 65 per cent. In addition, when seedlings were treated with 3% HClO_4 for different time intervals (1-6h), 4h treatment causes more than 88 per cent reduction in specific activity. The different parts of seedling (stressed with 3% HClO_4 for 4h) show the maximum reduction in specific activity in hypocotyl followed by epicotyl, cotyledon and then root. The results suggest that the role of PThPase is stress-related cellular processes and likely to inhibit the activity of intracellular protein threonine phosphatases.

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