

The Influence of Pesticides on Peroxidase (POD) Enzyme from Turnip (*Brassica rapa* L.) Purified by The 4-aminobenzohydrazide Affinity Chromatography

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Abstract: Plant peroxidases (PODs, E.C. 1.11.1.7) catalyse the hydrogen peroxide-dependent oxidation of a wide variety of substrates, including phenol compounds. PODs are found in all cells and play a role in many critical biological processes, such as the host-defence mechanism [1]. Pesticides are chemical substances used as biological agent against any pest and weed. Some of them are persistent organic pollutants and contribute to soil contamination [2].

The objective of this study was to determine the inhibitory effects of seven commonly used pesticides including 2,4-D-acid dimethylamin, Fenoxaprop-p-ethyl, Glyphosate-isopropylamin, Haloxyfop-p-methyl, Cypermethrin, Lambda cyhalothrin and Dichlorvos, on the purified POD from Turnip. An affinity resin was synthesised by coupling the 4-aminobenzohydrazide ligand and the L-tyrosine spacer arm to CNBr-activated-Sepharose-4B [3]. The purification factors for the Turnip-POD were 269.3-fold (with a yield of 9%). The results obtained from this study showed that the used pesticides displayed quite variable inhibition profiles against Turnip-POD. The half maximal inhibitory concentration (IC_{50}) of pesticides are ranging od 0.03-7.07 mM. However, Lambda cyhalothrin was found as the most effective inhibitor against Turnip-POD with IC_{50} of 0.03 mM and K_i value of 0.018 ± 0.002 mM.

Keywords: Peroxidase, Purification, Affinity Chromatography, Pesticides

References

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