



Study of peroxidase obtained from *Daucus carota* (carrot) juice extract

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ABSTRACT

During the last decades, peroxidases have emerged as good biocatalysts for the variety of organic biotransformation reactions like oxygenation of racemic hydroperoxide, hydroxylation of arenes, the oxyfunctionalization of phenols and aromatic amines, the epoxidation, halogenation of olefins and the oxygenation of hetero atoms. Thus, the main objective of this communication is to obtain a rich source of peroxidase and study the various properties. The enzyme was isolated by cutting the *Daucus carota* into the small pieces and squeezing its juice and studied its kinetic, thermal, pH and inhibition properties of peroxidase by substrates like H_2O_2 and guaiacol. The studies made have shown that *Daucus carota* (carrot) juice contains peroxidase activity of the order of $200 IU mL^{-1}$. The K_m values of this peroxidase for the substrates guaiacol and hydrogen peroxide were 1300 and $50 \mu M$, respectively. The pH and temperature optima were 6.5 and $50^\circ C$, respectively. pH stability of this peroxidase was pH 6.0 and it is most thermally stable at $30^\circ C$ when exposed for one hour and also retains its maximum activity at this temperature. The activation energy for thermal denaturation of the enzyme was $32 kJ mol^{-1} K^{-1}$. Activity of this peroxidase is inhibited completely by sodium azide at the concentration of 30 mM. Kinetic study reveals that this peroxidase can be utilized for different synthetic and biotransformation reactions. Due to its low K_m value for hydrogen peroxide, this peroxidase may be very fruitful in this area by using hydrogen peroxide as a substrate.

Keywords: Peroxidase, *Dacus carota*, H_2O_2 , guaiacol, sodium azide.
