

Study of the oxidation of capsinoids by basic peroxidases from pepper

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Capsinoids were recently isolated from some sweet peppers as non-pungent compounds similar to capsaicinoids in terms of structure and biological activities. The structural difference between the capsaicinoids and capsinoids is the way in which the carbon chain is bound to the aromatic ring: by an amide moiety in capsaicinoids and by an ester moiety in capsinoids.

Classical secretory plant peroxidases (class III Prx, EC 1.11.1.7) are heme-containing glycoproteins able to oxidize different substrates using hydrogen peroxide as electron donor. Peroxidase may be directly related to capsaicinoid metabolism since the vanillyl moiety of capsaicin is easily oxidized by this enzyme. The first report of capsaicin oxidation by a peroxidase enzyme was from Boersch *et al.* (1991). These enzymatic assays were carried out using horseradish and bovine peroxidase.

Bernal *et al.* (1993) reported the first data of capsaicin and dihydrocapsaicin oxidation by a pepper peroxidase. The oxidation of capsaicinoids by *Capsicum* peroxidase was strictly dependent on the presence of H₂O₂. The dependence of the oxidation rate of capsaicinoids by *Capsicum* peroxidase on capsaicinoids and H₂O₂ concentrations shows a kinetic behavior of the Michaelis-Menten type at low substrate concentrations, with inhibition at high substrate concentrations.

The aim of the present work was to characterize the oxidation of capsinoids by pepper peroxidases. An extract enriched in basic peroxidases was obtained by a two-step chromatography protocol. The characterization of the catalytic properties of this protein extract during the oxidation of capsate and dihydrocapsate was followed spectrophotometrically. The oxidation products obtained were studied by mass-spectroscopy.

Bernal, M.A. *et al.* (1993). *J. Agric. Food. Chem* 41: 1041-1044.

Boersch, A. *et al.* (1991). *Biochem. Pharmacol.* 41: 1863-1869.

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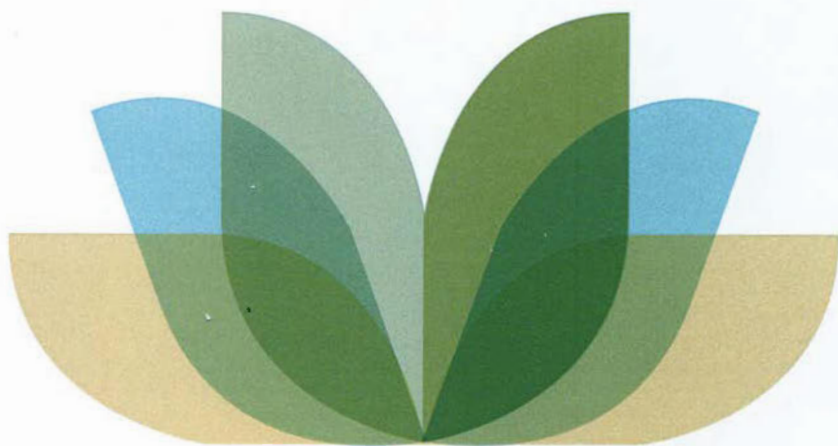


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