

Characterization of Extracellular Peroxidases Released by Coffee Suspension Cell Cultures

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SUMMARY

Cell suspension cultures release a broad and complex range of proteins into culture medium and, among these, peroxidases have been the most studied. The role of peroxidases has not yet been fully elucidated, but they have been shown to promote embryogenesis when added to non-embryogenic or tunicamycin-inhibited cell lines. The aim of this study was to characterize some properties of the extracellular peroxidases released by coffee (*Coffea arabica* cv Catuai) cell suspension cultures. During the growth of suspension cultures, extracellular proteins accumulated to a concentration of $63 \mu\text{g ml}^{-1}$ medium within 24 days. Secretion started slowly, but increased rapidly after 12 days of culture. Extracellular peroxidases have an optimum pH of 5 and show a rapid loss of activity at higher pH values. Although high activity levels of peroxidases were detected at the beginning of the growth cycle, a loss of activity was detected after 6 days of culture. Following this decrease, activity reached a maximum at day 18. The peroxidase isoenzyme patterns obtained by isoelectric focusing revealed several bands distributed over the whole pH range (pH 3 to 10). One major band observed at pH 7.5 showed a similar pattern to the activity curve during the culture cycle. These results showed that there is a direct relationship between growth, peroxidase activity and isoenzymatic patterns in coffee suspension cell cultures.