Symbiosis, 2 (1986)
Balaban Publishers, Philadelphia/Rehovot

Expression of an *Erwinia chrysanthemi* Pectate Lyase Cloned in Non Pathogenic Hosts

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Abstract

Although the ability to degrade plant pectic substances has been widespread amongst microorganisms, for a long time now commercial pectolytic enzyme preparations have been solely of fungal origin. The enterobacteria *Erwinia* is an agent of soft-rot disease in many plant species. This phytopathogenenicity is related to its ability to secrete pectinolytic enzymes degrading plant cell walls. In industry, *Erwinia* is already used for the production of the antileukemic enzyme asparaginase and eventually for the degradation of tea leaves in the quick tea obtention process, so, *Erwinia chrysanthemi* seems to be a good model system for study of plant pathogenicity and for industrial applications. The *E. chrysanthemi* wild-type strain B374, used in our laboratory, secretes in the external medium five pectate lyases revealed by electrofocusing. These inducible enzymes cut pectin or polygalacturonate into unsaturated digalacturonides. To permit a genetic study of genes involved in pectolysis, we constructed a genomic library of the B374 strain, using the broad-host-range cosmid pMMB33 grown in *E. coli.* A subcloning in the plasmid pBR322 permitted us to select the pPL03 plasmid with a 2.7 kb HindIII-SalI fragment, containing the *pelE* gene encoding pectate lyase PLe of *E. chrysanthemi* under its own promoter. One of the studies concerns the expression of the *pelE* gene cloned in non pathogen hosts: the periplasmic-leaky mutant of *E. coli* K12 and the yeast strain O4I constitutes the first step towards the industrial production of a pectolytic enzyme.

* Scientific contractant of the Biomolecular Engineering Program of the Commission of the European Communities

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