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P1.23

Induction of flocculation in *Kluyveromyces marxianus* by overexpression of the GAP1 gene.

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Yeast flocculation is an ability of few yeast strains that leads to the formation of flocs, harbouring hundreds of thousands of cells. The flocculation of yeast cells allows high cell density operations and greatly improves the downstream separation processes. The cellular interaction is mediated by cell wall proteins and in *Kluyveromyces marxianus* ATCC 10022 it has been shown that a glyceraldehyde-3-phosphate dehydrogenase (p37) accumulates in the cell wall and is involved in the flocculation phenotype. Furthermore, it was put in evidence that the accumulation of p37 in the cell wall of a non-flocculent strain of *S. cerevisiae* induces the formation of flocs. Based on the ability of p37 to induce flocculation, the present work aimed at obtaining a flocculating, pectinase-producing and lactose-consuming *Kluyveromyces marxianus*. The CCT 3172 *Kluyveromyces marxianus* strain was used to obtain an *ura* mutant by 5-fluoroorotic acid method and the mutant strain was transformed with an expression vector containing GAP1 (encoding p37) under S10 promoter in pKEp6. The transformed strain acquired a flocculation phenotype and pectinase production was tested. Analysis of the phenotype and pectinase secretion are presented.

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P1.25

Influence of the oxygen and the light on kinetic parameters of the degradative reactions of β -carotene, capsanthin and zeaxanthin of hot red pepper (*capsicum annuum*).

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The carotenoids form one of the most important groups of natural pigments and are to be found in all families of the vegetable and animal kingdoms. Various carotenoid extracts are now being used in the food industry to colour foods and animal feeds. The natural pigments are more acceptable to consumers as they have always been present in natural foods and are readily metabolised. In addition, the metabolites are good for human health; the hydrocarbon carotenoids have provitamin A activity and the oxygenated carotenoids or xanthophylls are possibly linked to a lower risk of cancer. During storage there is loss of pigments, lowering the quality of the natural pigments. The degradation reactions of carotenoid pigments do not affect them all similarly, being the deterioration selective. The purpose of the present work was the study of degradation reactions of β -carotene, capsanthin and zeaxanthin of hot red pepper stored in oxygen atmosphere (at light and at dark) and in vacuum atmosphere (at light and at dark). The carotenoid pigments of paprika powder were separated under reversed-phase HPLC conditions. The degradation specific rates of the three pigments depend on structure of the carotenoid molecules and storage conditions.

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P1.24

The influence of some parameters in the ligninolytic activity of *Trametes versicolor*.

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White rot fungi, such as *Trametes versicolor*, degrade lignin and other aromatic compounds, which make them a friendly environmental alternative to the chemical processment of pulp on Pulp and Paper Industry. So, the understanding of biological mechanisms behind lignin degradation has been studied in order to find out a new solution applying part or all of such fungal system. The ligninolytic enzymes secreted by *T. versicolor* include lignin peroxidase (LiP), manganese peroxidase (MnP) and laccase. LiP and MnP have been more studied than laccase, in part because this enzyme is not secreted by a model white rot fungus very used in the past, the *Phanerochate chrysosporium*. Furthermore, the substrate range of laccase was believed to be limited to the phenolic subunits of lignin. However, it was seen that fungus mainly producers of laccase can effectively degrade lignin without the involvement of LiP or MnP. Although *Trametes versicolor* is described as LiP, MnP and laccase producer, higher levels of activity can be achieved for laccase and this one presents the best potentialities for this fungal delignification. It was seen that several environmental factors stimulate the production and activity of these enzymes, which suggests a specific response and an adaptation of the fungus to the environment. Besides nutritional and environmental conditions, the morphologic patterns also play an important role in the enzymatic production, especially of laccase, and so in the *T. versicolor* ligninolytic activity.

P1.26

Pesquisa de Resíduos de fungicidas no mosto e no vinho.

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A utilização de fungicidas é uma prática comum em viticultura. No entanto, a presença de resíduos no vinho pode afectar negativamente a sua qualidade, principalmente quando a aplicação é efectuada 8 a 15 dias antes da vindima. Por outro lado, estes compostos têm sido apontados por vários investigadores como mutagénicos e com efeitos teragénicos em animais, mesmo em concentrações muito baixas.

Nos ensaios experimentais apresentados neste trabalho foram utilizadas as estirpes ESA 1, MB e MT de *Saccharomyces cerevisiae*, isoladas de um mosto proveniente da Adega Cooperativa de Murça e uma levedura comercial seca activa. As microvinificações foram efectuadas em médios e grandes volumes pela Adega Cooperativa de Murça.

No que diz respeito à avaliação do comportamento enológico das leveduras, verificamos que, o início, o término do processo de fermentação vinária e as características físico-químicas dos vinhos tinto e branco não foram significativamente afectadas pelo facto do mosto ter sido inoculado com diferentes estirpes de leveduras. No entanto, as propriedades organolépticas dos vinhos branco e tinto inoculados, respectivamente, com as estirpes MB e MT foram significativamente superiores às dos outros ensaios efectuados.

Relativamente à quantificação de fungicida nas uvas e ao longo do processo de fermentação vinária, constata-se que as perdas de diclofluaniida foram superiores às dos outros fungicidas estudados (benomil, procimidona e iprodiona), supostamente devido à sua menor estabilidade. Com efeito, a taxa de transferência para o benomil foi de 100%, sendo de 20 e 30% respectivamente para a procimidona e para a iprodiona. Nos vinhos de entre-louro e vinho foram detectados resíduos de gelonil que oscilaram entre 1,23 e 3,46 mg/L, respectivamente, nos vinhos brancos e tintos.

Nos vinhos de Trás-os-Montes praticamente não foram detectados resíduos de fungicidas, o que se justifica pelo facto de nesta região a utilização de benomil no combate à *Botrytis cinerea* ser pouco frequente.

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