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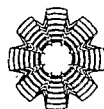
**IV**

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FRUITY AROMA PRODUCTION BY MICROORGANISMS GROWN  
ON SOLID COFFEE WASTE

Marlene Soares, Pierre/Christen\*, Carlos Ricardo Soccol

Laboratorio de Processos Biotecnológicos, Universidade Federal do Paraná, Brazil.

\* Laboratoire de Microbiologie, IRD, Université de Provence, Marseille, France.

Fax : (33) 4 91 82 85 70. e-mail : christen@esil.univ-mrs.fr

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**Introduction.** Extraction from plants and chemical synthesis have been the traditional ways to produce aromas or flavors. However, in the decades, an alternative route involving microbiological or enzymatic processes has been extensively studied. Yeast and fungi have a great potential to produce such compounds (1). Previous work demonstrated that solid agro-industrial wastes can be selected for this purpose (2,3). As coffee waste is a major environmental problem in Latin America (Brazil, Mexico), we explored the feasibility of using it for aroma production by the yeast *Pachysolen tannophilus* and the fungus *Ceratocystis fimbriata*.

**Methods.**

Static cultures were performed in Erlenmeyer flasks containing 15 g of steam treated coffee husk, milled, sieved and sterilized (15 psi 15 min) and different amounts of glucose. Temperature was controlled at 30°C and pH adjusted to 6. Experiments were followed by olfactometry and gas chromatography of the headspace of the culture.

**Results and discussion.**

With *P. tannophilus*, best production of volatile compounds (VC) was obtained with C/N ratio of 20, an initial moisture content of 70 % and an inoculum of  $10^8$  cells per gram. A strong fruity/alcoholic odour was found in the headspace of the culture and GC analysis revealed the presence of acetaldehyde, ethanol, ethyl acetate, isobutanol and isoamyl alcohol with a total VC equivalent to 4.0 mmol of ethanol per gram of dry matter (DM) within 3 days.

Temperature (25°C and 30°C) and initial pH (4.7 and 6) had no influence on the process.

With *C. fimbriata*, the same medium supplemented with glucose (20 and 35 % w/w) displayed a strong pineapple aroma. Besides the compounds reported for *P. tannophilus*, 2-propanol, ethyl isobutyrate, isobutyl acetate, isoamyl acetate and ethyl 3 hexanoate were identified by GC analysis, reaching a production of 6.58 and 5.39 mmol eq. ethanol per g DM within 6 and 10 days, respectively. Addition of leucine (10 mmol/l) to the substrate increased the total volatile production (8.81 mmol eq. ethanol /1.g DM), especially for ethyl acetate and isoamyl acetate and a strong banana odour was detected. While the addition of soybean oil did not improve the VC production, the addition of mineral salts drastically decreased their production.

**Literature.**

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