

Abstract for the U.S. - China meeting
May, 1997

Lowering Costs for Microbial Cellulose

M. Gonzales Pajuelo, T. Hogg, H. Bungay, and I. Vasconcelos

Escola Superior de Biotecnologia
Universidade Catolica Portuguesa
Porto, Portugal e-mail: bungah@rpi.edu

Cultivation of *Acetobacter xylinium* on simple media produces pure cellulose that already has exciting applications because of its creation as a very wet gel and its great strength wet or as a dried sheet. However, applications such as reinforcing conventional paper are limited because of cost. The best reported yield of microbial cellulose is roughly 20 per cent by weight based on the sugars consumed. More often, the observed yield is about 10 per cent. This means that microbial cellulose must cost five to ten times as much as the sugar from which it is made even if processing costs are not considered. The problem of disposal of wastes from making wine in Portugal presents an opportunity for finding an inexpensive medium from which microbial cellulose can be made.

Spent grape wastes from a local winery were extracted with water. The sugar concentration was roughly two per cent. Although the control medium required nitrogenous nutrients such as yeast extract or peptone, stationary flasks using the extracts from grapes with supplemental nitrogen sources at various concentrations showed essentially no differences from the flasks with no supplementation. Evidently, plant proteins and yeast that infest the spent, pressed grapes add to the nutritional value of the extract. Lowering the cost of the substrates should increase greatly the markets for microbial cellulose.