Brewing using freeze-dried raw materials and immobilized biocatalysts on micro and nano tubular cellulose

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A new brewing technology with dry raw materials is proposed with potential application in home brewing. A biocatalyst was prepared using micro and nano tubular cellulose after pine tree sawdust delignification and S. cerevisiae AXAZ-1 cells. Hopped wort and biocatalysts were freeze-dried and stored in airtight containers at 4°C for up to 2 months. Initially, the effect of biocatalyst quantity on fermentation kinetics was studied. Likewise, the effect of freeze-dried raw materials and their storage on the final product quality was assessed. After each month of storage, the freeze-dried raw materials were assessed on their fermentation activity in brewing and the quality of the final product. The content of the beer samples in alcohol, aroma volatile by-products, residual sugar, free cell concentration as well as their color and bitterness were evaluated. It is observed that the biocatalyst remained active and retained its fermentation activity and the final beer characteristics were within the acceptable commercial limits.

Keywords: brewing, freeze-drying, immobilization, S. cerevisiae

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Biography

Angelika-Ioanna Gialleli received her BSc in Chemistry (2008), from University of Patras, Greece. She also received an Interstate MSc in Food Biotechnology (2010) from University of Ulster, UK and University of Patras, Greece. The above-mentioned degrees were focused in fermentation technology and especially the production of wine and beer. At the present, she is a PhD Candidate at the University of Patras doing research on the field of food nanobiotechnology. She is a co-author in one research article in peer reviewed journal and has presented 10 papers in international and national conferences. She is member of the Food Biotechnology Group of the Department of Chemistry that specializes on fermentation technology (submerged & solid state), fermented food production, agro-industrial waste utilization, and industrial bioreactor design.

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