

Preparation and Characterization of *Nata de bamboo* and *Nata de chayote* Membranes with Gold Nanoparticles Impregnation

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ABSTRACT

Nata de chayote (NDCh) and *nata de bamboo* (NDB) have been obtained by the fermentation process of bamboo shoot and chayote using *Acetobacter xylinum*. Then, the NDCh and NDB were pressed to be thin membranes. Mass of bamboo shoot and chayote, which were used as a substrat for NDB and NDCh have been variated to obtain maximum mechanical properties. Their mechanical properties were measured by tensile strength, strain and water absorption capacity. From mechanical test have been obtained optimum mass of bamboo shoot was 225 gr and chayote was 300 gr. The result of mechanical properties of NDB and NDCh membranes were tensile strength 57,28 and 74,64 MPa ; strain 8,370% and 6,052% ; KPA 591,857% and 836,226% respectively. Moreover, NDCh and NDB had been impregnated by gold nano particles by 2 time variation (before and after fermentation process). Gold nanoparticles were added with volume variation until the optimum conductivity was reached. The highest conductivity were obtained from NDB and NDCh membranes impregnated by gold nanoparticles after the fermentation process, that is equal to 57,333 and 73,616 $\mu\text{S}/\text{cm}$ respectively.

Keywords: *nata de bamboo*, *nata de chayote*, cellulose, bacterial cellulose, gold nano particles.