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INTERNATIONAL JOURNAL OF ADVANCES IN MEDICAL BIOTECHNOLOGY

(e-ISSN: 2595-3931)



II EPNAT

Encontro de Polímeros Naturais

Meeting on Natural Polymers

21 a 23 de outubro de 2020.

Organização:



The 2nd Meeting on Natural Polymers – EPNAT brought together entrepreneurs, undergrad and graduate students, postdocs, and professors to discuss emerging research challenges and strategies for different applications of natural polymers. The II EPNAT was chaired by scholars from leading universities in Brazil: University of Araraquara (UNIARA), University of São Paulo USP–FZEA, Pirassununga, University of Campinas (UNICAMP), São Paulo State University (UNESP, Araraquara & Ilha Solteira campuses), Federal University of São Paulo (UNIFESP, Diadema campus), and Federal University of Piauí (UFPI).

The event took place virtually in 2020, gathering 1013 participants, 173 abstracts submitted and a strong international engagement, as the lectures given by top-notch speakers, which can you watch on-demand at <https://www.youtube.com/watch?v=P5ylh2UrZpQ&t=4673s>.



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21 a 23 de novembro de 2020.



CARNAUBA WAX MICRO- OR NANOEMULSIONS MODIFY THE WATER BARRIER PROPERTIES AND MICROSTRUCTURE OF ARROWROOT STARCH FILMS

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Area: (X) Food and Agriculture () Medical and Pharmaceutical () Multifunctional Applications

Starch-based films can have their poor technological properties improved by lipid supplementation. Our aim was to evaluate the incorporation of carnauba wax (0-15 wt%) using emulsion technology — micro- (ME) and nanoemulsion (NE) — in the water barrier properties and microstructure of arrowroot starch films. The water vapor permeability (WVP) was determined from the gravimetric method and the ultrastructure of the films was analyzed in a scanning electron microscope JEOL- JSM 6510. The WVP was significantly reduced by carnauba wax presence, mainly at the 15% concentration, due to the hydrophobic character of the wax. At the 15% concentration, the NE film presented lower WVP than the corresponding ME film, which may be due to smaller droplets resulting in lower discontinuity of the film. The microstructure of the films was altered by the addition of carnauba wax. Films with carnauba wax ME presented a rough surface with aggregates of wax particles, which were more noticeable with increasing ME concentration. Differently from the films with ME, those with NE were smoother, with fewer aggregates and more homogeneous distribution of carnauba wax, demonstrating that the decreased carnauba wax droplet size resulted in better dispersion of the hydrophobic phase on the starch matrix. The addition of either ME or NE enhanced the water barrier properties which results in films that may be used as environmentally friendly food packaging materials. In addition, nanoemulsification seems to be a good strategy for incorporating hydrophilic compounds in starch-based films.

Keywords: Polysaccharides; Biopolymers; Emulsion Films.