

ACTIVE COATING BASED ON BABASSU MESOCARP INCORPORATED WITH EXTRACTS OF AMAZONIAN PLANTS PREPARED WITH DEEP EUTECTIC NATURAL SOLVENTS (NADES): EFFECTS ON THE STORAGE QUALITY OF MUSHROOMS

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Summary:

Edible active coatings can preserve food by controlling biochemical or oxidation processes as a cost-effective packaging. Innovative active coatings were developed based on Babassu mesocarp infused with Uxi-amarelo (*Endopleura uchi*) and Jambolão (*Syzygium cumini* (L.) Skeels) leaves using NADES. The coatings were used to check the quality changes of the mushrooms up to 20 days at 4°C. NADES was prepared with choline chloride, citric acid and 30% water by heating(60°C) and stirring (2h). Extracts

from Uxi-amarelo or Jambolão leaves were obtained by ultrasonic extraction in NADES followed by filtration. Coating suspensions with Babassu Mesocarp (BM) (4g/100g suspension) and distilled water (96g/100g suspension), were homogenized (30min) and heated (90°C/15 min). Uxi-NADES or Jamb-NADES extracts (100g extract/100 g BM) were added and heated for 10 min. Mushrooms were immersed in the film solutions (Uxi-NADES and Jamb-NADES) or distilled water (control). Agar diffusion tests showed the antimicrobial activity of the extracts against *Staphylococcus aureus* (Uxi-NADES- 30 ± 2.6 mm and Jamb-NADES- 26 ± 3.61 mm), *Pseudomonas aeruginosa* (Uxi-NADES- 34.5 ± 0.71 mm and Jamb-NADES- 32 ± 4.24 mm), *Campylobacter jejuni* (Uxi-NADES- 27.25 ± 1.77 mm and Jamb-NADES- 34.25 ± 1.06 mm) and *Listeria monocytogenes* (Uxi-NADES- 26.83 ± 5.06 mm and Jamb-NADES- 21.83 ± 3.18 mm). Both extracts also showed high antioxidant activity (DPPH inhibition: Uxi-NADES- $89.82\% \pm 0.46$; Jamb-NADES $95.15\% \pm 0.8$). After 20 days of storage, there were no significant differences in weight loss ($20.09\% \pm 16.13$ for uxi-NADES, $24.2\% \pm 11.31$ for jamb-NADES and $17.78\% \pm 3.95$ for control) or browning index (Uxi-NADES- 93.99 ± 2.45 ; Jamb-NADES- 86.58 ± 26.13 ; and control- 64.32 ± 8.88) between coated and control samples. Color change (ΔE) showed noticeable differences between treatments (Uxi-NADES: 37.97 ± 5.05 ; Jamb-NADES: 30.41 ± 14.4 ; control: 41.56 ± 3.67). Developed coatings prevented weight loss and browning of the mushrooms yet demonstrated antibacterial and antioxidant properties, highlighting their potential as accessible green packages.

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