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Supercritical CO₂ Extraction of *Campomanesia xanthocarpa*: Extraction parameters and bioactivity

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This work reports the extraction of *Campomanesia xanthocarpa* using supercritical CO₂ as solvents. Antioxidant activity effect and antimicrobial activity were evaluated on the extracts obtained. The effects of the supercritical extraction conditions on the bioactivity of the extracts were evaluated and compared with essential oil of *Campomanesia xanthocarpa* obtained from hydrodistillation technique. The extractions were performed in a laboratory scale unit at pressures of 15.0 MPa, 20.0 MPa and 25.0 MPa and at 353.15 K, 333.15 K and 313.15 K for both solvents. The operating conditions tested achieved a maximum yield of 3.90 wt% for the CO₂ extraction at 25.0 MPa and 313.15 K. Pressure and temperature presented significant effect on the extraction yield with supercritical CO₂, but the pressure presented a positive effect and the temperature a negative effect. The antioxidant activity assays were evaluated on the extracts and essential oil obtained using the phosphomolybdenum reducing method. The extracts obtained presented high antioxidant effects. The highest antioxidant activity (5.668 ± 0.54 mg of α-tocopherol / g of extract) was found for extracts obtained using supercritical CO₂ as solvent at 353.15 K and 15.0 MPa. The extracts obtained using supercritical CO₂ presented antibacterial effects against *Staphylococcus aureus*, Gram-positive bacteria. The oil obtained by hydrodistillation differed from the other samples tested and had a lower capacity for inhibition of *Staphylococcus aureus* bacteria than the supercritical extracts but showed slight inhibition against *Pseudomonas aeruginosa*, *Salmonella typhimurium*, Gram-negative bacteria.