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Antioxidant Activity and Chemical Composition of Supercritical and Conventional Extracts of Cinnamon (*Cinnamomum cassia*)

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Cinnamon is one of the most appreciated spices for flavoring food products and it is used as fungicide and antiseptic. In addition, it presents medicinal properties as digestive, sedative and vasodilator. Objectives of this study were to chemically characterize and evaluate the antioxidant activities of cinnamon bark (*Cinnamomum cassia*) extracts. Extraction was performed using the techniques of supercritical extraction, hydrodistillation and ultrasound. Supercritical extract of cinnamon was obtained at 225 bar and 50°C for 90 minutes of extraction with CO₂ flow rate of 0.2 kg/h. The yield of cinnamon reached values of 8 ± 1% (w/w) for ultrasound extraction using ethanol; 1.9 ± 0.3% (w/w) for ultrasound water extraction; 1.6 ± 0.1% (w/w) for supercritical extraction and 1.4 ± 0.3% (w/w) for hydrodistillation. Antioxidant activity of extracts obtained by different techniques were evaluated by DPPH (2,2-diphenyl-1-picrilidrazina). Best results of EC₅₀ were obtained for cinnamon extracts obtained by ultrasound with ethanol (43 µg/mL) and ultrasound with water (48 µg/mL). Total phenolic content was measured by Folin-Ciocalteu method and the best result was obtained for the ultrasound (137 ± 29 mg GAE/g) with water. The method of bleaching system β-carotene/linoleic was also performed, and the best result was obtained for cinnamon extract obtained by ultrasound (19 ± 0.2%) with ethanol. The identification and quantification of cinnamon extract compounds obtained by supercritical extraction were performed by gas chromatography analysis and compared to a commercial cinnamon oil. The main compound identified by the chemical profile in terms of percentage of relative area was the cinnamic aldehyde.