EVALUATE THE PHYSICOCHEMICAL AND FUNCTIONAL QUALITY OF WATER-SOLUBLE EXTRACTS DERIVED FROM YELLOW CORN

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ABSTRACT: Currently, approximately 70% of the global population experiences adverse reactions to lactose, resulting in an increased demand for plant-based beverages. In this context, the present study aimed to evaluate the physicochemical and functional quality of water-soluble extracts derived from yellow corn. The seeds underwent maceration in distilled water (1:5, seed: water) at 25°C for 12 hours, followed by germination in an incubator for 96 hours under 80% relative humidity at 30°C. Subsequently, the seeds were dried at 45°C for 12 hours, ground using a knife mill, and subjected to maceration in water (1:6, flour: water) in a thermostatic bath, with a temperature ramp from 35 to 75°C over 2 hours. After this process, the samples were mixed for 2 minutes and filtered through fabric with a pore size of 0.88 mm. Samples derived from ungerminated flour were used as controls. The analyses included the quantification of gamma-aminobutyric acid (GABA), total phenolic compounds (TPC), total solids (TS), total soluble solids (TSS), and pH. Results indicated that the extracts from germinated seeds exhibited a significant increase in TS and TSS (TS: 8.13±0.01; TSS: 9.69±0.06) compared to the control (TS: 0.80±0.08; TSS: 5.38±0.06) ($p<0.05$), which can be attributed to the action of endogenous enzymes activated during germination. Moreover, the water-soluble extract from germinated corn flour showed a substantial increase in GABA levels (33.90±0.45) compared to the control (13.55±1.91), resulting from the activity of glutamate decarboxylase, an enzyme naturally present in plant tissues. Germination also enhanced the solubility of TPC (26.94 ± 2.98 mg GAE/ 100 mL) compared to the ungerminated sample (17.04 ± 1.63 mg GAE/100 mL). Therefore, germination of corn presents a viable strategy for improving the technological and nutritional properties of water-soluble extracts.