

Area: INO

EVALUATION OF TOTAL PHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY OF BRAZILIAN GINSENG STEM EXTRACTS

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Highlights

The stem extract of Brazilian ginseng contains phenolic compounds (conventional extraction at 40 °C) and shows antioxidant activity (ultrasound extraction at 40 °C).

The extraction method has a greater effect than temperature.

Abstract

The leaves, stems, and flowers of Brazilian ginseng (*Pfaffia glomerata* (Spreng.) Pedersen) exhibit relevant concentrations of phenolic compounds and antioxidants. The stem stands out due to its content of several bioactive compounds; however, the yield of these compounds depends on the extraction method and conditions. In this study, the total phenolic content and antioxidant activity (DPPH) of aqueous stem extracts obtained by conventional extraction (CE), ultrasound-assisted extraction (UAE), and microwave-assisted extraction (MAE), at two temperatures (40 °C and 60 °C), were evaluated. Analysis of the total phenolic content showed that both the extraction method and temperature were not significant ($p > 0.05$), while the interaction was significant ($p < 0.05$). According to Tukey's test (Table 1), no significant differences were observed overall. However, CE at 40 °C presented the highest total phenolic content, and in this method, temperature had a significant effect. Regarding antioxidant activity, the extraction method was significant ($p < 0.05$), while temperature and the interaction were not ($p > 0.05$). Results from Tukey's test (Table 1) indicated that the antioxidant activity of extracts obtained by UAE at 40 °C was higher and significantly different from those obtained by MAE at both temperatures, while for CE, values were statistically similar between the two temperatures. Therefore, the results indicate that for total phenolic content, there were no significant differences among the methods and temperatures, although CE at 40 °C showed the highest value. In contrast, for antioxidant activity, the extraction method was the main influencing factor, with UAE at 40 °C standing out as presenting the highest activity.

Table 1 – Total phenolic content and antioxidant activity of aqueous stem extracts of Brazilian ginseng obtained by different extraction techniques and temperatures.

| Method | Temperature (°C) | Total Phenolic Content ($\mu\text{gGAE}/\text{mL}_{\text{extract}}$) | Antioxidant Activity ($\mu\text{mol Trolox}/\text{mL}_{\text{extract}}$) |
|--------|------------------|--|--|
| UAE | 40 | 60,277 \pm 16,041 ^{a,b} | 0,379 \pm 0,074 ^a |
| | 60 | 96,987 \pm 4,771 ^{a,b} | 0,308 \pm 0,020 ^{a,b} |
| CE | 40 | 131,943 \pm 21,480 ^a | 0,347 \pm 0,012 ^{a,b} |
| | 60 | 22,541 \pm 4,981 ^b | 0,328 \pm 0,067 ^{a,b} |
| MAE | 40 | 46,184 \pm 28,447 ^b | 0,114 \pm 0,012 ^c |
| | 60 | 59,862 \pm 26,171 ^{a,b} | 0,169 \pm 0,048 ^{b,c} |

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