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Antioxidant properties and phenolic composition of "Composed *Yerba Mate*"

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Abstract

Yerba mate contains bioactive compounds, and is widely consumed as a decoction beverage in several Southern American countries. At present, the consumption of mate with added herbal blends and flavors, called "composed *yerba mate*", has increased; however, no studies on the antioxidant characteristics of these products have been published. In this sense, the main objective was to assess the antioxidant characteristics of "composed *yerba mate*" compared to "traditional *yerba mate*", in the form it is traditionally consumed. Total polyphenols content ranged from 15 to 45 mg/g GAE in all decoctions analyzed. Seventeen phenolic compounds were identified and quantified by HPLC–DAD-MS/MS, mainly belonging to the caffeoylquinic acids group. The antioxidant capacity was measured using in vitro assays, Ferric reducing ability of plasma (FRAP) and Trolox equivalent antioxidant capacity (TEAC), and with *Saccharomyces cerevisiae* as the in vivo model organism. All decoctions displayed antioxidant activity and were capable of rescuing yeast cells between 10.68 and 18.38% from oxidative stress. Multiple regression analysis showed a high correlation between phenolic composition and activity of samples, where different compounds indicate a significant contribution to the observed activity. Significant differences were found in the content, profile and antioxidant activity of polyphenols when "traditional *yerba mate*" and "composed *yerba mate*" were compared. In some cases, the antioxidant capacity was similar or higher in composed *yerba mate;* while the rest displayed lower biological activity. Based on these findings, it would be possible to assume that the addition of herb mixtures modifies the antioxidant and biological properties of mate.

Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Contributions

GC carried out the experiments and wrote de original draft of manuscript; MVB provided the resources and methodology, supervised the work and edit the manuscript; DAW provided the resources and projects administration; RDD provided the resources and methodology, supervised the work and edit the manuscript.

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Ethics declarations

Conflict of interest

The authors declare that they have no known competing financial interest or personal relationships that could have appeared to influence the work reported in this paper.

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