

Antioxidant Capacity and Phenolic Content of Peperina (*Minthostachys verticillata*)

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Introduction

Minthostachys verticillata, also known as Peperina, is constrained to Argentina and other neighboring South American countries. Peperina is traditionally consumed as a tea infusion. Peperina has been used as an herbal home remedy for ages, given its antioxidant, anti-inflammatory and immunomodulating properties (Brewer). Peperina's antioxidant and anti-inflammatory capabilities have been known to alleviate digestion problems (Schmidt-Lebuhn). Peperina's diverse medicinal properties are associated with chemical compounds such as total phenolics, or phenols (Brewer). Phenols are known to be found widely amongst plants. These compounds play an active role in combating against reactive oxygen species (ROS) that are known to be involved in cellular damage and numerous human ailments, including cardiovascular, neurodegenerative diseases and cancer (Brewer).

Objective

The objective of this study was to study the phenolic content in 5 commercial samples of Peperina, to assess their antioxidant capacity.

Methods and Materials

Plant Materials: *Peperina*: Five dry commercial samples of peperina leaves were used in this study (Suquia, Fraccionador, locally grown, Brochero, and Jumala).

Total Phenolic content: Total phenolic content was quantified using a modified Folin-Ciocalteu's protocol measuring absorbance at 765 nm. Total phenolic content (TPC) was expressed as mg Gallic acid equivalents/ mL plant extract (GAE mg/mL).

Antioxidant activity: Antioxidant activity was quantified using the ABTS Assay, based on reduction of the ABTS radical cation (2,2'-azino-bis (3-ethylbenzthiazoline - 6 - sulfonic acid) measured by absorbance at 734nm. Results were expressed as mg Trolox equivalents /mL plant extract.



Figure 3 Peperina Leaves. Credit; "Jornada de Revalorización del cultivo y producción de la Peperina".

Results

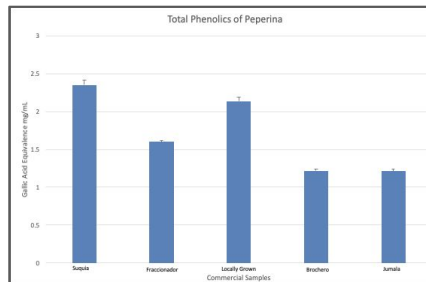


Figure 1: Total phenolic content of commercial samples of peperina (Suquia, Fraccionador, locally grown, Brochero, and Jumala). Bars indicate values \pm Standard Error.

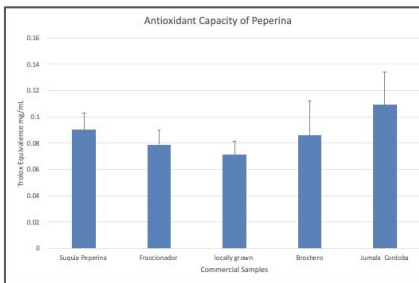


Figure 2: Antioxidant capacity of commercial samples of peperina (Suquia, Fraccionador, locally grown, Brochero, and Jumala). Bars indicate values \pm Standard Error.

Results & Discussion

Sample, "Suquia," had the highest total phenolic content, and sample "Jumala," had the lowest. Figure 1. Sample, "jumala," had the highest antioxidant capacity, and the sample, "locally grown," had the lowest. Figure 2 There was a poor correlation between sample's phenolic contents and antioxidant capacities. These results suggest that other chemicals are also responsible for sample's antioxidant capacities.

Conclusion

Commercial samples of peperina showed high antioxidant capacity. This study indicates these culinary herbs are rich in total phenols and also high in antioxidant capacity. These results help us understand the traditional uses of these culinary herbs. These results could possibly explain why peperina is often consumed as a tea to alleviate stomach pain by aiding digestive enzymes in patients. Incorporating these plants in a human diet can benefit individuals health and possibly help prevent diseases.

References

- Brewer, MS. "Natural Antioxidants: Sources, Compounds, Mechanisms of Action, and Potential Applications." *Comprehensive Reviews in Food Science and Food Safety*, 2011.
- Schmidt-Lebuhn, A.N. "Ethnobotany, biochemistry and pharmacology of *Minthostachys* (Lamiaceae)." *Journal of Ethnopharmacology* 118 (2008) 343–353