medical sciences forum

MDPI

Proceeding Paper

Influence of Organic and Conventional Agricultural Practices on Chemical Profile, In Vitro Antioxidant and Anti-Obesity Properties of *Zingiber officinale* Roscoe †

Monica Rosa Loizzo [1,*], Patrizia Formoso [1], Mariarosaria Leporini [1], Vincenzo Sicari [2], Tiziana Falco [1] and Rosa Tundis [1]

[1] Department of Pharmacy, Health and Nutritional Sciences, University of Calabria, 87036 Arcavacata di Rende (CS), Italy; patrizia.formoso@unical.it (P.F.); mariarosarialeporini@tiscali.it (M.L.); tiziana.falcot@tiscali.it (T.F.); rosa.tundis@unical.it (R.T.)

[2] Department of Agraria, University "Mediterranea" of Reggio Calabria, Salita Melissari, Feo di Vito, 89124 Reggio Calabria (RC), Italy; vincenzo.sicari@unirc.it

* Correspondence: monica_rosa.loizzo@unical.it

† Presented at the 1st International e-Conference on Antioxidants in Health and Disease, 1–15 December 2020; Available online: https://cahd2020.sciforum.net/.

Keywords: ginger; carbohydrate hydrolising enzyme inhibition; lipase inhibition

Citation: Loizzo, M.R.; Formoso, P.; Leporini, M.; Sicari, V.; Falco, T.; Tundis, R. Influence of Organic and Conventional Agricultural Practices on Chemical Profile, In Vitro Antioxidant and Anti-Obesity Properties of *Zingiber officinale* Roscoe. *Med. Sci. Forum* **2021**, *2*, 3. https://doi.org/10.3390/CAHD2020-08559

Academic Editor: Mihalis I. Panagiotidis

Published: 30 November 2020

Zingiber officinale Roscoe (Zingiberaceae), commonly known as ginger, is extensively used as a spice worldwide in cooking and in the preparation of beverages. Moreover, it is used to treat a wide range of diseases including metabolic syndrome (MetS). MetS is a group of risk factors, including insulin resistance and consequently impaired glucose tolerance, dyslipidaemia, obesity, and hypertension. It is estimated that MetS affects 25% of the population [1]. The efficacy of natural products, especially those derived from vegetables and spice largely consumed worldwide, is a topic of great interest not only to cure but also to prevent the onset of disease. In this study, the influence of organic (OR) and conventional (CONV) agricultural practices on chemical profiles and nutraceutical properties of *Zingiber officinale* Roscoe spice was evaluated. A multi-target approach was used to test the antioxidant activity by using DPPH, ABTS, β-carotene bleaching, and FRAP assays. The anti-obesity effect was investigated through inhibition of lipase and carbohydrate hydrolyzing enzymes α-amylase and α-glucosidase [2]. Ginger bioactive compounds were extracted by an ultrasound-assisted maceration process with ethanol. OR Ginger (Z5) showed the highest TPC and TFC, with values of 39.27 and 15.38 mg/g DW. This sample resulted in being the most active in all applied antioxidant tests, with particular reference to ABTS tests, where Z5 showed a stronger activity with an IC_{50} value of 0.81 µg/mL. RACI and GAS statistical approach confirmed the Z5 highest antioxidant potency. Moreover, Z5 exhibited a promising lipase inhibitory activity with IC_{50} values quite similar to the positive control orlistat. Collectively, our results demonstrated the impact of agricultural practices on ginger health properties. However, further in vivo studies will be needed to confirm the potential in humans and prove the safety of the products.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author, [M.R.L.], upon reasonable request.

References

1. Rochlani, Y.; Pothineni, N.V.; Kovelamudi, S.; Mehta, J.L. Metabolic syndrome: Pathophysiology, management, and modulation by natural compounds. *Ther. Adv. Cardiovasc. Dis.* **2017**, *11*, 215–225. [CrossRef] [PubMed]
2. Leporini, M.; Loizzo, M.R.; Sicari, V.; Pellicanò, T.M.; Reitano, A.; Dugay, A.; Deguin, B.; Tundis, R. *Citrus* × *Clementina* Hort. Juice Enriched with Its By-Products (Peels and Leaves): Chemical composition, in vitro bioactivity, and impact of processing. *Antioxidants* **2020**, *9*, 298. [CrossRef] [PubMed]