



# Assessment of Antioxidant Activity and the Tissue Influence of Phenolic Compounds from Coffee Extracts on Health

## Mancini Filho J\*

Department of Food and Experimental Science, Faculty of Pharmaceutical Sciences, University of São Paulo, Brazil

\*Corresponding author: Jorge Mancini Filho, Department of Food Science and Experimental Nutrition at the Faculty of Pharmaceutical Sciences at the University of São Paulo, Brazil, Tel: 55 11 37267843; Email: jmancini@usp.br

### Editorial

Volume 7 Issue 2

Received Date: December 15, 2023

Published Date: December 26, 2023

DOI: [10.23880/beba-16000222](https://doi.org/10.23880/beba-16000222)

**Abbreviations:** BHT: Butyl Hydroxy Anisole; CAT: Catalase; GTX: Glutathione Peroxidase; ROS: Reactive Oxygen Species; RNS: Reactive Nitrogen Species; RSS: Reactive Sulfur Species; TBARS: Substances Reactive to Thiobarbituric Acid.

## Editorial

This editorial is a continuation of the characterization of the importance of phenolic compounds naturally present in foods and their participation in the antioxidant activity of foods presented in the publication [1,2]. This editorial will highlight the presence of phenolic compounds in coffee extracts.

Coffee extracts are the most consumed beverage in the world. It is obtained in different ways after fermenting and roasting the grains. The extracts are obtained mainly from beans of two coffee species: *Coffea arabica* L. and *Coffea canephora* L [3].

Brazil is considered one of the main coffee producers in the world according to the Council of Exporters of Brazil. Exports in 2022 reached the mark of 2.2 million tons to 145 countries, notably the United States, Germany, Italy, Belgium and Japan [3].

The evaluation of antioxidant activity in coffee extracts has been carried out using different methodologies, mainly due to the characteristic of the relationship with the inhibition of oxidative and inflammatory processes in the body [4]. The experience of the Lipids laboratory of

the Department of Food and Experimental Nutrition of the Faculty of Pharmaceutical Sciences of the University of São Paulo - Brazil, with coffee and spices resulted in a doctoral thesis on coffee defended by Araujo [5], associated with the work made with spices and seaweed [6].

In the work carried out by Araujo, the antioxidant activity of phenolic compounds from coffee extracts (*Coffea arabica* L.) was evaluated using different methodologies: DPPH; ORAC; FRAP and the association of beta carotene with linoleic acid. The coffee extracts were obtained from “in natura” beans and roasted at different temperatures (140°C; 160°C; and 180°C). Antioxidant activity can be identified in samples that are equal to or greater than the synthetic antioxidant Butyl Hydroxy Toluene (BHT), at the same concentrations [5].

In the phenolic acid profile evaluated by gas chromatography (GC), the following phenolic acids were characterized: salicylic, ferulic, caffeic, synapic, chlorogenic, quinic, p-coumaric, gentisic and protocatechin. Which are very similar to the phenolic compounds we have evaluated different spices [1]. In the same way, the antioxidant potential “in vivo” can be evaluated using Wistar rats, supplemented daily by gavage for 30 days with different concentrations of 0.5, 1, 2 and 4mg of coffee extract roasted at 180°C/10min, per gram of animal body weight.

The results showed that coffee extract at a concentration of 4mg per day was very efficient in preventing tissue oxidation: plasma; hepatic; cerebral and cardiac, evaluating

the formation of substances reactive to thiobarbituric acid (TBARS). The results obtained are in accordance with the observations of Nieber [7] who highlighted the importance of coffee extracts in health, together with other studies that relate coffee extracts to the prevention of positive changes in the body's metabolism [8,9].

The phenolic compounds present in foods are adequately absorbed and metabolized, with the microbiota playing an important role in their absorption. The sum of phenolic compounds from coffee extracts with other phenolic compounds from foods such as spices, cereals, fruits and vegetables stands out in the consumption of these phytochemicals in the participation of metabolic processes. Epidemiological evidence indicates that the constant consumption of phenolic compounds through food is related to the protection of the body against non-transmissible diseases such as circulatory and degenerative diseases such as cancer and diabetes [10,11]. These reactive species of oxygen, sulfur and nitrogen compounds that can be formed by the body's normal metabolism and can also be induced by environmental factors such as sunlight, pollution, cigarette smoking, ionizing radiation, alcohol, among others, and also intrinsic factors such as bacterial, viral and parasitic infections. The organism is able to react against the oxidative process by inhibiting the formation of reactive oxygen species (ROS), through different enzymes such as: superoxide dismutase (SOD), glutathione peroxidase (GTX), catalase (CAT) and different vitamins such as C, D, E, carotenoids and phenolic compounds [12].

## Conclusion

The various studies carried out with coffee extracts, spices and foods that contain phenolic compounds in their composition, demonstrating that these can increase the body's resistance in combating non-transmissible infectious diseases, indicate the importance of their presence in diets.

The scientific knowledge acquired with our studies on coffee extracts and spices "In vitro" and "in vivo" demonstrates that the presence of phytochemicals in their compositions is closely related to the protection of the organism and their consumption should be encouraged together with fruits and vegetables.

## Conflict of Interest

The author declares no conflict of interest.

## Funding

None.

## Ethical Approval

Not Required.

## References

1. Mancini-Filho J (2020) Bioavailability of phenolic compounds in food and their properties in cellular protection. *Bioequiv & Bioavailab Int J* 4(1): 1-2.
2. Portari-Mancini DA, Mancini-Filho J (2023) Evaluation of the Participation of Phenolic Compounds Naturally Present in Food in Stimulating the Health of the Organism. *Bioequiv & Bioavailab Int J* 7(1): 1-3.
3. (2023) Council of Coffee Exports of Brazil (CECAFE).
4. Romualdo GR, Rocha AB, Vinken M, Cogliati B, Moreno FS, et al. (2019) Drinking for protection? Epidemiological and experimental evidence on the beneficial effects of coffee or major coffee compounds against gastrointestinal and liver carcinogenesis. *Food Res Int* 123: 567-589.
5. Araujo FA (2007) Coffee (*Coffea arabica*, L.) subjected to different roasting conditions: chemical characterization and evaluation of antioxidant and sensorial activity. *Tese e Doutorado* 119.
6. Novoa AV, Mancini-Filho J, Silva AMO, Andrade-Warta ERS, Díaz Gutierrez D (2021) Chemical characterization and in vitro antioxidant activity of the seaweed *Bryothamnion triquetrum* (SG Gmelin) Howe: analysis of experimental results. *Revista Cubana de Ciencias Biológicas* 9: 1-5.
7. Nieber k (2017) The impact of coffee on health. *Planta Med* 83(16): 1256-1263.
8. Safe S, Kothari J, Hailemariam A, Upadhyay S, Davidson LA, et al. (2023) Health benefits of coffee consumption for cancer and others diseases and mechanisms of action. *Int J Mol Sci* 24(3): 2706.
9. Van Dam RM, Hu FB, Willet WC (2020) Coffee, caffeine, and health. *N Engl J Med* 383(4): 369-378.
10. Gokcen BB, Sanlier N (2019) Coffee consumption and disease correlations. *Critical Reviews in Food Science and Nutrition* 59(2): 336-348.
11. Khanam S, Prakash A (2021) Promising Sources of Antioxidants from Herbs and Spices: A Review. *International Journal of Advanced Research in Science Communication and Technology* 4(2): 188-195.
12. Silva Amo, Pereira RO, de Souza Oliveira AK, Harris FS,

Pereira de Melo IL, et al. (2023) Ameliorative effects of aqueous extract from rosemary on oxidative stress and inflammation pathways caused by a high-fat diet

in C57BL/6 mice. *Applied Physiology Nutrition and Metabolism* 48: 875.

