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YERBA MATÉ HAS A HIGH LEVEL OF ANTIOXIDANTS

A recent study financed by the “Instituto Nacional de la Yerba Mate” (Yerba Maté National Institute, INYM) revealed that yerba maté infusions are an important source of antioxidants (in the form of total polyphenols), which delay the cellular aging process and are essential to prevent certain diseases.

The study was conducted by the prestigious Chemical Engineer and Master in Food Technology Dr. Luis Brumovsky of the College of Exact, Chemical and Natural Sciences of Misiones National University. It was financed by the “Programa Regional de Asistencia al Sector Yerbatero” (Regional Program of Assistance to the Yerba Maté Sector, PRASY) of the INYM.

In outline, the study determined that people who consume yerba maté in any of its different forms —maté, maté tea or terere— add to their bodies an important amount of total polyphenols.

Results of the study

The research conducted by Dr. Brumovsky indicated that of the three methods of consumption used in the region, hot maté is the one that provides the body with the biggest amount of these compounds. That is, according to the method of consumption, one may ingest:

-As “**mateada**” or **hot maté (I)**: Between 4.6 g and 5.7 g of polyphenols equivalent to chlorogenic acid, and between 2.5 g and 3.3 g of polyphenols equivalent to gallic acid, pouring 500 ml of water at 70 °C in a pot

-As **tereré (II)**: Between 1.5 g and 2.3 g of polyphenols equivalent to chlorogenic acid, and between 0.9 g and 1.3 g of polyphenols equivalent to gallic acid, pouring 500 ml of water at 5 °C in a pot containing 50 g of elaborated yerba maté.

-As **maté tea in tea bags (III)**: Between 0.5 g and 0.6 g of polyphenols equivalent to chlorogenic acid, and between 0.28 g and 0.31 g of polyphenols equivalent to gallic acid, considering a net weight of 3 g per tea bag, in an infusion prepared with 200 ml of boiling water.

Figures 1 and 2 show data related to the content of total polyphenols according to the different methods of consumption. The information obtained was based on 10 commercial samples of elaborated yerba maté produced in Argentina. The data is expressed in grams of polyphenols equivalent to the corresponding acid per 100 g of dry commercial product.

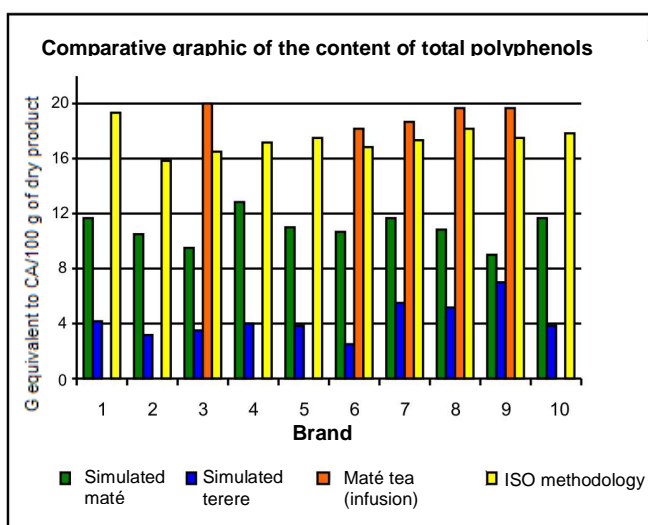


Fig. 1 – Content of total polyphenols according to brand and method of consumption, expressed as equivalents to chlorogenic acid.

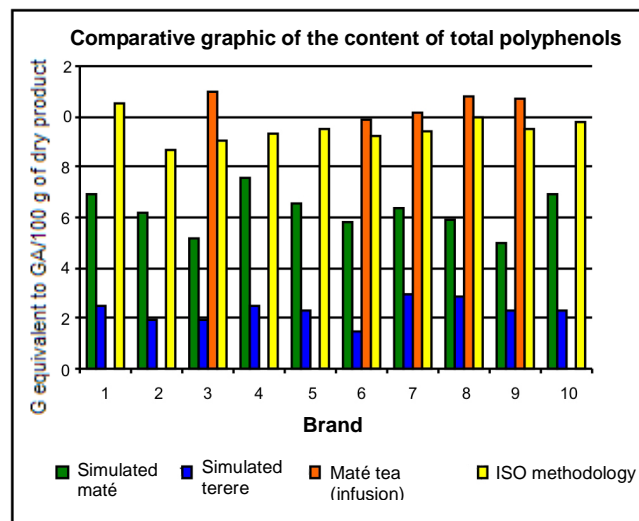


Fig. 2 – Content of total polyphenols according to brand and method of consumption, expressed as equivalents to gallic acid.

As compared to other beverages, yerba maté contains a significantly higher level of polyphenols:

Beverage	TP (mg equ. GA/100 ml)	Bibliographic source
Orange juice	62.56 ± 0.49	Bravo and col., (2007) (Folin-Ciocalteu method)
Red wine	170 ± 80	German and col., (2000) (Folin-Ciocalteu method)
Red wine	195.68 ± 1.78	Bravo and col., (2007) (Folin-Ciocalteu method)
Rosé wine	46 ± 13	German and col., (2000) (Folin-Ciocalteu method)
Rosé wine	41.36 ± 0.67	Bravo and col., (2007) (Folin-Ciocalteu method)
White wine	19 ± 29	German and col., (2000) (Folin-Ciocalteu method)
White wine	18.98 ± 0.59	Bravo and col., (2007) (Folin-Ciocalteu method)
Black tea infusion in tea bags	93.63 ± 2.02	Bravo and col., (2007) (Folin-Ciocalteu method)
Green tea infusion in tea bags	116.22 ± 1.07	Bravo and col., (2007) (Folin-Ciocalteu method)
Yerba maté infusion in tea bags	148.4 ± 7.4	Brumovsky and col., (2008)* (Folin-Ciocalteu method)
Simulated maté	586.5 ± 73.9	Brumovsky and col., (2008)* (Folin-Ciocalteu method)
Simulated terere	217.5 ± 41.5	Brumovsky and col., (2008)* (Folin-Ciocalteu method)
TP: Total polyphenols – GA: Gallic acid Data expressed as <i>average ± standard deviation</i> *Data obtained from this study; not yet published.		

Other nutrients

The same study also identified the presence of nutrients in yerba maté, obtained during one maté drinking occurrence (pouring 500 ml of water at 70 °C in a pot containing 50 g of elaborated yerba maté). The content of total fats is shown as zero, since the content is not significant in the product's aqueous extract. The following Table shows the data obtained:

Nutrient	Average value +/- standard deviation
Calories (kcal)	44.3 +/- 5.54
Carbohydrates (g)	9.82 +/- 1.42
Sugars (g)	2.97 +/- 0.76
Proteins (g)	1.03 +/- 0.18
Total fats (g)	0.00
Saturated fats (g)	0.00
Trans fats (g)	0.00
Dietary fiber (g)	0.56 +/- 0.21
Sodium (mg)	15.66 +/- 8.39
Iron (mg)	1.56 +/- 0.51
Calcium (mg)	33.61 +/- 10.76
Magnesium (mg)	66.97 +/- 32.13
Phosphorus (mg)	18.29 +/- 5.57
Vitamin B6 (mg)	0.51 +/- 0.17
Vitamin C (mg)	2.53 +/- 0.67
Thiamine (mg)	0.85 +/- 0.30
Niacin (mg)	1.31 +/- 0.58
Caffeine (g)	0.38 +/- 0.06
Total ashes (g)	1.45 +/- 0.17

What are polyphenols?

A series of researches recently conducted in the United States indicate that polyphenols are powerful antioxidants that improve the natural defenses of the organism, and protect it against the cellular damage that deteriorates the body and makes it develop disease symptoms (Jean Carper, 1988).

Antioxidants can be defined from different scientific disciplines, for example: from the point of view of food technology, antioxidants are substances that prevent or slow down the fat oxidation process, which is responsible for the formation of chemical compounds that produce unpleasant odors and flavors in food, as well as damages to the health (Dejian Huang, and col., 2005; Brand-Williams and col., 1995). From the nutritional point of view, antioxidants are substances found in food, which cause a significant reduction in the adverse effects of certain reactive oxygen and/or nitrogen species (free radicals) on the normal physiological functions of humans. In biochemistry and medicine, antioxidants can be defined as enzymes or other organic substances such as vitamin E, beta-carotenes, polyphenols, etc., capable of counteracting the harmful effects of oxidation on animal tissues (Dejian Huang, and col., 2005).

- (I) The most traditional method of consumption. The infusion is drunk using a “bombilla” (metal straw) placed into a pot with yerba maté. It requires hot water, between 80° and 83 °C.*
- (II) It also requires a “bombilla” and a pot with yerba maté, but in this case we are talking about a refreshing beverage. It is prepared with cold water or fruit juice, and ice.*
- (III) It is prepared in a similar way as other infusions, with hot water and yerba maté in tea bags. It is drunk from a cup. Other alternative is to let it cool down to obtain a different refreshing beverage, called cool maté tea.*