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### Effect of *Ilex paraguariensis* (mate) aqueous extracts and chlorogenic acid on the antioxidant enzymes (SOD, CAT and Px) in rat submandibular glands

Rosana Filip, Renzo Martino, Laura Cogoi and Claudia Anesini  
Universidad de Buenos Aires, Argentina

**Statement of Problem:** Reactive oxygen species (ROS) are well known inducers of cellular and tissue pathogenesis leading to numerous disorders including periodontal diseases. Antioxidant enzymes (AE) such as superoxide dismutase (SOD), peroxidase (Px) and catalase (CAT), play a protective role in mouth oxidative physiological and pathological process such as inflammation, infections and cancer. *Ilex paraguariensis* (mate tree) is a plant cultivated in South America. The leaves and stems are industrialized to obtain the "yerba mate" product consumed in the region as a tea-like beverage. This species is recognized worldwide for its nutritional, functional and medicinal properties and exported to over 40 countries. The stimulant, diuretic, antioxidant, hypocholesterolemic, slimming effects, are attributed to the bioactive compounds (methylxanthines, polyphenols and saponins). Polyphenols (caffeoyl derivative compounds) like chlorogenic acid (CL) have demonstrated antioxidant activity. Previous reports indicated that aqueous extracts of *I. paraguariensis* (AE) exerted a positive effect on the human oral health. The objective of this work was to determine *in vitro*, the effect of AE and CL upon SOD, CAT and Px secretion, using a rat submandibular glands model.

**Methodology:** AE were prepared and analyzed by HPLC. Submandibular glands were removed from the female albino Wistar rats. Different concentrations of AE and CL were assayed and SOD, CAT and Px secretion were determined.

**Findings:** AE and CL produced a secretion increase (SI) on SOD, CAT and Px, with different patterns. The maximum value for SI was AE: 700 % (SOD), 60% (CAT) and 66% (Px). CL: 100% (SOD). A biphasic response for CAT and Px was observed.

**Conclusion & Significance:** AE and CL are promising agents for the prevention or treatment of oral pathologies in which oxidative stress plays an important role and the concentrations to be used could be estimated according to the results obtained in this work.

#### Recent Publications

1. Agudelo A, Isolabella S, Filip R, Wagner M and Ricco R (2016) *Baccharis spicata* (Lam) Baill: Polyphenol screening, determination of their antioxidant activity and their main polyphenolic metabolites. *Journal of Pharmacognosy and Phytochemistry*. 5(6):278-285.
2. J Uribarri, M D Del Castillo, M P De La Maza, R Filip et al. (2015) Dietary AGEs and their role in health and disease advances in nutrition. 6(4):461-473.
3. L Cogoi, R Martino, G Giberti, C Anesini and R Filip (2014) Study of the potential value of *Ilex affinis* (Aquifoliaceae) as a novel source for the food and pharmaceutical industries. *Journal of Life Sciences*. 8(1):10-14.
4. L Cogoi, M S Giacomino, N Pellegrino, C Anesini and R Filip (2013) Nutritional and phytochemical study of *Ilex paraguariensis* fruits. *Journal of Chemistry*. 2013:1-6.
5. I Peralta, R Martino, R Alonso, R Filip and C Anesini (2013) Modulator activity of an aqueous extract from *L. divaricata* Cav. on basal oxidative and anti-oxidative parameters of normal rat submandibular glands. *International Journal of Indigenous Medicinal Plants*. 46(3):1363-1369.

#### Biography

Rosana Filip is Professor at the University of Buenos Aires (UBA), Argentina. Her teaching and research activities take place in the Chair of Pharmacognosy and Phytotherapy and in IQUIMEFA (Institute of Drug Chemistry and Metabolism) (UBA-CONICET), Faculty of Pharmacy and Biochemistry where she is Director of Research Projects and Post-graduate courses. Her expertise is in the area of vegetal natural products: phytochemical and pharmacological study of plant species used or potentially used in the pharmaceutical, food and cosmeceutical industries. She acts as Consultant and Evaluator for national and international projects, laboratory companies and has participated representing Argentina in many scientific international meetings on the subject "yerba mate and related species". She has published more than 50 papers, edited a book and won nine national awards. Some of her works are cited in the bibliography of international books that cover the areas of Medicine, Pharmacy, Food Processing, Chemistry, Analytical Techniques, etc.

rofilip@hotmail.com