



UNIVERSITÀ DEGLI STUDI
DI MILANO

**The Department of Pharmacological and
Biomolecular Sciences (DiSFeB)**

presents



Thursday, June 29th 2017

Via Balzaretti 9, Milan



UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI SCIENZE
FARMACOLOGICHE E BIOMOLECOLARI

Nutraceutical and Inflammation
Fields – room B
Chairs: Patrizia Restani and Enrica Sangiovanni



Antioxidants properties of food ingredients measured by different *in vitro* analytical approaches

F. Orgiu¹, C. Di Lorenzo¹, F. Colombo¹ and P. Restani¹

¹Department of Pharmacological and Biomolecular Sciences, University of Milan, Milan, Italy;

francesca.orgiu@studenti.unimi.it

Keywords: antioxidant activity, *in vitro* methods, *Camellia sinensis*, *Vitis vinifera*

ABSTRACT

Several epidemiological studies indicate that foods containing antioxidant compounds can play an important role in promoting human health.

In fact, they could contribute in reducing the risk factors for inflammation and chronic diseases such as cancer, heart diseases and aging-related disorders, where free radicals are involved. These are highly unstable molecules, which are capable to oxidize nucleic acids, proteins, lipids or DNA and can initiate degenerative diseases.

Antioxidant compounds inhibit or quench free radical reactions by accepting or donating electrons to eliminate the unpaired condition of the radical.

Among others, grapes (*Vitis vinifera* L.) and green tea (*Camellia sinensis* (L.) Kuntze) are considered a good source of compounds having significant antioxidant activity. However, the claimed antioxidant activity of a food or food supplement should be confirmed by analytical tests. Due to the complexity of foods and botanical ingredients (the so called "matrix effect"), the assessment of this property is often difficult and only rarely checked by food industry.

The aim of this study was to set-up and compare different *in vitro* analytical approaches suitable for the evaluation of the antioxidant activity of samples containing *Vitis vinifera* and *Camellia sinensis*. Two spectrophotometric assays were used to evaluate the total antioxidant activity of the samples included in the study and were based on the use of two specific radicals: 1) 2,2-azinobis-(3-ethylbenzothiazoline-6-sulphonate) radical (ABTS⁺), 2) 1,1-diphenyl-2-picrylhydrazyl radical (DPPH[•]). The results were expressed as equivalent of gallic acid (EAG) in mg/g.

A novel chromatographic approach, based on the use of High Performance Thin Layer Chromatography (HPTLC) was also applied, allowing the semi-quantitative measure of antioxidant activity associated with any specific compound in the samples analyzed.

Both chromatographic and spectrophotometric assays were reliable and the results obtained comparable. The positive results of the study suggest a possible application of methods here described to obtain a rapid *in vitro* evaluation of the biological activity of foods and food supplements.