МЕДИЦИНСКИ УНИВЕРСИТЕТ - ВАРНА
„Проф. д-р Параскев Стоянов“
Ул.“Марин Дринов“ 55, Варна 9002, България
Тел. : 052/ 65 00 57, Факс: 052/ 65 00 19
e-mail: uni@mu-varna.bg, www.mu-varna.bg

MEDICAL UNIVERSITY - VARNA
“Prof. Dr. Paraskev Stoyanov”
55, Marin Drinov Str., 9002 Varna, Bulgaria
Tel.: +359 52/ 65 00 57, Fax: + 359 52/ 65 00 19
e-mail: uni@mu-varna.bg, www.mu-varna.bg

Fund “Nauka” Project № 18001 Resume – Competition-Based Session 2018:
“An express method for the study of the relation between optical properties and the antioxidant effect of extracts of medicinal herbs and drinks from traditional fruits”
Project leader: Prof. Krastena Todorova Nikolova, PhD

This project establishes significant links between the optical properties and certain characteristics (composition, antioxidant and / or antimicrobial properties) of different types of extracts (oil, water-alcohol, alcohol and others) of traditional and innovative medicinal plants. A connection between the antioxidant activity and parameters of the applied photonics for juices of wild berries and red wines of the most frequently consumed Bulgarian grape varieties has been proved.

The research evaluates the expediency of the methods of applied photonics for determining the qualities of the product and their imposition as fast and non-destructive methods for analysis. The proposed optical methods and means can be used for qualitative evaluation of the content of polyphenolic compounds with antioxidant activity, pigments and oxidizing products obtained as a result of the method of obtaining or storing oil and water-alcohol extracts of traditional Bulgarian plants, non-traditional oils as well as for juices and red wines. Isopotential emission excitation matrices (IEEM) of the fluorescent spectra play the role of a kind of “fingerprints” of the studied objects and are especially useful in performing a quick analysis of the composition of the studied samples.

The kinetic changes of the antioxidant activity, anthocyanins, complete phenolic content and the optical characteristics of wines from the Varna region of Pinot Noir and Sangiovese varieties were observed. A comparison of the antioxidant activity of two studied red wines with that of wines of the same variety from other regions of Northern Bulgaria, Southern Bulgaria and abroad was made. It has been proven that with a suitable selection of grape variety and technology in Northern Bulgaria can be produced quality red wines with parameters comparable to those of wines obtained in Southern Bulgaria.

A comparative analysis was made between Bulgarian and imported red wines. It was found that the AOA of French wines from Cabernet Sauvignon and Syrah grapes from the regions of Nice and Paris is comparable to that of Bulgarian red wines of the same variety from the regions of the Thracian lowlands and Harmanli. It is interesting

that the blended Bulgarian red wines have higher antioxidant activity than the French samples. It has been found that there is a relationship between fluorescent peaks and the content of a wide range of natural fluorescent compounds, such as phenolic acids (gallic, vanilla, caffeic, ferric acid), flavonoids, vitamins.

The optimal conditions for obtaining plant extracts (oil, water or alcohol) with the maximum amount of antioxidants have been determined by using optical analysis. Correlations have been found between the amount of pigments, antioxidants, oxidation products and the fluorescence intensity of fluorescent peaks, and this fact can provide quantitative information about the type of chemical bonds anti-inflammatory and healthy properties.