Using Luminol Chemiluminescence method for comparative study of some Georgian red wines made from Sapheravi grapes.

In recent years, the special interest has been paid to the oxidative stress as one of the negative effects of harmful environmental factors affecting living organisms. To protect from oxidative stress, living organisms have developed powerful anti-oxidative systems: enzymatic and non-enzymatic. Flavonoids are the part of non-enzymatic protective system; these compounds are produced in high concentrations by plants. Grapes, especially red grapes, like Sapheravi, contain large amount and wide spectrum of polyphenolic compounds.
It is well known that the positive impact of wine on human body is mainly conditioned by its polyphenolic content and composition. These compounds have a strong antioxidant capacity that is the reason why we mostly use total Polyphenolic concentration determination method to estimate antioxidant properties of wine.

On the other hand, it is also known that polyphenolic content does not always have strong correlation with therapeutic and prophylactic properties of red wine; it is also conditioned by other secondary metabolites, which have strong antioxidant effects and powerful regulatory and messenger properties. Consequently, their common action is due to synergistic and antagonistic relationships. Based on these facts, to evaluate the anti-oxidative effect of wine and its compounds, it is not enough to determine the total concentration of polyphenols, but to appreciate their antiradical properties and then, complex study and assessment in the medico-biological point of view. The procedures mentioned above are hard to fulfil and takes a lot of time. Accordingly, it is crucial to develop rapid, maximally informative and less costly method that will have strong correlations with adequate characterization of the medico-biological properties of wine.

Proceeding from the above, the aim of the study was to determine evaluate and compare the antioxidant effects and potential medico-prophylactic properties of some Georgian Red Wines using traditional, in vitro and Luminol Chemiluminescence method that was modified accordingly by our team.

Several step experiment was conducted. Firstly, we used traditional method for estimating total antioxidant contents of wine, then we used in vitro methods, we determined the effect of our objects under study on rat liver antioxidant enzymes, Catalase (CAT) and Superoxide dismutase (SOD) in lipid peroxidation model. We also determined the concentration of malonyl-dealdehyde (MDA) which is one of the final products for lipid peroxidation. At the last stage of our study, we used luminol-chemiluminescence method for estimating anti-radical and potential medico-prophylactic properties of wines.

The results obtained once more approved the state that we can not evaluate antioxidant and medico-biological properties of wine only be determining total polyphenolic content, Luminol chemluminescence method gives us more detailed information about it. This method has strong correlations with in vitro methods that had been used during our experiments.

According to the results, we can conclude that by using luminol chemiluminescence method it is possible to obtain detailed information about antioxidant and potential medico-biological properties of wines. The method is less time consuming, less costly and maximally effective.