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POSTERS

Vachnadze N et al., J Chem Tech App 2018, Volume 2

STUDY ON CYTOTOXIC ACTIVITY OF SOME EXTRACTS OF *VINCA ROSEA L.* INTRODUCED TO WESTERN GEORGIA

Vachnadze N, Vachnadze V, Mshvildadze V, Legoult J and **Pichette A**

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Malignant cancer belongs to the number of the most widespread diseases in the world. As WHO forecast notifies number of victims of malignant cancer will be 2015 will die 9 million, 11,4 million in 2030. So mortality caused by the malignant tumors is presented disturbing statistical data.

The object of our research were the alkaloids extracts obtained from aerial parts of Vinca rosea L. Cytotoxicity was assessed against A-549 (lung cancer cell line), DLD-1(colon adenocarcinoma cell line) and WS-1 (normal skin fibroblast cell line) cytotoxic activity was expressed inhibiting cell growth by 50% (IC50). Etoposide was used as positive control.

Results: *In vitro* cytotoxic activities of extracts 1,2 were assessed against using resasurin reduction test, but extract 3 Hoechs test.

Table *in vitro* cytotoxic activities of extracts 1,2,3

Compounds	Resasurin			Hoechs		
	Cell lines			Cell lines		
	A-549 mg/ml	DLD-1 mg/ml	WS-1 mg/ml	A-549 mg/ml	DLD-1 mg/ml	WS-1 mg/ml
extracts 1	1,563	1,563	8±3			
extracts 2	3,7±0,2	3,8±0,4	1±2			
etoposide	2,3±0, 2μM	2,8±0, 04μM	19± 3μM			
extracts 3	4,6±0,22	3,57±0,08	2,3±0,1	0,45±0,4	2,7±0,1	2±0,2
etoposide				1,5±0,1 μM	3,0±0,3 μM	3,1±0,5 μM

Biological activities of extracts 1, 2, 3 which were obtained from Vinca rosea L. introduced to Western Georgia. The results showed that the extracts 1, 2, 3 presented strong cytotoxic activities on A-549, DLD-1 and WS-1.

BIOGRAPHY

Vachnadze N has completed her PhD at the age of 45 years from Tbilisi State Technical University, Georgia. She is a principal scientist of TSMU Iovel Kutateladze Institute of Pharmacochemistry. She has published more than 60 publications in reputed journals. She is a member of organizing committee of several international conferences and meetings.

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Ivanova A V et al., J Chem Tech App 2018, Volume 2

STUDY OF ANTIOXIDANT PROPERTIES OF COMBINED VITAMIN PREPARATIONS BY POTENTIOMETRIC METHOD

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The oxidative action of reactive oxygen species (ROS) in the human body can lead to disruption of cell membranes, and thus cause a number of diseases. Compounds with antioxidant properties of endogenous and exogenous nature carry out regulation of the oxidation processes. Since all processes take place in the body both in the aqueous and in the lipid phase, in order to maintain the redox balance of the organism, the use of combined pharmaceuticals containing active substances, both lipophilic and hydrophilic in nature, is most effective, and therefore it is relevant to study the antioxidant properties of the pharmaceuticals. Earlier, we developed the potentiometric method for studying antioxidant properties using the K3[Fe(CN)6]/K4[Fe(CN)6] system as an oxidizer model1. However, the limitation of the potentiometric method is the low solubility of the complexes in lipophilic media, which makes it impossible to evaluate the antioxidant properties of the important lipophilic antioxidants, for example, α-tocopherol. The aim of this work was to study the total antioxidant capacity (TAC) of different hydrophilicity antioxidants mixtures by the example of vitamins C and E, which are important components of metabolism and are part of many vitamin preparations. The studies were carried out in a water-emulsion medium in the presence of different type's surfactants. Various surfactant concentrations (0.5-2 mM) and concentrations ratio of surfactant:α-tocopherol (1:1-5:1) were studied. The criteria for selecting surfactants were stability of the system potential, adherence to the Nernst dependence, the emulsion stability. The nonionic surfactants Triton X-100 and Brij 35 satisfy the criteria. TAC model mixtures of vitamins C and E in different concentrations and commercial vitamin preparations containing C and E with the use of selected surfactants were studied. The experimental data obtained confirm the possibility of using the proposed approach for studying TAC mixtures of different hydrophilicity antioxidants. The relative standard deviation does not exceed 5-7%. 1Kh. Z. Brainina, A. V. Ivanova, E. N. Sharafutdinova,E. L. Lozovskaya, E. I. Shkarina "Potentiometry as a method of antioxidant activity investigation" Talanta, 71 (2007), p.13-18.

BIOGRAPHY

Ivanova A V has completed her PhD from Ural State University of Economics (Yekaterinburg, Russia). She is associate professor of the department of analytical chemistry, Institute of Chemical Engineering of the Ural Federal University named after the first President of Russia B.N.Yeltsin. She has published more than 25 papers in reputed journals.

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Note:

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Kintsurashvili L et al., J Chem Tech App 2018, Volume 2

BIOLOGICALLY ACTIVE ALKALOIDS FROM THE ROOTS OF *TAXUS BACCATA L.* GROWING IN GEORGIA

Kintsurashvili L, Mshvildadze V and **Gorgaslidze N**
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Gen. Taxus L. (Fam. Taxaceae) is famous as the sources of the natural cytostatic medical preparation for Paclitaxel (Taxol), which has a high anticancer activity. *Taxus baccata L.* is the only one species of Taxus, which is widespread in Georgia. Cytotoxic activity of the alkaloids from the bark and the leaves of T. baccata was studied "*in vitro*" tests, using the cells: A-549 (lung carcinoma), DLD-1 (intestinal adenocarcinoma), WS-1 (human fibroblasts). The aim of the research was to study content of Taxol and other alkaloids in roots of Taxus baccata. For deriving of the alkaloids from the row material was used the method of liquid-liquid extraction. Based on experimental researches, the main alkaloids are taxol and karakoline in the sum of alkaloids from the roots of Taxus baccata grown in Georgia. The cytotoxic activity of the taxol containing alkaloids, obtained from the roots of Taxus baccata, was studied at the department of fundamental sciences of the University of Quebec at Chicoutimi (Canada). Cytotoxic activity of the alkaloids was studied "*in vitro*" tests, using the cells: A-549 (lung carcinoma), DLD-1 (intestinal adenocarcinoma), WS-1 (human fibroblasts). On the base of the researchers is shown that the substance reveals 50% inhibition of cancer cell cultures: A-549 (lung carcinoma), DLD-1 (intestinal adenocarcinoma), WS-1 (human fibroblasts). Standard was etoposide.

Cytotoxic activity of alkaloids from the roots of *Taxus baccata L.*

Plant	Vegetative organ	Alkaloids	Tumor cells cultures and methods					
			Resazurine			Hoechst		
			A-549 µg/ml	DLD-1 µg/ml	WS-1 µg/ml	A-549 µg/ml	DLD-1 µg/ml	WS-1 µg/ml
T. baccata	roots	Taxol, Karakoline	5±1	5±2	112±10	<1,563	2,4±0,6	9±3
Etoposide			24±4	10±2	35±16	2,1±0,3µM	2,1±0,3µM	31±14µM

Cytotoxic studies show, that the sum of alkaloids from the roots of Taxus baccata shows specific cytotoxic activity in tumor cells: A-549 (lung carcinoma), DLD-1 (intestinal adenocarcinoma), WS-1 (human fibroblasts).

BIOGRAPHY

Kintsurashvili L has completed her PhD at the age of 39 years from I. Kutateladze Institute of Pharmacochemistry (Georgia). She is a senior scientist of TSMU Iovel Kutateladze Institute of Pharmacochemistry. She has published more than 80 publications in reputed journals, the author of 2 patens. She is a member of organizing committee of several international conferences and meetings.

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ORIENTED IMMOBILIZATION OF ANTIBODIES ON THE ELECTRODE SURFACE FOR IMPROVING THE ANALYTICAL CHARACTERISTICS OF ELECTROCHEMICAL IMMUNOSENSORS

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The electrochemical method of detection associated with specific immunochemical reactions occurring on the working area of the transducer is extremely attractive. Electrochemical immunosensors are characterized by simplicity, reliability, relatively low cost, the possibility of achieving low detection limits, simplicity of automation and miniaturization, small operating volumes.

Method of immobilization of antibodies on the working surface of the sensor played a key role in creating of immunosensors.

The robust and oriented immobilization of the bioreceptor increases the sensitivity and accuracy of detection, and also allows the regeneration of the surface, thereby increasing the life of the sensor. Immunosensors developed using covalent immobilization of antigens/antibodies are characterized by higher accuracy and reproducibility.

The search for new ways of targeted immobilization of protein receptors on the transducer surface using “friendly linkers“ is an extremely urgent task today, since it allows for a short time to provide the bioreceptor immobilization in aqueous solutions with physiological pH and temperature. Such immobilization methods do not degrade protein structures that reduce their recognition ability, and allow multiple reuses of antigen / antibody and greater variety of immunosensors designs.

Two methods of immobilizing antibodies on the transducer surface are proposed:

1. Electrochemical assisted copper-catalyzed azide-alkyne cycloaddition using copper nanoparticles.
2. Electrografting of 5-diazo-1H-[1,2,4]triazole-3-carboxylic acid followed by antibody immobilization by carbodiimide cross-linking.

Carcino-embryonic antigen/antibody (CEA) was used as a model. The working electrode was a glass-carbon disc (Metrohm). The electrochemical response was detected voltammetrically and using the electrochemical impedance spectroscopy method (mediator system was K4[Fe(CN)6] / K3[Fe(CN)6]).

The obtained results demonstrate the high strength and stability of bioreceptor immobilization in comparison with the physical sorption.

BIOGRAPHY

Kozitsina A has completed her PhD from Ural State University named after A.M. Gorkiy (Yekaterinburg, Russia). She is a head of department of analytical chemistry Institute of Chemical Engineering of the Ural Federal University named after the first President of Russia B.N.Yeltsin. She has published more than 30 papers in reputed journals.

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Kikalishvili B et al., J Chem Tech App 2018, Volume 2

STUDY OF THE LIPIDS FROM THE FRUITS OF *YUGLANS REGIA L*. GROWING IN GEORGIA

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The aim of the investigation is to study on content of lipids fruits of usual walnut growing in Georgia for the use in medicine, for strengthening medical effect in oncological therapy, also in cosmetology.

Usual walnut - Juglans regia L. (Juglandaceae) is widely spread in Georgia. The fruit (kernel) of plant is rich in lipids and various classes (groups) physiologically active compounds: vitamins, fatty acids, flavonoids, sterines, aminoacids. The fruit of walnut and lipids from them is used for treatment of atherosclerosis, cardio-vascular diseases, in the time of liation immunic system, dermatitis, depressy, possesses cholagogic action.

From the fruits of walnut there was isolated the sum of neutral lipids (nl) in ameunt 70%, in which are revealed substances of following classes: hydrocarbons, triglycerides, free fettiy acids, sterines. There were determined some physical-chemical constants of the sum neutral lipids: specific weight d20 -0,925; index of refraction n20 -1,481; acid number- 1,9mg.KOH; iodine number I-135.

On the following stage of investigation with the help of method high performance liquid chromatography (HPLC) qualitatively and quantitatively there were identified free fatty acids: dodecanic acid - 0,10 mg/%, tetradecanic acid - 0,12 mg/%; hexadecanic acid -4,98mg/%; octadecanic acid - 1,4 mg/%; eicosanic acid - 0,21 mg/%; docosanic acid - 0,15 mg/%; tetracosanic acid -0,10mg/%; 9-octadecenic acid-70mg%; 9,12-octadecadienic acid-18,6 mg/% and 9,12,15-octadecatrienic acid-1,8mg%.

In the polar sum of the fruits of walnut there were revealed four phospholipids: lizophosphatidilcholin Rf-0,25; phosphatidilinosit Rf-0,34; phosphatidilcholin Rf 0,58; phosphatidilethanolamin Rf 0,64.

The sum of neutral lipids walnut from saturated fatty acids dominates hexadecanoic acid, but from unsaturated fatty acids-9-octadetsenic.

By the pharmacologically studies there was established that lipids from the fruits of walnut possess gastro protectoral action.

BIOGRAPHY

Kikalishvili B has completed her PhD at the age of 35 years from I. Kutateladze Institute of Pharmacochemistry (Georgia). She is a principal scientist of TSMU Iovel Kutateladze Institute of Pharmacochemistry. She has published more than 74 publications in reputed journals. She is a member of organizing committee of several international conferences and meetings.

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CHALLENGES AND CONSIDERATIONS FOR QUANTITATIVE ANALYSIS OF CHOLESTEROL PRECURSORS AND METABOLITES IN HUMAN PLASMA BY LC-MS/MS METHODOLOGY

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Concentrations of Cholesterol Precursors and Metabolites in human body are very closely related to human cognitive performance and human heart health as well. Many new drugs are developed to improve the rations of among the precursors or metabolites in human body for human health needs. Because they are so important biomarkers that sensitive and accurate determinations of all concentrations of the precursors and metabolites are critical during the drug developments and studies. For such purpose, Bio-analytical methods were developed and fully validated following US FDA and European EMA guidance for Cholesterol three precursors: Lathosterol, Lanosterol and Desmosterol, and four Cholesterol metabolites: 4β-Hydroxycholesterol, 24S-Hdroxycholesterol, 25-Hdroxycholesterol and 27-Hdroxycholesterol by LC-MS/MS methods at our laboratories. Since such marker molecule structures and polarities are very similar or the same with only a double bond position different, the bio-analytical methodology faced extremely challenge during our method development stage, which include all extraction procedures, HPLC conditions and Mass Spectrometer parameters. Especially in human plasma samples, Cholesterol is dominate marker that had significant interference with the analysis. During the method validations, we have considered that the methods need to be conducted from regulatory point of view, that is, "method validation for biomarker assays should address the same questions as method validation for PK assays……" so that the method accuracy, precision and all stabilities were completed for all assessments to meet acceptance criteria from the regulatory agencies, instead, not reference methods "fit-for-purpose" for diagnostic. In this presentation, all above scientific challenges and regulatory considerations are introduced and discussed. All methods were successfully applied to our several clinical studies, and with later on the methods for phytosterol have provided very useful insights for the drug developments.

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ON THE PROS AND CONS OF SOME ELECTROCHEMICAL TECHNIQUES FOR ANALYZING MICROBIOLOGICAL CORROSION (MIC)

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Microbiologically influenced corrosion (MIC) is electrochemical corrosion in which living organisms (both micro- and macro-) affect the severity and rate of corrosion. Annual loss of industries caused by MIC is billions of dollars. The main difference between MIC and other electrochemical corrosion processes (eg corrosion under insulation-CUI) is the involvement of living organisms.

In analysing MIC, various electrochemical methods are being applied, from simple OCP measurement to polarisation and electrochemical noise analysis. While the use of these methods in electrochemical research is quite frequent, MIC research is an exception. Not all of these methods are applicable to MIC studies, some of them are highly likely to affect corrosion-related bacteria (CRB) adversely so that the results cannot be relied upon.

In this presentation, after a brief review of economical importance of MIC and its most updated definition, we will consider the variety of CRB (contrary to what some researchers may think that MIC is only related to a particular class of CRB such as sulphate reducing bacteria (SRB)) and later list the most applied electrochemical methods for investigation with their pros and cons when applied to MIC research.

Note: