

# DYNAMIC OF SOLUBLE PROTEINS CONCENTRATION AT NICOTINE CONTAMINATED MICE (*MUS MUSCULUS* VAR. ALBINUS)

COZMA CLAUDIA <sup>1</sup>, TINCA MIOARA NAVROTESCU <sup>2</sup>  
OVIDIU TOMA <sup>1\*</sup>

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**Abstract**: The injection of some toxic substances like nicotine into a living organism gives a dynamic of proteins concentration.

## INTRODUCTION

The principal alkaloid present in smoke, derived from commercial tobaccos is S - ( - ) nicotine. The nicotine accounts for about 95% of the total alkaloid content of tobacco, the remainder being made up of various proportions of other compounds. Tobacco has been used in medical purposes for a very long time ( it was included into the majority of pharmacopeias even as late as 1890). Among the various diseases which have been successfully treated with tobacco, tobacco extracts or tobacco smoke are skin ulcers, epilepsy and apoplexy, parkinsonism, muscle spasm, cardiovascular complaints, hiccoughs. Expore to tobacco has long been proposed as a prophylactic measure against contagious diseases (Gorrod and Jenner , 1986).

Today most of the tobacco produced is processed into cigarettes, cigars or packed tobacco, with much more amount being converted into tobacco snuff. Nicotine and some tobacco extracts are used in horticulture and agriculture for the control of aphids and some other insects. Nicotine is a powerful poison and is probably the agent responsible for the toxicity produced by overdose from early medicinal use of tobacco (Gorrod and Jenner, 1986).

## MATERIAL AND METHOD

Like biological material for research it was used, every time, a sample of five mice (*Mus musculus* var. albinus), males, one year old (Public Health Institute-Biobase, Iasi), having 35 to 51 grams. During the experiment (8 consecutive days, repeated 3 times, spring 2001-2002-2003), the mice (15) had been feed in the same way using wheat cariopses and carrot (rooth) in the biobase of the Faculty of Biology, "A.I.Cuza" University of Iasi.

The experiment involved daily-intraperitoneal injection of a nicotine dose (dilution 3% in physiological serum or solution NaCl 8.95 ‰), 0,5 micrograms / kg corp. After every 2 injections (after every 2 days) a mouse has been sacrificed. An exemplar chosen at random was used like control not injected with nicotine and being sacrificed the last. Brain, kidney, liver and heart have been taken from each sacrificed mouse and at those sample level (tissues) the dosage of soluble proteins (albumins) has been determinated with Folin-Ciocalteu reactive.

The method is based on the proteins reaction with Cu<sup>2+</sup> in alkaline medium , with the formation of a Cu-proteinate. This Cu-proteinate reduces Folin-Ciocalteu reactive with the formation of blue coloured product. The dose of albumins (soluble proteins previously extracted in the distilled water) was achieved with the help of Folin-Ciocalteu reactive and the concentration of the standard curve for the dose was realised with the help of Lowry method using human seric albumins (Artenie and Tanase, 1981). The medium values of the soluble proteins (from the samples analyzed in 2001, 2002, 2003) were transformed in masses concentration (µg protein/100grams animal tissue). Soluble proteins concentration was determinated at the spectrophotocolimeter type Spekol at 500 nm.

## RESULTS AND DISCUSSION

As a result of the analyze of the sample at 500 nm and the ulterior identification of the soluble proteins (albumins) concentration there were obtained the following medium values (corresponding to those three consecutive years of investigation 2001, 2002, 2003) of quantities (micrograms of protein / 100 grams animal tissue) of proteins at the four animal organs level (liver, brain, kidney, heart) compared to the control ones (Table I).

The result has shown differences between soluble proteins concentration of the control tissues and soluble proteins concentration of contaminated mice and also a dynamic of those values. Immediately after the first and the second injection the amount of investigated protein has suddenly decreased at the level of every internal organ - reaction called "nicotine shock". In the end the proteins concentration presents variations at tissues belonging to other organs.

Table I. The dynamic of medium soluble proteins concentration (albumins) at contaminated mice (*Mus musculus*, var. *albinus*) with nicotine (solution 3% in physiological serum) vs. uncontaminated mice (control).

Research material mouse ( <i>Mus musculus</i> var. <i>albinus</i> )	Soluble proteins concentration-medium values (micrograms /100 grams animal tissue)			
	liver	brain	kidney	heart
Contaminated mouse 1 (sacrificed after 2 days)	2410	1410	1350	1530
Contaminated mouse 2 (sacrificed after 4 days)	2240	2150	2950	2860
Contaminated mouse 3 (sacrificed after 6 days)	1600	2240	3310	1790
Contaminated mouse 4 (sacrificed after 8 days)	2330	1970	1870	2050
Uncontaminated mouse- control (sacrificed after 8 days)	2240	2410	1530	1690

## CONCLUSIONS

The administration of nicotine (solution 3% in physiological serum) intraperitoneal way on mice (*Mus musculus* var. *albinus*) gives, at firsts, a "nicotinic shock" when the soluble proteins (albumins) concentration is very small.

Then, after "nicotinic shock" the soluble proteins concentration is getting back, having some fluctuations at each afferent tissue of the investigated organs (liver, kidney and heart) excepting brain, where it was showed out (after this 3 years long study) a very small level of soluble proteins concentration until the end of the experiment.

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<sup>1</sup> "Al. I. Cuza" University-Iași, B-dul Carol I., 20 A. 700506 Iași, România

<sup>2</sup> Institute of Public Health - Iași

\* Corresponding author: Prof. Ph.D. Ovidiu Toma , E-mail : otoma@uaic.ro