

Journal of Biological Research

Bollettino della Società Italiana di Biologia Sperimentale



**90th SIBS National Congress
on Experimental biology in basic
and applied research to the environment
and human health**

Trapani, Italy, 27-28 October 2017

ABSTRACT BOOK

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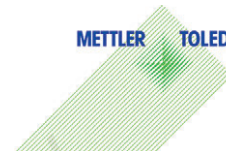


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as evidenced from *in vitro* studies. Literature data have demonstrated that xanthotoxin possess inhibitory activities on monoaminoxidase (MAO), butyrylcholinesterase (BuChE) and acetylcholinesterase (AChE). BuChE and AChE degrade acetylcholine that prevents the formation of senile plaques in Alzheimer's disease. The aim of the present study was to examine the effects of a subchronic administration of xanthotoxin on memory processes as well as on memory impairment induced by injection of scopolamine in the passive avoidance (PA) paradigm in male Swiss mice. We also assessed the relation of this drug in the level of AChE in prefrontal cortex and hippocampus. Xanthotoxin by high-performance counter-current chromatography from methanol extract of fruits of *Angelica officinalis* was purified. Our results revealed that subchronic injections of xanthotoxin at the dose 1 mg/kg, i.p., improved processes of memory acquisition and consolidation in the PA task as well as increased the level of AChE. Moreover, xanthotoxin administered subchronically improved memory acquisition and consolidation impaired by scopolamine (1 mg/kg). Moreover, it was detected that acute injection of scopolamine decreased the level of AChE in the brain, whereas xanthotoxin reverse this action. The results obtained suggest xanthotoxin can be an interesting therapeutical option in disorders with memory deficits.

Acknowledgements: This study was supported by grant no 2014/13/B/NZ4/01249 from the National Science Centre, Poland.

APPRAISAL OF THE ABIOTIC AND BIOTIC FRAMEWORK OF FARO LAKE (MESSINA, SICILY)

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Faro Lake is a meromictic basin with singular characteristics in the Mediterranean. It is located in the northern part of Messina, and is part of the Natural Reserve of Capo Peloro (38°15'57"N; 15°37'50"E). The brackish water of the lake is renewed thanks to the connection with the sea (both Tyrrhenian and Ionian) and with Ganzirri lake. In the study area traditional mollusc farming activity is present that has been recognized as ethno-anthropological heritage. The purpose of our study was to assess a start point for the monitoring of the parameters of the water and haemolymph of traditionally farmed *Mytilus galloprovincialis*. The determination of electrolytes (Na⁺, Cl⁻, K⁺, Ca²⁺, Mg²⁺, P inorganic) and heavy metals in both Faro lake water and haemolymph have been carried out. The electrolytes have been determined using the method colorimetric and potenziometric and the heavy metals using ICP-MS method. Chemical and physical parameters of the water have been recorded during sampling, using a multiparametric probe (T, Sal, pH, Conductivity), while Winkler method was used to measure the O₂ present. The monitoring period was of one year (from April 2016 to March 2017) with monthly samplings in the same point of the Faro lake. *M. galloprovincialis* is a good bioindicator, ideal for assess levels of environmental pollution thanks to its biological, ecological and physiological characteristics (sessile, ubiquitous, filter-feeder and osmoconformer). The results of our study showed a typical fluctuation range in haemolymph parameters, related to the water ones. As osmoconformer organism, the

haemolymph parameters were influenced by water parameter oscillation. Despite this, the variation of chemical-physical parameters affected the ions levels in some period of the year. The presence of heavy metals traces was constant during all the year. Our study reports for the first time the correlation between water parameters and haemolymph content of mussels farmed in the Faro lake, describing the trends and creating reference data for further studies.

MEPHEDRONE EXPOSURE IN MALE SWISS MICE: DAMAGES AND POSSIBLE SOLUTIONS TO ADDRESS DRUG ADDICTION

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Mephedrone (MEPH) [or 4-methylmethcathinone (4-MMC) or 4-methylephedrone], is a cathinone derivative and a synthetic stimulant that accelerates information sent from the brain to the body: induces the extracellular level of dopamine and the level of serotonin in the nucleus accumbens. It creates dependence as it induces a stimulating effect on the central nervous system (CNS). Addiction is an illness associated with functional disorders of the rewarding system with alterations in the structural remodeling of the synaptic connections, involving neuronal plasticity mechanisms with learning and memory phenomena. Key enzymes in remodeling are extracellular matrix proteases (ECMs) such as matrix metalloproteases (MMPs). MMPs play a key role in remodeling as well as being important for long-term learning, induction and maintenance as well as tasks of memory, all processes strongly associated with drug addiction. Therefore, the aim of our study was to study how subchronic exposure to three different doses (0.5, 2.5 and 5 mg/kg) of MEPH affects the activity of MMP-2 and 9 in the hippocampus and prefrontal cortex of mice, the structures involved in memory and learning, after subchronic administration of mephedrone. The results show that there is a significant increase in the activity of MMP-2 and MMP-9 in both structures at higher doses (2.5 and 5 mg/kg) of mephedrone, while the lowest dose of mephedrone (0.5 mg/kg) did not cause any significant changes. We also assessed the relationship with the memory consolidation processes evaluated in the passive avoidance (PA) paradigm in male Swiss mice, demonstrating that mephedron enhances the consolidation of memory and learning processes. Our results confirmed that treatment with three different doses of mephedrone resulted in an increased activity of MMP-2 and MMP-9. Therefore inhibiting MMPs activity, could possibly contribute to arrest the development of drug addiction.

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GAMBLING: SPREADING AMONG STUDENTS IN PALERMO

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