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ABSTRACT BOOK

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CRETA MARIS HOTEL

ORAL PRESENTATIONS

EFFECTS OF TOXIC CYANOBACTERIA IN THE DIET ON PHYSIOLOGICAL AND BIOCHEMICAL PARAMETERS IN RATS EXPOSED VIA FOOD - SIMPLE SIMULATIONS OF THE FOOD WEB TRANSFER

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Cyanobacteria produce numerous bioactive compounds including widely studied peptide hepatoxins - microcystins (MCs). Aims of the present study were to provide a model simulation of the simple food chain for evaluation of impacts cyanobacteria on the mammal (rat) physiology under different exposure scenario. Rats were fed with the diet enriched by fish meat and/or toxic *Microcystis* biomass and/or isolated MCs for 28 days and then studied for number of parameters. Although considerable amounts of microcystins were administered to rats, only minor trace levels of MCs were found in the rat tissues as determined with tandem LC/MS (maximum concentrations around 5 ng/g fresh weight). Besides levels of MCs, we studied parameters of oxidative stress in the liver. Group with the highest concentration of MCs in the diet had increased level of lipid peroxidation (LPO) and significantly elevated activities of glutathione S-transferase (GST) and glutathione reductase (GR). Other parameters of oxidative stress, i.e. levels of GSH, enzymatic activities of GPx, SOD and CAT were not modulated in the present study. Series of hematological parameters were also investigated but most of the analyzed indices did not show any clear differences among groups. With regard to immune parameters, statistically significant stimulation of the antibody response to model antigen KLH was observed in the group with the highest MCs level. Our study demonstrates that oral exposure to high dose of microcystin in the diet may induce some detoxification responses, oxidative stress and immune modulations. However, effects observed in the present investigations were relatively weaker in comparison with previously published studies. Supported by Czech projects NAZV QH71015 and MSM 6215712402.

THE MANILA CLAM *RUDITAPES PHILIPPINARUM*: A NEW MODEL SPECIES TO INVESTIGATE THE GENETIC BASIS OF RESISTANCE TO PARALYTIC SHELLFISH TOXINS?

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The Manila clam, *Ruditapes philippinarum*, a native of the western Pacific, has been deliberately introduced to Pacific North America and Europe, including both Atlantic and Mediterranean coasts of France, where established populations support valuable commercial fisheries. Manila clams accumulate intermediate levels of paralytic shellfish toxins (PSTs) relative to other bivalves. This study determined a) the individual susceptibility of Manila clams to toxic *Alexandrium* spp. as measured by effects on in vivo burrowing behavior and in vitro nerve response, and b) the effects of exposure to *Alexandrium* spp. on hemocyte concentrations and function, and the progression of brown ring disease (BRD), caused by *Vibrio tapetis*. PSTs slowed the progression of BRD, rather than aggravating the disease, as initially hypothesized, but they produced no overall detrimental effects on hemocyte parameters. Individual variability in susceptibility to PSTs in a clam population from southern Brittany, France, characterized by relatively low PSP levels, was confirmed from both burrowing and nerve responses. A burrowing assay indicated that 45% of the adult test population was resistant to PSP, while the remaining 55% was sensitive, i.e. was incapacitated following ~1d exposure to a high-toxicity *Alexandrium* isolate. Clams from this region also exhibited 5-fold individual variability in nerve resistance to saxitoxin. Prior findings of phenotypic variability in sensitivity to PSTs led to the discovery of a Na^+ channel mutation that confers resistance to PSTs in softshell clams, *Mya arenaria*. Thus *T. philippinarum* may provide an alternate model species in which to investigate the molecular/genetic basis for resistance to PSTs.

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