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energetic status of *A. mexicanum* juveniles involving probably metal regulation, compensation and detoxification processes. The obtained information contributes to the environmental risk analyses of metals exposure in Xochimilco wetland and to the future management of the axolotl wild populations.

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The study of biomarkers of toxic effects of oil in the background species of animals from oil contaminated territories

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Intensive development of the oil and petroleum industry inevitably leads to environmental pollution by oil and oil products. The ecological situation can worsen considerably if these territories belong to an arid zone. For example, in Kazakhstan where recently intensive oil production is conducted and in natural landscapes deserts and semi-deserts prevail, the ecosystems are characterized by low resistance to the influence of the human activity. In this regard there is a threat of degradation of desert ecosystems, the risk of sharp reduction of a biodiversity and deterioration of public health. To assess the state of the biota of various oil producing regions of Kazakhstan (Atyrau and Mangistau regions) in the background species of amphibians, reptiles and mammals (rodents) molecular, cellular and tissue biomarkers of oxidative stress, of a detoxication and genetic disorders were identified. In background indicator species: lake frog (*Rana ridibunda*), green toad (*Bufo viridis*), water snake (*Matrix tessellata*) and the great gerbil (*Rhombomys opimus*) from the oil-contaminated biotopes of Atyrau and Mangistau region fatty

degeneration and necrosis hepatocyte shrinkage vascular glomeruli and renal tubular epithelial degeneration, inflammation, a two-fold increase in oxygen radicals, lipid hydroperoxide (GPL) and malondialdehyde (MDA), and reduction of the activity of superoxide dismutase (SOD), catalase (CAT), cytochrome P450 and glutathione-S-transferase in the serum, liver and kidney homogenates were found. In the great gerbil (*Rhombomys opimus*) of oil contaminated habitat, as well as in laboratory rodents (rats and mice) exposed to crude oil from the fields of the studied regions, level of somatic cells (bone marrow, blood and liver) with a single-stranded DNA breaks also considerably increased. It was found that the activation of lipid peroxidation, inhibition of xenobiotic detoxification and antioxidant protection, as well as genetic disorders are associated with significant accumulation of aromatic hydrocarbons (benzo (a) pyrene) in the blood and tissues of the test animals. Of all the bioindicator species studied, in the conditions of arid climate amphibians: a lake frog (*Rana ridibunda*) and a green toad (*Bufo viridis*) are the most sensitive to oil-contamination. And the most vulnerable area is the territory of the Mangistau region. The improvement of an environmental situation and the preservation of a biodiversity in the studied regions requires decrease in an intensification of exploitation of old oil fields, introduction of modern technologies of oil production and the use of alternative energy sources.

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