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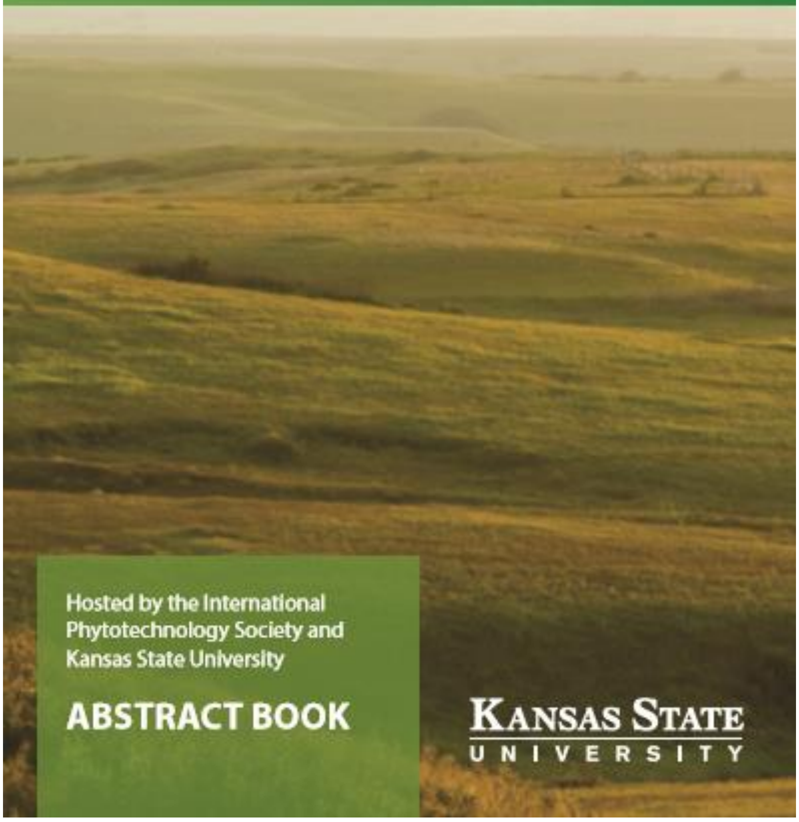

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## ABSTRACT BOOK

KANSAS STATE UNIVERSITY

## P10. Bolatkhan K.

Biotesting various contaminated aquatic ecosystems based on the Mutant test strains of microalgae

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There are some difficulties to control the content of toxicants in the environment by chemical methods, in addition, the physiochemical methods of indicating the status of the environment do not give a direct answer to the question about the possible response of ecosystems to these or other contamination. Due to the high sensitivity of the algae to the environmental conditions, they play an important role in bioassay methods. One of the major advantages of using unicellular eukaryotes as test objects is the high rate of reproduction, which allows the laboratory to observe the cell population for many generations, and accordingly get a quick response to the presence of toxic and mutagenic substances. In this study, the method of induced mutagenesis derived mutant of Chlamydomonas reinhardtii (CC1021), named as CC1021Mut1 - mutant obtained in photoautotrophic conditions, characterized by light green color. The bioassay of water samples from two different bays of Lake Balkhash (Torangalyk and Baytal) using pigment cells of the mutant green microalgae Chlamydomonas reinhardtii CC1021Mut1 in order to obtain a more complete assessment of the ecological status of the lake. The results indicate the presence of toxic substances in concentrations that do not have a toxic effect on the growth of a strain of Chlamydomonas reinhardtii CC1021Mut1. The study of water samples taken from the two bays of Balkhash Lake by using bioassay methods with mutant strain Chlamydomonas reinhardtii CC1021Mut1showed a medium degree of water pollution from these sources.

Keywords: Biotest, microalgae, mutant strains, ecosystem, wastewater

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## P11. Bradfield, Scott

Influence of TiO2 Engineered Nanoparticles on Photosynthetic Efficiency and Contaminant Uptake

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The majority of plant-nanoparticle interactions are currently focusing on the direct negative effects of nanoparticles on the health of the plant; however the current research aimed to determine if TiO2 engineered nanoparticles (ENPs) could be beneficial for plants via two different strategies. Firstly, determination whether the foliar application of TiO2 engineered nanoparticles and/or bulk TiO2 on Zea mays elicited a positive response in terms of photosynthetic efficiency. Physiological parameters (net photosynthesis, transpiration, stomatal conductance, and internal leaf temperature) were recorded to determine the effects of TiO2 on photosynthesis. Previous research with spinach has shown that the foliar application of TiO2 may increase several parameters associated with photosynthesis. However, these studies were performed for short time periods in controlled environments. The current study examined the effects of TiO2 ENPs and bulk material on Z. mays under natural settings. Secondly, efforts were made to determine the influence of TiO2 ENPs on the uptake and accumulation of cadmium and arsenate by broccoli plants. The underlying thought was that if the contaminants became adsorbed to the surface of the TiO2 ENPs, it would restrict the uptake or the bioavailability of the contaminants. Restriction of inorganic contaminant bioavailability via ENP-contaminant interactions may reduce the toxicity of a contaminated soil by limiting the amount of the inorganic contaminant that is freely available for the plants to take up and accumulate.

Keywords: nanoparticles, titanium dioxide, photosynthesis, inorganic contaminants

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