17th International Conference on
Environmental Toxicology and Ecological Risk Assessment
&
36th International Conference on
Environmental Chemistry & Water Resource Management
September 24-25, 2018 | Chicago, USA

Noemi Sandra Tirado Bustillos

Universidad Mayor de San Andres, Bolivia

Biomarkers for biomonitoring of populations exposed to pesticide in Bolivia

Living beings are frequently exposed to a large number of xenobiotic from different environmental sources. In humans many times this exposure is increased by the type of occupation, or also by lifestyles, such as habitat, food, smoking and others. Human exposure to pesticides occurs either by contact, inhalation or by ingestion. The xenobiotic reaches the blood circulation and as a result of this exposure can be carcinogenic, mutagenic or teratogenic effects (dosage related effects). The susceptibility to developing diseases dependent on exposure to pesticides and the variability between individuals is modulated by individual variations in the genes related to the metabolization/detoxification of these compounds and also in the repair capacity of injuries induced by them. The susceptibility biomarkers are being widely used as a tool in human biomonitoring studies together with the exposure and effect biomarkers. In Bolivia, a high percentage of the population is engaged in agriculture and uses different pesticides for the production of their crops, where the management of these products is empirical, without personal protective equipment. In the laboratory of Toxicological Genetics of the Institute of Genetics, research work has been carried out in populations exposed to pesticides from different places in Bolivia, in exposed farmers where biomarkers of exposure were used (cholinesterase in blood, metabolites of pesticides in urine), effect biomarkers to measure the DNA damage (Micronuclei in peripheral blood lymphocytes, micronuclei in buccal cells, Chromosomal aberrations and comet assay in blood) and biomarkers of genetic susceptibility (polymorphisms GSTM1, GSTT1 and CYP2E1) by exposure to pesticides. The results of these studies showed statistically significant differences in the genotoxic damage tests comparing the exposed groups in relation to the controls ($p < 0.05$) with the comet assay and chromosomal aberrations. In other studies, the comet assay and the Micronuclei in buccal cells showed statistically significant differences between exposed farmers and the controls ($p<0.05$). In relation to the cytogenetic parameters analyzed, the effect of the genotype on null individuals for GSTT1 presented a higher number of Micronucleus in relation to positive GSTT1 individuals. Determine the genotoxic risk of populations exposed to pesticides is a way to prevent the occurrence of cases of cancer and other degenerative diseases.

Biography

Noemi Sandra Tirado Bustillos is the professor of Biochemistry and Molecular Biology at Higher University of San Andres (UMSA), Head of Genotoxicology Unit at Genetic Institute – Medicine School – UMSA- La Paz – Bolivia. Secretary of the Executive Committee of the Latin American Association of Mutagenesis, Carcinogenesis and Environmental Teratogenesis, (ALAMCTA). President of the Bolivian Society of Mutagenesis, Carcinogenesis and Environmental Teratogenesis (SBOMCTA). She is the coordinator of a research regarding environmental toxicology studies (pesticide exposure) – Swedish cooperation, Bolivian coordinator of a grant related to Arsenic Metabolism in women exposed to contaminated drinking water, she is the author/co-author of 25 scientific papers, research papers, all of them concerning biomonitoring of people exposed to environmental contaminants as Heavy metals, pesticides, chemicals (131I, Formaldehyde) and radiations and conferences worldwide. She is the recipient of several national and international award, Chairperson of The XIX International A. Hollaender Courses by the IAEMS – 2015, Member of Organizing Committee of X ALAMCTA Congress 2016- Uruguay, Member of Organizing Committee of X ALAMCTA Congress 2019- Paraguay.

noemitirado@yahoo.com

Notes: