

Influence of Pesticides on the Cytogenetic Effect

Khalikov Pulat Khuzhamkulovich

Doctor of Biological Sciences, Professor of the Department of Histology and Medical Biology
Tashkent Medical Academy Uzbekistan Tashkent

Daminov Akmal Okhunjonovich

Candidate of Medical Sciences, Associate Professor of the Department of Histology and Medical
Biology Tashkent Medical Academy Uzbekistan Tashkent

Islamova Shohista Abdikhalilovna, Khusainova Husnobot Zhuraevna

Assistant of the Department of Histology and Medical Biology Tashkent Medical Academy
Uzbekistan Tashkent

Abstract. Separate repeated action of pesticides in small doses can affect the genetic apparatus of both somatic and generative cells. However, with repeated combined action of pesticides in generative and somatic cells, there was no increase (sensitization) or decrease in the cytogenetic effect when using one drug with another. The cytogenetic effect of dalapon was studied in somatic (bone marrow) cells using tests for accounting, chromosome aberrations in metaphase in bone marrow cells. There are few data on the genetic effect of pesticides obtained on an animal object, especially on mammals, taking into account chromosome aberrations.

Keywords: genetic effect, pesticides, bone marrow, micronuclei in PChE, chromosome aberrations, metaphase, chromosomal mutations, cytogenetic effect, metaphases.

INTRODUCTION. Unlike other pollutants, pesticides are deliberately introduced by humans into the biosphere. Oki circulate in it on an ever-increasing scale, migrating along trophic chains, and accumulate in various objects of the natural environment. This leads to the inevitable contact with them, practically, of all living things and significantly aggravates the prognosis of their possible genetic danger. Therefore, it is necessary to carry out not only testing of pesticides for genetic activity, but also, importantly, genetic monitoring to assess the mutagenicity of the environment in areas of their intensive use.

MATERIAL AND METHOD The following doses of dalopolum were used: LD₅₀); dalapon - 320, 640, 1280, 2560 and 5000 mg / kg (1/18, 1/9, 1/4, 1/2 and close to LD₅₀. Dalapon was administered to animals with an intragastric needle with a blunt end. In all experiments for cytogenetic - analysis of bone marrow cells, the animals were sacrificed 24 hours after the administration of dalapon .

To take into account chromosome aberrations in metaphase, preparations from bone marrow cells were prepared according to the generally accepted method [1]. Mice were injected intraperitoneally with a 0.04% solution of colchicine in an amount of 0.01 ml/g of body weight. An hour later, the animals were sacrificed and the femurs were quickly removed. The bone marrow was washed with warm (37°C) hypotonic solution into a centrifuge tube with a medical syringe. A 56% potassium chloride solution was used as a hypotonic solution. The bone marrow cell suspension was incubated in a hypotonic medium for 5 min at 37°C. This suspension was then centrifuged for 5 minutes at 800-1000 rpm. Draining over the sedimentary fluid, the bone marrow

cells were fixed with a mixture of methyl alcohol and glacial acetic acid (3 parts of methyl alcohol and 1 part of acetic acid). The fixative was changed 3-4 times. After that, the contents of the tube (approximately 0.5 ml of the fixative) were shaken and a homogeneous suspension of cells in the fixative was obtained. The duration of fixation is 1-2 hours. 2-3 drops of cell suspension in fixative were applied to a clean glass slide. The fixative was burned out and the preparations were stained with a dye made from a mixture of ammonium oxalate and violet crystal .

Table 1. Chromosome aberration frequency and number of PChEs with micronuclei in mouse bone marrow cells after separate and combined exposure Kotoran (10 mg/kg), phasalona (0.8 mg/kg) And chlorate magnesium (52 mg/kg) with their repeated (3 months) administered

Options	Number studied		Metaphases with rearrangements		FEC with micronuclei (for 9000 cells)	
	animals	metaphase	number	%	number	%
1	2	3	4	5	6	7
Control	8	860	4	0.46±0.32		0.86±0.09
Apart						
Kotoran	6	578	14	2.42±0.63	466	5.17±0.92
Fazalon	8	681	21	3.08±0.66	616	6.84±0.96
Chlorate magic	7	645	19	2.94±0.66	581	6.45±0.96
Combination _ _						
Fazalon + chl . magnesium	8	875	26	2.97±0.57	600	6.67±0.84
Kotoran + fazalon + chl . magnesium	7	809	25	3.09±0.60	533	5.92±0.82

In experiments with separate, combined action of pesticides, the study of rearrangements in bone marrow cells was mainly of the chromatid type, chromosomal rearrangements were single. Of the chromatid rearrangements, terminal single deletions were often encountered. Then microfragments and translocations followed in terms of number . The main types of chromosome rearrangements noted in diakinesis -metaphase are somatic univalents, then translocations were located according to their number.

CONCLUSION. Thus, the separate repeated action of pesticides in small doses can affect the genetic apparatus of both somatic and generative cells. However, with repeated combined action of pesticides in generative and somatic cells, there was no increase (sensitization) or decrease in the cytogenetic effect when using one drug with another. Therefore, the frequency of chromosome aberrations and the number of ATS under the combined action of both two and three pesticides were the same as with one pesticide.

REFERENCES:

1. Grushko, Ya. M. (1971). Toxic substances of organic origin in industrial waters and the problem of sanitary protection of water bodies. *Hygiene and Sanitation* , (10), 82-85.
2. Imamaliev.I.Kh, Vesmanova.O.Ya, Ergashev.A.K. Differential sensitivity of chromosomes to the action of a defoliant and pesticides. "All-Union meeting" Ecological and genetic monitoring of the state of the environment. Karaganda. 1990. P-54.
3. Kurinny.A.I., Pilinskaya.M.A. Research on pesticides as environmental mutagens . Kiev. Naukova Dumka, 1976-C,113
4. Kurbanov A.K., Khalikov P.K., Shigakova L.A., Islamova S.A., Zh.K.K. (2022). The study of

working conditions and environmental pollution in the application of the herbicide Zellek .
International Journal of Scientific Trends , 1 (2), 91-94.

5. Khalikov P.Kh., Kurbanov A.K., Shigakova L.A. Correction of the genetic result of dalapon (HERBICIDE) using plant extracts : dis . – Uzbekistan , Tashkent , 2022.