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THIRD INTERNATIONAL CONFERENCE «INTEGRATION NETWORK OF THE PHARMACEUTICAL ECOLOGY - 2025»

Study of the mitosis-modifying properties of the extract *Cyclachaena xanthiifolia* (Nutt.) Fresen.

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Introduction. Environmental pollution with heavy metals and synthetic xenobiotics is one of the most pressing environmental problems of our time. At the same time, plants, as a source of a vast diversity of secondary metabolites, remain a promising target for identifying new compounds with regulatory and antimutagenic activity that could find application in medicine and biotechnology.

The ecological valence of *Cyclachaena xanthiifolia* (Nutt.) Fresen. and its competitive strength suggest that it possesses a strong allelopathic potential and a complex of biologically active substances, the effects of which at the cellular level have not been adequately studied.

Materials and research methods. In 2024, an alcoholic extract ($C = 10.78 \text{ g/L}$ or 1.078%) was obtained from *Cyclachaena xanthiifolia* raw material, followed by dealcoholization ($C = 21.56\%$). It was analyzed using the Allium test. To identify the mitotic index and chromosomal aberrations, squashed preparations of onion root meristems stained with ethyl-orcein were prepared. A Leica DM2500P microscope was used for microscopy. Photographs of the preparations were taken using Leica Application Suite software. The results were processed statistically.

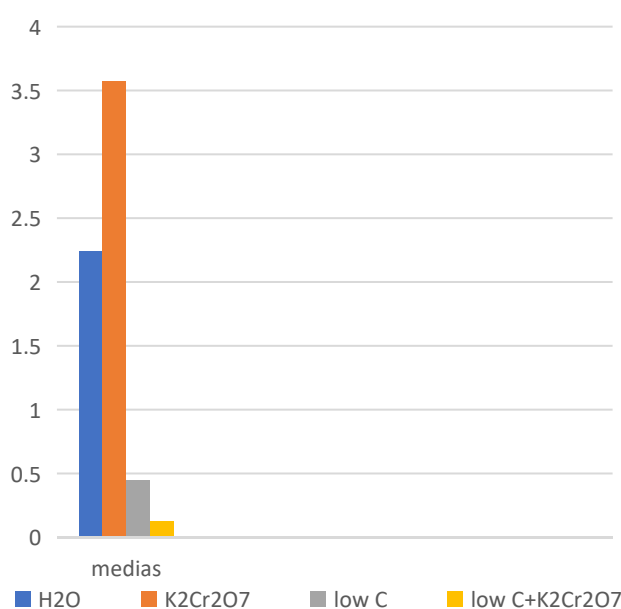
Materials and research methods



The aim of this work was to study the mitosis-modifying capacity of the dry extract of *Cyclachaena xanthiifolia* at a concentration of 21.56% , as well as its effect on the cytogenetic effect induced by potassium bichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) in the Allium test system.

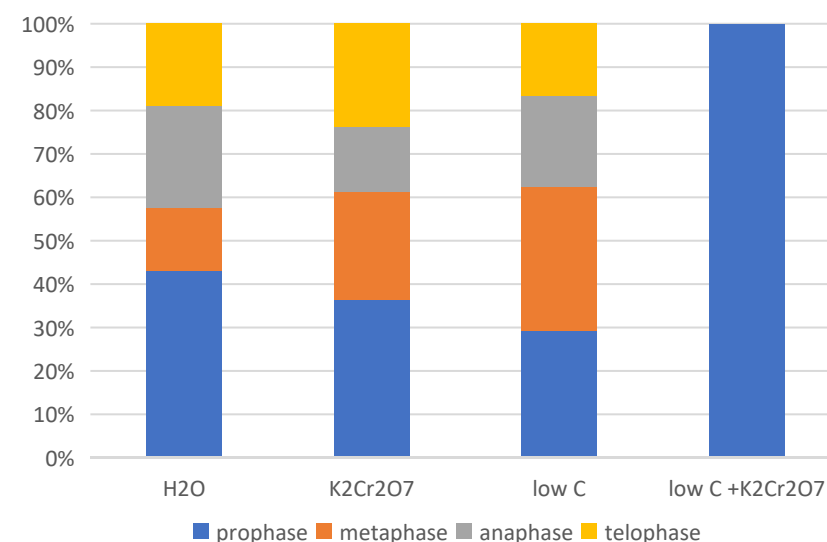
Results. Figure 1.

Mitotic Index of onion roots grown on different media

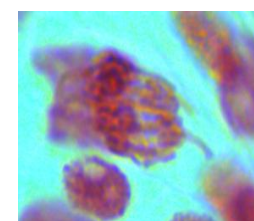


Results. Figure 1.

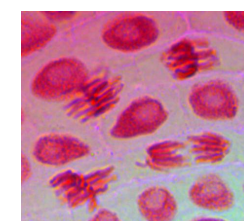
Prophase, metaphase, anaphase and telophase indices of onion roots grown on different media



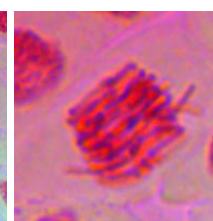
Acentric fragments



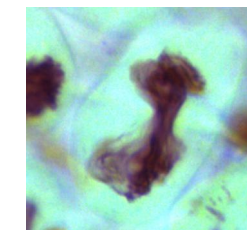
Media: distilled water



Media: potassium bichromate



Anaphase Bridge



Media: low C of extract

Conclusions.

1. A low-concentration aqueous extract of *Cyclachaena xanthiifolia* exhibits pronounced antimutagenic activity
2. A synergistic effect was detected from the combined action of *Cyclachaena* extract and potassium dichromate.
3. The combined action of *Cyclachaena* extract and dichromate causes complete blockade of the mitotic cycle.
4. Thus, *Cyclachaena xanthiifolia* is a promising source of compounds with cytostatic action, the mechanism and nature of which require further phytochemical investigation.