



The new plant growth regulators based on derivatives of oxazole and oxazolopyrimidine

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Abstract:

As is known, the major plant hormones cytokinins take an important part in control of embryo patterning, seed germination, de-etiolation, cell cycle control and protein synthesis, chloroplast differentiation, overcoming of apical dominance, releasing of lateral buds from dormancy, flower and fruit development, delaying of leaf senescence, plant-pathogen interactions, and in vitro morphogenesis in plants [1-5]. In our work to study cytokinin-like activity of chemical heterocyclic compounds, derivatives of pyrimidine, pyrazole, isoflavones, and pyridine we used specific bioassay conducted on the cotyledons (i.e. food-storage organs) isolated from seeds of muscat pumpkin (*Cucurbita moschata* Duch. et Poir.) cultivar Gilea. As is known, this bioassay is based on key role of cytokinins in regulation of cell division in isolated plant organs, which leads to an increase in their biomass [1, 6]. The activity of chemical heterocyclic compounds was compared with the activity of plant hormone cytokinin Kinetin. The specific bioassay on cytokinin-like activity showed that among heterocyclic compounds, derivatives of oxazolopyrimidine and oxazole, used at the concentration 10⁻⁹M in water solution, the highest activity on the growth of biomass of cotyledons isolated from seed of muscat pumpkin (*Cucurbita moschata* Duch. et Poir.) cultivar Gilea demonstrated the compounds: the compound **2** - 2,5-diphenyl[1,3]oxazolo[5,4-d]pyrimidin-7(6H)-one, which contains phenyl substituent at the 5th position of pyrimidine fragment, the compound **4** - 7-amin-5-(4-ethylphenyl)-2-phenyl[1,3]oxazolo[5,4-d]pyrimidine, which contains amino group at the 7th position of pyrimidine fragment, and the compound **6** - 2-tolyl-5-(piperidin-1-ylsulfonyl)-1,3-oxazole-4-carbonitrile, which contains tolyl substituent at the 2nd position of oxazole. It is obvious that cytokinin-like activity on the growth of the biomass of cotyledons isolated from seed of muscat pumpkin (*Cucurbita moschata* Duch. et Poir.) cultivar Gilea of chemical compounds, derivatives of oxazolopyrimidine may depend on substituents at the 5th and 7th positions of pyrimidine fragment, while as activity of compounds, derivatives of oxazole



may depend on substituents at the 2th position of oxazole. The obtained results confirmed the inducing cytokinin-like effect of synthetic heterocyclic compounds on plant cell elongation, division, and differentiation that are the basic processes of plant growth. The practical application of derivatives of oxazolopyrimidine and oxazole as new plant growth regulators was proposed.

Biography:

Tsygankova Victoria Anatolyivna, Dr. Biol. Sci., principal researcher, senior staff scientist. She is a Head of group of screening of synthetic compounds of Department for Chemistry of Bioactive Nitrogen-Containing Heterocyclic Compounds, V.P. Kukhar Inst. Bioorganic Chemistry and Petrochemistry, NAS of Ukraine. She has published the 5 Ukrainian patents, 3 Monographs and more than 150 articles published in the Ukrainian national and international peer-reviewed journals and has been serving as an editorial board member of repute.

Recent Publications:

1. Tsygankova V.A, et al Front Plant Sci, 2019.
2. Tsygankova V.A, et al J ChemTech Research, 2019.
3. Tsygankova V.A, et al Commun Agric Appl Biol Sci, 2012

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