

Thematic section: Preparative Research.

Subsection: Organic Chemistry.

**Full Paper**

The Reference Object Identifier – ROI-jbc-A/21-1-1-4

The Digital Object Identifier – DOI: 10.37952/ROI-jbc-A/21-1-1-4

Received 30 January 2021; Accepted 2 February 2021

## **Synthesis of 2- and 4-(1*H*-1,2,4-triazol-ylmethyl)phenol alkyl esters and study its biological activity in express analysis on *Lepidium sativum***

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**Keywords:** 1-[2-(alkyloxy)benzyl]-1*H*-1,2,4-triazoles, 1-[4-(alkyloxy)benzyl]-1*H*-1,2,4-triazoles, lipophilicity, dipole moment, molecular volume, effect on the morpho-physiological parameters of *Lepidium sativum*.

### **Abstract**

1,2,4-Triazole derivatives are widely used in pharmacology and agriculture as drugs, plant growth regulators and fungicides. But the presence of side effects that were discovered earlier complicate their further exploitation. A simple and convenient method was proposed for the preparation of alkyl esters of 2- and 4-(1*H*-1,2,4-triazol-1-ylmethyl) phenols by the reaction of 2- and 4-(1*H*-1,2,4-triazol-1-ylmethyl) phenols with the corresponding alkyl halides in DMF in the presence of sodium hydride. The structure of the synthesized compounds was established on the basis of IR and <sup>1</sup>H NMR spectroscopy data. The IR spectra contain absorption bands, which prove the presence of methyl and methylene fragments of the corresponding functional groups, as well as absorption bands corresponding to the oxymethylene unit linked to the phenolic fragment. The <sup>1</sup>H NMR spectroscopy data contain additional information on the belonging of the synthesized compounds to *ortho*- and *para*-isomers. The biological activity of the compounds was assessed by their effect on the growth of roots and stems of *Lepidium sativum*. The seeds were germinated in a thermostat at a temperature of +22 °C in solutions of the obtained derivatives of triazole using 0.5% isopropyl alcohol as a solvent. The significance of differences between the effect of the compounds and the control was assessed using two-way analysis of variance. It has been proved that the growth processes of *Lepidium sativum* are influenced not only by the type of phenolic isomerism, but also by the structure of the alkyl fragments of the investigated compounds. The revealed patterns can be used to study other types of biological activity of the synthesized triazolides. The relating between biological

activity and physicochemical properties of compounds (lipophilicity, dipole moment and molecular volume) was assessed using correlation analysis by using the HyperChem 8.0 software.

**For citation:** Zoya P. Belousova, Ekaterina S. Selezneva, Ekaterina A. Agapova. Synthesis of 2- and 4-(1*H*-1,2,4-triazol-ylmethyl)phenol alkyl esters and study its biological activity in express analysis on *Lepidium sativum*. *Butlerov Communications A*. **2021**. Vol.1. No.1. Id.4. DOI: 10.37952/ROI-jbc-A/21-1-1-4

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