

Synthesis and growth stimulating activity of methyl 4-aryl-2- {[4-(*N-R*-sulfamoyl)phenyl]amino}-4-oxobut-2-enoates

© Vladimir L. Gein,^{*,†} Olga V. Bobrovskaya, Irina V. Kovtonogova, Grigory V. Seliverstov, Alexander A. Russkih, Valentina D. Belonogova, Alevtina G. Anisimova, and Tatiana A. Yagontseva

Department of General and Organic Chemistry. Department of Pharmacognosy with Course of Botany. Perm State Pharmaceutical Academy. Polevaya St., 2. Perm, 614990. Russia.

Phone: +7 (342) 282-58-30. E-mail: geinvl48@mail.ru

^{*}Supervising author; [†]Corresponding author

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Abstract

A major focus of the search for new biologically active agents is the synthesis of compounds with programmable features, including the modification of molecules known drugs.

Reacting methyl esters of aroilpiruvate acids with sulfanilamides (sulgin, sulfacetamide, sulfathiazole) in a mixture of acetic acid-ethanol in a ratio of 1:1 obtained methyl 4-aryl-2- {[4-(*N-R*-sulfamoyl)phenyl]amino}-4-oxobut-2-enoates, existing in the solutions in the form of *Z*- and *E*-isomers with a predominance of *Z*-form. The structure of the compounds were established by IR, ¹H NMR spectroscopy. The compounds do not give distinctive red color with an ethanol solution of iron(III) chloride, which also confirms this structure.

There are literature data on the link between nitrogen-containing compounds and plant biology, suggesting that growth promoting activity from methyl 4-aryl-2- {[4-(*N-R*-sulfamoyl)phenyl]amino}-4-oxobut-2-enoates as a nitrogen-containing compounds.

The physiological role of nitrogen-containing compounds is that they as active metabolites are involved in biosynthesis of various compounds also can act as sensitizers, i.e. substances enhancing the sensitivity of cells and tissues of the plants to certain parts of the solar spectrum. Promoting the absorption of sunlight by plants, they accelerate the flow formation phase and the development of fruiting bodies. There is a positive effect of nitrogen-containing biologically active substances to increase the morphometric parameters and other grain products.

It was studied the growth stimulating activity of methyl (2*Z*)-4-aryl-2- {[4-(*N-R*-sulfamoyl)phenyl]amino}-4-oxobut-2-enoates, which was determined by their effect on laboratory germination of wheat seeds. In addition to determination of germination and vigor studied morphometric characteristics of wheat seedlings on the third day after seeding (the length of the shoot, length of the longest root and the number of roots). For the seed treatment used 0.05 and 0.005% solutions of test compounds in 20% DMF solution. The highest activity has methyl (2*Z*)-2- {[4-(carbamidoylsulfamoyl)phenyl]amino}-4-oxo-4-phenyl-but-2-enoate at a concentration of 0.05%, which has no substituents in the residue aroyl pyruvic acid, and methyl (2*Z*)-2- {[4-(carbamidoylsulfamoyl)phenyl]amino}-4-oxo-4-(4-fluorophenyl)-but-2-enoate (0.05%), having a 4-fluorophenyl substituent.