compounds proved to be quite effective in terms of antibacterial and antifungal action.

Thus, it is shown that 4-acetylphenyldiazonium salts can be used as effective arylating reagents in dediazonization reactions in the presence of unsaturated compounds and nucleophiles. The introduction of acetyl group into the structure of anionarylation products expands the possibilities of their usage in pure organic synthesis, in particular for the preparation of biologically active compounds and sulfur- and nitrogen-containing heterocycles.

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THIOUREAS BASED ON 4-AMINOANTIPYRINE. SYNTHESIS AND RE-REGULATING ACTIVITY

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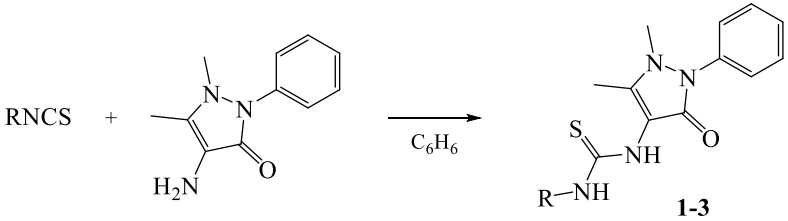
Today, one of the urgent tasks of organic chemistry is the synthesis of new analogues of natural biologically active compounds.

In particular, special attention is paid to derivatives of heterocyclic carbonyl compounds as an important group of substances that are promising in terms of biological, clinical, medical, analytical and pharmacological research. Among them, heterocyclic compounds based on 4-aminoantipyrine are of priority because they are widely distributed in nature and have a wide range of biological activity [1]. 4-Aminoantipyrine is a pyrazole derivative that reduces temperature and is used to obtain azo dyes, protect against oxidative stress, and prevent some diseases, including cancer, which are important areas in medicine. Derivatives of 4-aminoantipyrine are also known for their wide use as catalysts and bioactive compounds characterized by analgesic, bactericidal, anti-inflammatory, antiviral, insecticidal, fungicidal and restorative effects. They are also strong inhibitors of cyclooxygenase isozymes, platelet thromboxane synthesis, and prostanoid synthesis, which catalyze the synthesis of prostaglandins [2].

In continuation of research on expanding the range of N,N'-disubstituted thioureas and the synthesis of potential bioactive thiocarbamate derivatives containing a 4-aminoantipyrine fragment, we studied the interaction of allyl-, phenyl-, 4-methylphenylisothiocyanates with 4-aminoantipyrine (4-amino-1, 5-dimethyl-2-phenyl-1,2-dihydro-3*H*-pyrazol-3-one).

It was established that the studied reactions are accompanied by the formation of the corresponding N,N'-disubstituted thioureas. The synthesis of thioureas based on 4-aminoantipyrine was carried out according to the schemes:



1-3

1-3: R = CH_2=CH-CH_2- (**1**), Ph (**2**), 4-MeC_6H_4 (**3**)

It was shown that aryl(allyl)isothiocyanates interact with 4-aminoantipyrine in a benzene environment with the formation of 1-aryl(allyl)-3-(1,5-dimethyl-3-oxo-2-phenyl-2,3-dihydro-1*H*-pyrazol-4-

yl)thioureas **1-3** in practically quantitative yields.

The structure of the synthesized compounds was confirmed by IR and ^{1}H NMR spectra. The characteristic absorption bands of thioamide, carbonyl, and amide groups are located in the region of 1218, 1696, and 3328 cm^{-1}, respectively, and the bands of δ_{CH} deformation vibrations of the benzene ring are observed at 812-808 cm^{-1} [3]. At the same time, in the IR spectrum of compound **1**, there is additionally a band of valence vibrations $\nu_{C=C}$ of the allylic fragment (1640 cm^{-1}).

Analysis of ^{1}H NMR spectrum of 1-allyl-3-(1,5-dimethyl-3-oxo-2-phenyl-2,3-dihydro-1*H*-pyrazol-4-yl)thiourea **1** confirms the presence in the structure of the molecule protons of allyl (5.06-5.85 ppm) and phenyl fragments (7.35–7.43 ppm), as well as protons of methyl groups (2.28 ppm) and two NH-protons of the thiocarbamate fragment (7.85, 11.41 ppm).

Thus, we have shown the possibility of formation of 1-allyl(aryl)-3-heterylsubstituted thioureas containing antipyrine fragments. The synthesized compounds are of interest as building blocks for the construction of complex heterocyclic systems with two or more heterocyclic fragments, have significant potential for further research in terms of obtaining new derivatives containing an antipyrine residue and creating combinatorial libraries of bioactive substances based on them that can be studied according to different directions of manifestation of practically useful properties.

Research on the re-regulating activity of synthesized 1-allyl(aryl)-3-heterylsubstituted thioureas was carried out on the seeds of winter wheat variety "Lazurna" of the first reproduction, which were treated with solutions of the corresponding substances **1-3** with a concentration of 0.002%. Distilled water was used as a control.

At the initial stage (3 days), the indicator of germination energy varied slightly (CV = 6%). Yes, the absolute majority of experimental options prevailed over the control - 3.7 - 18.5%. The most significant increase relative to the control variant was noted with substance 3 - 18.5%. A slightly smaller value was characterized by substance 1, + 13.6%. The energy of germination in the variant with substance 2 was insignificantly higher than in the control (+3.7%).

The mass of dry seedlings varied significantly - 14%. Substance

3 showed a significant increase in the dry weight of seedlings by 8.9%.

The mass of raw roots was slightly different from other indicators. Thus, the variation of this indicator was close to significant - 18%. High efficiency compared to the control was shown by substance 1, where the mass of roots increased by 40.8%.

In general, the results of the study proved that the compound **3** – 1-(4-methylphenyl)-3-(1,5-dimethyl-3-oxo-2-phenyl-2,3-dihydro-1*H*-pyrazol-4-yl)thiourea is characterized by a sufficiently high re-regulating activity, and the negative effect is observed for compound **1** – a product containing an allylic fragment in the molecule.

Thus, the obtained data confirm the perspective of using the synthesized compounds as seed germination stimulators and plant growth regulators.

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