

Resulting transformants were observed phenotypically and for stability of the insert for two generations; lines with best indices were chosen for phytopathological greenhouse testing. Samples (30–40 seeds) were grown for 14 days and inoculated with synthetic population of *Puccinia triticina*, compiled from Kazakhstan's isolates of the pathogen. Plants were kept in moist chamber for 24 h and 10–14 days in conditions optimal for disease. Plant resistance was assessed by Mains and Jackson scale.

Control (not modified) plants were susceptible to moderately susceptible to the infection. In the cisgenic lines tested, one was susceptible, four showed moderate susceptibility, one was moderately susceptible to moderately resistant, and two expressed moderate resistance to leaf rust.

Although none of the plants showed complete resistance to leaf rust, two most promising lines will be further studied and might be used in breeding schemes for increased fungal resistance.

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### The genetic potential of spring wheat (*Triticum aestivum* L.) resistance to heavy metals

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The aim of our study was to identify wheat germplasm resistant to heavy metals (copper and lead), priority soil pollutants in the East Kazakhstan. The objects of the study are different genotypes of spring wheat from the collection of the East - Kazakhstan Agricultural Research Institute. The following parameters were studied: phenological indicators, survival in summer vegetation, yield, crop structure, amount of metals in the root zone soil, accumulation of studied metals in wheat grain. The variety Ulbinka-25 can be recommended for growing on soils contaminated with copper, and the variety Eritrospermum-616 can be recommended for cultivation on soils contaminated with lead, so they least accumulate the corresponding metals in seeds and at the same time are characterized by high yield and good survival in the summer vegetation. The Kutulukskaya variety can be recommended for cultivation on soils contaminated with both copper and lead, as this spring wheat variety accumulates the least amount of copper and lead in the seeds and at the same time is characterized by good yield and survival in the summer vegetation in conditions of polymetallic soil contamination.

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### Studying the particularities of shampoo and liquid soap on a basis of plant extract of *Cistanche deserticola*

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*Cistanche deserticola* (CD) is one of the important plants flora of Kazakhstan. It has physiological activity 5 times more than ginseng. Based on the extract of *cistanche* stolons, the technology and formulation for preparation of liquid soap and shampoo, which contains only basic components necessary for foaming and foam stabilization, is used. Experiments on laboratory mice on wound healing showed that using a liquid soap with addition of *cistanche* extract, the process of healing wounds goes faster. Consolidation of liquid soap with vaseline in combination with addition of *cistanche* extract also stimulates the process of healing and hair growth. The shampoo with extract of *cistanche* juice is not active for hair growth. Identification of organic compounds in shampoo and soap was carried out by GCMS and derivatization with the help of various extractants. It was found out that the organic components of CD in our soap and shampoo are not determined. Other components of soap and shampoo are easily identified. Although the components of Dehyquart CC7 conditioning and the preservative ROKONSAL are not determined. We assume that most of the components of plant extracts interact with detergents of shampoo and do not have any physiological effect.

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### Signaling molecules in the spring wheat varieties differing in resistance to infection after puccinia recondita inoculation

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The research studies the effect of the leaf rust (*Puccinia recondite*) on the seedlings of the widespread kazakhstani spring wheat cultivars - Akmola-2 (susceptible to leaf rust) and Astana (resistant to leaf rust). In the first phenophase plants were inoculated with urediniospores of the leaf rust *P. recondite* (pathotype TKT/Y). The quantitative content of salicylic (SA), jasmonic (JA), arachidonic (AA) acids were studied. Methods for determining the concentration of the signaling molecules (SM) with GCMS, LCMS, markers