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Assessment of contamination of soil in Pestrechinsky District (Tatarstan, Russia) phytopathogenic fungi

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Soil microflora include varies type of micromycetes and bacteria, that plays the specific role in soil ecosystem function. If soil is used for agricultural purposes Nitrogen-fixing bacteria, that catch atmospheric nitrogen, as well as saprotrophic fungi, that converted organic material into biomass, CO_2, and molecules, such as organic acids is very desirable. Saprotrophic fungi are able to decomposed organic pollution. The mycorrhizal fungi, that colonize plant roots, are able to convert phosphorus, nitrogen and microelements into the soluble forms, which is available for plants. Ever amount fungi there are groups that are very undesirable in soil microbial community in agricultural soils (pathogenic and parasite fungi). Rootpathogenic fungi, such as *Fusarium, Verticillium, Pythium*, and *Rhizoctonia* lead to plants death, loses of yields of agricultural crops, as well as to need of pesticides use, these all leads to very high economical loses. In agricultural trend to develop organic farming technologies is observed. Organic farming means no pesticides, toxic chemicals and mineral fertilizers having negative effect both on the soil covering and the soil microbial community should be used in farm production. However, before organic farming can be implemented into practice, it is necessary to estimate the level of soil infestation. The Republic of Tatarstan is one of the leading subjects of the Russian Federation in the area of agriculture. As the Pestrechinsky District is located close to the million city of Kazan and still have relatively favorable ecological situation, the government of the District decided to organize organic farming in it. Before the implementation of this technology into practice, it is necessary to estimate the level of agricultural land infestation with phytopathogenic organisms in the region. This study is aimed to monitor the level of soil contamination with *Fusarium* genus and *Alternaria* genus in the Pestrechinsky District of the Republic of Tatarstan. Agricultural lands were marked at the map of the administrative region, 100 sampling site were generated using GIS Technologies. It was found out that soil microbial community was characterized by a typical ratio and count of yeast fungi ($3.4{\cdot}10^5$ - $1.6{\cdot}10^6$ CFU$\cdot$g^{-1}), mold fungi ($1.0{\cdot}10^4$ - $1.7{\cdot}10^5$ CFU$\cdot$g^{-1}) and bacteria ($1.6{\cdot}10^6$ - $3.1{\cdot}10^7$ CFU$\cdot$g^{-1}). In all the selected soil samples plant pathogenic fungi of the *Fusarium* genus were found (26 to 250 CFU$\cdot$g^{-1}), and as for another genus of plant pathogenic fungi, *Alternaria,* their count was rather low (0 to 9 CFU$\cdot$g^{-1}), herewith in 46 samples out of 100 they were absent. In whole, the amount and the ratio of bacteria, yeast fungi and mold fungi in the tillable lands of the Pestrechinsky District are typical for agricultural soils. However, all the samples under analysis are contaminated with fungi of the *Fusarium* species. The count of plant pathogenic fungi of *Alternaria* species is low, or there are no fungi of these species. Thus, it is reasonable to realize organic farming on the tillable lands of the Pestrechinsky District in combination with biological methods of plant protection against *Fusarium* blight.