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MICROBIOLOGICAL CONTROL OF SOIL-BORNE ANTIBIOTIC RESISTANCE HUMAN PATHOGENS IN AGROECOSYSTEMS

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ABSTRACT

The spread of antibiotic-resistant microorganisms is one of the biggest problems, for the solution of which is necessary a detailed study of this process. We detected the presence of pathogenic bacteria in soil of agroecosystems of such medicinal plants: *Mentha piperita*, *Inula helenium*, *Thymus serpyllum*, *Rosa odorata* and *Calendula officinalis*. A total of 106 isolates from soil of medicinal plants were examined for resistance to 9 antibiotics: lincomycin, oleandomycin, ampicillin, cefepime, ciprofloxacin, vancomycin, gentamicin, streptomycin, cefamandole. From all the above-mentioned ecosystems, antibiotic-resistant pathogenic microorganisms have been isolated. From soil with cultivated *Thymus serpyllum* two bacterial strains: *Serratia marcescens* and *Yersinia enterocolitica* were resistant to majority of tested antibiotics. From the soil samples with cultivated *Inula helenium* 15 dominant bacterial strains were isolated. *Pantoea agglomerans* was one of the most antibiotics resistant bacteria among of others tested. *Serratia odorifera* biogroup 1 isolated from agroecosystem of *Mentha piperita*, was resistant to vancomycin, lincomycin, ampicillin and to cefepime. High level of antibiotic resistance was detected for *Enterococcus faecalis* and *Bacillus cereus* isolated from agroecosystems of *Calendula officinalis* and *Rosa odorata* where organic manure was used. The soil of agroecosystems, where medicinal plants are cultivated, is a source of antibiotic-resistant microorganisms pathogenic and conditionally pathogenic for humans.

Keywords: Soil, antibiotic resistance, bacteria, medicinal plants, pathogens, agroecosystems.