ECOLOGICAL-TROPHIC PECULIARITIES OF TOXIGENIC FUNGI

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Peculiarities of fodder colonization by toxigenic fungi were studied, selective action of plants during vegetation period and concurrent interactions between fungal species during substrate colonization were observed. Results obtained can be used to help predict prognosis of mycobiota formation on fodders in different agrobiocenoses.

Mycobiota, toxigenic fungi, fodders, mycotoxins.

Last decades have been marked general mycotoxical deterioration of the situation in the world in connection with violation of ecological balance, which was effected by intensive technologies of crops cultivation, as well as environmental pollution.

In the group of toxicants of natural origin special place belongs to metabolism products of microscopic fungi - antibiotics, probiotics, mycotoxins. For today is known more than 250 species of toxigenic fungi [2,7,12], which infect agricultural crops and more than 400 toxic substances of different chemical origin which are characterised by various mechanisms of biological effect on living organism. [5,14].

The most common types of fungi in feeds are representatives of these

genera: Rhizopus, Aspergillus, Penicillium, Fusarium, Alternaria, Cladosporium, Drechslera, Epicoccum and Nigrospora. Among them the main producers of mycotoxins are fungi of genera Fusarium, Aspergillus and Penicillium, the source of which in feed is soil, rhizosphere, dust and insects [1,10].

Vegetating plants populated by microorganisms that reproduct the most rapidly on stems, leaves, seeds (corn) plants during their growing season.

Mushrooms - pathogens, including fuzariyi, Aspergillus, which damage the vegetative plant after death may continue their livelihoods in period between vegetation as saprotroph on grain, stalks, leaves (hay, straw) and fruits [11,13]. Therefore, monitoring the quality of feed is associated not only with damage them during harvesting, threshing, storage, but also with injuring of feed raw material in plant vegetation period.

In recent years are paying more attention to studing of pathogenic fungi toxins which is explained by the inclusion of mycotoxins in the food cycle of the biosphere [7,14].

Materials and methods of research.. To identify microbiota were used classical mycological methods: the accrual crop of mushrooms in wet cells, the method of direct inoculation of plant samples on nutrient media. Crops were cultivated at 26-28°C during 3-5 days [6,8].

In the study were used a differential diagnostic agar nutrient medium optimal for growing and development of individual physiological groups of microorganisms: meat-peptonic agar (MPA) - for bacteria; Chapek media - mycelial fungi; mash -agar (CA 7° for Balinhom) - - mycelial fungi and yeast; Saburo environment - yeast and yeast-like fungi.

A counting of colonies was started 3-4 days after sowing of sample and 2-3 counts were done at intervals of 1-2 days.

The identification of seized species of Micromycetes was conducted by morphological microstructures of fungi (spores, conidia, etc.) , using light microscopes of firms"Carl Zeiss" (Germany) and MBD-6 (lenses x8, x40, x90) [1,3,4,10,11].

As testing cultures were taken hyphomycetes, yeast, yeastlike, fungi, gram-positive and gram-negative bacteria. The bacteria were incubated at 37□S during 24 hours, filamentous fungi and yeast - 26-30□S during 48-72 hours [6]. Sample of seeding material respectivelly about 250-500mln. bacterial cells 200-300 thousand. yeast cells and yeastlike organisms, 10-20 thousands. hyphomycetes

conidia (mycelium elements, spores) containing in 1 ml of suspension. Bioassay was tested on susceptible microorganisms to determine the toxicity of mushrooms.

To study the spectrum of antibiotical influence of hyphal mushrooms received from ear of wheat against the various groups of microorganisms methods of agar blocks and paper drives were used [6,8] ..

The toxicity assessment was performed according to testing culture growth inhibition aound the block or disc:

Toxicity level	The radius of growth inhibition zone, mm
Toxic	>10
Less-toxic	5-10
Non-toxic	The absence of growth inhibition zone

Research results. We have conducted the researches for studying the micromycetes (the potential mycotoxins producers during the growing season)

We found micromyceta belonging to 4 divisions: Zygomycota, Ascomycota, Basidiomycota, Deuteromycota (Mitosporic fungi); 4 classes: Zygomycetes, Euascomycetes, Hyphomycetes, Agonomycetes; 5 orders: Mucorales, Eurotiales, Sordariales, Hyphomycetales Agonomycetales; 7 families: Mortierellaceae, Mucoraceae, Trichocomaceae Chaetomiaceae Moniliaceae Dematiaceae Agonomycetaceae; 17 genera: Mortierella, Absidia, Mucor, Rhizopus, Emericella Eupenicillium Eurotium Talaromyces Chaetomium Aspergillus Paecilomyces Penicillium Trichoderma Alternaria Cladosporium Fusarium Mycelia sterilia 51 species.

Among them the dominant rgenera were Aspergillus, Penicillium, Fusarium, Alternaria.

A large number of epiphytic microbiota species was found during the flowering and milk ripeness phases - respectively 44 and 37, and the lowest - in the phase of earing (29 species).

The major percentage of species during the earing was represented by dark-coloured and penicillum. During the flowering and milk ripeness - dark-coloured

and fuzarium, during the ripeness dark-coloured fungi of genera Alternaria, Cladosporium, Drechslera were dominating.

Endophytic ear mycobiota was represented by three divisions, including the most numerous group of anamorphic fungi. There were isolated 34 species of fungi at all.

The dominant families also were Alternaria, Aspergillus, Fusarium and Penicillium, represented by fewer speies quantity.

The species composition of endophytic microbiota was also generally represented in phases of flowering and milk ripeness (20 and 21 species), and the smallest number of species (16) was identified in the phase of earing.

Herewith the dark-coloured fungi were dominating among the endophytic microbiota by thir number at almost all stages of earing. Fungi of the genus Fusarium dominated on the stage of milk ripeness.

Settling the plant substrates by fungi depends on biochemical characteristics Micromycetes: presence of enzymes complex and ability to produce substances toxic to other organisms. There is evidence that fungi toxins perform functions aimed at ensuring the survival of Micromycetes at the competition in familiarization of the substrate, that’s why they have much in common with antibiotics for the specificity of their action on the appropriate chains of metabolism of microorganisms. We have investigated the antimicrobial activity of isolated 27 species (74 strains of fungi).

A significant number of saprotrophic Micromycetes belonging to different taxonomic groups provides the antagonistic influence against pathogenic fungi. The antibiotic effect of fungi is due to their ability to form antibiotics, and actively compete in the famiarization of nutrient substrate and provide the hyperparasiting influence. [15].

Fusarium sambucinum 139, Fusarium oxysporum 1806, F. culmorum 216, F. graminearum 986, Aspergillus flavus 8799, A. fumigatus 276, Penicillium granulatum2898, Alternaria tenuissima 2706A are characterized by the broad

spectrum of antimicrobial influence. (Testing cultures growth inhibition zone from 5 to 20 mm)

In terms of in vitro hifomitsety family Dematiaceae not observed significant fungistatic activity against test cultures Micromycetes, although natural association mikotsenozu dark color mushrooms prevail among the components of the microbiota ear of wheat. Perhaps this is due to the peculiarities of Representatives melaninoutvoryuyuchyh Micromycetes to adapt to adverse environmental conditions.

Conclusions

Ecological trophic features toxigenic fungi that affects feed determined selective action of plants during the growing season and competitive relationship in the settlement substrate.

Timely detection of toxigenic fungi in agrocenoses is important to prevent accumulation of mycotoxins in plant products and feed.

The results will be used for forecasting bases forming various microbiota feed agrobiocenosis.

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