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DISTRIBUTION OF PARASITE FUNGI IN HIGH ZONES OF KASHKADARYA REGION

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Abstract:

The article studies the spread of fungal and parasitic diseases on cereals and legumes in various high-altitude zones of the Kashkadarya region. All researchers note that the mountainous areas are the poorest in micromycetes, and the foothill and mountain regions are the richest, which is explained by favorable ecological conditions and a variety of feeding plants. During the transition from the lowland zone to the highland zone, the dominant groups of fungi change. The number of species of smut and rust fungi is sharply reduced in the high mountainous zone. The ecological requirements of imperfect mushrooms, like those of representatives of other groups of mushrooms, are closely related to their biological characteristics

Keywords: The spread of fungal and parasitic diseases, cereals and legumes, high-altitude steps of the territory, "chul", "adyr", "tau", "yailau" zones.

The distribution of fungi in phytocenosis depends on different factors. Thus, parasitic micromycetes, strictly confined to certain species of nutrient plants, are found in those phytocoenoses, where grow their host plants. But the distribution of parasitic fungi is also determined by other environmental factors, so the distribution of parasitic micromycetes sometimes does not coincide with the range of the feeding plant.

At the description of vegetation of the river Zaravshan [6] has designated separate high-altitude stages of the territory by folk names "stock" (up to 400-500 m above sea level), "Adyr" (from 700-800 to 1200-1800 m), "Tau" (from 1200-1500 to 2700-2800 m), "Yailau" (from 2700-2800 m) and "Vpne". The same names were used to describe the vegetation of the Kashkadarya region [13] and to describe the results of the study of wild lucerns in Central Asia [21].

Having accepted these high-altitude subdivisions, we have traced the regularities of mushroom distribution in Kashkadarya region on plants of Roasea and Fabaceae families. In the zone of stockings we found 79 species of micromycetes, in the zone a hole 119, in the zone Tau 114, in the zone Yailau - 22 species. Among the fungi parasitizing in different areas of the Kashkadarya region, many common species, developing both on cultivated crops and wild plants, which can be explained by the similarity of conditions of growth. Similarity of microflora of grain spiked crops in rainfed and irrigated agriculture has already been noted [11,12,17]. Of the environmental conditions conducive to the development of fungi in agrophytocoenoses, the most important are relatively high humidity in the herbage, significant dense grass and monotony of host plants [19].

In each natural zone of Kashkadarya region, it is possible to identify the main groups of parasitic fungus. Among the fungi found on cereals and legumes in different plant formations of chulls, representatives of powdery dew and head, developing mainly on sandstone plants predominate.

Here, (ErysiphegraminisDC. f. poaeMarchal and E. graminisf. bromiMarchal) and ribbonfire (UstilagophrygicaMagh.) are usually affected by powdery pink mushrooms. In the stocking of the Kashkadarya region there are also elements of riparian vegetation, where instead of fires, pendrons, mortuces appear coastal solonchak, in some places - species of camel prickle in combination with reeds. On a camel prickle in early summer appears Leveillula 'tauricaArn. f. alhaginisJacz., by autumn it is replaced by TrichocladiaalhagiGolov. Of the head mushrooms, SphacelothecaaeluropiTrott is often found here on the salt marshes. Of the takyr plants, the most frequently affected is the fungus SeptoriaelymiEll. et. Ev.moltuki. Rust mushrooms in the stockpile area develop on plants growing in oases, along the banks of ditches, near wells, where humidity is relatively high. PucciniacynodontisDesm., P. brominaEriks., P. isiaceae(Tbilm.) Wint, Uromyces. alhaginisSzembel have been repeatedly found here and etc. Almost the same species composition of rust fungi parasitizing on cereals and legumes under similar conditions was observed in the Central Karayums [10] and the northern part of the Murghab oasis [9].

Under the same conditions in the stockpile zone of the Kashkadarya region, both peronosporaa and guifalloid fungi were found, but their composition is monotonous (PeronosporaaaestivalisSyd., CercosporamedicaginisEll. et. Ev. et. al.).

Annual grasses and legumes predominate in plant communities of the Adyr zone, although there are perennials as well. In this zone there are 56 species of legumes and 55 species of cereals affected by micromycetes. Groups of fungi by frequency of their occurrence on legumes and cereals can be arranged in the following order: pycnidial, head, powdery, rusty and hyphatic. Indificators of different vegetation formations of the lower adyr are RoabulbosaL., AgropyrontrichophorumRicht., PsoraleadrupaceaBge. The latter is often affected by AscochytaworonowianaSiem., Phaeostagonospo-ropsispsoraleaeUsp. et. al. Eschonk.,LeveillulatauricaArn. f. psoraleaJacz.

Poabulbosa is consistently found in Selenophomanebulosa (Rostr.) Lavrov and ErysiphegraminisDC.f. poaeMarchal, and in Pucciniaagropyri Elf. etEvet al. [22] In addition to parasitic fungi affecting plants-indicators of plant formations, micromycetes - PhyllostictabromiPot, which develop on other plants, can be named, Ph. viciae(Lib.) Cooke, SeptoriabromiSacc., TilletiaguyontianaHar., UstilagobromivoraFisch, v. Waldh., Leveillulataurica f. viciaeJacz., Uromycesvicia-craceaeConst, and others.

The Upper adyr-Kashkadarya region has a wide representation of thickets of cereal-growth, cereal-growth tugayns PhragmitescommunisTrin. and ImperatacylindricaBeauv. The last two species are distributed not only near water bodies, but also on dry slopes (if groundwater is close). Only rust fungi (Pucciniaphragmitis (Schhum.)Korn. - on reeds and P. rufipesDiet. - on the emperor). These grains are also found in the Tau area, but on them called rust fungus are not found.

Only the Sclerodermaviridis (Sacc.) Schrot. is labeled in the Adyrot belt, because its host plant is Setariaviridis Beauv. On the territory of Adyr, Kashkadarya region, dry wheatgrass steppes are widely represented. The annual cycle of plant development begins in early April. During spring and summer, the appearance of the steppe abruptly changes: large grasses develop after ephemerals and ephemeroids. Change of host plants leads to a change of micromycetes. Thus, in summer, mealy and rusty mushrooms are found everywhere, and the feathering and guifal mushrooms are practically absent. Representatives of the last two groups can be found only in crops on irrigated land, near water.

In the taiga zone, the quantitative ratio of species from different systematic groups of mushrooms is almost the same as in Adyra, but the occurrence of peronospora mushrooms is noticeably higher. According to [4] who studied beans of Kashkadarya region, conditions for their development are most favorable in the Adyr and Tau zones. The species Melilotus, Trigonella, Onobrychis and others are particularly common here. The most frequently micromycetaminated cereals and legumes were noted in multi-grass and multi-grass-steppe formations.

The former are characterized by Erysiphecommunis (Wallr.) Fr. f. melilotiRab. on Melilotusden- talusPers. and PeronosporamelilotiSyd. - on MelilotusalbusDesr., Uromycesantillid.es (Grw.) Schrot - on TrigonellagrandifloraBge. and others. In these formations, it is common to use ErysiphegraminisDC. f. agropyriJacz. on AgropyrontrichophorumRicht. and A. intermediumBeauv. Interestingly, PucciniaagropyriEli. etEv. on AgropyrontrichophorumRicht. is not found here, although in Adyr this fungus is common.

In the Tau, it is met only on A. repens (L.) -P. B. Single specimens of this plant, affected by this fungus, were found in yailau. Probably, the environmental requirements of the fungus is quite wide, but the conditions of growth of the host plants are such that the fungus changes the feeding plant. In these same formations, along with species of the genus Agropyron grow species Onobrychis, of which the most affected was O. chorassanicaBge.

StipacaucasicaSchmalh is one of the edifices of multi-grained-step tau formations in Kashkadarya region. It is usually affected by UromycesferganensisTremz. etEremeeva and PucciniastipinaTranz.; these mushrooms never develop on the same host plant specimen. P. stipinaTranz. has been repeatedly found on Slip a hohenackerianaTrin.

Along the rivers of the Tau belt there are developing a kind of riverside phytocoenosis. From the grains and legumes growing here, affected by micromycetes, let's call the species Trifolium. Roa, Cynodon and etc. For example, some specimens of RoapratensisL. were simultaneously affected by ErysiphegraminisDC. f. poaeMarchai and UromycespoaeRab., and on TrifoliumpratenseL. and T. fragiferumL., ErysiphecommunisWellr. f. TrifoliiRab. and Uromycestrifolii-repentis (Cast.) Liro. The joint development of rust and real powdery mildew on plants was described by many researchers [5, 19] and others.) M. S. Dunin believes that rust and powdery mildew are conjugated diseases of plants: rust agents, developing on plants, significantly increase transpiration, which contributes to the infection of their powdery mildew fungi.

Mushrooms of the genus Erysiphe are most common in temperate latitudes of the globe; they are less xerophytes than representatives of other genera of the order Erysiphales, which we found in Kashkadarya region. Therefore, their frequent occurrence in downstream parts of mountain water bodies is logical. Particularly often, different expression of the xerophytism of powdery pink mushrooms is seen in the analysis of micromycetes' links with plants of specific phytocoenoses, for example, on stony, crushed stone and rocky mountain slopes. Astragalus species are abundant here [14]. In the Tau, we noted 17 species of Astragalus affected by micromycetes, and all of them grew in habitats characterized by significant dryness. LeoeillulatauricaArn., f. astragalJacz. and TrichocladiaastragaliGolov. And others representative of the most xerophilous genera of powdery mushrooms, have been noted in these plant communities in different species of astragalus.

There is more humidity in the different wood and shrub formations of the Tau zone. Among the parasites of herbaceous plants of such habitats are the most characteristic of the following fungi: PeronosporapretensesSyd.,P. astragalinaSyd., P. melilotiSyd., P. trigonellaGaum., PseudopezizatrifoliiFckl, Hadrothrichumsorghi (Pass.) Terr., PolythrinciumtrifoliiKunze and etc. The hygrophilicity of the latter species was noted [18]. In the different herbal-steppe formations of the upper Adyr, where TrifoliumrepensL. sometimes grows, the causative agent of black spotting was not found, which indicates that this fungus is very demanding to the appropriate environmental conditions (primarily - to moisture); less demanding was Phyllachoratrifolii (Fr.) Fckl, found on TrifoliumrepensL. both in the upper Adyr and Tau under the canopy of trees and shrubs. Least of all cereals and legumes affected by micromycetes were found in the Yailau zone, which is connected with relative poverty of vegetation of this zone. From cereals and legumes, there are representatives of the genera Stipa, Festuca, Astragalus and a few others, forming a kind of plant groups. It was not possible to establish micromycete dates for this or that phytocoenosis in the jailau zone, because the affected plants were found only rarely.

The exception is the hedgehog (DactylisglomerataL.) - a cereal of motley grass formations, in composition approaching to the mountain motley grass lutes. Four micromycetes were found on it, of which UstilagosalveiBerk, etBr, and ErysiphegraminisDC reached greater development of. da'ctilidisJacz.

Less frequently, in the same formations, a mint { PoanemoralisL.) and the parasitic UromycespoarumNoAlp were noted. UromycespunctatusSchrot. on AstragalussubscaposusM was found much more often. Pop. exBoriss. Of the feather mushrooms in this belt found one species-Peronosporamedicaginis- orbicularisRaysr. f. rigiduiaePhajz. Representatives of mealy pink mushrooms are more common. It should be noted that in the zone of yailau species of this group of mushrooms were found only on plants growing on the south-eastern slopes; probably, north-western cold winds are unfavorable for development of these mushrooms. Spheropsidal fungi,such as PhornaastragaliCookeetHarkn., SeptoriagraminumDesm, have also been found under similar environmental conditions. S. serebriankowiiSacc. and others.

When comparing our results with the findings of published studies [1,2,7,8,16,22], an analogy in distribution of fungi over high-altitude zones in various geographical areas of the CIS countries characterized by close natural and climatic conditions is noticeable. All researchers note that mountainous areas are the poorest micromycetes, while foothill and mountainous areas are the richest, which is explained by favorable environmental conditions and the diversity of feeding plants. As the transition from the flat zone to the highlands changes the dominant groups of mushrooms. In Kashkadarya region this is especially well demonstrated by the distribution of feather-sporous and mealy-dewy mushrooms: with increasing the height of the area on legumes and cereals, the number of fungi species of the first group increases, and the second group - decreases. The number of species of head and rust fungus sharply decreases in the high mountain zone. Environmental requirements of imperfect mushrooms, as well as representatives of other groups of mushrooms, are closely related to their biological characteristics. Spheropsidal fungi are the most indifferent to the surrounding conditions, but they are also distributed unevenly in the Kashkadarya region: in the desert and high mountainous areas, they are much smaller than in the foothills and mountains. Their prevalence in these high-altitude zones has been described [15]. Gifal mushrooms in the stocking develop mainly on wild legumes and cereals near ditches and other household water bodies. They have not been found in the sandy part of the chulls. This confirms the opinion [4] about the absence of hyphen mushrooms in a typical desert.

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