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**MICROMYCETES ROSSICAE: CHOROLOGICAL AND TAXONOMICAL NOTES.
4. SPHACELOTHECA HYDROPIPERIS AND MICROBOTRYUM CORDAE
(PUCCINIOMYCOTINA, MICROBOTRYOMYCETES), TWO DIFFICULT
TO DETECTION PERSICARIA-ASSOCIATED MICROMYCETES,
NEW FOR VOLGOGRAD REGION (RUSSIA)**

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The present notice continues a series devoted to rare and interesting species of micromycetes of various regions of Russia that cause rust, shoot deformations, and leaf spots and highlights the *Sphacelotheca hydropiperis* and *Microbotryum cordae* (*Pucciniomycotina*, *Microbotryomycetes*), two difficult to detection *Persicaria*-associated micromycetes, new for Volgograd Region (Russia). The symptoms caused by *Sphacelotheca hydropiperis* and *Microbotryum cordae* are very similar: infected flowers slightly increase in size, appear above the general flowers row in the inflorescence, and acquire a wine-brown color due to fungal sori development. The morphology of both species is re-studied highlighting the teliospore variability. Thus, we have clarified the distribution of two rare microbotryomycete species over the Russian territory as well as their teliospores dimensions. Both taxa appear to be a “good”, clearly specialized species. This notice can be designed to draw attention to the symptomatology of the inflorescences of polygonaceous plants in the other regions of Russia.

Keywords: false smuts, flowers hypertrophy, microbotryomycete species, *Polygonaceae*, *Persicaria*, teliospores

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The present notice continues a series devoted to rare and interesting species of micromycetes of various regions of Russia that cause the some rust, shoot deformations, and leaf spots (Zmitrovich et al., 2020a, 2020b; Dudka, Zmitrovich, 2020) and highlights two species of interesting group of microbotryomycetes.

Representatives of the class *Microbotryomycetes* (*Basidiomycota*, *Pucciniomycotina*) cause smut-like syndrome in many dicotyledons, but their urediniomycetous nature has already been clearly proven (Begerow et al., 1997; Weiss et al., 2004; Bauer et al., 2006). Obviously, such forms are derivatives of the micro- and endo- types of the rust life cycle (Linder, 1940; Zmitrovich, Wasser, 2004).¹ Their teliospores (called ustospores until the 2000s) develop under an indistinctly formed peridium within the host’s flowers and produce 2–4-celled phragmobasidia giving rise the basidio-

spores (still called sporidia) which produce a budding mycelium (many groups of microbotryomycetes are known by the mitosporic *Rhodotorula*-like yeast stage). The dikaryotization occurs by the fusion of budding cells and dikaryophytic mycelium tends to the ovary zone of host plant. The infection is usually local and does not spread to the entire inflorescence or shoot. Such false smuts-producing species are especially numerous in the genera *Microbotryum* and *Sphacelotheca* (Schäfer et al., 2010; Schuster et al., 2016).

The present notice will focus on two difficult to detection *Persicaria*-associated microbotryomycete species, new for arid rayons of European Russia (the Volgograd region), the area of traditional buckwheat cultivation. The reproduction of the infectious origin in nature outside buckwheat crops usually occurs in weed *Persicaria* populations, where they were recorded by us during the 2020 field season.

Infected plant shoots were photographed in the field before their herbarization. The Nikon D80 camera, AF Micro Nikkor 60 mm lens was used for shooting. Micromorphological analysis of lesions and mi-

¹ Microcyclic forms delete both aecia and uredinia, usually leaving the telial and spermatogonial stage, but often deleting the latter. Because of the reduced life cycle, all these are autoecious. In micro- forms the teliospores appear as such, while in endo- forms the teliospores have the morphology of aeciospores (Petersen, 1974).

tened, (7.2)8.6–10(11.3) × (7.1)8.3–9.4(10.3) μm (measured from the specimen LE F-332669, 60 measurements), reddish-brown with a violet hue; exosporium abundantly covered with small warts 0.4–0.6 μm high, obscurely visible under LM; when mature, bipolar colorless appendages are often visible on exosporium surface. Basidia 2–3-celled.

Symptoms. Infected flowers slightly increase in size, appear above the general flowers row in the inflorescence, and acquire a wine-brown color due to the development of the fungal sori.

Hosts. In Russia infect *Persicaria hydropiper*, *P. longiseta*, *P. minor*, and *P. senticosa*.

Distribution range. Russia: Kamchatka Krai, Krasnoyarsk Krai, Leningrad Oblast, Moscow Oblast, Murmansk Oblast, Primorsky Krai, Saint Petersburg, Saratov Oblast, Tver Oblast, Yaroslavl Oblast, Republic of Kalmykia, Republic of Karelia, Volgograd Oblast, Voronezh Oblast (Karatygin, Azbukina, 1989; LE F herbarium).

Material examined: Russia, Volgograd Oblast, Sredneakhtubinsky District, Burkovsky village, 48°43′03.01″, 44°40′13.15″, Alt. – 10 m below sea level, 17.09.2020 on *Persicaria minor*, leg. V.A. Dudka (DV-270-20), det. V.A. Dudka (LE F-332669).

Thus, on the present notice, we have somewhat clarified the distribution range of two rare microbotryomycete species over the territory of Russia as well as the sizes of their teliospores, which are diagnostically significant structures. Both taxa appear to be “good”, clearly specialized species. This notice can be designed to draw attention to the symptomatology of the inflorescences of polygonaceous plants on the other Russian regions.

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Микромицеты России: географические и таксономические заметки. 4. *Sphacelotheca hydropiperis* и *Microbotryum cordae* (*Pucciniomycotina*, *Microbotryomycetes*), два сложных для выявления *Persicaria*-ассоциированных вида микромицетов, новые для Волгоградской области (Россия)

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Сообщение продолжает серию, посвященную редким и интересным видам микромицетов из различных регионов России, вызывающих ржавчину, деформации побегов и листовые пятнистости. В нем представлены новые данные о *Sphacelotheca hydropiperis* и *Microbotryum cordae* (*Pucciniomycotina*, *Microbotryomycetes*), двух сложных для выявления *Persicaria*-ассоциированных вида микромицетов, новые для Волгоградской обл. (Россия). Симптомы поражений растений, вызываемые *Sphacelotheca hydropiperis* и *Microbotryum cordae*, сходны: зараженные цветки слегка увеличиваются в размерах, выдаются над общим уровнем цветков в соцветии и приобретают винно-коричневый цвет вследствие развития сорусов с окрашенными телиоспорами. Уточняются морфологические особенности обоих видов, вариабельность их телиоспор. Оба таксона представляются “хорошими” видами, проявляющими отчетливую специализацию. Настоящее сообщение имеет целью привлечение внимания к симптоматике соцветий гречишных в других регионах России.

Ключевые слова: гипертрофия цветков, ложная головня, микроботриомыцеты, телиоспоры, *Polygonaceae*, *Persicaria*