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RESEARCH ARTICLE

Preliminary checklist of micromycetes on trees and shrubs common in the city of Samarkand

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Abstract

This study provides a comprehensive examination of the diversity and distribution of micromycete fungi colonizing trees and shrubs in Samarkand, one of the oldest and ecologically significant cities in central Uzbekistan. The research documents a total of 132 micromycete species belonging to 61 genera, revealing a rich fungal diversity in the urban green spaces of the region. Of particular importance is the identification of 32 species that are recorded for the first time in the mycobiota of Uzbekistan, including *Phyllosticta albizinae*, *Cercospora muelleriana*, *Ramularia philadelphi*, *Colletotrichum aucubae* and *Erysiphe euonymicola*. These findings indicate both the underexplored nature of urban fungal biodiversity in Central Asia and the ecological significance of Samarkand's dendroflora as a host for diverse fungal communities.The most frequently encountered taxa were members of the genera *Camarosporium*, *Phyllosticta*, *Pseudocercospora*, *Diplodia*, *Erysiphe* and *Melampsora*, which are known to include several phytopathogenic and endophytic species. The checklist compiled in this study includes detailed data on fungal species, their associated host plants and observed distribution patterns, contributing to the foundational knowledge necessary for monitoring plant health and managing urban ecosystems. The vegetation of Samarkand is predominantly composed of mesophytic plant species and demonstrates high floristic diversity. Also, planting many non-native trees and shrubs has created complicated relationships between hosts and pathogens, which adds to the variety of micromycete communities. This study revealed the importance of continued fungal biodiversity assessments in urban environments across Central Asia.

Keywords: ascomycota; basidiomycota; biodiversity assessments; new species; oomycote; trees and shrubs

Introduction

The health and sustainability of urban green infrastructure is important not only for aesthetic beauty, but also for ecological balance and public health. Trees and shrubs act as the "green lungs" of cities, purifying the air, moderating the microclimate and preserving biodiversity. However, because of the acceleration of urbanization, increasing anthropogenic impacts and climate change, urban plants are becoming increasingly vulnerable to various diseases, including fungal infections caused by micromycetes.

Micromycetes, i.e. microscopic fungi, can live in plants as pathogens, saprotrophs or endophytes. Pathogenic micromycetes damage the leaves, stems, fruits and roots of plants, causing serious damage to their growth and development, reducing their decorative properties and sometimes even leading to their complete death. This, in turn, can cause significant economic damage to the urban greening system. At the same time, saprotrophic micromycetes play an important role in the decomposition of organic matter, while endophytic fungi can increase the resistance of plants to stress factors. Therefore, the study of the mycobiota of urban dendroflora, its species composition and analysis of ecological groups are of fundamental and practical importance.

Central Asia, in particular Uzbekistan, is characterized by a sharply continental climate, with dry and hot summers and cold winters. Such specific climatic conditions directly affect the species diversity and distribution of micromycetes. The city of Samarkand is distinguished by its centuries-old history and rich dendroflora. Many local and introduced tree and shrub species, such as *Platanus orientalis* (Oriental plane tree), *Morus alba* (White mulberry), *Juniperus virginiana* (Virginia juniper), *Robinia pseudoacacia* (White acacia), are found on the streets and in the parks of the city. In recent years, a number of studies have been conducted on the study of phytopathogenic micromycetes on ornamental and fruit trees in the city of Samarkand. The study analyzed the species composition of phytopathogenic fungi found on ornamental plants in the urban landscape. Although these studies have made a significant contribution to our knowledge of the mycobiota of Samarkand, they focused mainly on phytopathogenic species and did not fully cover all green areas of the city (1, 2).

The main goal of this study is to compile a preliminary but comprehensive list of micromycetes on trees and shrubs common in Samarkand, including not only pathogenic, but also saprotrophic and potentially endophytic species. This

study is scientifically innovative in that it covers plant species that have been little studied or not studied at all in previous works, as well as in clarifying the species composition of micromycetes using modern morphological and, if necessary, molecular-genetic identification methods. The results of this study will serve to expand fundamental knowledge about the mycobiota of Uzbekistan and serve as an important scientific basis for protecting urban green spaces, developing effective strategies to combat plant diseases and improving the city's phytosanitary status.

Checklists of fungi have previously been published for specific regions, such as Southern Uzbekistan, the Nuratau Mountains and the Fergana Valley. However, to date, no checklist has been compiled for the micromycetes inhabiting the urban and peri-urban vegetation of the city of Samarkand. The present checklist focuses specifically on micromycete species isolated from trees and shrubs, deliberately excluding those associated with herbaceous plant hosts. Therefore, although this compilation contributes valuable new data on the fungal flora of the region, it must be considered preliminary and open to future expansion. The primary aim of this study is to establish an initial checklist of micromycetes colonizing woody plants within the Samarkand region.

Materials and Methods

The object of the study is micromycetes distributed on trees and shrubs in Samarkand. This research work was prepared on the basis of mycological herbarium samples collected from trees and shrubs damaged to varying degrees by pathogenic micromycetes during mycological studies conducted in the territory of Samarkand in 2022-2024, monitoring phytopathogenic fungi that cause economic damage to plants of economic importance and preventive measures taken to combat them.

The studies were conducted in two stages, collecting samples from plants damaged by pathogenic micromycetes during field studies and identifying fungal species in laboratory conditions.

Mycological herbarium samples collected during route field studies were mycologically analyzed in the Laboratory of Botanical and Herbarium Research of Samarkand State University named after Sharof Rashidov.

Microscopic analysis of mycological herbarium samples collected during the research was carried out using special methods and was used to identify the species of phytopathogenic micromycetes and study the specific morphological characteristics of their spores and conidia (3, 4, 5).

Materials obtained from diseased plant parts were examined using the “crushed drop” method and magnified through 4, 10, 40, 60, 100 objective lenses of the microscope (6).

Methods for preparing temporary preparations were used to study pathogenic micromycetes stored in herbarium specimens (7).

Determining the species composition of powdery mildew fungi that occurs only in the anomorphic stage is a rather complicated process. Since they do not form ascocarps, it is necessary to determine the structure and size of pathogenic conidia and conidiophores. During the study, powdery mildew fungi that have not developed the sexual stage were studied using special methods (8). To do this, first a small part of the diseased leaf is cut, a drop of 10 % lactic acid (CH3CHOHCOOH) is placed on the slide and slightly heated. Then the leaf fragment is removed from the slide, the coverslip is closed and the preparation is examined under a microscope.

The degree of similarity of the systematic composition of pathogenic micromycetes recorded in the dendroflora of Samarkand with the mycobiota of other regions was determined (9).

Micromycetes recorded in the dendroflora of Samarkand were identified and deposited in the scientific unique collection of the Tashkent Mycological Fungarium (TASM). As a result, the TASM collection has been significantly enriched with new fungarium specimens of economically and agriculturally important fungal species distributed in Uzbekistan. Furthermore, the analytical results contribute to the expansion of knowledge on the fungal diversity of Uzbekistan and hold significant scientific and practical value. The research was conducted between 2022 and 2024, during which herbarium specimens were collected (Fig. 1). The collected samples were analyzed using microscopic and standard methods. Identification was carried out with the aid of relevant literature (10-30).

Flowering host plant species were identified using *Flora of Uzbekistan* (1941-1962), *Identifier of Ornamental Trees and Shrubs of Uzbekistan* and *Central Asian Plant Classifier* (1968-1993). Fungal specimens collected during the field survey were deposited in the Tashkent Mycological Fungarium (TASM) at the Institute of Botany. These specimens are listed under each fungal taxon in the *Results and Discussion* section. Collector names are abbreviated as initials: GN (Guljakhon Norimova). To ensure accurate nomenclature and authorship of fungal and host plant species, databases such as MycoBank (http://www.mycobank.org/), Index Fungorum (http://www.indexfungorum.org/) and Plants of the World Online (https://powo.science.kew.org/) were consulted. Species names are presented alphabetically, with accompanying data on hosts, substrate and references (31-60).

Results and Discussion

Between 2022 and 2024, a total of 132 micromycete species were identified within the dendroflora of Samarkand. These species belong to 3 phyla, 5 classes, 18 orders, 36 families and 61 genera. Among them, 32 species were recorded for the first time in the mycobiota of Uzbekistan.

Taxonomic analysis revealed that the most abundant orders were *Pleosporales* (7 families, 34 species, 25.75 %), *Mycosphaerellales* (10 families, 23 species, 17.29 %), *Helotiales* (14 families, 21 species, 15.9 %) and *Botryosphaeriales* (3 families, 17 species, 12.88 %). Of the identified 132 species, 120 species (90 %) belong to *Ascomycota*, 10 species (7.58 %) to *Basidiomycota* and 2 species (1.52 %) to *Oomycota*. The *Ascomycota* species were distributed across four classes: *Dothideomycetes* (85 species), *Leotiomycetes* (21 species), *Sordariomycetes* (13 species) and *Taphrinomycetes* (2 species). Among the 35 recorded families, the most-rich species were *Mycosphaerellaceae* (10 genera, 23 species, 17.29 %), *Camarosporiaceae* (1 genera, 22 species, 16.67 %) and

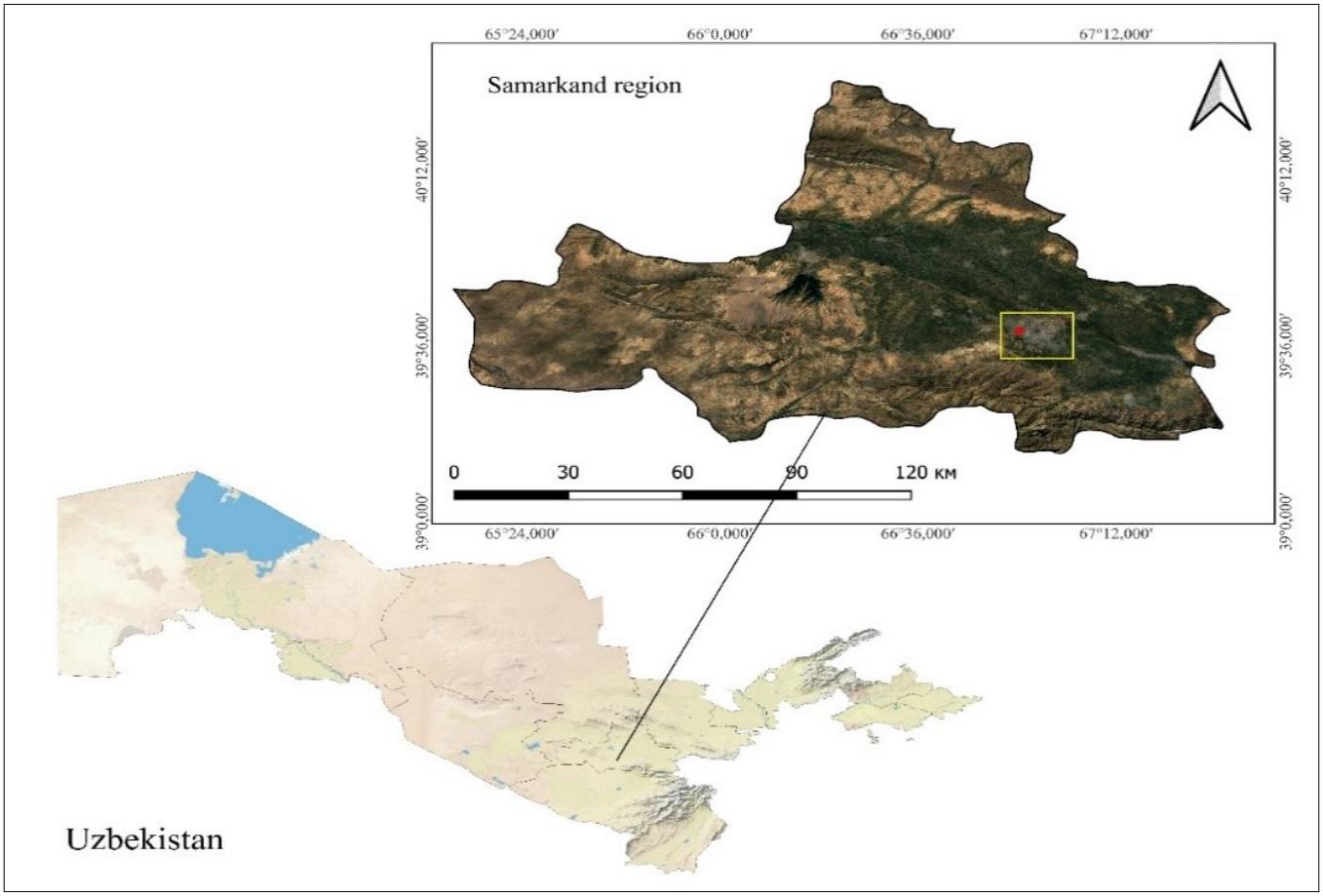

Fig. 1. Map of Samarkand state and route of mycological investigation.

Erysiphaceae (7 genera, 14 species, 10.6 %), while the remaining 32 families contained between 1 and 7 species each. The most diverse genera were *Camarosporium* (22 species, 16.67 %), *Pseudocercospora* (10 species, 7.58 %) and *Phyllosticta* (10 species, 7.58 %), while the other 58 genera were represented by 1 to 6 species.

The identified 132 micromycete species were associated with 75 host tree and shrub species, belonging to 50 genera and 32 families. Among these host species, 21 were shrubs and 54 were trees, classified into 19 shrub genera (13 families) and 32 tree genera (21 families) (Table 1).The most widespread micromycete species in Samarkand's dendroflora include *Melampsora microspore*, *Melampsora pinitorqua*, *Gymnosporangium confusum*, *Venturia inaequalis*, *Fusicladium fraxini*, *Elsinoë ampelina*, *Cladosporium magnoliigena*, *Cladosporium delectum*, *Stemphylium canadense*, *Alternaria cylindrica*, *Alternaria alternata*, *Ascochyta syringicola*, *Didymella negriana*, *Wilsonomyces carpophilus*, *Neophloeospora maculans*, *Passalora quercus*, *Mycosphaerella fraxinicola*, *Mycosphaerella platani*, *Ramularia vitis*, *Pseudocercospora platanicola*, *Macrophoma fraxini*, *Phyllosticta negundinis*, *Asteroma diospyri* and *Ophiognomonia leptostyla*, all of which were noted for their significant impact on host trees and shrubs. The results of the research work were posted on the website https://www.gbif.org and a certificate was received (https://www.gbif.org/dataset/affc93e7-f928-423a-be92-c97fcb565a41).

Checklist of micromycetes distributed on trees and shrubs of Samarkand city

ASCOMYCOTA (Berk.) Caval. -Sm.

Pezizomycotina O.E. Erikss. & Winka

DOTHIDEOMYCETES *sensu* O.E. Erikss. & Winka

Botryosphaeriales C.L. Schoch, Crous & Shoemaker

Phyllostictaceae Fr.

PHYLLOSTICTA Pers.

Phyllosticta aesculina Sacc., Atti Ist. Veneto Sci. Lett. Arti 2: 451 (1884)

Host - *Aesculus hippocastanum* L., Uzbekistan, Samarkand State, 6 September 2024, NGK-11177, (TASM).

Phyllosticta albizinae V.G. Rao, Bulletin Bot. Soc. Coll. Sci., Nagpur: 54 (1963)

Host - *Albizia julibrissin* Durazz., Uzbekistan, Samarkand State, 2 October 2024, NGK-11308, (TASM).

Note: New record for mycobiota of Uzbekistan.

Phyllosticta catalpae Ellis & G. Martin, Amer. Naturalist 18: 189 (1884)

Host - *Catalpa bignonioides* Walter., Uzbekistan, Samarkand State, 5 December 2024, NGK-11228, (TASM).

Note: New record for mycobiota of Uzbekistan.

Phyllosticta coluteae Fiedler, Fungi Europaei exsiccati, Klotzschii herbarii vivi mycologici continuatio. Editio nov. Series secunda. Cent. 9: no. 877 (1865).

Host - *Colutea arborescens L.,* Uzbekistan, Samarkand State, 17 June 2024, NGK-11284, (TASM).

Note: New record for mycobiota of Uzbekistan.

Table 1. The percentage of micromycetes identified in the study area, depending on the number of orders, families, genera and species

Phylum	Order	Genera	Species	%	Family	Genera	Species	%
Ascomycota	*Botryosphaeriales*	3	17	12,88	*Phyllostictaceae*	1	10	7,58
					Botryosphaeriaceae	2	7	5,30
	Capnodiales	2	2	1,52	*Capnodiaceae*	1	1	0,75
					Metacapnodiaceae	1	1	0,75
	Cladosporiales	1	2	1,52	*Cladosporiaceae*	1	2	1,52
	Dothideales	1	1	0,76	*Saccotheciaceae*	1	1	0,75
	Mycosphaerellales	10	23	17,42	*Mycosphaerellaceae*	10	23	17,29
	Myringiales	1	1	0,75	*Elsinoaceae*	1	1	0,75
	Pleosporales	7	34	25,76	*Pleosporaceae*	2	6	4,54
					Didymellaceae	3	5	3,79
					Dothidotthiaceae	1	1	0,75
	Venturiales	2	2	1,52	*Camarosporiaceae*	1	22	16,67
					Venturiaceae	2	2	1,52
	Helotiales	14	21	15,9	*Erysiphaceae*	7	14	10,60
					Drepanopezizaceae	2	2	1,52
					Ascodichaenaceae	1	1	0,75
					Sclerotiniaceae	1	1	0,75
					Dermateaceae	2	2	1,52
					Discinellaceae	1	1	0,75
	Rhytismatales	1	1	0,75	*Rhytismataceae*	1	1	0,75
	Amphispaeriales	2	2	1,52	*Amphisphaericeae*	1	1	0,75
					Pestalotiopsidaceae	1	1	0,75
	Diaporthales	5	5	3,79	*Gnomoniaceae*	2	2	1,52
					Cytosporaceae	1	1	0,75
					Erythrogloeaceae	1	1	0,75
					Tubakiaceae	1	1	0,75
	Glomerellales	1	4	3,03	*Glomerellaceae*	1	4	3,03
	Hypocreales	2	2	1,52	*Nectriaceae*	2	2	1,52
	Trichosphaeriales	1	1	0,75	*Trichosphaeriaceae*	1	1	0,75
	Taphrinales	1	2	1,52	*Taphrinaceae*	1	2	1,52
Basidiomycota	*Puccinales*	5	10	7,58	*Melampsoraceae*	1	5	3,79
					Gymnosporangiaceae	1	1	0,75
					Puccinaceae	2	2	1,52
					Phragmidiaceae	1	2	1,52
Oomycota	*Peronosporales*	2	2	1,52	*Peronosporaceae*	2	2	1,52
Total	18	61	132	100	35	61	132	100

Phyllosticta koelreuteriae Hollós, Ann. Hist.-Nat. Mus. Natl. Hung. 5: 455 (1907)

Host - *Koelreuteria paniculata* Laxm., Uzbekistan, Samarkand State, 2 October 2024, NGK-11176, (TASM).

Note: New record for mycobiota of Uzbekistan.

Phyllosticta liriodendri Thüm., Boll. Soc. Adriat. Sci. Nat. Trieste 3 (2): 459 (1877)

Host – *Liriodendron tulipifera* L., Uzbekistan, Samarkand State, 17 June 2024, NGK-11268, (TASM).

Note: New record for mycobiota of Uzbekistan.

Phyllosticta magnoliae Sacc., Michelia 1 (2): 139 (1878).

Host - *Magnolia grandiflora* L., Uzbekistan, Samarkand State, 17 June 2024, NGK-11283, (TASM).

Note: New record for mycobiota of Uzbekistan.

Phyllosticta negundinis Sacc. & Speg., Michelia 1 (2): 149 (1878).

Host -*Acer negundo* L., Uzbekistan, Samarkand State, 17 June 2024, NGK-11239, (TASM).

***Phyllosticta* sp.**

Host - *Cercis siliquastrum* L., Uzbekistan, Samarkand State, 11 July 2024, NGK-11287, (TASM).

Note: New record for mycobiota of Uzbekistan.

Phyllosticta viburni-opuli Miura, Rep. Akita Pref. Agric. Exp. Sta. 8: 33 (1957)

Host – *Viburnum opulus* L., Uzbekistan, Samarkand State, 4 June 2024, NGK-11295, (TASM).

Note: New record for mycobiota of Uzbekistan.

Botryosphaeriaceae Theiss.

MACROPHOMA (Sacc.) Berl.

Macrophoma fraxini Delacr., Bull. Soc. Mycol. France 6 (1): 140 (1890)

Host - *Fraxinus excelsior* L., Uzbekistan, Samarkand State, 15 September 2023, NGK-11291, (TASM).

DIPLODIA Fr.

Diplodia buxicola Sacc., Michelia 1 (5): 518 (1879).

Host – *Buxus sempervirens* L., Uzbekistan, Samarkand State, 21 July 2024, NGK-11302, (TASM).

Diplodia cydoniae* var. *cydoniae Sacc., Michelia 2 (no. 7): 269 (1881).

Host – *Cydonia oblonga Mill.*, Uzbekistan, Samarkand State, 7 July 2024, NGK-11306, (TASM).

Diplodia catalpae Speg., Michelia 1 (5): 486 (1879).

Host – *Catalpa bignonioides* Walter., Uzbekistan, Samarkand State, 19 April 2024, NGK-11275, (TASM).

Note: New record for mycobiota of Uzbekistan.

Diplodia juniperi Westend., Bull. Acad. Roy. Sci. Belgique Ser. 2, 2 (7): 560 (1857)

Host – *Juniperus virginiana* L., Uzbekistan, Samarkand State, 21 June 2024, NGK-11292, (TASM).

Diplodia mori Berk., London J. Bot. 6: 325 (1847).

Host – *Morus alba* L., Uzbekistan, Samarkand State, 24 June 2024, NGK-11262, (TASM).

Diplodia rosarum (Fr.) Westend., Bull. Acad. Roy. Sci. Belgique, Cl. Sci. 7: 91 (1859).

Host – *Rosa* x *alba* L., Uzbekistan, Samarkand State, 13 November 2023, NGK-11219, (TASM).

Capnodiales Woron.

Capnodiaceae (Sacc.) Höhn. ex Theiss.

CAPNODIUM Mont.

Capnodium pini Berk. & M.A. Curtis, Grevillea 4 (32): 157 (1876).

Host - *Pinus brutia* var. *eldarica* (Medw.) Silba., Uzbekistan, Samarkand State, 21 August 2023, NGK-11249, (TASM).

Metacapnodiaceae Hughes & Corlett.

METACAPNODIUM Speg.

Metacapnodium juniperi (W. Phillips & Plowr.) Speg., Physis (Buenos Aires) 4 (17): 288 (1918)

Host - *Juniperus seravschanica* Kom., Uzbekistan, Samarkand State, 19 May 2024, NGK-11304, (TASM).

Cladosporiales Abdollahz. & Crous

Cladosporiaceae Chalm. & R.G. Archibald

CLADOSPORIUM Link.

Cladosporium delectum Cooke & Ellis, Grevillea 6 (37): 6, pl. 96, fig. 36 (1877).

Host - *Magnolia cylindrica* E. H. Wilson., Uzbekistan, Samarkand State, 20 April 2024, NGK-11203, (TASM).

Cladosporium magnoliigena Jayasiri, E.B.G. Jones & K.D. Hyde, Mycosphere 10 (1): 127 (2019).

Host - *Magnolia grandiflora* L., Uzbekistan, Samarkand State, 10 September 2023, NGK-11190, (TASM).

Dothideales Lindau.

Saccotheciaceae Bonord.

AUREOBASIDIUM Viala & G. Boyer.

Aureobasidium pullulans (de Bary) G. Arnaud ex Cif., Ribaldi & Corte, Atti Ist. Bot. Lab. Crittog. Univ. Pavia 14: 85 (1957).

Host – *Elaeagnus angustifolia* L., Uzbekistan, Samarkand State, 13 November 2023, NGK-11216, (TASM).

Mycosphaerellales (Nannf.) P.F. Cannon.

Mycosphaerellaceae Lindau.

ASPERISPORIUM Maubl.

Asperisporium juniperinum (Georgescu & Badea) B. Sutton & Hodges, Mycologia 82 (3): 317 (1990)

Host – *Juniperus pseudosabina* Fisch., & C.A.Mey. Uzbekistan, Samarkand State, 4 May 2024, NGK-11265, (TASM).

CERCOSPORA Fresen.

Cercospora muelleriana U. Braun & Crous, CBS Biodiversity Series 1: 284 (2003)

Host – *Wisteria sinensis* (Sims) DC., Uzbekistan, Samarkand State, 4 October 2024, NGK-11179, (TASM).

Note: New record for mycobiota of Uzbekistan.

***Cercospora* sp.**

Host – *Hibiscus syriacus* L., Uzbekistan, Samarkand State, 1 June 2024, NGK-11279, (TASM).

MYCOSPHAERELLA Johanson.

Mycosphaerella fraxinicola (Schwein.) House, Bull. New York State Mus. 233-234: 27 (1921)

Host – *Fraxinus sogdiana* Bunge., Uzbekistan, Samarkand State, 23 February 2023, NGK-11250, (TASM).

Mycosphaerella platani (Ellis & G. Martin) Tomilin, Novosti Sistematiki Nizshikh Rastenii 5: 167 (1968)

Host – *Platanus orientalis* L., Uzbekistan, Samarkand State, 17 June 2024, NGK-11298, (TASM).

NEOPHLOEOSPORA U. Braun.

Neophloeospora maculans (Bérenger) Videira & Crous, Stud. Mycol. 87: 338 (2017)

Host – *Morus nigra* L., Uzbekistan, Samarkand State, 12 June 2024, NGK-11260, (TASM).

PASSALORA Fr.

Passalora quercus (Chupp) Crous & U. Braun, Mycotaxon 78: 337 (2001)

Host – *Quercus acutissima* Carruth., Uzbekistan, Samarkand State, 17 June 2024, NGK-11237, (TASM).

Note: New record for mycobiota of Uzbekistan.

PHLOEOSPORA Wallr.

***Phloeospora* sp.**

Host – *Platanus x hispanica* Mill. ex Münchh., Uzbekistan, Samarkand State, 20 June 2024, NGK-11193, (TASM).

PSEUDOCERCOSPORA Speg.

Pseudocercospora ailanthicola (Patw.) Deighton, Mycol. Pap. 140: 138 (1976)

Host – *Ailanthus altissima (Mill.) Swingle.,* Uzbekistan, Samarkand State, 6 September 2024, NGK-11175, (TASM).

Note: New record for mycobiota of Uzbekistan.

Pseudocercospora cercidicola Crous, U. Braun & C. Nakash., Stud. Mycol. 75: 79 (2012)

Host – *Cercis canadensis* L., Uzbekistan, Samarkand State, 10 September 2024, NGK-11172, (TASM).

Note: New record for mycobiota of Uzbekistan.

Pseudocercospora concentrica (Cooke & Ellis) U. Braun & Crous, Mycol. Progr. 1 (1): 22 (2002)

Host – *Yucca gloriosa L.,* Uzbekistan, Samarkand State, 3 September 2023, NGK-11213, (TASM).

Note: New record for mycobiota of Uzbekistan.

Pseudocercospora lythracearum (Heald & F.A. Wolf) X.J. Liu & Y.L. Guo, Acta Mycol. Sin.: 294 (1992)

Host – *Lagerstroemia indica L.,* Uzbekistan, Samarkand State, 20 June 2024, NGK-11200, (TASM).

Pseudocercospora mori (Hara) Deighton, Mycol. Pap. 140: 148 (1976)

Host – *Morus nigra L.,* Uzbekistan, Samarkand State, 12 June 2024, NGK-11258, (TASM).

Pseudocercospora platani (J.M. Yen) J.M. Yen, Bull. Trimestriel Soc. Mycol. France 94 (4): 388 (1979)

Host – *Platanus orientalis L.,* Uzbekistan, Samarkand State, 28 August 2024, NGK-11276, (TASM).

Pseudocercospora platanicola (Ellis & Everh.) U. Braun, Trudy Bot. Inst. im. V.L. Komarova 20: 80 (1997)

Host – *Platanus orientalis L.,* Uzbekistan, Samarkand State, 21 July 2024, NGK-11300, (TASM).

Pseudocercospora salicina (Ellis & Everh.) Deighton, Mycological Papers 140: 94 (1976)

Host – *Populus nigra* L., Uzbekistan, Samarkand State, 6 September 2024, NGK-11174, (TASM).

Pseudocercospora sp.

Host – *Parthenocissus quinquefolia (L.) Planch.,* Uzbekistan, Samarkand State, 6 September 2024, NGK-11178, (TASM).

Note: New record for mycobiota of Uzbekistan.

Pseudocercospora vitis (Lév.) Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires ser. 3, 13: 438 (1911)

Host – *Vitis vinifera L.,* Uzbekistan, Samarkand State, 21 June 2024, NGK-11280, (TASM).

RAMULARIA Unger.

Ramularia lonicerae Voglino, Annals R. Accad. Agric. Torino: 72 (1904)

Host – *Lonicera japonica* Thunb., Uzbekistan, Samarkand State, 19 April 2024, NGK-11256, (TASM).

Note: New record for mycobiota of Uzbekistan.

Ramularia philadelphi Sacc., Mycoth. Ven. Cent. XI: no. 1049 (1876)

Host – *Philadelphus coronarius* L., Uzbekistan, Samarkand State, 11 July 2024, NGK-11297, (TASM).

Note: New record for mycobiota of Uzbekistan.

Ramularia vitis (Richon) U. Braun, Int. J. Mycol. Lichenol. 3 (2-3): 283 (1988)

Host – *Vitis vinifera* L., Uzbekistan, Samarkand State, 25 September 2024, NGK-11285, (TASM).

SEPTORIA Sacc.

Septoria crataegi Desm., Index generum, specierum et synonymorum in J.B.H.J. Desmazières, Plantes Cryptogames de France, Edit. I, Ser. I, Fasc. I-XLIV, 1825-1851. Edit. II, Ser. I, Fasc. I-XXXVII, 1836-1851.: no. 230 (new label) (1851)

Host – *Crataegus flava* Aiton., Uzbekistan, Samarkand State, 19 April 2024, NGK-11261, (TASM).

SPHAERULINA Sacc.

Sphaerulina frondicola (Fr.) Verkley, Quaedvl. & Crous, Studies in Mycology 75: 296 (2013)

Host – *Populus nigra* L., Uzbekistan, Samarkand State, 4 June 2024, NGK-11296, (TASM).

Myriangiales Starbäck.

Elsinoaceae Höhn.

ELSINOE Racib.

Elsinoe ampelina (de Bary) Shear, Phytopathology 19: 677 (1929).

Host – *Vitis vinifera* L., Uzbekistan, Samarkand State, 10 June 2024, NGK-11278, (TASM).

Pleosporales Luttr.

Pleosporaceae Nitschke.

STEMPHYLIUM Wallr.

Stemphylium canadense Woudenb. & Crous, Studies in Mycology 87: 89 (2017)

Host – *Cercis canadensis* L., Uzbekistan, Samarkand State, 23 May 2023, NGK-11238, (TASM).

Stemphylium vesicarium (Wallr.) E.G. Simmons, Mycologia 61 (1): 9 (1969)

Host – *Lycium barbarum* L., Uzbekistan, Samarkand State, 23 May 2023, NGK-11286, (TASM).

Note: New record for mycobiota of Uzbekistan.

ALTERNARIA Nees.

Alternaria alternata (Fr.) Keissl., Beih. Bot. Centralbl. 29: 433 (1912)

Host – *Viburnum opulus* L., Uzbekistan, Samarkand State, 1 June 2024, NGK-11233, (TASM)., *Viburnum carlesii* Hemsl., Uzbekistan, Samarkand State, 17 June 2024, NGK-11234, (TASM)., *Cercis canadensis* L., Uzbekistan, Samarkand State, 6 July 2024, NGK-11299, (TASM).

Alternaria cylindrica Jun. Nishikawa & C. Nakash., Fungal Syst. Evol. 5: 239 (2020)

Host – *Magnolia cylindrica* E.H. Wilson., Uzbekistan, Samarkand State, 14 May 2022, NGK-11180, (TASM).

Note: New record for mycobiota of Uzbekistan.

Alternaria sp.

Host – *Fraxinus angustifolia* Wahl., Uzbekistan, Samarkand State, 1 June 2024, NGK-11240, (TASM).

Alternaria spp.

Host – *Syringa vulgaris* L., Uzbekistan, Samarkand State, 2 October 2024, NGK-11312, (TASM).

Didymellaceae Gruyter.

ASCOCHYTA Lib.

Ascochyta syringicola Kabát & Bubák, Hedwigia 47: 360 (1908)

Host - *Syringa vulgaris* L., Uzbekistan, Samarkand State, 13 October 2023, NGK-11189, (TASM).

PHOMA Sacc.

Phoma armeniacae Thüm. (1888)

Host – *Prunus armeniaca* L., Uzbekistan, Samarkand State, 2 May 2023, NGK-11289, (TASM).

Phoma sp.

Host - *Cephalotaxus fortunei* Hook., Uzbekistan, Samarkand State, 20 June 2024, NGK-11226, (TASM).

Phoma viridarii Sacc., Michelia 2 (6): 96 (1880)

Host - *Magnolia grandiflora* L., Uzbekistan, Samarkand State, 20 April 2024, NGK-11274, (TASM).

DIDYMELLA Sacc.

Didymella negriana (Thüm.) Qian Chen & L. Cai, Stud. Mycol. 82: 178 (2015)

Host – *Vitis vinifera* L., Uzbekistan, Samarkand State, 30 May 2023, NGK-11290, (TASM).

Dothidotthiaceae Crous & A.J.L. Phillips.

WILSONOMYCES Adask.

Wilsonomyces carpophilus (Lév.) Adask., J.M. Ogawa & E.E. Butler, Mycotaxon 37: 283 (1990)

Host – *Prunus laurocerasus* L., Uzbekistan, Samarkand State, 20 June 2024, NGK-11196, (TASM)., *Prunus cerasus* L., Uzbekistan, Samarkand State, 1 June 2024, NGK-11197, (TASM)., *Prunus domestica* L., Uzbekistan, Samarkand State, 19 April 2024, NGK-11198, (TASM)., *Prunus persica (*L.) Batsch., Uzbekistan, Samarkand State, 1 June 2024, NGK-11199, (TASM).

Camarosporiaceae Wanas.

CAMAROSPORIUM Schulzer.

Camarosporium acerinum Ellis & Everh., Proc. Rochester Acad. Sci. 1: 54 (1890)

Host – *Acer pseudoplatanus* L., Uzbekistan, Samarkand State, 19 April 2024, NGK-11191, (TASM).

Camarosporium ailanthi Sacc. (1993).

Host – *Ailanthus altissima* (Mill.) Swingle., Uzbekistan, Samarkand State, 20 June 2024, NGK-11195, (TASM).

Camarosporium betulae Dearn. & Barthol., Mycologia 20 (4): 236 (1928)

Host – *Betula pendula* Roth., Uzbekistan, Samarkand State, 17 June 2024, NGK-11267, (TASM).

Note: New record for mycobiota of Uzbekistan.

Camarosporium elaeagni Potebnia, Annales Mycologici 5 (1): 18 (1907)

Host – *Elaeagnus angustifolia* L., Uzbekistan, Samarkand State, 19 April 2024, NGK-11201, (TASM).

Camarosporium forsythiae Hollós, Ann. Hist.-Nat. Mus. Natl. Hung. 4: 366 (1906)

Host – *Forsythia viridissima* Lindl., Uzbekistan, Samarkand State, 23 June 2024, NGK-11281, (TASM).

Note: New record for mycobiota of Uzbekistan.

Camarosporium hibisci Hollós, Ann. Hist.-Nat. Mus. Natl. Hung. 4: 367 (1906)

Host – *Hibiscus syriacus* L., Uzbekistan, Samarkand State, 15 January 2024, NGK-11251, (TASM).

Camarosporium juglandis Ellis & Barthol., Transactions of the Kansas Academy of Science 16: 167 (1899)

Host – *Juglans regia* L., Uzbekistan, Samarkand State, 20 April 2024, NGK-11220, (TASM).

Camarosporium koelreuteriae Died., Annales Mycologici 2 (6): 513 (1904)

Host – *Koelreuteria paniculata* Laxm., Uzbekistan, Samarkand State, 20 April 2024, NGK-11204, (TASM).

Camarosporium multiforme Sacc. & Schulzer, Hedwigia 23: 110 (1884)

Host – *Chaenomeles japonica* (Thunb.) Lindl. Ex Spach., Uzbekistan, Samarkand State, 16 February 2023, NGK-11264, (TASM).

Note: New record for mycobiota of Uzbekistan.

Camarosporium orni Henn., Hedwigia 42: 221 (1903)

Host – *Fraxinus excelsior* L., Uzbekistan, Samarkand State, 20 April 2024, NGK-11206, (TASM).

Camarosporium passerinii Sacc., Sylloge Fungorum 10: 344 (1892)

Host – *Morus alba* L., Uzbekistan, Samarkand State, 18 June 2024, NGK-11263, (TASM).

Camarosporium platani Politis, J. Tokyo Agric. Coll.: 268 (1949)

Host – *Vitis vinifera* L., Uzbekistan, Samarkand State, 23 March 2024, NGK-11282, (TASM).

Camarosporium polymorphum (De Not.) Sacc., Sylloge Fungorum 3: 461 (1885)

Host – *Sequoiadendron giganteum* (Lindl.) J.Buchholz., Uzbekistan, Samarkand State, 18 April 2024, NGK-11192, (TASM).

Camarosporium quercus Sacc. & Roum., Revue Mycologique (Toulouse) 6: 34 (1884)

Host – *Quercus robur* L., Uzbekistan, Samarkand State, 19 April 2024, NGK-11202, (TASM).

Camarosporium robiniicola Wijayaw., Camporesi & K. D. Hyde, Phytotaxa 183: 21 (2014)

Host – *Robinia pseudoacacia* L., Uzbekistan, Samarkand State, 19 April 2024, NGK-11181, (TASM).

Camarosporium rosae Grove, British Stem- and Leaf-Fungi (Coelomycetes) 2: 362 (1937)

Host – *Rosa canina* L., Uzbekistan, Samarkand State, 20 April 2024, NGK-11205, (TASM).

Camarosporium rosarum (Westend.) Sacc., Sylloge Fungorum 3: 462 (1884)

Host – *Rosa x alba* L., Uzbekistan, Samarkand State, 20 April 2024, NGK-11211, (TASM).

Camarosporium sophorae Gonz. Frag., Trabajos del Museos Nacional de Ciencias Naturales Serie Botanica 12: 77 (1917)

Host – *Styphnolobium japonicum (*L.) Schott., Uzbekistan, Samarkand State, 23 March 2024, NGK-11282, (TASM).

Camarosporium sp.

Host – *Buxus sempervirens* L., Uzbekistan, Samarkand State, 19 April 2024, NGK-11221, (TASM).

Camarosporium sp.

Host – *Liriodendron tulipifera* L., Uzbekistan, Samarkand State, 17 June 2024, NGK-11269, (TASM).

Note: New record for mycobiota of Uzbekistan.

Camarosporium syringae Cooke & Massee, Grevillea 16 (77): 9 (1887)

Host – *Syringa vulgaris* L., Uzbekistan, Samarkand State, 15 April 2024, NGK-11188, (TASM).

Camarosporium viticis Petr., Sydowia 7 (1-4): 31 (1953)

Host – *Vitis vinifera* L., Uzbekistan, Samarkand State, 1 June 2024, NGK-11271, (TASM).

Venturiales Y. Zhang.

Venturiaceae E. Müll.

VENTURIA Sacc.

Venturia inaequalis (Cooke) G. Winter, Mycoth. Univ. Cent. 3: no. 261 (1875).

Host – *Malus domestica* (Suckow) Borkh., Uzbekistan, Samarkand State, 10 September 2023, NGK-11241, (TASM)., *Populus nigra* L., Uzbekistan, Samarkand State, 11 October 2023, NGK-11242, (TASM).

FUSICLADIUM Bonord.

Fusicladium fraxini Aderh., Hedwigia 36: 74 (1897).

Host – *Fraxinus excelsior* L., Uzbekistan, Samarkand State, 12 June 2024, NGK-11257, (TASM).

LEOTIOMYCETES O.E. Erikss.

Helotiales Nannf.

Ascodichaenaceae D. Hawksw.

PSILOSPORA Rabenh.

Psilospora quercus Rabenh. ex Fuckel, Jahrb. Nassauischen Vereins Naturk. 23-24: 401 (1870)

Host – *Quercus robur* L., Uzbekistan, Samarkand State, 20 January 2024, NGK-11212, (TASM).

Dermateaceae Fr.

MARSSONINA Magnus.

Marssonina rosae (Lib.) Died., Kryptogamen-Flora der Mark Brandenburg 9 (5): 830 (1915)

Host – *Rosa x alba* L., Uzbekistan, Samarkand State, 1 June 2024, NGK-11255, (TASM).

GLOEOSPORIUM Desm.

Gloeosporium sp.

Host – *x Chitalpa tashkentensis* T.S.Elias & Wisura., Uzbekistan, Samarkand State, 2 October 2024, NGK-11307, (TASM).

Discinellaceae Ekanayaka & K.D. Hyde.

PSEUDOPEZICULA Korf.

Pseudopezicula tracheiphila (Müll.-Thurg.) Korf & W.Y. Zhuang, Mycotaxon 26: 464 (1986)

Host – *Vitis vinifera* L., Uzbekistan, Samarkand State, 20 June 2023, NGK-11293, (TASM).

Drepanopezizaceae Baral.

DIPLOCARPON F.A. Wolf.

Diplocarpon mespili (Sorauer) B. Sutton, The Coelomycetes. Fungi imperfecti with pycnidia, acervuli and stromata: 150 (1980)

Host – *Cydonia oblonga* Mill., Uzbekistan, Samarkand State, 19 April 2024, NGK-11182, (TASM)., *Malus domestica* (Suckow) Borkh., Uzbekistan, Samarkand State, 19 April 2024, NGK-11183, (TASM)., *Photinia serratifolia* (Desf.) Kalkman., Uzbekistan, Samarkand State, 20 June 2024, NGK-11194, (TASM).,

DREPANOPEZIZA (Kleb.) Jaap.

Drepanopeziza populi (Lib.) Rossman & W.C. Allen, Mycotaxon 132 (4): 954 (2017)

Host – *Populus alba* L., Uzbekistan, Samarkand State, 1 June 2024, NGK-11227, (TASM).

Erysiphaceae N.K. Sredinsky.

ERYSIPHE R. Hedw. ex DC.

Erysiphe alphitoides (Griffon & Maubl.) U. Braun & S. Takam., Schlechtendalia 4: 5 (2000)

Host – *Quercus robur* L., Uzbekistan, Samarkand State, 11 October 2023, NGK-11277, (TASM).

Erysiphe euonymicola U. Braun, CBS Biodiversity Series 11: 461 (2012)

Host – *Euonymus japonicus* Thunb., Uzbekistan, Samarkand State, 10 November 2023, NGK-11186, (TASM).

Note: New record for mycobiota of Uzbekistan.

Erysiphe kenjiana (Homma) U. Braun & S. Takam., Schlechtendalia 4: 20 (2000)

Host – *Ulmus minor* Mill., Uzbekistan, Samarkand State, 5 December 2023, NGK-11231, (TASM).

Erysiphe lagerstroemiae E. West, Phytopathology 23: 814 (1933)

Host – *Lagerstroemia indica* L., Uzbekistan, Samarkand State, 23 May 2023, NGK-11305, (TASM).

Erysiphe platani (Howe) U. Braun & S. Takam., Schlechtendalia 4: 12 (2000)

Host – *Platanus orientalis* L., Uzbekistan, Samarkand State, 6 September 2024, NGK-11173, (TASM).

MICROSPHAERA Lév.

Microsphaera syringae (Schwein.) Magnus, Berichte der Deutschen Botanischen Gesellschaft 16: 67 (1898)

Host – *Syringa vulgaris* L., Uzbekistan, Samarkand State, 17 June 2024, NGK-11266, (TASM).

OIDIUM Link.

Oidium tuckeri Berk., Gard. Chron. 1847 (48): 779 (1847)

Host – *Vitis vinifera* L., Uzbekistan, Samarkand State, 11 October 2023, NGK-11210, (TASM).

PODOSPHAERA Kunze.

Podosphaera leucotricha (Ellis & Everh.) E.S. Salmon, Mem. Torrey Bot. Club 9: 40 (1900)

Host – *Prunus domestica* L., Uzbekistan, Samarkand State, 19 April 2024, NGK-11243, (TASM).

Podosphaera oxyacanthae* f. *cydoniae Jacz., Karmannyi opredelitel' gribov. II. Muchnisto-rosjanye griby: 117 (1927)

Host – *Cydonia oblonga* Mill., Uzbekistan, Samarkand State, 17 June 2024, NGK-11235, (TASM).

Podosphaera tridactyla (Wallr.) de Bary, Abh. Senckenberg Naturf. Ges. 7: 390 (1870)

Host – *Prunus cerasus* L., Uzbekistan, Samarkand State, 12 June 2024, NGK-11245, (TASM).

PHYLLACTINIA Lév.

Phyllactinia suffulta* f. *moricola Jacz., Karmannyi opredelitel' gribov. II. Muchnisto-rosjanye griby: 434 (1927)

Host – *Morus alba* L., Uzbekistan, Samarkand State, 12 June 2024, NGK-11248, (TASM).

Phyllactinia suffulta* f. *pruni Jacz., Karmannyi opredelitel' gribov. II. Muchnisto-rosjanye griby: 438 (1927)

Host – *Prunus persica (*L.) Batsch., Uzbekistan, Samarkand State, 17 June 2024, NGK-11270, (TASM).

SAWADAEA Miyabe.

Sawadaea bicornis (Link) Miyabe, J. Fac. Agric. Hokkaido Imp. Univ. 38: 371 (1937)

Host – *Acer negundo* L., Uzbekistan, Samarkand State, 1 June 2024, NGK-11253, (TASM).

SPHAEROTHECA Lév.

Sphaerotheca pannosa* var. *rosae Woron.: 450 (1914)

Host – *Rosa x alba* L., Uzbekistan, Samarkand State, 11 November 2023, NGK-11252, (TASM).

Sclerotiniaceae Whetzel.

MONILINIA Honey.

Monilia laxa (Aderh. & Ruhland) Honey, Amer. J. Bot. 23: 105 (1936)

Host – *Cydonia oblonga* Mill., Uzbekistan, Samarkand State, 25 August 2023, NGK-11215, (TASM).

Rhytismatales M.E. Barr ex Minter.

Rhytismataceae Chevall.

LOPHODERMIUM Chevall.

Lophodermium juniperinum (Fr.) De Not., Giorn. Bot. Ital. 2 (7-8): 46 (1847)

Host – *Juniperus seravschanica* Kom., Uzbekistan, Samarkand State, 2 October 2024, NGK-11313, (TASM).

SORDARIOMYCETES O.E. Erikss.

Amphisphaeriales D. Hawksw.

Amphisphaeriaceae G. Winter.

PESTALOTIA De Not.

Pestalotia malorum Elenkin & Ohl, J. Pflanzenkrankh.: 99 (1913)

Host – *Chaenomeles japonica* (Thunb.) Lindl. Ex Spach., Uzbekistan, Samarkand State, 5 December 2023, NGK-11214, (TASM).

Pestalotiopsidaceae Maharachch.

PESTALOTIOPSIS Steyaert.

Pestalotiopsis rosea Maharachch. & K.D. Hyde, Fungal Diversity 56 (1): 118 (2012)

Host – *Rosa* x *alba* L., Uzbekistan, Samarkand State, 1 October 2023, NGK-11207, (TASM).

Diaporthales Nannf.

Gnomoniaceae G. Winter.

ASTEROMA DC.

Asteroma diospyri (Schwein.) Sacc., Sylloge Fungorum 3: 207 (1884)

Host – *Diospyros kaki* Thunb., Uzbekistan, Samarkand State, 28 August 2023, NGK-11259, (TASM).

OPHIOGNOMONIA (Sacc.) Sacc.

Ophiognomonia leptostyla (Fr.) Sogonov, Studies in Mycology 62: 62 (2008)

Host – *Juglans regia* L., Uzbekistan, Samarkand State, 12 June 2024, NGK-11184, (TASM).

Cytosporaceae Fr.

CYTOSPORA Ehrenb.

Cytospora translucens Sacc., Sylloge Fungorum 3: 261 (1884)

Host – *Salix babylonica* L., Uzbekistan, Samarkand State, 20 April 2024, NGK-11217, (TASM).

Erythrogloeaceae Senan.

***DENDROSTOMA* X.L. Fan & C.M. Tian.**

Dendrostoma leiphaemia (Fr.) Senan. & K.D. Hyde, Fungal Diversity 93: 317 (2018)

Host – *Quercus robur* L., Uzbekistan, Samarkand State, 25 September 2023, NGK-11230, (TASM).

Note: New record for mycobiota of Uzbekistan.

Tubakiaceae U. Braun.

TUBAKIA B. Sutton.

Tubakia dryina (Sacc.) B. Sutton, Trans. Brit. Mycol. Soc. 60 (1): 165 (1973)

Host – *Aesculus hippocastanum* L., Uzbekistan, Samarkand State, 2 October 2024, NGK-11310, (TASM).

Note: New record for mycobiota of Uzbekistan.

Glomerellales Chadef.

Glomerellaceae Locq.

COLLETOTRICHUM Corda.

Colletotrichum aucubae Gutner, Trudy Botanicheskogo Instituta Akademii Nauk SSSR 2 1: 290 (1933)

Host – *Aucuba japonica* Thunb., Uzbekistan, Samarkand State, 10 November 2023, NGK-11232, (TASM).

Note: New record for mycobiota of Uzbekistan.

Colletotrichum elaeagni Siemaszko, Acta Societatis Botanicorum Poloniae 1: 9 (1923)

Host – *Elaeagnus angustifolia* L., Uzbekistan, Samarkand State, 3 October 2024, NGK-11309, (TASM).

Note: New record for mycobiota of Uzbekistan.

Colletotrichum euonymi Lu Lin & X.L. Fan, J. Fungi 9 (2, no. 271): 14 (2023)

Host – *Euonymus japonicus* Thunb., Uzbekistan, Samarkand State, 25 September 2023, NGK-11230, (TASM).

Note: New record for mycobiota of Uzbekistan.

Colletotrichum sp.

Host – *Fraxinus excelsior* L., Uzbekistan, Samarkand State, 10 June 2024, NGK-11311, (TASM).

Hypocreales Lindau.

Nectriaceae Tul.

CALONECTRIA De Not.

Calonectria pseudonaviculata (Crous, J.Z. Groenew. & C.F. Hill) L. Lombard, M.J. Wingf. & Crous, Studies in Mycology 66: 56 (2010)

Host – *Buxus sempervirens* L., Uzbekistan, Samarkand State, 5 December 2023, NGK-11224, (TASM).

Note: New record for mycobiota of Uzbekistan.

CYLINDROCLADIUM Morgan.

Cylindrocladium sp.

Host – *Ginkgo biloba* L., Uzbekistan, Samarkand State, 20 June 2024, NGK-11225, (TASM).

Note: New record for mycobiota of Uzbekistan.

Trichosphaeriales M.E. Barr.

Trichosphaeriaceae G. Winter.

GIBELLULOPSIS Bat.

Gibellulopsis nigrescens (Pethybr.) Zare, W. Gams & Summerb., Nova Hedwigia 85 (3-4): 477 (2007)

Host – *Rosa x alba* L., Uzbekistan, Samarkand State, 21 July 2024, NGK-11301, (TASM).

Note: New record for mycobiota of Uzbekistan.

TAPHRINOMYCETES O.E. Erikss.

Taphrinales Gäum.

Taphrinaceae Gäum.

TAPHRINA Fr.

Taphrina sp.

Host – *Fraxinus americana* L., Uzbekistan, Samarkand State, 20 April 2024, NGK-11218, (TASM).

Taphrina deformans (Berk.) Tul., Ann. Sci. Nat., Bot. 5: 122 (1866)

Host – *Prunus persica (*L.) Batsch, Uzbekistan, Samarkand State, 20 April 2024, NGK-11218, (TASM).

BASIDIOMYCOTA Whittaker ex R.T. Moore

PUCCINIOMYCETES R. Bauer.

Pucciniales Clem. & Shear.

Melampsoraceae Dietel.

MELAMPSORA Castagne.

Melampsora laricis-populina Kleb., Zeitschrift für Pflanzenkrankheiten 12: 43 (1902)

Host – *Populus alba* L., Uzbekistan, Samarkand State, 2 October 2023, NGK-11209, (TASM).

Melampsora microspora Tranzschel & Erem., Conspectus Uredinalium USSR: 155 (1939)

Host – *Populus nigra* L., Uzbekistan, Samarkand State, 2 August 2023, NGK-11185, (TASM).

Melampsora pinitorqua Rostr., Afbildning og beskrivelse af de Farligste Snyltesvampe i Danmarks Skove: 10 (1889)

Host – *Pinus nigra* subsp. *pallasiana* (Lamb.) Holmboe., Uzbekistan, Samarkand State, 17 June 2024, NGK-11236, (TASM).

Melampsora salicina (Pers. ex DC.) Rabenh., Klotzschii herbarium vivum mycologicum sistens fungorum per totam Germaniam crescentium collectionem perfectam. Editio nova. Centuria V: no. 494 (1857)

Host – *Salix alba* L., Uzbekistan, Samarkand State, 19 May 2024, NGK-11303, (TASM).

Melampsora tremulae Tul. & C. Tul., Ann. Sci. Nat., Bot. Sér. 4, 2: 95 (1854)

Host – *Populus alba* L., Uzbekistan, Samarkand State, 1 June 2024, NGK-11254, (TASM).

Gymnosporangiaceae P. Zhao & L. Cai.

GYMNOSPORANGIUM R. Hedw.

Gymnosporangium confusum Plowr., A Monograph of the British Uredineae and Ustilagineae: 232 (1889)

Host – *Crataegus turkestanica* Pojark., Uzbekistan, Samarkand State, 12 June 2024, NGK-11246, (TASM)., *Crataegus monogyna* Jacq., Uzbekistan, Samarkand State, 1 June 2024, NGK-11247, (TASM).

Pucciniaceae Chevall.

AECIDIUM Pers.

Aecidium philadelphi Dietel, Annales Mycologici 12 (1): 85 (1914)

Host – *Philadelphus coronarius* L., Uzbekistan, Samarkand State, 11 July 2024, NGK-11288, (TASM).

PUCCINIA Pers.

Puccinia buxi Sowerby, Coloured Figures of English Fungi Supplement: [24], t. 439 (1815)

Host – *Buxus sempervirens* L., Uzbekistan, Samarkand State, 11 October 2023, NGK-11223, (TASM).

Phragmidiaceae Corda.

PHRAGMIDIUM Link.

Phragmidium rubi-idaei (DC.) P. Karst., Bidrag till Kännedom av Finlands Natur och Folk 31: 52 (1879)

Host – *Rubus caesius* L., Uzbekistan, Samarkand State, 13 November 2023, NGK-11208, (TASM).

Phragmidium tuberculatum Jul. Müll., Berichte der Deutschen Botanischen Gesellschaft 3: 391 (1885)

Host – *Rosa x alba* L., Uzbekistan, Samarkand State, 4 May 2024, NGK-11272, (TASM).

OOMYCOTA Arx.

PERONOSPOROMYCETES Locq.

Peronosporales A. Fisch.

Peronosporaceae de Bary.

PHYTOPHTHORA de Bary.

Phytophthora cinnamomi Rands, Mededelingen van het Instituut voor Plantenziekten Batavia 54: 1 (1922)

Host – *Buxus sempervirens* L., Uzbekistan, Samarkand State, 20 December 2023, NGK-11222, (TASM).

PLASMOPARA J. Schröt.

Plasmopara viticola (Berk. & M.A. Curtis) Berl. & De Toni, Sylloge Fungorum 7: 239 (1888)

Host – *Vitis vinifera* L., Uzbekistan, Samarkand State, 12 October 2024, NGK-11314, (TASM).

Discussion

The areas selected for comparison were selected considering natural and geographical conditions, location and plant forms. We conducted comparative studies, first, analyzing systematic groups based on the leading genera and species in their location. We consider new systematic indicators in analyzing the species composition of micromycetes in the compared areas. The results of our comparative analysis of micromycetes found on trees and shrubs in Samarkand showed that 171 species of pathogenic fungi belonging to 4 divisions, 6 classes, 15 orders, 28 families and 74 genera were listed on trees and shrubs in the Kyrgyz Republic from the CIS countries (61). Among the most common diseases caused by these fungi are powdery mildew and rust. Based on the analysis of the species composition of pathogenic fungi found on trees and shrubs in the Kyrgyz Republic, 18 species of fungi were identified that are similar to the micromycete fungi found on trees and shrubs in Samarkand. Our studies also identified 14 species of powdery mildew and 10 species of rust fungi. A study of pathogenic micromycetes on the leaves of introduced trees and shrubs in Siberia identified 121 species of pathogenic micromycetes belonging to 2 divisions, 14 orders and 46 genera (62). During the study, 1 new species was recorded for science. The study also provides information on new host plants of 16 species of fungi. Of the regions compared, the southern part of Uzbekistan - the Kashkadarya oasis - is the closest in distance (63). According to the results of the comparative analysis, the similarity coefficient of the micromycetes of the Samarkand dendroflora with the micromycetes of ornamental trees and shrubs introduced in the Kashkadarya oasis by species, genera and families was 30 % by family, 24 % by genera and 5.4 % by species. Also, Pleosporaceae, Venturiaceae, Capnodiaceae, Cladosporiaceae, Mycosphaerellaceae, Phyllostictaceae, etc. (a total of 14 similar families), Alternaria, Phoma, Camarosporium, Cercospora, Diplodia, Phyllactinia, Cytosporinas, Mells, etc. (a total of 19 in similar families), similar species Alternaria alternata, Phoma viridarii, Camarosporium koelreuteria, etc. (a total of 13 similar species) (63). For comparative analysis, the Rusanov Botanical Garden was selected from the northern part of the republic. Scientific research on the study of micromycetes of higher plants was carried out in the Rusanov Botanical Garden of the Academy of Sciences of the Republic of Uzbekistan (64). As a result of the scientific work carried out, 313 species of fungi belonging to 4 divisions, 9 classes, 12 orders, 24 families and 79 genera were identified (64). Among the micromycetes of higher plants of the Botanical Garden named after M.V. Rusanov, located at the Institute of Botany under the Academy of Sciences of the Republic of Uzbekistan, the similarity coefficient of micromycetes widespread in trees and shrubs by species, genera and families was 50 % by families, 38 % by genera and 6.5 % by species. Also, Erysiphaceae, Venturiaceae, Pleosporaceae, Melampsoraceae, Camarosporiaceae, Cytosporaceae, Mycosphaerellaceae, Gnomoniaceae, etc. (total 23 similar families), Taphrina, Erysiphe, Melampsora, Monilia, Pharalostoyl, Comasporae, Drepanopeziza, etc. (total 36 similar families), similar species *Venturia inaequalis*, *Pleospora herbarum* (*Stemphylium versicarium*), *Melampsora tremulae*, *Gymnosporangium confusum*, *Phragmidium tuberculatum*, etc. (total 16 similar species) (64).

For comparative analysis, the Namangan region was selected from the eastern part of the republic (65). When comparing the species composition of the mycobiota of higher plants in the Namangan region, 480 species of micromycetes belonging to 115 genera, 333 species of parasites and saprophytes in 205 genera of typical plants were identified. Among the micromycetes of higher plants of the Namangan region, the coefficient of similarity between species, genera and families of micromycetes, common on trees and shrubs, was 50 % by family, 25 % by genera and 7.6 % by species. Further Taphrinaceae, Pleosporaceae, Erysiphaceae, Gymnosporangiaceae, Pucciniaceae, Venturiaceae and others (23 similar families in total), *Melampsora, Puccinia, Phragmidium, Wilsonomyces, Septoria, Marssonina, Taphrina* and others (26 similar families in total), similar species *Phyllosticta aesculina, Cylindrosporium maculans* (*Neophloeospora maculans*), *Alternaria tenuis* (*Alternaria alternata*), et al, (19 species in total are similar) (65).

Conclusion

In the woody and shrubby vegetation of Samarkand, 127 species, 4 forms and 1 variety of micromycetes were found, belonging to 3 divisions, 6 classes, 18 orders, 35 families, 61 genera. Of the identified micromycetes, 16 genera and 32 species were registered for the first time for the mycobiota of Uzbekistan. The Ascomycota division is the most numerous in terms of species composition. In total, the division has 115 species, 4 forms and 1 variety, which is 90.91 % of the total number of identified fungi. Next come 10 species from the

Basidiomycota division, accounting for 7.58 % of the total number of identified micromycetes and 2 species from the Oomycota division, accounting for 1.52 % of the total number of identified micromycetes.

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Authors' contributions

GN carried out the sampling of micromycetes, performed microscopic identification, and drafted the initial manuscript. ZU was involved in laboratory culturing and microscopic analysis. KK contributed to the ecological analysis of host plants. BI participated in specimen preparation and herbarium documentation. MH assisted in organizing the sampling process and contributed to data interpretation. IM took part in the coordination of lab protocols and ensured quality control of microscopy work. ZR contributed to the statistical processing and data visualization. UO participated in the formatting of the final checklist and references. MS conducted literature review and helped revise the manuscript. LN was responsible for verifying taxonomic names and contributed to editing the manuscript. All authors read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: Authors do not have any conflict of interests to declare.

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