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Microfungi of Nezahat Gökyiğit Botanic Garden I.; New Family and Species Records

Faruk SELÇUK¹, Merve ULUKAPI^{2*}

*Corresponding author: merveulukapi@gmail.com

^{1,2}Kırşehir Ahi Evran University, Sciences and Arts Faculty, Department of Molecular Biology and Genetic, Kırşehir / TURKEY

¹Orcid ID: 0000-0002-3565-4544 / selcuk_faruk@yahoo.com

²Orcid ID: 0000-0002-9167-6123 / merveulukapi@gmail.com

Abstract: *Bartalinia robillardoides* Tassi (*Bartaliniaceae*) on leaves of *Phyllostachys glauca* McClure, and *Amerosporium polynematoides* Speg. on leaves of *Phyllostachys aureosulcata* McClure. were reported from Nezahat Gökyiğit Botanic Garden during field studies in June 2018. *B. robillardoides* was recorded as family level, and *A. polynematoides* was recorded as species level first time for Turkey mycobiota. The Morphological and microscopic characteristics of the records were presented depend on collected samples, and supported by macro and microphotographs.

Key words: Biodiversity, New record, *Bartaliniaceae*, *Amerosporium*, *Phyllostachys*

Nezahat Gökyiğit Botanik Bahçesi'nin Mikrofungusları I.: Yeni Familya ve Tür Kayıtları

Öz: Nezahat Gökyiğit Botanik Bahçesi'nden (NGBB) periyodik olarak yapılan saha çalışması sırasında Haziran 2018'de toplanan örneklerden *Phyllostachys glauca* McClure'nin yapraklarında *Bartalinia robillardoides* Tassi (*Bartaliniaceae*) ve *Phyllostachys aureosulcata* McClure yapraklarında *Amerosporium polynematoides* Speg. Türkiye mikrobiotası için familya ve tür düzeyinde ilk kez kaydedilmiştir. Kayıtların morfolojik ve mikroskopik özellikleri toplanan örneklere bağlı olarak sunulmuş ve makro ve mikro fotoğraflar ile desteklenmiştir.

Anahtar kelimeler: Biyoçeşitlilik, Yeni kayıt, *Bartaliniaceae*, *Amerosporium*, *Phyllostachys*

Introduction

In 1995 Ali Nihat Gökyiğit established the garden as a memorial park in memory of his wife. In 2002 the park was transformed into a botanic garden covering 46 ha of land in Istanbul allocated to the ANG Foundation by the Department of Highways.

It is only botanic garden in the World to be located at a cloverleaf intersection of two motorways, on 12 islands encircled by approach and exit roads. The most important of these are the Central, Ertuğrul, Recreation, Istanbul, Arboretum, Oak, Anatolia, and Thrace Islands. The garden lies between the districts of Ataşehir and Ümraniye of Istanbul (Gökyiğit, 2013).

Infrastructure includes 8 artesian wells, water storage tanks, fire extinguishing and watering systems,

several ponds, tunnels and bridges linking the islands, and 2 amphitheatres.

Facilities include a herbarium, classrooms, library, seed house and 2 greenhouses.

NGBB's extensive programme of activities includes educational courses on numerous subjects, research projects, and protecting endangered plant species. The Bamboo species found in NGBB as host of microfungi in our study are as follows:

1. *Hibanobambusa tranquillans* (Koidz.) Maruy. & H.Okamura

2. *Phyllostachys arcana* Mc Clure

3. *P. aurea* Rivière & C. Rivière

4. *P. aureosulcata* Mc Clure



5. *P. bambusoides* Siebold & Zucc.

6. *P. flexuosa* Riviére & C. Riviére

7. *P. glauca* Mc Clure

8. *P. nigra* (Lodd. ex Lindl.) Munro

9. *P. nuda* Mc Clure

10. *Pleioblastus fortunei* (Van Houtte) Nakai

11. *Pseudosasa japonica* (Steud.) Makino

12. *Semiarundinaria fastuosa* (Mitford) Makino

Plants biodiversity of Nezahat Gökyiğit Botanic Garden (NGBB) has been well studied and well known, but mycobiota has not been investigated. In 2018, during mycological investigation in NGBB two species of anamorphic fungi have been collected and identified. These collections are reported herein.

Material and method

The micromycobiota of NGBB was not investigated which was very rich in aspect of plant diversity. We were aimed in this study to contribute to mycobiota of NGBB. The microfungi samples were collected during periodic mycological excursion from the NGBB in June 2018. They were transferred to the laboratory and microscopic investigations were carried out. The collections were examined in distilled water and for morphological photographs Olympus SZX16 with Olympus DP digi-CAM (Japan) stereo microscope, and microphotographs Leica DMLB with Leica DFC320 digi-Cam (Germany) research microscope were used. For the identification of fungi species some literature sources were employed (Sutton, 1980 "repr. 2004"; Nag Raj, 1993; Crous et al., 2014; Senanayake et al. 2015, and Face of Fungi, 2019). The systematic status of fungi arranged following Index Fungorum database (access: 1 September 2019). All collections deposited at Kırşehir Ahi Evran University, Arts and Sciences Faculty, Mycology Laboratory.

Results and Discussion

As results of field and laboratory studies, on dead leaves of *P. glauca* and *P. aureosulcata* identified two microfungi species.

Of these microfungi, taxonomic status, morphological and microscopic characteristics, macro and microphotographs, habitat, and collected locations are given below.

Fungi

Ascomycota

Pezizomycotina

Sordariomycetes

Xylariomycetidae

Amphisphaeriales

Bartalinia

Bartalinia

***Bartalinia robillardoides* Tassi**

Bartaliniaceae Wijayaw., Maharachch. & K.D. Hyde

Faceoffungi: 00667; Senanayake et al., (2015): 75.

Conidiomata acervular or pycnidial to irregular, solitary to gregarious, superficial to sub-immersed, unilocular, globose to subglobose, dark brown to black. Ostiole apapillate. Conidiomata wall comprising two strata, outer wall composed of thick-walled, dark brown cells of textura angularis, inner wall thin, composed of hyaline to sub-hyaline cells of textura angularis. Conidiophores present or reduced to conidiogenous cells; when present cylindrical, hyaline, sparsely septate, smooth-walled. Conidiogenous cells holoblastic, ampulliform, integrated or discrete, determinate, hyaline, smooth-walled. Conidia fusiform, straight to slightly curved, subhyaline to brown, bearing only apical appendages or having both apical and basal appendages.

***Bartalinia* Tassi**

Nag Raj, (1993): 133.

The genera have superficial to subimmersed acervular or pycnidial to irregular fruiting bodies, conidiophores reduced to conidiogenous cells, holoblastic conidiogenesis and fusiform, straight to slightly curved, subhyaline to brown conidia with apical or apical and basal appendages.

***Bartalinia robillardoides* Tassi, (Figures 1-6).**

Nag Raj, (1993): 141; Crous et al., (2014): 145.

Conidioma stromatic, pycnidoid to indeterminate or variable, amphigenous, scattered to gregarious, subepidermal in origin, initially immersed, then erumpent, globose, or depressed globose, 127-173 µm diam.

Unilocular, glabrous, brown to black, lacking an ostiole, but dehiscing by an irregular break in the apical wall; textura angularis, cells thick-walled and brown in the outer layers, becoming thin-walled and paler toward the conidial hymenium. Conidiophores arising all around the cavity of the conidioma from the inner most wall layer, reduced to conidiogenous cells, invested in mucus. Conidiogenous cells ampulliform, colourless, thin-walled, smooth. Conidia subcylindrical, 4-septate, wall smooth and slightly constricted, at the septa, 20.6-25(-25.4) × 2.6-3.8(-4.3) µm. Basal cell obconic with a truncate base, almost colourless, 3-3.8 µm long; median cells 3, subcylindrical, pale brown, almost colourless, 17.3- 20.8(-22.2) µm long, apical cell conical, colourless,



(2.4-)2.7-4.2 μm long; apical appendage branches three, drawn out at the apex into a tubular, unbranched, attenuated, flexuous, divergent, 13-19 μm long; basal appendage single, unbranched, filiform, flexuous, excentric, (3.5-)5-8(-9.9) μm long.

Habitat: On dead leaves of *P. glauca*.

Specimen examined: Turkey, Istanbul Province, Nezahat Gökyiğit Botanic Garden, Anadolu Island, 70 m a.s.l., 40° 59' 821" N, 29° 07' 251" E, 20.06.2018, FS 1137.

Bartalinaceae family includes species of *Bartalinia*, *Broomella*, *Dyrithiopsis*, *Hyalotiella*,

Truncatella, and *Zetiaplozina* genera. Among them *Truncatella* was recorded in Turkey before, but it has been transfer into the family (Senanayake et al., 2015). *B. robillardoides* has serious importance due to reside in type genus. *Bartalinia* genus has 25 species, all of them spread different localities and hosts all around the World, but it is first in Turkey.

B. robillardoides is a new record species for Turkey mycobiota as level *Bartalinia* genus and Bartalinaceae family.



Figures 1 - 2: Habitat of *B. robillardoides*

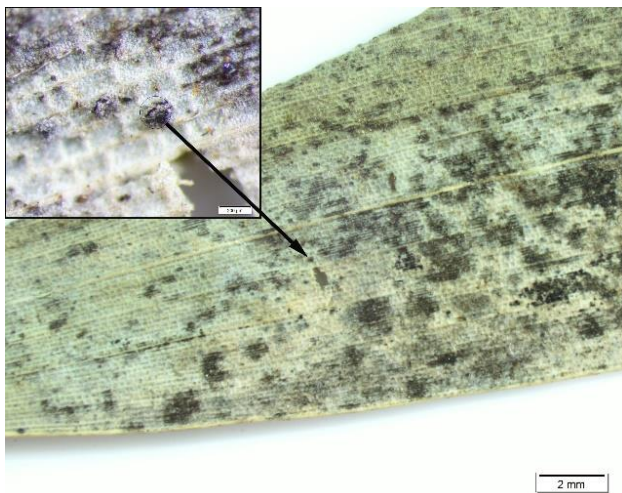


Fig 3: Habit of *B. robillardoides*

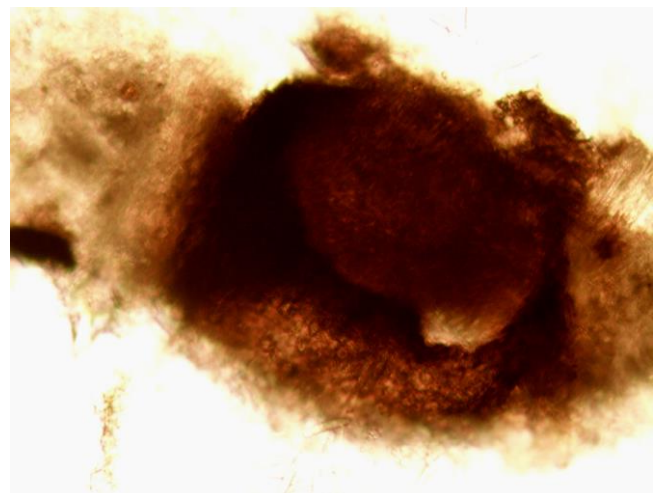
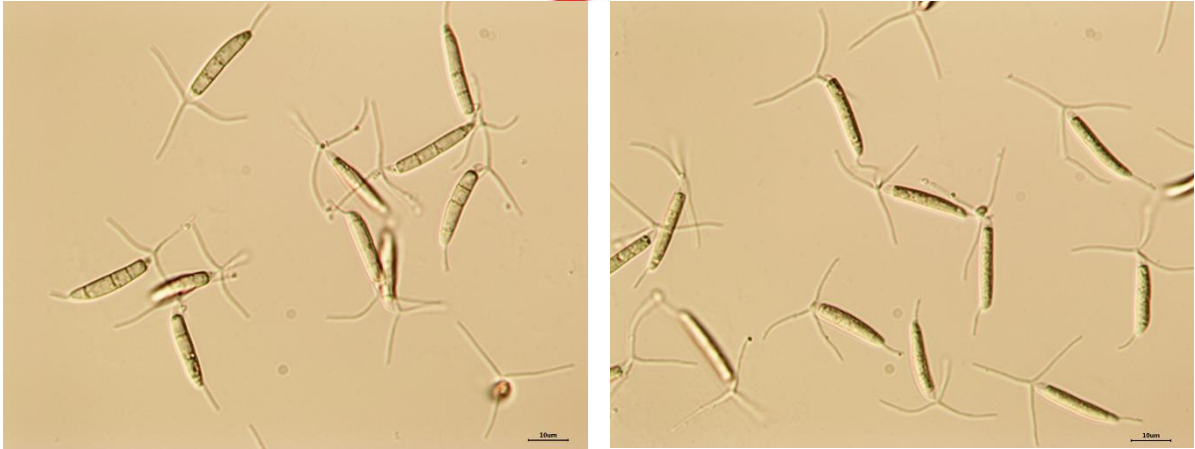


Fig 4 (x100) Vertical section of conidioma of *B. robillardoides*

Figures 5-6 Conidia of *B. robillardoides*

Fungi
Ascomycota
Pezizomycotina
Leotiomyces
Leotiomycetidae
Helotiales
Sclerotiniaceae
***Amerosporium* Speg.**

***Amerosporium polynematoides* Speg.**, (Figures 7-12).

Sutton, (1980, repr. 2004): 619.

Conidioma pycnidoid, initially sphaerical, later collapsed irregularly, usually superficial, separate, greenish, sessile, unilocular, initially closed, later dehiscing longitudinally in the upper wall, wall pseudoparenchymatous. Ostiol absent. Setae sparse, straight, or slightly curved, unbranched, dark brown 125-140 × 5-6 µm long. Conidiophores absent. Conidiogenous

cells enteroblastic. Conidia pale brown to olivaceous, fusiform, aseptate, smooth, apex conical, base often flattened, (10.7-)11.2-14.3(-15.2) × (1.9-)2.3-3 µm long.

Habitat: On dead leaves of *P. aureosulcata*.

Specimen examined: Turkey, Istanbul Province, Nezahat Gökyiğit Botanic Garden, Anadolu Island, 70 m a.s.l., 40° 59' 842" N, 29° 07' 214" E, 20.06.2018, FS 1142.

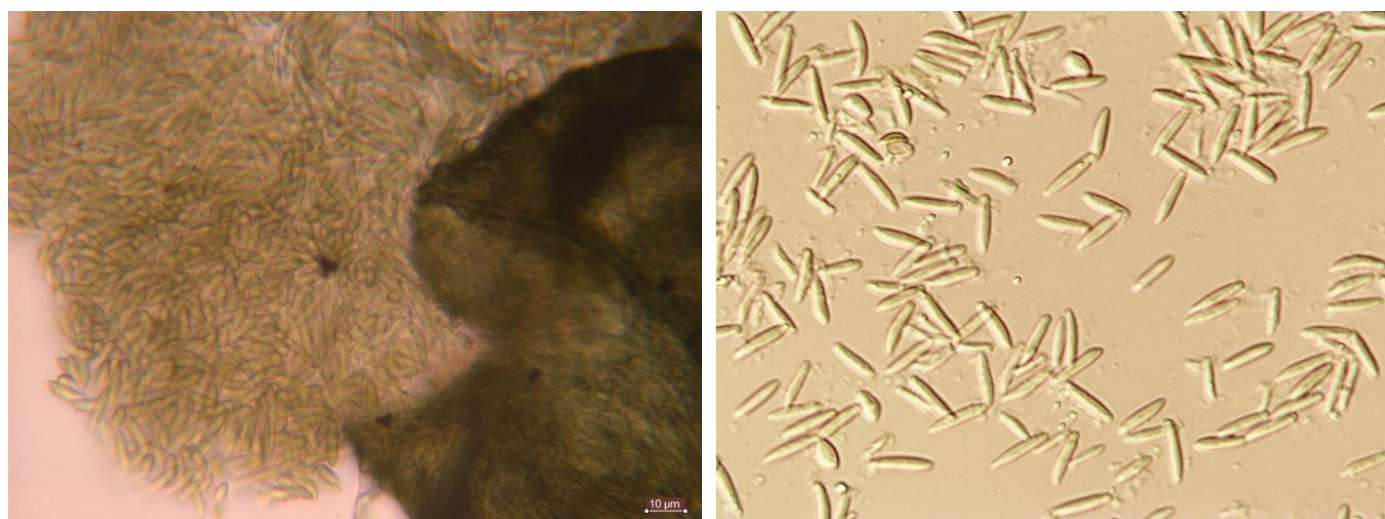
Amerosporium genus has 60 species, but among them only *A. atrum* (Fuckel) Höhn. was reported on *Phragmites* sp. in Turkey previously. The Genus has been the subject of considerable confusion and although about 60 taxa have been described in the genus, only two species can at the moment be retained in it with confidence. These are *A. polynematoides* and *A. concinnum* Petr.

A. polynematoides is a new record species for Turkey mycobiota.

Figures 7 - 8: Habitat of *A. polynematoides*



Figures 9 – 10 (x100): Habit and Pycnidium of *A. polynematoides*



Figures 11 – 12 (x400): Conidia of *A. polynematoides*

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