Available online: April 24, 2019

Commun.Fac.Sci.Univ.Ank.Series C
Volume 28, Number 1, Pages 67-77 (2019)
ISSN 1303-6025 E-ISSN 2651-3749
https://dergipark.org.tr/tr/pub/communc/issue/45050/562286

FOUR NEW MICROFUNGI FOR TURKISH ASCOMYCOTA

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ABSTRACT. In the present study, *Phyllosticta cyclaminis* Brunaud, *Passalora juniperina* (Georgescu & Badea) H. Solheim, *Ascochyta paliuri* Sacc. and *Asteroma padi* DC.) were reported for the first time from Turkey. Short descriptions, localities, collection dates, altitude and accession numbers of the newly reported species were provided.

1. INTRODUCTION

Ascomycota is the largest fungal division including more than 64000 species which are sabrobe parasitic or lichen-forming. However, among them some few species have adapted to marine or freshwater environments. The division contains plant pathogenic fungi that cause some disease such as hypertrophy, chlorosis, deformations, sterility, galls or mildews. The attacked plants may also grow poorly and the fungal sporulating structures develop directly in or on the infected, still living tissues [1].

According to the literature [2-20] approximately 2000 species belonging to the division Ascomycota have thus far been reported from Turkey but *Phyllosticta cyclaminis* Brunaud, *Passalora juniperina* (Georgescu & Badea) H. Solheim, *Ascochyta paliuri* Sacc. and *Asteroma padi* DC. have not been recorded yet for Turkish Ascomycota.

2. MATERIAL AND METHODS

Infected plant specimens were obtained from Mersin and Kayseri province in Turkey between the years 2013 and 2016. Host plants were diagnosed according to

Received by the editors: March 13, 2019; Accepted: March 30, 2019.
Key word and phrases: New records, Ascomycota, Turkey.

the Flora of Turkey and East Aegean Islands [21]. The fungal specimens were microscopically examined. Spores were obtained from the dried host specimens by gentle scraping. Macro and microphotographs were taken under a stereomicroscope (Novex trinocular zoom stereo microscope RZT-SF) and light microscope (Noveks B series 1000) respectively. Sizes of the spores and sporophores were determined using the Analysis LS Starter software. The current names of the fungi were checked according to the index fungorum and mycobank databases. Names of the host plants and families were validated using the plantlist database. The species were identified using the current literature [22-25]. All the samples used in this study were stored in the Inönü University Herbarium (INU).

3. Results

The systematics of the newly reported species were in accordance with Kirk et al. [1], and they were presented together with notes on localities, altitudes, collection dates and accession numbers.

Ascomycota
Dothideomycetes
Botryosphaeriales
Phyllostictaceae
Phyllosticta Pers.
Phyllosticta cyclaminis Brunaud (1890)](Figure 1)

Spots circular, 1-3 diam, light brown. Pycnidia 100-140 µm, epiphyllous, immersed, globose, thin-walled and brown. Conidia 6-8 x 2-3 µm, one-celled, ellipsoid, straight or slightly curved, hyaline.
Specimen examined: TURKEY-Mersin: Tarsus, near the Çamalan road located in between Gülek and Çamlıyayla, on Cyclamen cilicium Boiss. & Heldr. (Primulaceae), 24.04.2014, *Ş. Kabaktepe and I. Akata* 7383.
Distribution: Europe and South Africa [26].

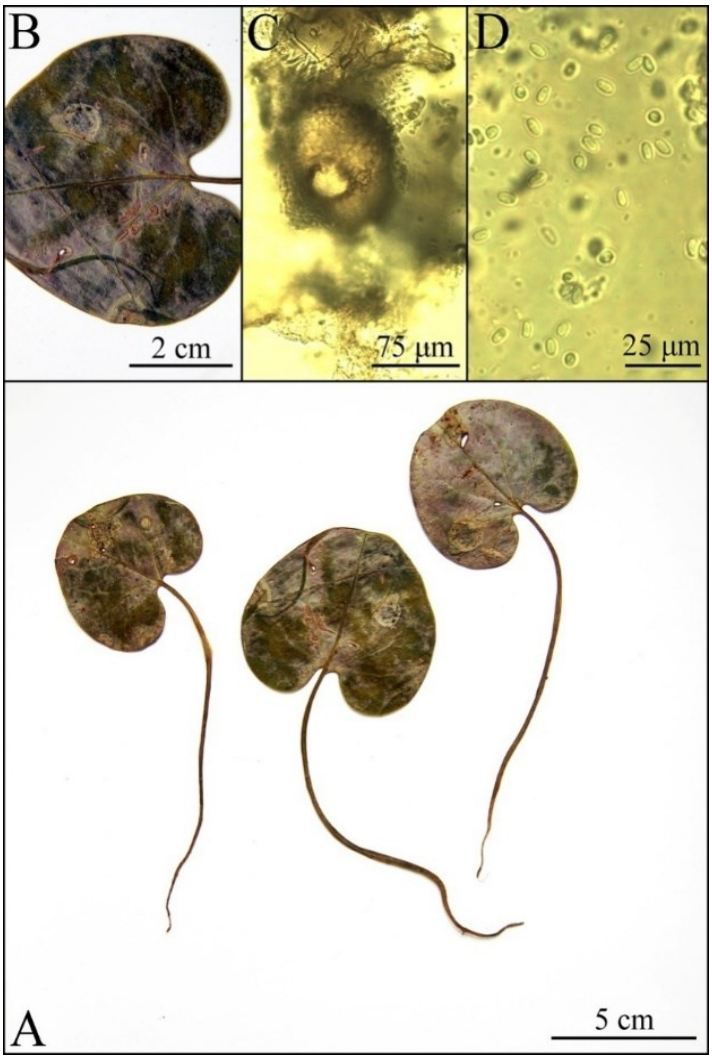

FIGURE 1. *Phyllosticta cyclaminis* on *Cyclamen cilicium* **A**-dried herbarium specimen; **B**-infected plant; **C**- LM view of Picnidia; **D**- LM view of Conidia.

Capnodiales
Mycosphaerellaceae
Passalora Fr.
Passalora juniperina (Georgescu & Badea) H. Solheim (2014)] (Figure 2)

Spot circular, 1-3 diam, light brown. Conidiomata epiphyllous, scattered or aggregated, immersed, pale brown to black. Conidia 30-60 × 9-18 µm, elliptical to rounded, slightly constricted with 3-7 septa and light brown.
Specimen examined: TURKEY- Kayseri, in between Develi and Yahyalı, 1030 m, 05.09.2013, *Ş. Kabaktepe and I. Akata* 7261.
Distribution: Finland, Norway, Romania, Sweden, Russia and the USA [26,27].

FIGURE 2. *Passalora juniperina* on *Juniperus excelsa* **A**-dried herbarium specimen; **B**- infected plant; **C**- LM view of Conidium.

Pleosporales
Didymellaceae
Ascochyta Lib.
Ascochyta paliuri Sacc. (1878)] (Figure 3)

Pycnidia predominantly epiphyllous, scattered or aggregated, immersed, pale brown or brown, globose or sometimes lentiform, 150-300 µm diam., with a circular pore, up to 20 µm diam., surrounded by small dark cells, sometimes with a small papillate ostiole. Pycnidial wall thin. Conidia 7-9 × 3-4 µm, cylindrical, both ends rounded, straight, sometimes slightly bent, not or sometimes slightly constricted.
Specimen examined: TURKEY— Mersin: Sebil, Cehennem Depth, on Paliurus spina-christi Mill. (Rhamnaceae), 620 m, 23.05.2014, *Ş. Kabaktepe and I. Akata* 7524.
Distribution: Bulgaria, Italy, Russia, Serbia and USA [26].

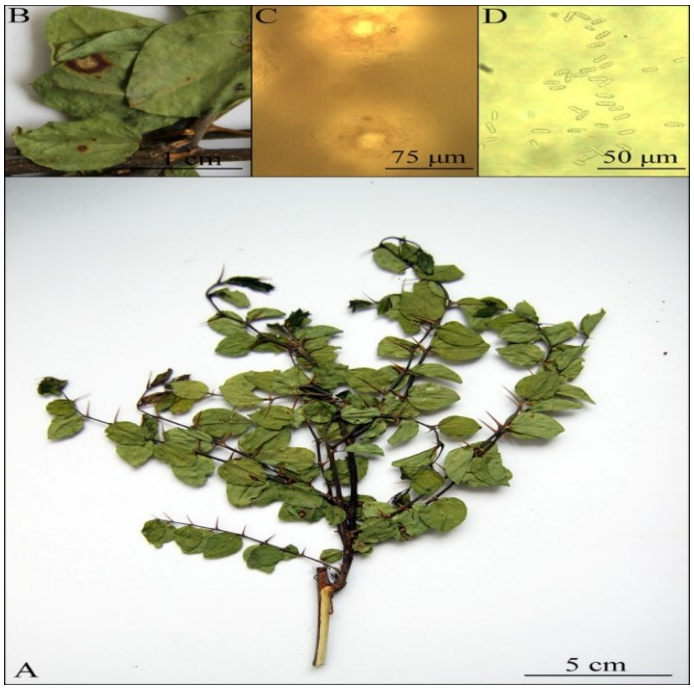

FIGURE 3. *Ascochyta paliuri* on *Paliurus spina-christi* **A**-dried herbarium specimen; **B**- infected plant; **C**- LM view of Picnidia; **D**- LM view of Conidi.

Sordariomycetes
Diaporthales
Gnomoniaceae
Asteroma DC.
Asteroma padi DC. (1815) (Figure 4)

Conidiogeneus cells lageniform to cylindrical, up to 16 x 2,5-3,5 µm, wide. Conidia straight or slightly curved, fusiform, 11-15 x 2-4 µm, one-celled, hyaline.
Specimen examined: TURKEY- Kayseri: Yahyalı, Kapuzbaşı waterfall, on Prunus domestica L. (Rosaceae), 700 m, 18.09.2014, *Ş. Kabaktepe and I. Akata* 7794.
Distribution: Czech Republic, Germany, Poland and Russia [26].

FIGURE 4. *Asteroma padi* on *Prunus domestica* **A**-dried herbarium specimen; **B**- infected plant; **C**-LM view of Conidia.

4. Discussion

P. cyclaminella Bubák was reported from Algeria and Italy on *Cyclamen hederifolium* Aiton. Although it is close to *P. cyclaminis* due to their similar morphology, it is easily distinguished from latter species by having larger pycnidia and globose conidia [28].

P. cyclaminis can also be confused with *P. cyclaminicola* Trel. in terms of their similar appearance but latter species was only recorded from the USA, on *Cyclamen persicum* Mill. and it is separated from the former species by its smaller, darker pycnidia and larger conidia [29].

P. juniperina is very close to *P. sequoiae* (Ellis & Everh.) Y.L. Guo & W.H. Hsieh because both species are cercosporoid species growing on gymnosperms. *P. sequoiae* was reported on various host such as *Cryptomeria japonica, Cupressus arizonica, C. lusitanica, C. macrocarpa, C sempervirens, Glyptostrobus pensilis,, Juniperus communis, J. chinensis, J. virginiana, Platycladus orientalis, Sequoiadendron giganteum, Sequoia sempervirens* and *Taxodium mucronatum* from USA, Canada, Brazil, Japan, Jamaica and China. This species is distinct from *P. juniperina* by its smaller pcynidia and larger conidia [27].

A. paliuri resembles *A. frangulina* Kabát & Bubák in terms of their similar appearance but the latter species has larger pcynidia (up to 1500 µm), longer spores (8-16 × 2-3 µm) and different host plant (*Rhamnus alaternus* L.) [30].

A. padi and *A. rubi* Fuckel are morphologically similar but the latter species differs from the former by its host plants (*Rubus praecox* Bertol. and *R. vulgaris* Weihe & Nees), shorter conidiogeneus cells (up to 10 µm) and conidia (8-10 × 3-4 µm) [31].

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