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## First Report of *Clasterosporium pistaciae* in Türkiye

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### Abstract

Türkiye is a very rich country in terms of plant diversity. In addition, parasitic fungi that cause diseases in plants are quite common, especially in some humid regions. Diseases caused by fungal species unfortunately cause significant losses in plant species that are important for use in agriculture, health or industry. The species of *Clasterosporium* was recorded in many parts of the world. Dematiaceous anamorph species *Clasterosporium pistaciae* M.B.Ellis cause serious damage to many plants living in their natural habitats and it was previously reported from Cyprus. However, it has only been recorded on mastic tree (*Pistacia lentiscus* L.), which has different uses in terms of human health, as in this study. In this article, fungal species *C. pistaciae* was reported for the second time in the world and for the first time from Southern Anatolia (Türkiye) on *P. lentiscus*, evergreen tree or shrub species belonging to the Anacardiaceae. In addition to distribution information, the taxonomic classification, macro and microscopic characteristics of the microfungus was explained.

**Keywords:** New record, *Clasterosporium pistaciae*, mastic tree, *Pistacia lentiscus*, Türkiye

## *Clasterosporium pistaciae*'nin Türkiye'den İlk Kaydı

### Özet

Türkiye, bitki çeşitliliği açısından oldukça zengin bir ülkedir. Ayrıca bitkilerde hastalık yapan parazit mantarlar özellikle bazı nemli bölgelerde ne yazık ki oldukça yaygındır. Mantar türlerinin neden olduğu hastalıklar maalesef tarım, sağlık veya sanayide kullanımı önemli olan bitki türlerinde ciddi kayıplara neden olmaktadır. *Clasterosporium* türleri dünyanın birçok yerinde kaydedilmiştir. Anamorf tür *Clasterosporium pistaciae* M.B. Ellis'nin doğal ortamlarında yaşayan birçok bitkiye ciddi zarar verdiği ve daha önce Kıbrıs'tan rapor edildiği bildirilmiştir. Ancak bu fungus türü, yavru vatanda da çalışmamızda olduğu gibi insan sağlığı açısından önemli kullanım alanları olan sakız ağacı (*Pistacia lentiscus* L.) üzerinde kaydedilmiştir. Bu makalede, Anacardiaceae familyasına ait yaprak dökmeyen ağaç veya çalı türü olan sakız ağacı *P. lentiscus* üzerinde *C. pistaciae* mantar türü dünyada ikinci kez, Güney Anadolu'da (Türkiye) ilk kez rapor edilmiştir. Çalışmada yayılış bilgilerinin yanı sıra mikrofungusun taksonomik sınıflandırması, makro ve mikroskobik özellikleri de açıklanmıştır.

**Anahtar Kelimeler:** Yeni kayıt, *Clasterosporium pistaciae*, sakız ağacı, *Pistacia lentiscus*, Türkiye

## 1.Introduction

More than 150 species of Magnaporthales have been described all within Ascomycota division. Today, most of the species of this family that are pathogenic in monocots have been identified and grown under laboratory conditions. Fungi belonging to this order are found in a variety of habitats, such as pathogens of grains and grasses and saprophytes [1-3]. Species belonging to *Clasterosporium*, a genus of the Magnaporthales order in the Sordariomycetes class, are both a model taxon for studying

plant-fungal interactions and a serious plant pathogen. [3]. *Clasterosporium pistaciae* is a dematiaceous anamorph fungus, and it causes serious damage to *Pistacia lentiscus* plant species in Southern Anatolia. The aim of this paper is to report, *C. pistaciae* for *P. lentiscus* for the first time from Anatolia (Türkiye). With this study, we contribute to Türkiye's mycoflora diversity knowledge by adding a new record.

## 2. Materials and Methods

Field applications of the research were carried out between 2015 and 2017, mainly between April-June and August-November in Manavgat (Antalya Türkiye) (Figure 1). Samples of host plants and microfungus were photographed and collected in accordance with herbarium rules. Morphological characteristics of the plant and the pathogenic microfungus samples were noted during collection from the field. The samples brought to the laboratory were arranged according to the herbarium techniques.

Color changes and other symptoms caused by microfungi on host plants were observed with a stereo microscope; conidiophores and conidiospores were observed with a light microscope. Colonies and spores from the specimens were examined with Nikon Eclipse E100 microscope and measured at least 11 for each specimen (Figure 2). The host samples were identified using Flora of Turkey and The East Aegean Islands [4,5] and A Check List of The Flora of Turkey (Vascular Plants) [6] In the identification of parasitic fungus, Dematiaceous Hyphomycetes [7], More Dematiaceous Hyphomycetes [8], Parasitische Pilze an Gefaesspflanzen in Europa [9], Index fungorum website [10] and The Global Biodiversity Information Facility [11] have been used. Plant samples infected with microfungi are stored in Akdeniz University Manavgat Tourism Faculty Laboratory after being dried according to herbarium conditions.



**Figure 1.** Satellite view of Manavgat city

## 3. Results and Discussion

The taxonomic classification (Dematiaceous Hyphomycetes, More Dematiaceous Hyphomycetes, Index fungorum) macro and microscopic characteristics of the microfungus identified as a result of the research are given below:

## Taxonomy

Ascomycota

Sordariomycetes

Magnaporthales

Magnaporthaceae

*Clasterosporium* Schwein

*Clasterosporium pistaciae* M.B. Ellis, in Ellis, Mycol. Pap. 72:7(1959)

*Clasterosporium pistaciae*

M.B. Ellis, in Ellis, Mycol. Pap. 72:7(1959)

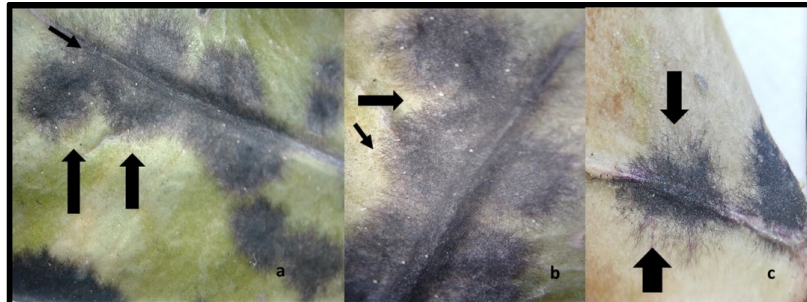
Colonies amphigenous, usually epiphyllous, round 0.5-3 mm. in diameter, grey to black. Mycelium superficial, not hyphopodia lobed, composed of a repent network of branched and anastomosing, septate pale brown to brown, 1.5-4 $\mu$ m thick. Conidiophores are dark brown in color, straight or curved. Conidia obclavate, fragile in septa, brown coloured, 11-21  $\times$  2-4 $\mu$ m in size (Figure 2, 3 a-f).

**Specimen Examined** – On *P. lentiscus* L. Anacardiaceae Türkiye: Antalya, Manavgat, Sorgun Pine Forest 12.10.2017, 4014, FA.

**Current Distribution:** Cyprus, Turkey



**Figure 2.** Black colonies formed by *C. pistaciae* on *P. lentiscus*





**Figure 3.** *C. pistaciae* on *P. lentiscus* **a. b. c.** Black colonies and conidiophores (Stereo microscope images) **d.** Conidiophores, conidiogenous cells and appressorium(A) **e., f.** Conidia

These microfungi cause serious damage to many plants living in their natural habitats. They cause yield losses in wild fruit trees, fruit trees and shrubs [1]. The species of *Clasterosporium* was recorded in many parts of the world such as China, India, Cyprus, Scotland, Uzbekistan, Asia and southern Africa. *C. mori* Syd. & P. Syd. was recorded on *Morus alba* L. in China, Korea and Pakistan; on *M. australis* Poir. and *M. mongolica* (Bureau) C.K. Schneid. in China; on *Morus nigra* L. [12] in Türkiye; on *Stigmia carpophila* (Lév.) M.B. Ellis [13] in Russia; on *Prunus cerasifera* Popov (cherry plum) and *Prunus avium* (L.) L. (wild cherry) [14] in Armenia. *C. carpophilum* (Lév.) Aderh. was recorded in many parts of the world such as China, India, Cyprus, Scotland, Uzbekistan, Asia and southern Africa [15]. It was recorded on *Amygdalus communis* L. in Spain; on *Armeniaca vulgaris* Lam. in China; on *Prunus amygdalus* Stokes in Cyprus and India; on *P. domestica* L. in Central Asia; on *P. armeniaca* L. in Chile, China, India, Mexico and Southern Africa; on *P. persica* (L.) Stokes Chile, China, Colorado, Cyprus, India, Mexico, Nepal and Southern Africa [15-18]. *Clasterosporium pistaciae* M.B. Ellis, previously reported from Cyprus [7]. So far it has only been recorded on *Pistacia lentiscus* L. With our study, *C. pistaciae* was recorded for the second time in the world and for the first time in Türkiye.

The spread of fungal diseases in plant species such as mastic trees, which have important uses for human health, is a very serious problem. It is necessary to increase efforts to prevent fungal diseases and further losses in plants that are very important for the country's economy, especially in the food, pharmaceutical, cosmetics or furniture sectors.

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