www.biodicon.com Biological Diversity and Conservation

ISSN 1308-5301 Print; ISSN 1308-8084 Online 3/1 (2010) 66-69

A new record for Turkish Mycota: *Serpula lacrymans* (Wulfen) J.Schröt

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Abstract

This fungi specimen is founded in Dolmabahçe Palace at the time of restoration – conservation processes; it has been identified as *Serpula lacrymans* (Wulfen) Schröt and registered for the first time in Turkey. This fungus is defined and photographed. The photo of the spores seen under the light microscope is given in this study.

Key Words: Basidiomycetes, Serpulaceae, *Serpula lacrymans*, dry rot, Turkey

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Türkiye mikoflorası için yeni bir kayıt: *Serpula lacrymans* (Wulfen) J.Schröt

Özet

Bu mantar türü 2001 yılında Dolmabahçe Sarayında yürütülen restorasyon-konservasyon çalışmaları sırasında bulunmuş, *Serpula lacrymans* (Wulfen) J. Schröt olarak teşhis edilmiştir. Türkiye'de ilk defa kaydedilmiştir. Bu tür tanımlanmış ve resmedilmiştir. Sporların ışık mikroskobu altındaki görüntüleri verilmiştir.

Anahtar Kelimeler: Basidiomycetes, Serpulaceae, *Serpula lacrymans*, kuru çürüklük, Türkiye

1. Introduction

The Dolmabahçe Palace is located in Istanbul at the district of Beşiktaş and on the European Coastline of Bosphorus. Because of the building is located at the coastline with a heavily air polluted metropolitan area, high relative humidity, salts from the sea leaves; it is vulnerable to natural detrimental factors. The building is based on timber posts embedded into the infill, overlaid with a timber grid in filled with a layer of rough cement Horasan Harcı, 1.00 m–1.20 m deep. There are three rows of timbers throughout the grid over which the buildings were constructed. The outer walls are made of stone, the interior walls of brick, and the floors of wood. They support a roof of timber surfaced with lead. The structural timbers are mainly pine and oak, together with some African and Indian woods originally (Anonymous, 2005).

Although there is a lack of information on the presence of *S. lacrymans* in Turkey, it is clear that certain building materials such as lath and plaster used in many historic constructions are particularly susceptible to the fungus. Microbial biodeterioration of building materials and their contents in both modern and historic buildings are attributed to changes in the building environment. The main environmental parameters favouring the decay of materials and contents are water, humidity, temperature and lack of ventilation (Palfreyman and Low, 2002). These environmental factors cause biodeterioration of building materials for these reasons, a *Serpula lacrymans* specimen is observed on door and its cornice made from the coniferous timber wood located at the basement of the Dolmabahçe Palace where the air-conditioning is inadequate and the humidity is high (75-90 %)

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Reports of *S.lacrymans* in the wild were, until recently, limited to sightings of basidiocarps, with no isolates available for analysis. Two reports are generally considered to be reliable, one from Bagchee (1954) which describes *S.lacrymans* at two sites in Himachal Pradesh in the Himalayan foothills of India (specifically at Narkanda and Pulga), the second from Cooke (1957) identified *S. lacrymans* on the slopes of Mount Shasta in Northern California in the USA. A third unconfirmed report suggests that *S. lacrymans* is found in the Sumava Mountains in the Czech Republic (Bagchee, 1954; Kotlaba, 1992; Cooke, 1957). However there is no published report until today regarding to the presence of this fungus specie in Turkish flora.

S. lacrymans preferentially attacks softwoods but also hardwoods as well as other cellulosic materials such as paper, cardboard and textiles (Palfreyman, Low, 2002).

2. Materials and Methods

The specimens of *S. lacrymans* were obtained from pine wood used at the Dolmabahce Palace in Istanbul; June, 2001. The fungal specimens were photographed in original place where it was first founded; the macroscopic features were noted and transported to the Plant Diseases and Microbiology Laboratory of Science and Letters Faculty, Marmara University for microscopic evaluation.

In the microscopic examination of the fungus the below findings were noted. The fungi were treated with 20 % KOH solution for softening and preparation for microscopic examination. Olympus Cx41 Light microscope was used for microscopic examination. Then the microscopic photos were taken with Image-Pro Express (Micropublisher 5.0 RVT) imaging device which is compatible with this microscope. The fungi were identified according to Jordan (1995) and Breitenbach, Kranzlin (1986).

3. Results

In the light of the literature, this fungus is reported as a new macrofungus record for the mycoflora of Turkey (Solak et al., 2007; Sesli, Denchev, 2009). The specimen is preserved in the Herbarium of the Faculty of Science and Letters, Marmara University, Istanbul (MUFE). Its description, locality, date of collection and herbarium number are given below (Istanbul, Dolmabahce Palace, on pine wood, 19.06.2001, H.T., 1). The systematics of the species was made according to Index fungorum.

Serpulaceae

Serpula lacrymans (Wulfen) P.Karst.
Syn. Boletus lacrymans Wulfen, *Boletus obliquus* Bolton, *Gyrophana lacrymans* (Wulfen) Pat., *Merulius destruens* Pers., *Merulius domesticus* H.G. Falk, *Merulius giganteus* Saut., *Merulius guillemotii* Boud., *Merulius lacrymans* (Wulfen) Schumach., *Merulius lacrymans var. guillemotii* (Boud.) Boud., *Merulius lacrymans* var.terrestris Peck., *Merulius terrestris* (Peck) Burt., *Merulius vastator* Tode, *Serpula destruens* (Pers.) Gray., *Serpula domestica* (Falck) Bondartsev, *Serpula terrestris* (Burt) S.Ahmad, *Sesia gigantea* (Saut.) Kuntze., *Sistotrema cellare* Pers.

The fruit body of *Serpula lacrymans* (Wulfen) P.Karst. is embedded in a surface of 36 cm in length and 13 cm by height. The horizontal surface is round shaped like a disk and the vertical surface is in the shape of small brackets. The vertical surface has favourable diameters of 4-18 cm in diameter and 0,4- 0,8 cm in thickness. The fungus is spongiform and pulpy in texture so that can be easily separated from the substrate. The fruiting body is at first yellowish, scarlet in colour and as the fungus decays and gets elder changes into a morello brownish colour. The himenium surface is wrinkle and corrugated, also moist and the edges has marginal zones of white and well bordered. (Figure 1). The young fruiting body of the fungus has a pleasant fungous odour, as it gets older becomes foul and unpleasant. The spores are massive and rusty red in colour. The spores are ellipse in shape, smooth and yellowish brown in colour. The spores are 11-13 µm x 5.5-8 µm in dimension (Figure 2). Some of them have droplets. Basidia slendery clavate has 4 sterigmata and shows basal clamped pattern. The hyphae are colourless and the septa with clamps. Rhizomorphs are brownish and has thick- walled and with crystals.

Figure 1. Fruiting body of *Serpula lacrymans*

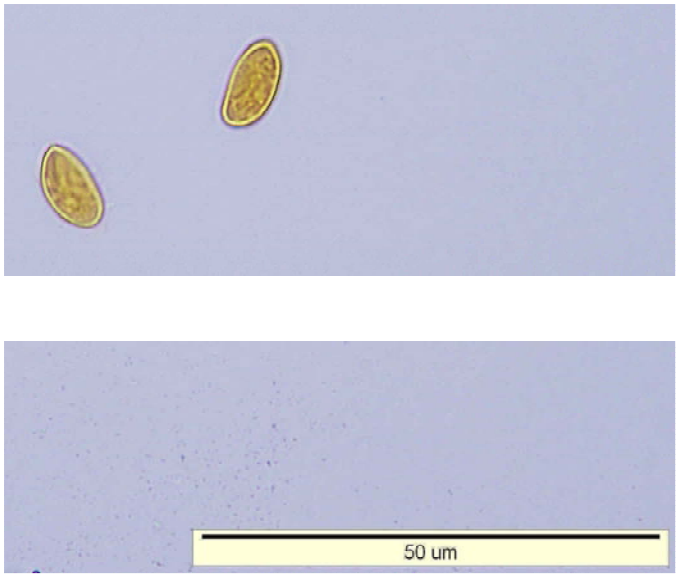

Figure 2. Spores of *Serpula lacrymans* in LM

4. Discussion

The struggle for the eradication of *Serpula lacrymans* in historic and cultural constructions is a great ordeal. The dry rot fungi different than the others humidify the region where they are located and they transfer the water to dry timber meters away from where they are located via their mycelia. This is the only and most important fungus which can do rots in low temperatures in the buildings.

In the restoration and conservation processes done in the Dolmabahçe Palace, solutions and aerosols and in the places where needed, injection techniques are used for fungi eradication process. The infected timber material which is replaced with the new one is impregnate to with the pressure-vacuum technique thus, successful results has been acquired in the struggle against fungi.

Acknowledgements

I would like to thank Prof. Dr. Sabri SÜMER and Dr. Zeki SEVEROĞLU (Marmara University, Faculty of Science and Letters, Department of Biology), Prof. Dr. Ertuğrul SESLİ (Karadeniz Technical University, Fatih Faculty of Education, Department of Biology Education) for their kind help.

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(Received for publication 30 June 2009; The date of publication 01 April 2010)