

***Phellinus sulphurascens* (Hymenochaetaceae, Basidiomycota): A Very Rare Wood-Decay Fungus in Europe Collected in Turkey**

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Abstract: *Phellinus sulphurascens* Pilát was collected from juniper tree stumps (*Juniperus excelsa* and *J. foetidissima*) in two different localities situated in the Mediterranean region of Turkey. This very rare species is known in Europe only from the Ural Mountains in Russia. This fungus is an aggressive root rot pathogen associated with Douglas fir and other conifers in North America. This is the first report on juniper as a new host outside of its known distribution area.

Key Words: *Basidiomycota*, *Phellinus sulphurascens*, wood-decay fungus, *Juniperus*, Turkey

***Phellinus sulphurascens* (Hymenochaetaceae, Basidiomycota), Avrupa'da Nadir Bir Odun Çürüklüğü Mantarı Türkiye'den Toplandı**

Özet: *Phellinus sulphurascens* Pilát Türkiye'de Akdeniz bölgesinin iki farklı lokalitesinde, ardıç ağaçları kütüğü üzerinde (*Juniperus excelsa* ve *J. foetidissima*) toplandı. Bu nadir mantar Avrupa'da yalnızca Rusya Ural Dağlarından bilinmektedir. Bu mantar Kuzey Amerika'da Douglas köknarı ve diğer koniferlerde saldırgan kök çürüklüğü hastalığıdır. Bu mevcut yayılış alanı dışında ve ardıç için konak olarak yeni bir bulgudur.

Anahtar Sözcükler: *Basidiomycota*, *Phellinus sulphurascens*, odun çürüklük mantarı, *Juniperus*, Türkiye

Introduction

Phellinus sulphurascens Pilát was originally described from the Primorsk Territory in Russia. This species is closely related to *Phellinus weirii* (Murrill) Gilb. and the two species are virtually identical microscopically. In North America the two species have been treated together as *P. weirii*. This fungus has been recognised (Gilbertson & Ryvarden, 1986) as a Douglas fir form that causes laminated root rot in Douglas fir [*Pseudotsuga menziesii* (Mirb.) Franco] and other conifers in North America

(Larsen et al., 1990), and has been distinguished as *P. sulphurascens*, which was originally described from Siberia. Since then, the cedar form that causes butt rot in western red cedar (*Thuja plicata* Donn ex D. Don) in North America has been referred to as *P. weirii* sensu stricto (Larsen et al., 1990).

Kotlaba and Pouzar (1970) reviewed the taxonomy and nomenclature of *P. weirii* from North America and *P. sulphurascens* from Siberia, and concluded that they are facultative synonyms. According to Banik et al. (1993),

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the serological relatedness of the Douglas fir form of *P. weirii* and the Siberian isolates supports Kotlaba and Pouzar's contention that Asian *P. sulphurascens* and *P. weirii* sensu lato are conspecific.

Larsen and Kobb-Pouille (1990) maintained *P. sulphurascens* and *P. weirii* as separate taxa. Later, Larsen et al. (1994) considered the correct generic placement of *P. sulphurascens* and *P. weirii* to be in *Inonotus*, because the monomitic hyphal system is a principal criterion of the genus *Inonotus*. Yet, Ryvarden and Gilbertson (1993) think that the two species are in natural relationships with *Phellinus* species, which have basidiocarps of light density that are often short-lived and have hyaline basidiospores that are negative in Melzer's reagent. *P. sulphurascens* is separated by having a rather thin annual basidiocarp compared with the thick and perennial basidiocarp of *P. weirii* (Ryvarden & Gilbertson, 1993; Wagner & Fisher, 2002).

Materials and Methods

Materials were collected from *Juniperus excelsa* M.Bieb. stumps in Antalya and from *Juniperus foetidissima* Willd. in Karaman (Figure 1). These localities are situated in the Mediterranean region of Turkey. The forests consist primarily of *Cedrus libani* A.Rich. mixed with *Abies cilicica* (Ant. & Kotschy) Carr. and subsp. *isaurica* Coode & Cullen; there is also pure juniper forest (*J. excelsa* and *J. foetidissima*) in these two localities. The altitude of the collection localities is 1400-1700 m.

The materials were examined with Melzer's reagent and KOH 5%. Identification was made with reference to

Gilbertson and Ryvarden (1986), Larsen and Kobb-Pouille (1990), and Ryvarden and Gilbertson (1993).

All described materials are kept at the Mushroom Application and Research Centre of Selçuk University, Konya, Turkey.

Description of the Species

Phellinus sulphurascens Pilát, Bull. Soc. Mycol. France 51: 372, 1935. Figures 2, 3.

Basidiocarps annual, with sporulation in late summer/autumn. Entirely resupinate, firmly attached to the substrate, effused up to 10 cm, very light in weight, not readily separable, darkens with KOH. Margin pale brown, soft, fimbriate, up to 2 cm wide. Pore surface greyish brown to dark ferruginous; pores round to irregular, often oblique, 5-7 per mm, with thick setulose dissepiments that become thin and lacerate. Context yellowish to brown, soft, fibrous, spongy, azonate, up to 1 cm thick. Tube layer light greyish brown, brittle, up to 3 cm thick.

Basidiospores 4.5-6 µm in diameter, subglobose to short ellipsoid, smooth, hyaline, non-dextrinoid, and cyanophilous. Basidia 6 × 30 µm, short clavate, with a short sterigmata. Hymeneal setae absent. Hyphal system monomitic. Generative-hyphae 2-6 µm diameter, sparingly branched, with a slightly thickened brown wall, lacking clamp-connections. Setal-hyphae present, very abundant in both context and hymenophore, projecting up to 20 µm beyond the hymenium, 5-10 µm diameter, up to 3 mm long, with a thickened wall and a subacute apex.

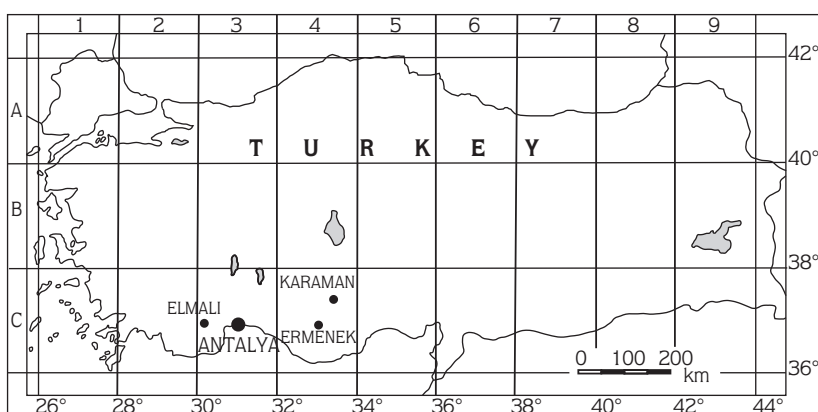
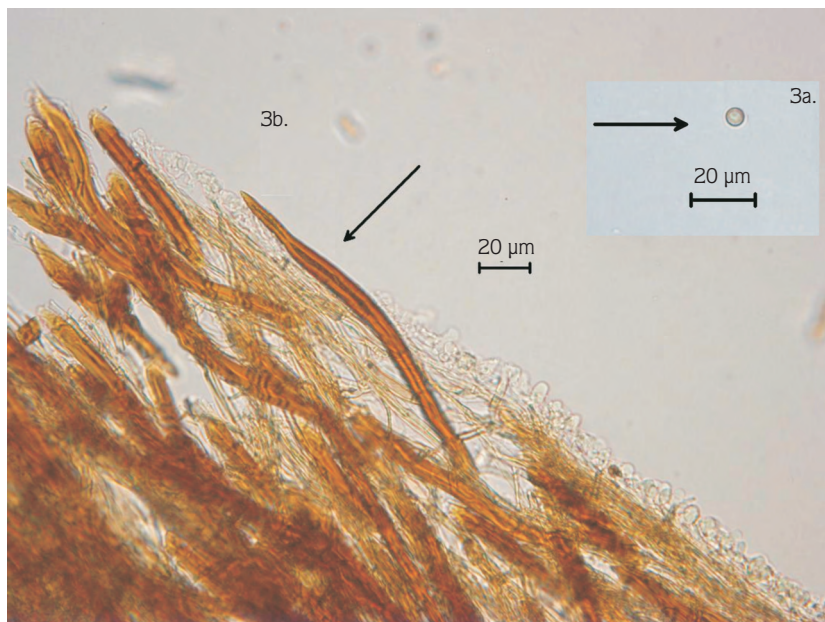


Figure 1. Distribution of *P. sulphurascens* in Turkey.

Figure 2. Macroscopic view of *P. sulphurascens*.Figure 3. a. Basidiospore of *P. sulphurascens*, b. Setal-hyphae (tramal setae) of *P. sulphurascens*.

Material Examined: Antalya-Elmalı, Avlan radyolink road, on *J. excelsa* stump, 1400 m, 04.05.2004, HD 1713; Karaman-Ermenek Damlaçalı, on *J. foetidissima* stump, 1650 m, 21.10.2005, HD 2103.

Phellinus sulphurascens has very similar anatomical and morphological features as *P. weirii*. *P. sulphurascens* is separated by having a rather thin annual basidiocarp compared with the thick and perennial basidiocarp of *P. weirii* (Ryvarden & Gilbertson, 1993; Wagner & Fischer, 2002). Ongoing discussion related to the taxonomic status of *P. sulphurascens* and *P. weirii* clearly demonstrates the problems inherent in the traditional generic concepts of *Phellinus* s.l. and *Inonotus* s.l. Based

on a morphological concept, it is essentially a matter of preference if the two species should be placed within *Phellinus* or *Inonotus* (Kotlaba & Pouzar 1970; Ryvarden & Gilbertson 1993; Larsen et al., 1994; Wagner & Fischer, 2002).

P. sulphurascens causes a yellowish laminated rot of the roots of Douglas fir (*P. menziesii*) and other conifers in North America, and in Siberia, from where it was originally described on *Larix sibirica* Ledeb. The fungus penetrates the root through intact bark where it produces a thin layer of cream to dark yellow mycelium covering the outer bark of infected roots. Older infected trees may live in a slowly declining state for many years, whereas

10-15-year-old trees are usually destroyed within 3 or 4 years. The infection advances about 30 cm per year (Lim et al., 2005).

According to the known distribution area, this is a very rare species in Europe and is known only from the Ural Mountains in Russia (Lim et al., 2005). The species is widespread further to the east and south-east, and into North America (Ryvarden & Gilbertson, 1993). Kotiranta et al. (2005) reported that the most westerly

known citing of *P. sulphurascens* is in the South Ural Mountains.

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