

Screening of Morphological and Anatomical Features of *Coprinellus micaceus* (Bull.) Fr. From Turkey

Türkiye'den *Coprinellus micaceus* (Bull.) Fr.'un Anatomik ve Morfolojik Özelliklerinin İncelenmesi

Research Article

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ABSTRACT

In this study, cultural properties those morphological and anatomical features of *Coprinellus micaceus* (Bull.) Fr. spores and mycelium were examined. Carpoforescence is tawny brown-brown and shape from oval to bell-shaped to convex. Stem is white. The mushroom samples were brought to the laboratory and were incubated in the dark for 10 days, in 26°C. During incubation period, the development of mycelium were measured on a daily and the radial growth rates was taken as criteria. The spores and mycelium of *Coprinellus micaceus* were investigated with help of both light microscopy and scanning electron microscopy (SEM).

Key Words

Coprinellus micaceus, Spor features, Mycelium development.

ÖZET

Bu çalışmada, *Coprinellus micaceus* (Bull.) Fr.'un kültürel özellikleri, spor ve misellerinin anatomik ve morfolojik özellikleri incelenmiştir. Karpofor esmer kahverengi ve kahverengi, şekli oval, çan şekilli, konvektir. Sap beyazdır. Mantar örnekleri laboratuvarında 26°C'de, karanlıkta, 10 gün inkübe edildi. İnkübasyon dönemi sırasında misel gelişimi günlük olarak ölçüldü ve radyal büyüme oranı kriter olarak alındı. *Coprinellus micaceus*'un spor ve miselleri ışık mikroskobu ve taramalı elektron mikroskobu (SEM) ile incelendi.

Anahtar Kelimeler

Coprinellus micaceus, Spor yapısı, Misel gelişimi.

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INTRODUCTION

Coprinellus micaceus is a common species of fungus in the family Psathyrellaceae with a cosmopolitan distribution. *Coprinus micaceus* is a synonym [1]. It was the type species of the genus *Coprinus*, a grouping of related taxa with veils made of sphaerocysts exclusively or with thin-filamentous connective hyphae intermixed [2]. Molecular studies published in the 1990s [3,4] demonstrated that many of the coprinoid mushrooms were in fact unrelated to each other. This culminated in a 2001 revision of the genus *Coprinus*, which was split into four genera; *C. micaceus* was transferred to *Coprinellus* [5].

In this study, cultural properties those morphological and anatomical features of *Coprinellus micaceus* (Bull.) Fr. spores and mycelium from Turkey were examined.

MATERIAL and METHODS

Organism

In this study, *Coprinellus micaceus*-Psathyrellaceae familia- was used. *Coprinellus micaceus* was collected Kırıkkale region at Turkey in 2012. Mushroom samples were stored at Kırıkkale University Mushroom Application and Research Laboratory.

Morphological studies

Piece of tissue taken from the help of a scalpel *Coprinellus micaceus* fructifications were inoculated center of malt extract agar (MEA) plates and the primary mycelium was developed. Mycelial agar discs (8mm diameter) that taken from the primary mycelium were inoculated in the center of MEA and incubated in the dark for a period of 26°C for 10 d. The morphological structure of the development of secondary mycelium was examined. During the incubation period; mycelium development was measured on a daily basis. In the development; radial growth rates of mycelium were taken as criteria.

Anatomical studies

Light Microscopy studies

Light microscopy studies were maintained with Zeiss (40x) that was present Kırıkkale University Faculty of Arts and Science.

Electron Microscopy studies

Scanning electron microscope (SEM) examinations were performed with Electron Microscopy with the JEOL 5600 microscope presenting Kırıkkale University Electron Microscopy Laboratory. *Coprinellus micaceus* samples were washed in the 0.2 M sodium phosphate buffer, and divided into small pieces. Examples were fixed that left at 4°C and 3% glutaraldehyde for 1 hour. After fixation, samples were washed at the sodium phosphate buffer pH= 7.2, 3 times in a 10 minute intervals, then samples were fixed at 4°C for 1.5 hours, in 1% osmium tetroxide and during dehydration, examples were kept 10-min intervals at 50%, 60%, 70%, 80%, 90%, 95% absolute ethyl alcohol and 99%. After dehydration, samples placed in Petri Dishes and dried, leaving the incubator at 60°C for 6 nights. Dried specimens were mounted onto aluminum stubs, coated with gold for 2 min at 20 mA [6].

RESULTS AND DISCUSSION

Spores Structure

The spores of *C. micaceus* are reddish-brown, with dimensions of 3-5 x 5-7 µm. generally, they shaped like lentiform, almond-shaped or oval. Spores have a germ pore in the center of the spore (Figures 1 and 2).

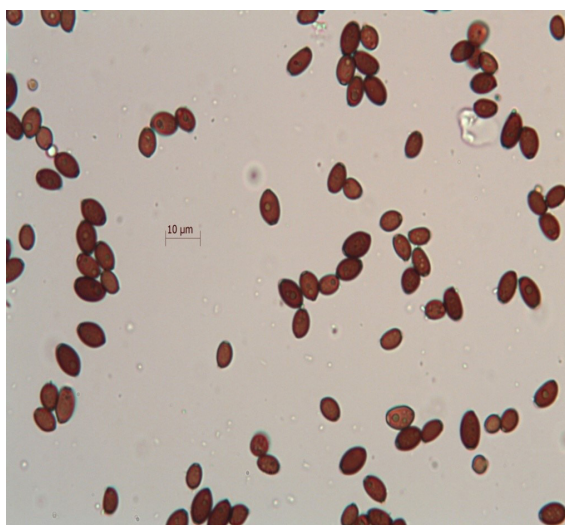


Figure 1. Spore structure with light microscope (100 X).

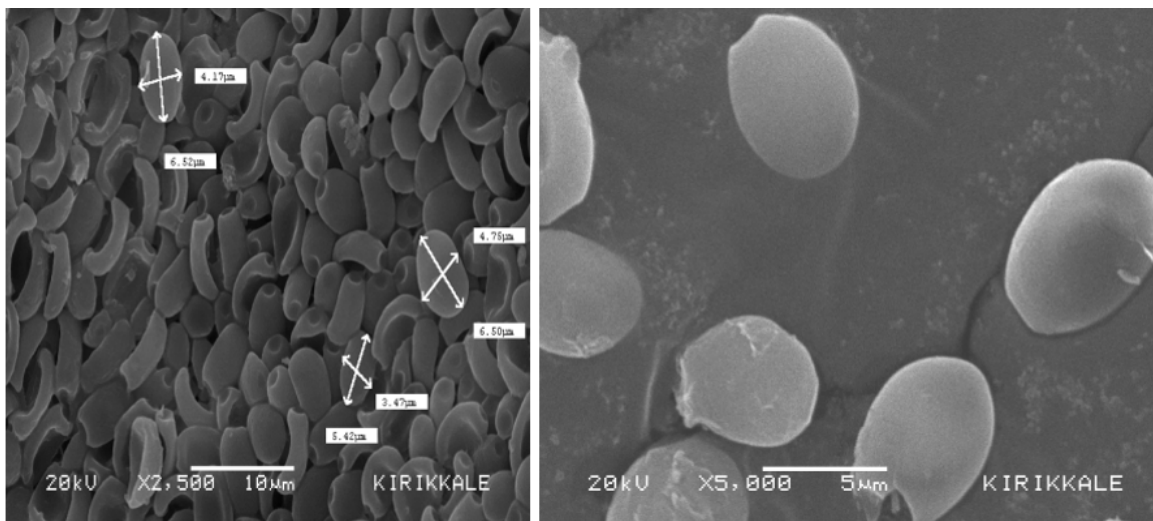


Figure 2. Spore structure with SEM.

Mycelium Structure

The mushroom samples were brought to the laboratory, tissue fragments were taken and they were cultured on the malt extract agar (MEA) and were incubated in the dark for 10 days, in 26°C. Primary mycelium began to develop after 48 hours after inoculated into the center of agar medium. During the development, the mycelium has cottony to the agar medium surface. Mycelia were concentrated center to the edges. White mycelium develops in the center, light yellowish-brown pigmentation was found on the edges. There were air hyphae. Mycelium was improved as slow, weak and confuse. After 10 days of inoculation, mycelium was covered to Petri dishes completely and was finished colonization (Figure 3).



Figure 3. Morphological structure of mycelium.

During incubation period, the development of mycelium were measured on a daily. In the development of mycelium; the radial growth rates was taken as criteria. Daily development of mycelium are given in Figure 4.

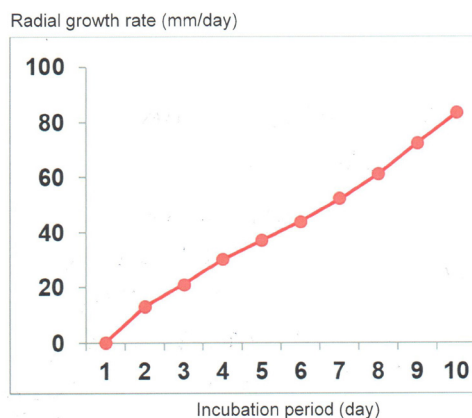


Figure 4. Radial growth curve of mycelium.

According to Light and Scanning Electron microscopy investigations; *Coprinellus micaceus* mycelium has septa. SEM images have shown Figure 5 and Figure 6. Mycelium widths were measured as 1.60 µm, 2.00 µm, 2.60 µm using SEM images.

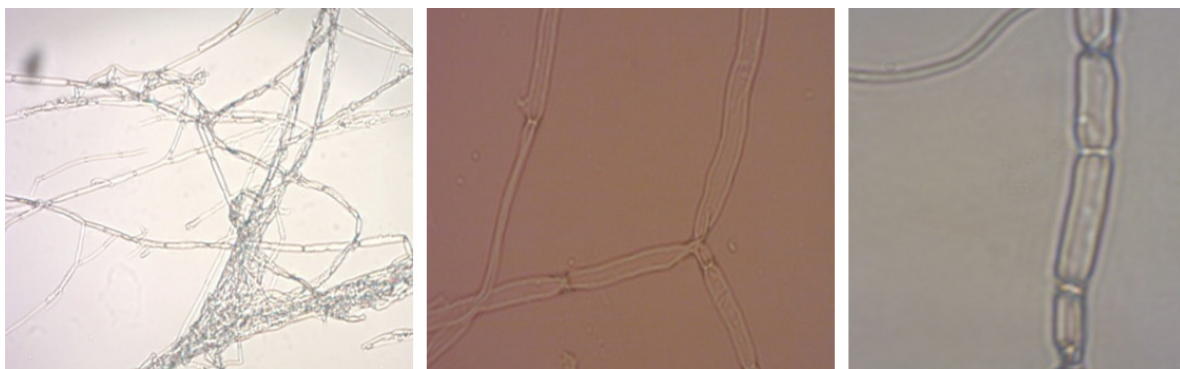


Figure 5. Mycelium structure with light microscope.

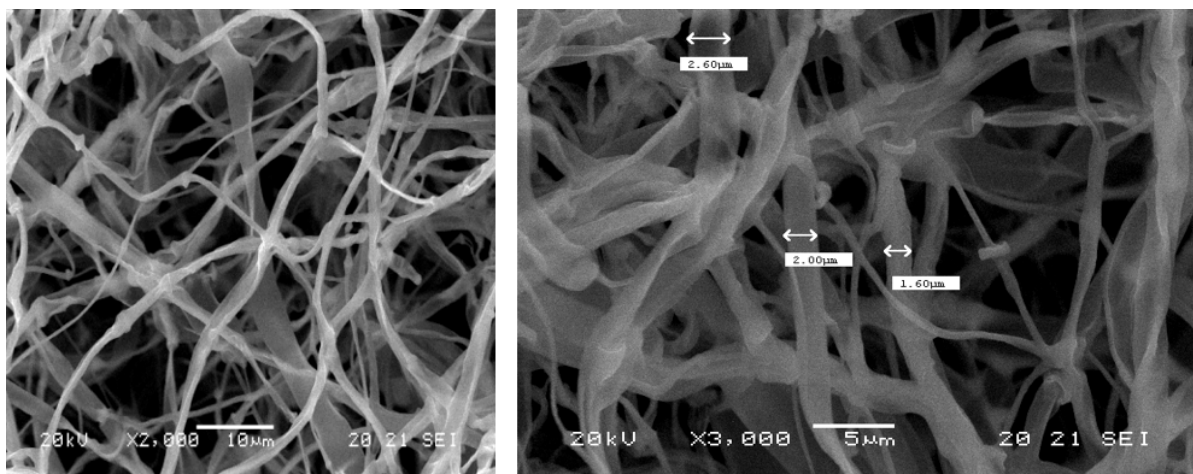


Figure 6. Mycelium structure with SEM.

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