



STUDY OF *PANAEOLUS SEMIOVATUS* (SOWERBY) S. LUNDELL AND NANNF., (1938), A COPROPHILOUS FUNGUS

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Abstract

In this study, the macroscopic and microscopic characters of *Panaeolus semiovatus* (Sowerby) S. Lundell & Nannf., (1938), coprophilous fungus, have been studied and illustrated.

Key words: *Panaeolus semiovatus*, coprophile, Khmisset, Maroc.

Introduction

The genus *Panaeolus* (Fr.) Que., (1872) (Incertae sedis, Agaricales, Agaricomycetidae, Agaricomycetes, Agaricomycotina, Basidiomycota, Fungi) is composed of a relatively small number of species, about twenty-five (Kirk *et al.*, 2008), compared to other genera, which might suggest that systematic determination of this kind is easy (Bon and Courtecuisse, 2003; Courtecuisse and Duhem, 2011). *Panaeolus* species, saprophytes solitary or dispersed in groups on manure and soil (Singer, 1986; Pegler, 1986), are distinguished by small size (Kaur *et al.*, 2014). However, some differential characters are difficult to assess and the keys to systematic, rare, are divergent as to the names and synonyms of the species (Bon and Courtecuisse, 2003).

In Morocco, the genus *Panaeolus*, Basidiomycetes, belonging to the family of Bolbitiaceae, is little studied (Malençon and Bertault, 1970). It contains coprophilous species that can appear all year when conditions are favorable (Gerault, 2005). Representatives of the genus *Panaeolus* are characterized by a hemispherical cap conical-convex, smooth fine line or even sometimes cracked, often to appendicular margin remains of the veil (Boedyn, 1966). The blades are particular, at least at a certain time of growth, spotted or cloudy, this being due to the maturation of the spores which is not done at the same time on the whole surface of the blades (Boedyn, 1966). The flesh is non-deliquescent and the stipe is pruinose, at least at the top, sometimes with fine droplets

at first (Romagnesi, 1995; Roux, 2006). The spore-print is black to dark brown. The spores are smooth, rough to warty, thick-walled and have a large and clean germinating pore (Heim, 1984; Roux, 2006).

In this work, the macroscopic and microscopic characters of a coprophilous fungus, *Panaeolus semiovatus*, have been described and illustrated.

Materials and Methods

Surveys were conducted in Khemisset tray (Houderran, Central Plateau Center) to study higher fungi in this area.

Specimens of these species were harvested and returned to the laboratory. The macroscopic descriptions of the carpophores have focused on the morphological characters (shape, color, size, appearance...) as well as other peculiarities related to the hat and stipe (smell, flavor...). This description is completed by a microscopic description of the spores and sections at the level of the hymenium, cuticle, flesh and stipe. The dimensions of the spores, cystidia, basidia and sometimes sterigmata, are measured *via* a micrometer wide field 10 × (18mm) at 10 mm scale divided into 100 graduations (0.1 mm). Microscopic observations were made using an optical microscope (× 400 magnification). The mounting liquid is tap water. The shape of the spores is obtained from the calculation of the quotient of Bas, (1969) according to the following ratio, $Q = \text{length (L)} / \text{width (l)}$.

Species identification was carried out by consulting

the work of Malençon and Bertault, (1970), Romagnesi (1995); Gray *et al.*, (1996); Bon and Courtecuisse, (2003); Roux, (2006) and Courtecuisse and Duhem, (2007).

Results

A single coprophilous species of the genus *Panaeolus* has been described in this study:

Panaeolus semiovatus (Sowerby) S. Lundell & Nannf., (1938). Syn *Panoleol* ovoid, coprophilous panoleol (Breitenbach and Kranzlinm, 1995; Courtecuisse and Duham, 2011); *Panaeolus semiovata* (Sow, Fr.) Lundell & Nannf. (Courtecuisse and Duham, 2011), scientific names formerly used: *Anellaria semiovata* (With.: Fr.) Pears and Dennis, (1948); *Panaeolus fimiputris* (Bull.: Fr.) Quélet, (1872); *Panaeolus separatus* (L.) Wunsche. (Bon and Courtecuisse, 2003).

Coprophilous species harvested on 08-04-2015 on horse dung in Houdaran (Khémisset).

The cap (2 to 4 cm in diameter) is hemispherical then strongly convex in the shape of half-egg as its name indicates it upwards and becomes then exploded, white tanned and slightly viscous. The margin is curved flat, slightly lighter than the hat with remnants of the hymenium to form the veil of the ring. The stipe (8 to 12 cm in diameter) is cylindrical, streaked longitudinally long, silver-white and bulb-shaped at the base. The ring is white, great, close and permanent. The flesh is whitish, fragile and low consistency.

Basidia ($29.9 \times 11.6 \mu\text{m}$) are hyaline, clavate and tetrasporic. The cheilocystids ($36.5 \times 8.5 \mu\text{m}$) are hyaline, cylindrical and crowned with crystals. Basidiopores ($16.65 \mu\text{m} \times 11.65$) are blackish brown in color, elliptical ($1.3 < Q < 1.7$) and smooth.

Discussion

In Morocco, the genus *Panaeolus* (Fr.) Quélet, (1872), is presented by eight species, four of which are described (*Panaeolus acuminatus* Quélet, 1874, *P. foeniseccii* (Pers.) J. Schröt., 1926, *P. papilionaceus* (Bull.) And 1872 *P. phalaenarum* (Fr. 1872) and four reported (*Panaeolus campanulatus* (L.) 1872, *P. fimicola* (Pers.) Gillet 1878, *P. retirugus* (Fr.) Gillet 1878 and *P. sphinctrinus* (Fr.), 1872) (Malençon and Bertault, 1970).

Ouabbou *et al.*, (2010) encountered four species of the genus *Panaeolus*. Among them *Panaeolus dunensis* Bon and Courtec, 1983, harvested at the level of the gray dunes of Mehdia is new for the fungal flora of Morocco and the other species, *P. campanulatus* (L.) Quélet, 1872, *P. sphinctrinus* (Fr.) Quélet, 1872 and *P. foeniseccii* (Pers.) J. Schröt., 1926, met in the Mamora, were previously reported by Malençon and Bertault, (1970).

In 2012, five coprophilous species of the genus *Panaeolus* have been described (*Panaeolus ater* (JE Lange) Kühner & Romagn, 1953, *P. olivaceus* FH Møller 1945, *P. semiovatus* (Sowerby) S. Lundell and Nannf, 1938, *P. papilionaceus* (Bull.) 1872 and *P. sphinctrinus* (Eng.) 1872). The first three can be considered as new for the fungal flora of Morocco (N'Douba *et al.*, 2012).

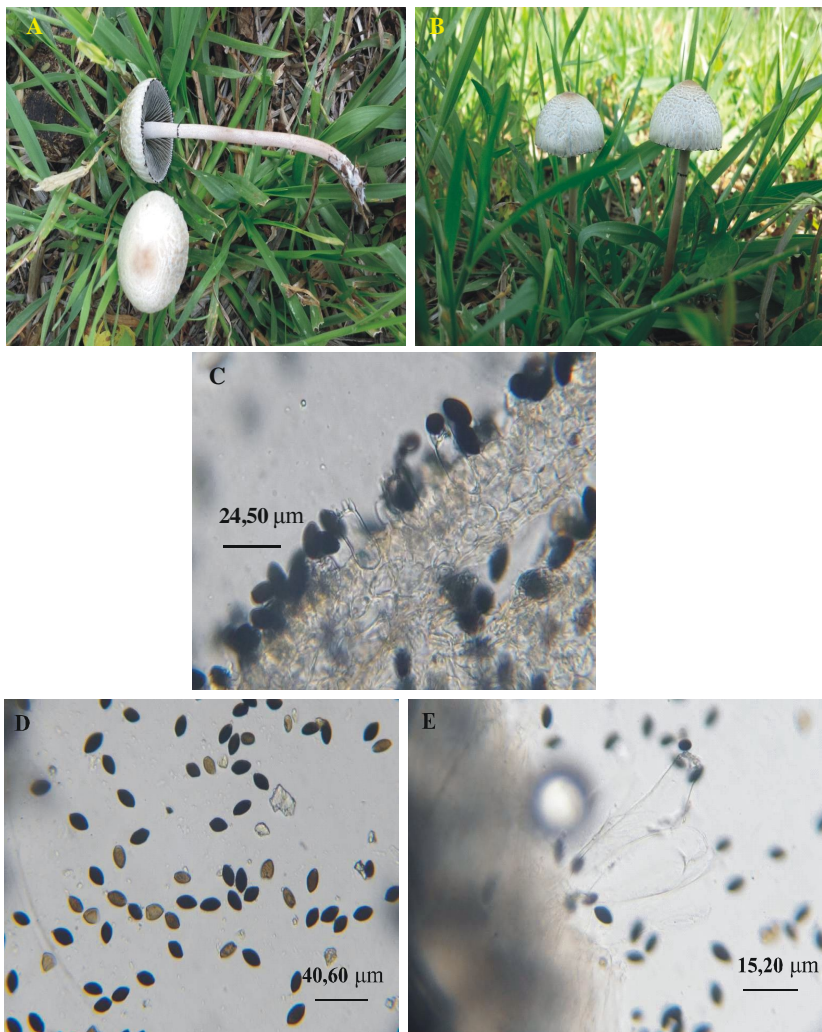


Fig. 1: *Panaeolus semiovatus*; A, B: Cap; C : basidia; D Spores, E : Cheilocystidia.

Conclusion

Specimens of *Panaeolus semiovatus* (Sowerby) S. Lundell & Nannf., (1938) are harvested for the first time in the region of Khémisset (Houderran, Central Plateau Central). This species can be considered as new for the fungal flora of the central plateau of Khémisset.

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