

MONTAGNEA HAUSSKNECHTII RAB. (PODAXALES) A RARE AGARICOID FUNGUS: FIRST RECORD FROM BRAZIL¹

Iuri Goulart Baseia^{2,4}

Adauto Ivo Milanez³

Recebido em 14/08/2001. Aceito em 15/01/2002.

RESUMO – (*Montagnea haussknechtii* Rab. (Podaxales) um raro fungo agaricóide: primeira citação para o Brasil). Esta espécie xerófila é registrada pela primeira vez para o Brasil, encontrada em solo arenoso de cerrado do Estado de São Paulo. São fornecidas descrições das características macro e microscópicas a partir de basidiocarpos maduros e adicionalmente, microscopia eletrônica de varredura dos esporos.

Palavras-chave – Taxonomia, foto-MEV, cerrado, estado de São Paulo

ABSTRACT – (*Montagnea haussknechtii* Rab. (Podaxales) a rare agaricoid fungus: first record from Brazil). This xerophilic species is recorded for the first time from Brazil, found on sandy soil from cerrado of the State of São Paulo. A description of the macro and microscopic features from mature basidiomata is given. Pictures of the spores under the scanning electron microscope are added.

Key words – Taxonomy, SEM-picture, cerrado, São Paulo state

Introduction

The genus *Montagnea* was established by E. M. Fries (1836) in honor to the French mycologist C. Montagne, who had initially sent the dried material, which served as the basis for the generic description. This genus is mainly characterized by its agaricoid appearance with the apex of the stipe expanded into a disc from the margin of which

hang the radiating, lamelloid, black, naked tramal plates.

According to Hawksworth et al. (1995), Podaxales is an improper order of Gasteromycetes; on the other hand, Dring (1973) includes Podaxaceae belonging to Agaricales. However, various authors like as Liu (1984), Dörfelt & Bum•aa (1986), Chio et al. (1990), Reid & Eicker (1991) and Pardavé (1991), yet consider this group as belonging to the

¹Parte da Tese de Doutorado do primeiro autor. Bolsista CAPES.

²Aluno de Doutorado do Instituto de Biociências/USP, ibaseia@bol.com.br

³Instituto de Botânica, C. Postal 4005, 01061-970, São Paulo, SP, Brasil.

⁴Depto. de Micologia - CCB, Universidade Federal de Pernambuco, Cidade Universitária, 50.670-901, Recife, PE.

Gasteromycetes. Hence, we note some controversy about the mentioned statements by Dring (1973) and Hawksworth et al. (1995).

Currently, four taxa are recognized for the genus, *Montagnea arenaria* (DC.) Zeller, *M. arenaria* var. *macrospora* Reid & Eicker, *M. schuppilii* Rick and *M. haussknechtii* Rab. These species are separated mainly on the basidiomata and basidiospores sizes.

There are not enough studies about this genus from South America; few specimens in the herbaria were not even studied. This work highlights some results for a survey of gasteroid fungi from the cerrado areas in the State of São Paulo. The aim here is to get an improved insight on this polyphyletic group, by including a detailed description of micro and macroscopic features from mature basidiomata.

Material and methods

Fieldworks have been made in the “Estação Ecológica de Jataí”, located in the State of São Paulo. This area is characterized by seasonal but moderately deciduous forest, occurring in the high-altitude (520-851m), also appearing on soils of intermediate fertility. Climatic conditions are of the AW type according to Köppen System.

Fresh and dried material were prepared for examination under light microscope by removing small sections of the hymenium, and soaking them in Melzer's reagent plus 5% KOH (Singer, 1986). Color terms in parenthesis are those of Kornerup & Wanscher (1978). The material is preserved at the Herbario do Estado Maria Eneyda P. K. Fidalgo (SP).

Spores have been examined in a Philips XL 20 scanning electron microscope. The investigated matter has been mounted dusting it over aluminum stubs and covered with a thin layer of gold-palladium in Sputter Coater Bal-Tec SCD-050.

Results and discussion

Montagnea haussknechtii Rab., Sitzungsber, naturw. Ges. 'Isis' Dresden 8, 1870.

Synonyms: *Montagnites elliottii* Mass., Grevillea 21, 1, 1892; *Montagnites tenuis* Pat., Jl. Bot. 8, 219, 1894; *Montagnea tenuis* (Pat.) Teng. Fungi of China 762, 1964; *Montagnites candollei* var. *minor* P. Henn., Hedwigia 40(98), 1901; *Montagnites candollei* var. *coprinoides* P. Henn., Hedwigia 40(98), 1901; *Montagnites candollei* var. *somala* Bacc., Eumycet. Somalia 191, 1916; *Montagnites spagazzini* Sacc. & Trott., Syll. Fung. 23, 327, 1925 (Reid & Eicker 1991).

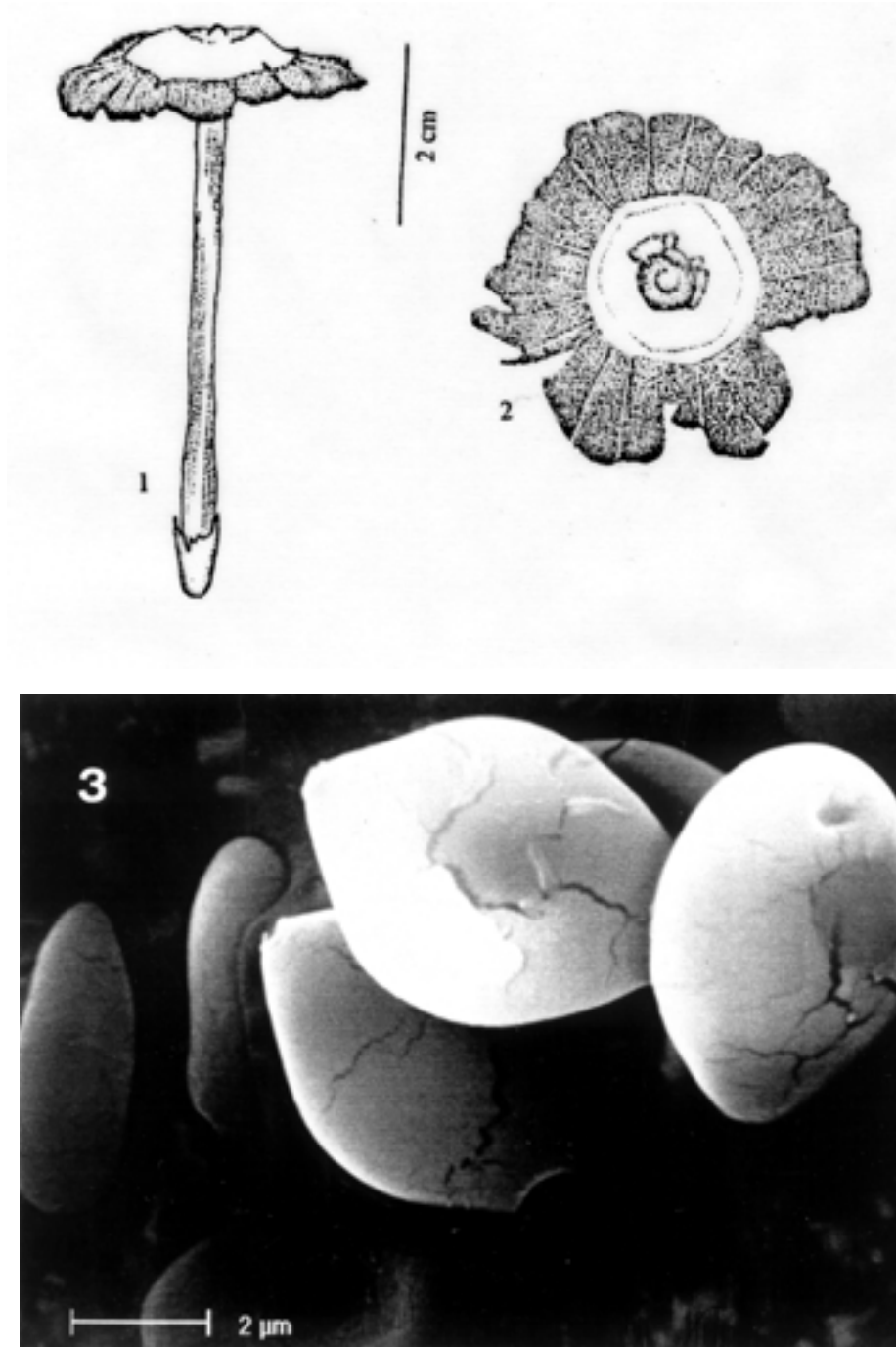
Fig. 1

Basidiomata agaric-like 6-7 cm. high. Pileus 3-4 cm diam., conic-truncate, depressed in the center, yellowish brown (5F4) to brownish grey (5F2). Stipe woody, yellowish brown (5F4), cylindrical, 7-8 cm. tall., covered with some coarse lacerated scales, longitudinally wrinkled and at the base an inconspicuous fringed papery volva. Lamellae numerous, black to dark grey (3F3), very crowded, radially orientated. Hymenium comprising of 4-spored basidia. Spore powder dark grey (3F3), basidiospores 6-7 x 3-4 mm, elliptic to pyriform, with a slightly thickened wall, and a germ pore, sessile, dark brown.

Material examined: **BRAZIL, São Paulo:** Município de Luís Antônio, Estação Ecológica de Jataí, 09/V/2000, I. G. Baseia (SP 307517); 23/III/2001, I. G. Baseia (SP 307552).

Habitat: Solitary on sandy soil in open sunlight of cerrado region.

Distribution: Russia (Sorokin, 1884); Egypt (Masse, 1892); Africa (Hennings, 1901); United States of America (Zeller, 1943); Iran (Petra, 1949); Canary Islands (Eckblad, 1962; 1975); Israel (Dring & Rayss, 1963); Afghanistan (Eckblad, 1970); Cuba (Kreisel, 1971); Spain (Calonge, 1975) Turkey (Watling & Gregory, 1977); China (Liu, 1984).



Figs. 1-3. *Montagnea haussknechtii*: 1. mature basidioma; 2. higher surface of pileus; 3. basidiospores under SEM

Discussion: *Montagnea* Fr. has been made the type genus of the Montagneaceae Sing. (Singer 1976) that comprises two other genera: *Panaeolopsis* Sing. and *Polyplocium* Berk. However, Singer (1986) observed that the affinities of his new family Montagneaceae lie with Coprinaceae in the Agaricales. On that occasion, Singer (1986) wrote about *Montagnea*: “Many authors consider this genus as belonging to the Agaricales, somewhere near *Coprinus*. There is no doubt in the author’s mind but that *Montagnea* is, indirectly, related with the Coprinaceae. However, if there is such a thing as a Gasteromycete, *Montagnea* is one of them”. There are evidences from rDNA sequences data to support long-held hypothesis for other close relationship among secotoid, false-truffle and agaric forms (Vilgalys et al. 1993). The examples include the shaggy mane mushroom, *Coprinus comatus* and the gasteroid forms *Montagnea* and *Podaxis*.

Montagnea and the genus *Gyrophragmium* share superficial resemblance, such as: size, color and texture of the gills and the presence of a small volva at the base of the stipe; but they differ mainly by the gills that are lamellate and radiate in *Montagnea* while in *Gyrophragmium* the tramal plates are separated and arranged in parallel lines.

From Brazil, there was only one record for this genus: *M. schuppilii*, given by Rick (1928; 1939). *M. haussknechtii* and *M. schuppilii* differ mainly by the size and color of the pileus that in *M. schuppilii* are bigger and clear. This is the first record of *Montagnea haussknechtii* from Brazil.

Acknowledgments

We thank the financial support of the Coodenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), the Instituto de Biociências/USP and Seção de Micologia e Liquenologia/IBt. We also thank the referee’s suggestions for improving the paper.

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