

A new species of *Lepiota* (Agaricaceae, Basidiomycetes) from China

HAN-CHEN WANG

higherfungi2005@yahoo.com.cn

Kunming Institute of Botany, Chinese Academy of Sciences

Kunming 650204, Yunnan Province, P. R. China

Institute of Applied Ecology, Chinese Academy of Sciences

Shenyang 110016, Liaoning Province, P. R. China

Graduate School of the Chinese Academy of Sciences, P. R. China

ZHU-LIANG YANG*

fungi@mail.kib.ac.cn

Kunming Institute of Botany, Chinese Academy of Sciences

Kunming 650204, Yunnan Province, P. R. China

Abstract—A new species, *Lepiota catenariocystidiata*, is described and illustrated. It is compared with similar species.

Key words—*Agaricales*, taxonomy

Introduction

During our study of lepiotaceous fungi, we came across an undescribed species of the genus *Lepiota* (Pers.: Fr.) Gray. It is described and illustrated herein. In descriptions of the basidiomata, color designations (e.g., 1A1) are from Kornerup & Wanscher (1981), and color names with first letters capitalized (e.g., Pale Smoke Gray) are from Ridgway (1912). In descriptions of basidiospores, the notation [*n/m/p*] shall mean *n* basidiospores measured from *m* basidiomata of *p* collections in Melzer's reagent. Q is used to mean quotient of length and width of a spore in side view; \bar{Q} means average Q of all basidiospores \pm sample standard deviation. Herbarium code HKAS = Herbarium of Cryptogams, Kunming Institute of Botany, Chinese Academy of Sciences.

Taxonomy

Lepiota catenariocystidiata Han C. Wang & Zhu L. Yang, sp. nov.

Figs. 1-4

Pileus 3-5 cm *latus*, *initio subcampanulatus*, *deinde convexus vel applanatus*, *albidus vel griseolus*, *squamulis tomentosus*, *griseis vel obscure griseis*. *Lamellae liberae*, *albidae vel cremeae*. *Stipes* 4-6 \times 0.3-0.6 cm, *subcylindricus*, *albidus*, *annulatus*, *squamulis confertis*,

* *Corresponding author*

tomentosis, griseis infra annulum. Annulus superus, membranaceus. Basidiosporae (7.0) 7.5-9.0 (10.0) × (3.5) 4.0-4.5 (5.0) μm, oblongae vel subcylindricae, incoloratae, hyalinae, dextrinoideae. Basidia 20-30 × 7.5-10 μm, subclavata, 4-sporigera, raro 2-sporigera. Pleurocystidia nulla. Cheilocystidia 10-20 × 8-12 μm, subglobose, ovata vel breviclavata, catenaria, incolorata. Squamulae pilei ex hyphis subcylindricis terminalibus compositae. Fibulae praesentes.

Holotype: CHINA, Yunnan Prov., Mengla County, Menglun, 2. XI. 1989, Z.L. Yang 918 (HKAS 22145).

Etymology: Named because of the cheilocystidia often in chains.

Basidiomata (Fig. 1) scattered. *Pileus* 3-5 cm in diam, at first subcampanulate, then convex to applanate, with an obtuse umbo or non-umbonate; pileal surface dry, whitish to grayish (1A1-1B1; Pale Smoke Gray) but with pinkish tinge (11A2-11B2; Light Brownish Drab) at center, densely covered with minute, dark gray (11C1 + 11D1 + 11E1; Dark Neutral Gray to Blackish Slate) tomentose squamules over disc, with small, concentrically arranged, grey to dark grey squamules towards the margin, margin often slightly exceeding lamellae. *Lamellae* free, whitish to cream-coloured, moderately crowded, in 2-3 ranks, up to 0.7 cm broad, with white to concolorous eroded edge. *Stipe* 4-6 × 0.3-0.6 cm, central, subcylindrical, hollow, slightly enlarged near base, surface whitish, lower part covered with grey (11C1 + 11D1; Dark Neutral Gray to Hair Brown) tomentose squamules often in belts. *Annulus* superior, membranous, upper surface white and glabrous, lower surface covered with grey tomentose squamules, persistent or fugacious. *Context* whitish, unchanging; odor indistinct; taste slightly hot.

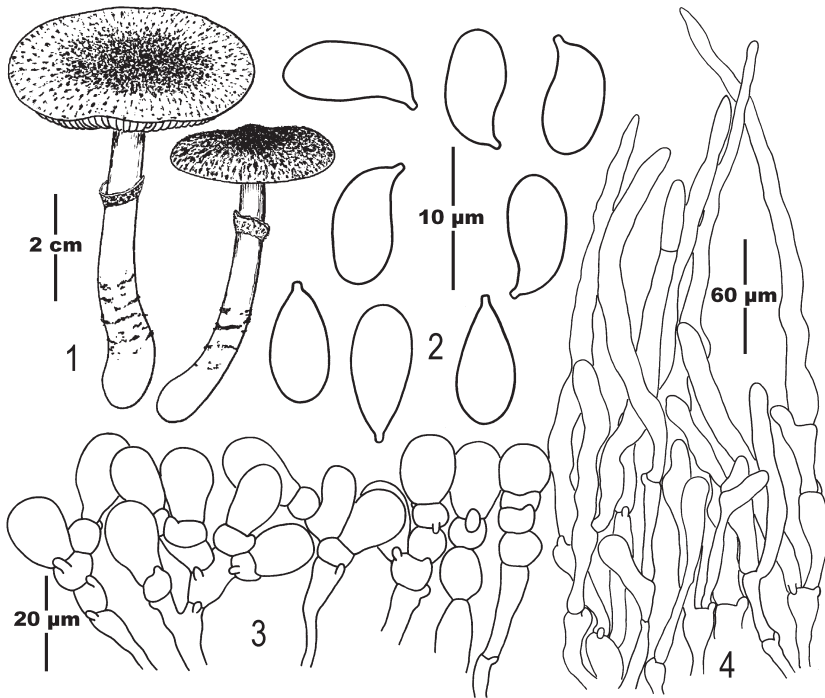
Basidiospores (Fig. 2) [42/2/2] (7.0) 7.5-9.0 (10.0) × (3.5) 4.0-4.5 (5.0) μm [Q = (1.67) 1.75-2.25, Q = 2.01 ± 0.18], oblong to subcylindrical, with a distinct suprahilar depression in side view, water-drop-shaped in front view, broader at apical part, attenuate towards the base, slightly thick-walled, colorless, hyaline, dextrinoid, reddish in Congo Red, not metachromatic in Cresyl Blue. *Basidia* 20-30 × 7.5-10 μm, subclavate, hyaline, thin-walled, 4-spored, rarely 2-spored. *Pleurocystidia* absent. *Cheilocystidia* (Fig. 3) abundant, 10-20 × 8-12 μm, subglobose, ovoid to short clavate, often in chains, colorless and hyaline. *Squamules* (Fig. 4) on pileus a disrupted trichodermium consisting of loose fascicles of long, more or less erect, subcylindrical, terminal elements (45-300 × 10-17 μm) with tapering or round apex and pale yellow-brown to dark yellow-brown intracellular pigments; with short clavate cells at the base of these long elements; the repent hyphae at the base of erect elements sometimes with incrusting pigments. Squamules on surface of stipe similar to those on pileus. *Clamp connections* abundant in basidiomata.

Habitat: On well-rotten wood with soil in limestone monsoon forests; fruiting in summer and autumn in southwestern China at 600–700 m elev.

Known distribution: Known from tropical Yunnan only.

Additional material examined: CHINA, Yunnan Prov., Mengla County, Menglun Nature Reserve, 22. X. 1988, Zang 11515 (HKAS 20358).

Notes: *Lepiota catenariocystidiata* is well characterized by its whitish to grayish pileus with a pinkish center, gray to dark gray squamules on the pileus made up of a disrupted trichodermium with long subcylindrical terminal elements and short clavate cells at the base of these long elements, water-drop-shaped basidiospores in front view, catenulate cheilocystidia and the common presence of clamp connections in the basidiomata.



Figs. 1-4. *Lepiota catenariocystidiata* (from holotype)
 1. Basidiomata. 2. Basidiospores. 3. Cheilocystidia. 4. Squamules on pileus

Due to the trichodermium type of the squamules on the pileus and the oblong to subcylindrical basidiospores, *L. catenariocystidiata* may belong to *Lepiota* sect. *Ovisporae* (J.E. Lange) Kühner. Species with pileal squamules made up of long, erect elements and short, clavate elements in between were put in the subsect. *Felininae* Bon within sect. *Ovisporae* (Vellinga 2001). Because *L. catenariocystidiata* has short, clavate elements at the base of long, erect ones, it should be placed in the subsection. However, according to recent molecular phylogenetic studies, the ITS data set does not support sect. *Ovisporae*, and thus a re-evaluation of this section is needed (Vellinga 2003). The present species may be clustered within the Clade 1 of *Lepiota* s. l. (Vellinga 2003).

Lepiota catenariocystidiata may be related to *L. felina* (Pers.) P. Karst., *L. pseudolilacea* Huijsman and *L. pseudohelveola* Kühner ex Hora. However, the latter two species have differently coloured basidiomata, ellipsoid to oblong basidiospores in front view and rarely with a suprahilar depression in side view, and differently shaped cheilocystidia (Kühner 1936; Huijsman 1947; Hora 1960; Enderle & Krieglsteiner 1989; Bon 1981, 1996; Candusso & Lanzoni 1990). According to Vellinga (2001), *L. pseudohelveola* should be regarded as a synonym of *L. pseudolilacea*. *Lepiota felina* differs from *L. catenariocystidiata* in the colour of the basidiomata, the shape of the cheilocystidia and

basidiospores (Kühner 1936; Huijsman 1947; Hora 1960; Bon 1981, 1996; Enderle & Krieglsteiner 1989; Candusso & Lanzoni 1990; Vellinga 2001).

The basidiospores of *L. catenariocystidiata* are very similar to those of *L. plumbicolor* (Berk. & Broome) Sacc., originally described from Sri Lanka. However, the latter has blackish purple squamules on pileus with elongate clavate terminal elements with an obtusely rounded apex and clavate-cylindrical cheilocystidia (Pegler 1972, 1986).

Acknowledgements

We are very grateful to Dr. E.C. Vellinga for having sent us her valuable publications on *Agaricaceae*, and to Drs. E.C. Vellinga and D.E. Desjardin for their critical reviewing the manuscript. This project was financed by the Natural Science Foundation of China's Yunnan Province (No. 2002C0059M) and the National Natural Science Foundation of China (No. 30270017).

Literature cited

- Bon M. 1981. Clé monographique des "Lépiotes" d'Europe (= *Agaricaceae*, Tribus *Lepioteae* et *Leucocoprineae*). Doc. Mycol. 11 (43): p1-p77.
- Bon M. 1996. Die Großpilzflora von Europa 3. *Lepiotaceae* (übersetzt und bearbeitet von F. Medjebeur-Thrun & W. U. Thrun). IHW-Verlag: Eching (Germany). 141pp.
- Candusso M, Lanzoni G. 1990. *Lepiota* s. l. Fungi Europaei 4. Giovanna Biella: Saronno (Italy). 743pp.
- Enderle M, Krieglsteiner GJ. 1989. Die Gattung *Lepiota* (Pers.) S. F. Gray emend. Pat. in der Bundesrepublik Deutschland (Mitteleuropa). Z. Mykol. 55: p43-p104.
- Hora FB. 1960. New check list of British Agarics and Boleti. Transactions British Mycol. Soc. 43: p440-p459.
- Huijsman HSC. (1947). *Lepiota pseudolilacea* nov. spec. Bull. Soc. Linn. Lyon 16: p180-p183.
- Kornerup A, Wanscher JH. 1981. Taschenlexikon der Farben. 3. Aufl. Muster-Schmidt Verlag: Zürich (Switzerland). 242pp.
- Kühner MR. 1936. Recherches sur le genre *Lepiota*. Bull. Soc. Mycol. France 52: p175-p238.
- Pegler DN. 1972. A revision of the genus *Lepiota* from Ceylon. Kew Bull. 27: p155-p202.
- Pegler DN. 1986. Agaric Flora of Sri Lanka. Kew Bull. Add. Ser. 12: p1-p519.
- Ridgway R. 1912. Color Standards and Color Nomenclature. R. Ridgway, Washington, D.C. (USA). 43pp.
- Vellinga EC. 2001. *Lepiota* (Pers. : Fr.) S. F. Gray. In: Flora Agaricina Neerlandica 5 (eds. M.E. Noordeloos, Th.W. Kuyper and E.C. Vellinga). A. A. Balkema Publishers, Holland: p109-p151.
- Vellinga EC. 2003. Phylogeny of *Lepiota* (*Agaricaceae*) - Evidence from nrITS and nrLSU sequences. Mycol. Progr. 2: p305-p322.