

## A revised checklist of *Marasmiellus* for China Mainland

DENG CHUN-YING<sup>1,2</sup>, LI TAI-HUI<sup>1</sup>, SONG BIN<sup>1</sup>

<sup>1</sup>Guangdong Provincial Key Laboratory of Microbial Culture Collection and Application, Guangdong Open Laboratory of Applied Microbiology, State Key Laboratory of Applied Microbiology, Guangdong Institute of Microbiology, Guangzhou 510070, China; Mycolab@263.net

<sup>2</sup>Department of Biotechnology, South China University of Technology, Guangzhou, 510640 China; dengchunying01@gmail.com

Chun-Ying D., Tai-Hui L., Bin S. (2011): A revised checklist of *Marasmiellus* for China Mainland. – Czech Mycol. 63(2): 203–214.

The current knowledge of *Marasmiellus* in China is summarised, and a total of 52 taxa (51 species and one variety) are listed alphabetically. Two of them are synonyms of other species, one is an invalid name. *Marasmiellus purpureus* and *M. alvaradoi* are new to the Chinese mycobiota. Descriptions of the new records are provided.

**Key words:** *Marasmiaceae*, taxonomy, diversity.

Chun-Ying D., Tai-Hui L., Bin S. (2011): Soupis druhů rodu *Marasmiellus* z Číny. – Czech Mycol. 63(2): 203–214.

V současné době je z Číny známo 51 druhů a 1 varieta z rodu *Marasmiellus*. Dvě z těchto jmen jsou synonymní, jedno neplatné. *Marasmiellus purpureus* a *M. alvaradoi* jsou nové pro Čínu a jsou publikovány jejich popisy.

### INTRODUCTION

The genus *Marasmiellus* Murrill (1915) belongs to Basidiomycota, *Agaricales*, *Marasmiaceae* Roze & Kühner, with about 250 accepted species (Singer 1973; Pegler 1977, 1983, 1986; Antonín & Noordeloos 2010; Corner 1996; Kirk et al. 2008) and some 402 published names (<http://www.indexfungorum.org>).

The genus *Marasmiellus* was first introduced by Murrill (1915), and emended by Singer (1951, 1973, 1986). *Marasmiellus* is characterised by collybioid or omphalioid basidiocarps, white spore print, a cutis consisting of a pileipellis, sometimes with a transition to a trichoderm, with or without *Rameales*-structure. It is related to *Campanella*, *Micromphale*, *Collybia*, *Marasmius*, and *Neoclitocybe*. Although Singer (1973) considered this genus to be a fully natural group, several genera have been segregated based on micromorphological structures and the phylogenetic placement of *Marasmiellus sensu stricto* remains elusive

(Moncalvo et al. 2002, Wilson & Desjardin 2005). *Marasmiellus* has been studied less recently (e.g. Takahashi 2000, 2006).

Studies on *Marasmiellus* in China started in the first half of the 20<sup>th</sup> century (Keissler 1937, Sawada 1942). Early reported species included *M. albus-corticis* (Secr.) Singer and *M. ramealis* (Bull.: Fr.) Singer from Yunnan (Keissler 1937), and *M. epochnous* (Berk. & Broome) Singer from Taiwan (Sawada 1942). Tai (1979) reported *M. fibula* (Bull.) Singer, now belonging to the genus *Rickenella*. Huang & Wu (1978) reported the new species *M. salicicolus*, but without a Latin description (thus the name is invalid). Redhead & Liu (1982) described three new species of the genus *Marasmiellus* and one new record of a *Marasmiellus* species. This fungus group has since been extensively studied. Bi et al. (1983) reported nine new species records and two new species, Bi et al. (1990) reported 12 new records from Guangdong. Li et al. (1994) reported one new species and eight new records from Guangdong and Hainan. Bi et al. (1994) recorded another eight new taxa from Guangdong. Chang & Mao (1995) reported one new record from Tibet. Some of the illustrated field handbooks and fungus floras of less studied provinces introduced some new localities (e.g. Mao 2000, Shao & Xiang 1997, Tolgor 2004).

This study aims to summarise the known information of Chinese *Marasmiellus* species via the Chinese literature and the specimens deposited in Chinese herbaria. The authors are planning to expand the specimen collection and taxonomic study of the Chinese *Marasmiellus* species at a later time.

#### MATERIAL AND METHODS

The specimens cited in this study are deposited in Guangdong Institute of Microbiology Macrofungi Herbarium (GDGM), Herbarium of Cryptogams, Kunming Institute of Botany, Chinese Academy of Sciences (KUM, with HKAS numbers), Institute of Microbiology, Academia Sinica Mycological Herbarium (HMAS), and the Agriculture and Agri-Food Canada National Mycological Herbarium (DAOM). Specimens deposited in DAOM were not examined, only the specimen numbers are published in this study. Specimens deposited in GDGM, KUM and HMAS were re-examined. The macro- and microscopic methods used in the study follow Singer (1986). Colour terms and notations follow Kornerup & Wanscher (1978). Photographs of nine species are added to this study.

## RESULTS

## LIST OF SPECIES

In the following text an alphabetical list of *Marasmiellus* taxa reported from China is given. The authors of scientific names are according to the second edition of Authors of Fungal Names (<http://www.indexfungorum.org/AuthorsOfFungalNames.htm>). Literature referring to the first written records in China follows the names, and herbarium specimen numbers are added after the literature for each species. The species marked with an asterisk (\*) are synonyms and an invalid name, new records are marked with two asterisks (\*\*). Collections of here newly reported species for China are macro- and microscopically described at the end of our list.

1. *Marasmiellus albiceps* Z.S. Bi, (Bi et al. 1983), GDGM 4379 (holotype).
2. *Marasmiellus albofuscus* (Berk. et M.A. Curtis) Singer, (Bi et al. 1990), GDGM 7824, 10262; HMAS 187249, 187360, 63323.
3. \**Marasmiellus albocorticis* Singer, (Keissler and Lohwag 1937), GDGM 4348, 4804, 5228, 5238, 5239, 5283, 7947, 8251, 10210, 13009, 10058, 11767, 15952, 16591, 20767, 21324; HKAS 14116, 14117, 22007, 38264, 76478, 75463.  
= *Marasmiellus candidus* (Bolton) Singer, (Singer 1951).
4. *Marasmiellus alneus* Singer, (Bi et al. 1990), GDGM 6192, 6529, 6530, 11293, 19094, 25557.
5. \*\**Marasmiellus alvaradoi* Singer, GDGM 26430. See below.
6. *Marasmiellus candidus* (Bolton) Singer, (Ying et al. 1987), GDGM 27112, 27248, 27253, 27256, 27268; HKAS 24957; HMAS 186562.
7. *Marasmiellus chamaecyparidis* (Hongo) Hongo, (Chen et al. 1999), HKAS 20580, 20678, 23325, 34425; HKAS 28022.
8. *Marasmiellus cinereus* Singer, (Li et al. 1994), GDGM 12901, 27494 (Fig. 1b).
9. *Marasmiellus coilobasis* (Berk.) Singer, (Bi et al. 1983), GDGM 4503, 8965, 10305, 11267; HKAS 33207; HMAS 220913, 221013, 221105.
10. *Marasmiellus columbianus* Singer, (Bi et al. 1983), GDGM 4567, 4634.
11. *Marasmiellus confertifolius* Singer, (Bi et al. 1994), GDGM 10431.
12. *Marasmiellus corticum* Singer, (Bi et al. 1994), GDGM 4394, 5485, 5493, 6614, 10427, 11333, 11382, 13669, 17193, 25441 (Fig. 1c); HKAS 50123.
13. *Marasmiellus dendroegrus* Singer, (Bi et al. 1990), GDGM 8015, 8375, 8846, 8966, 9044, 9506, 10608, 12448, 13602, 13794, 17206, 17317, 21328, 25158, 25264, 26047 (Fig. 1e), 26215, 26237, 26428, 26640, 26643, 26648, 26673, 26801, 26807, 26808, 26809, 26817, 26869, 27266; HKAS 25508.
14. *Marasmiellus distantifolius* (Murrill) Singer, (Bi et al. 1990), GDGM 7486, 12396, 13675, 13793; HKAS 21742; HMAS 221077.

15. *Marasmiellus dryogeton* Singer, (Li et al. 1994), GDGM 13602, 13794, 16370.
16. *Marasmiellus eburneus* (Theiss.) Singer, (Li et al. 1993), GDGM 6518.
17. *Marasmiellus enodis* Singer, (Bi et al. 1994), GDGM 4194, 12354, 12559, 26366 (Fig. 1f).
18. *Marasmiellus epochnous* (Berk. et Broome) Singer, (Sawada 1942, Li et al. 1997), GDGM 13061, 14946, 16583, 18358, 20653, 20659, 21355, 21798, 25385 (Fig. 1d), 25390, 25420.
19. *Marasmiellus filocystis* Redhead et B. Liu, (Redhead and Liu 1982), DAOM 180446 (holotype).
20. *Marasmiellus goossensiae* (Beeli) Pegler, (Yang and Zang 2003), HKAS 22508, 22509, 25525, 23198.
21. *Marasmiellus gossypinulus* (Speg.) Singer, (Bi et al. 1994), GDGM 11295.
22. \**Marasmiellus hondurensis* (Murrill) Singer, (Bi et al. 1994), GDGM 4586, 4589, 5301.  
= *Gymnopus hondurensis* (Murrill) J.L. Mata, (Mata 2003).
23. *Marasmiellus laschiopsis* Singer, (Chang and Mao 1995), HMAS 52721.
24. *Marasmiellus mesosporus* Singer, (Redhead and Liu 1982), DAOM 180442, 180443.
25. \**Marasmiellus nigripes* (Schwein.) Singer, (Li et al. 1994), GDGM 27117, 27250; HKAS 38797; HMAS 286689.  
= *Tetrapyrgos nigripes* (Schwein.) E. Horak, (Horak 1986).
26. *Marasmiellus nivosus* (Berk.) Singer, (Bi et al. 1983), GDGM 4675, 4808, 4809.
27. *Marasmiellus oligocinsulae* Murrill, (Bi et al. 1990), GDGM 8440, 8729, 25306 (Fig. 1g).
28. *Marasmiellus panamensis* Singer, (Li et al. 1994), GDGM 13031, 24520, 21381, 17212, 14367, 12780, 12837.
29. *Marasmiellus pernambucensis* Singer, (Li et al. 1994), GDGM 12891, 24016, 27620 (Fig. 1h).
30. *Marasmiellus petiolorum* (Berk. et M.A. Curtis) Singer, (Li et al. 1994) GDGM 13763.
31. *Marasmiellus picipes* (Murrill) Singer, (Bi et al. 1994), GDGM 12040; HMAS 75209.
32. *Marasmiellus pilosus* (Dennis) Singer, (Bi et al. 1983), GDGM 5238, 5239.
33. *Marasmiellus pseudoparaphysatus* Singer, (Bi et al. 1983), GDGM 13201, 16586, 20623, 21573; HMAS 63324, 75331, 75464.
34. \*\**Marasmiellus purpureus* (Berk. et M.A. Curtis) Murrill, GDGM 26607, 26434, 26547.
35. *Marasmiellus pusillimus* Redhead et B. Liu, (Redhead & Liu 1982), DAOM 180444 (holotype).



**Fig. 1.** a – *Marasmiellus alvaradoi* (GDGM 26430). b – *M. cinereus* (GDGM 27494). c – *M. corticum* (GDGM 25441). d – *M. epochnous* (GDGM 25385).

36. *Marasmiellus quercinus* Singer, (Bi et al. 1994), GDGM 4624, 10644, 11228, 13068, 13525, 13528, 16356, 18169, 21964; HKAS 29465.

37. *Marasmiellus ramealis* (Bull.) Singer, (Keissler and Lohwag 1937), GDGM 26421, 27602, 27605; HMAS 52722, 52723, 51482, 63518, 69772, 63518, 69772.

38. \**Marasmiellus salicicolus* Huang, (Huang and Wu 1978). Notes. This is an invalid name. Huang (1978) described and illustrated this species without selecting holotype specimens and a Latin diagnosis. Pileus 1.5–2.1 cm in diam., white. Lamellae decurrent, subdistant (10–12 at the stipe). Stipe central or eccen-





**Fig. 2.** a – *Marasmiellus dendroegrus* (GDGM 26047). b – *M. enodis* (GDGM 26366). c – *M. oligocinsulae* (GDGM 25306). d – *M. panamensis* (GDGM 27620).

tric, 10–15 × 1–2 mm, apex white, becoming greyish black. Basidiospores 8.8 × 2.2 µm. Gregarious on *Salix* trees.

39. *Marasmiellus sanctae-marthae* Singer, (Bi et al. 1990), GDGM 7557.

40. *Marasmiellus sinensis* Redhead et B. Liu, (Redhead and Liu 1982), DAOM 180445 (holotype).

41. *Marasmiellus sprucei* (Berk.) Singer, (Redhead and Liu 1982), GDGM 6525, 8653.

42. *Marasmiellus stenophylloides* (Dennis) Dennis, (Bi et al. 1983), GDGM 4278.



**Fig. 3.** a, b – *Marasmiellus purpureus* (GDGM 26547, 26434). c – *M. stenophyllus* (GDGM 21926). d – *M. trojanus* (GDGM 28439).

43. *Marasmiellus stenophyllus* (Mont.) Singer, (Bi et al. 1990), GDGM 4761, 8439, 13748, 21962, 4379, 11775, 4519, 7458, 4340, 4761, 10331, 4288, 8894, 17194, 5229, 8439, 21926, 15232, 8689, 4344, 18599, 21926 (Fig. 1k), 26411, 26523.

44. *Marasmiellus subcoracinus* (Berk. et M.A. Curtis) Singer, (Li et al. 1994), GDGM 13660; HMAS 75463.

45. *Marasmiellus subdealbatus* T.H. Li, (Li et al. 1994), GDGM 13082 (holotype), 14471.

46. *Marasmiellus subepiphyllus* Z.S. Bi et G.Y. Zheng, (Bi et al. 1983), GDGM 4288 (holotype), GDGM 4655, 5226, 5281.

47. *Marasmiellus subgraminis* (Murrill) Singer, (Li et al.1994), GDGM 11686, 13860.

48. *Marasmiellus synodicus* (Kunze) Singer, (Bi et al. 1990), GDGM 5310, 18360 18058, 19058, 11826, 13526, 21138, 12359, 18279, 4287, 5281, 18159, 20579, 6526, 17195.

49. *Marasmiellus tenerrimus* (Berk. et M.A. Curtis) Singer, (Bi et al. 1900), GDGM 7767.

50. *Marasmiellus tetrachrous* (Singer) Singer, (Bi et al. 1983), GDGM 4572, 5284.

51. *Marasmiellus tricolor* var. *vialis* (Peck) Singer, (Bi et al. 1983), GDGM 4804, 5278, 5282.

52. *Marasmiellus trojanus* (Murrill) Dennis, (Bi et al. 1990), GDGM 18339, 11070, 12297, 6512, 8632, 10419, 26610, 28439 (Fig. 11); HKAS 34261.

#### DESCRIPTIONS

*Marasmiellus alvaradoi* Singer, Beih. Nova Hedwigia 44: 322, 1973. Figs. 1a, 4.

Pileus 15–20 × 16 mm, orange white (5A2, 6A2), pale orange (5A3, 6A3), with white or concolorous margin, glabrous, slightly striate. Lamellae adnexed to almost free, distant to subdistant (L = 6–8), with 0–2 series of lamellulae, intervenose, narrow (1–1.5 mm), non-marginate, orange grey (6B2). Stipe 3 × 1 mm, eccentric, tapering to the base, pruinose, insititious, brownish orange (6C3–4).

Basidiospores 7–9.5 × 3.8–4.8 µm, ellipsoid, smooth, hyaline, inamyloid. Basidia 20–32 × 6–10 µm, 2- or 4-spored, clavate. Cheilocystidia numerous, ventricose, ventricose-subcapitate, or irregularly shaped, main body 15–40 × 6–20 µm, hyaline, strongly branched and diverticulate, diverticula 1.5–6 × 0.6–2 µm, rod-shaped and obtuse. Pleurocystidia absent. Pileipellis a cutis of narrow woven hyphae, 5–15 µm wide, with occasional knobs or prongs, or bearing a very strong developed *Rameales*-structure. Caulocystidia not observed.

Habitat. Gregarious on monocotyledonous twigs.

Specimen examined. Guangxi Province, Maoershan National Nature Reserve, 27 May 2009 leg. H. Huang and C.Y. Deng (GDGM 26430).

Discussion. In comparison with the original description (Singer 1973), basidiocarps of *Marasmiellus alvaradoi* collected in China differ by having a paler pileus than the holotype, the stipe does not become glabrescent with age, and the stipe base is not sub-insititious with white basal mycelium.



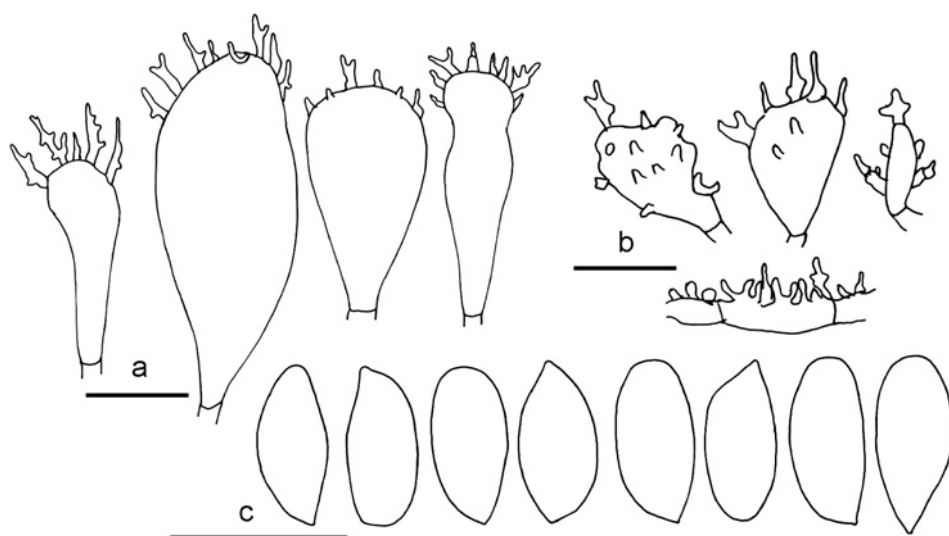


Fig. 4. *Marasmiellus alvaradoi*. a – cheilocystidia, b – pileipellis, c – basidiospores. Bars = 10  $\mu$ m.

***Marasmiellus purpureus*** (Berk. et M.A. Curtis) Murrill, N. Amer. Fl. 9(4): 244, 1915. Figs. 3a, 3b; 5.

= *Marasmius purpureus* Berk. et M.A. Curtis, J. Linn. Soc., Bot. 10(45): 299. 1868

Pileus 10–25 mm, convex to plano-convex, light purple, lavender (17A2–3) when young, becoming purple (18A2), greyish purple (19A3–4–19B4), irregularly radially plicate, pruinose. Lamellae adnate to adnexed, subdistant, narrow (2 mm broad), white, light yellow. Stipe reduced or very short, 1–3  $\times$  1 mm, eccentric, cylindrical, white, non-insititious, basal mycelium white. Flesh thin, white, light yellow. Odour and taste not distinctive.

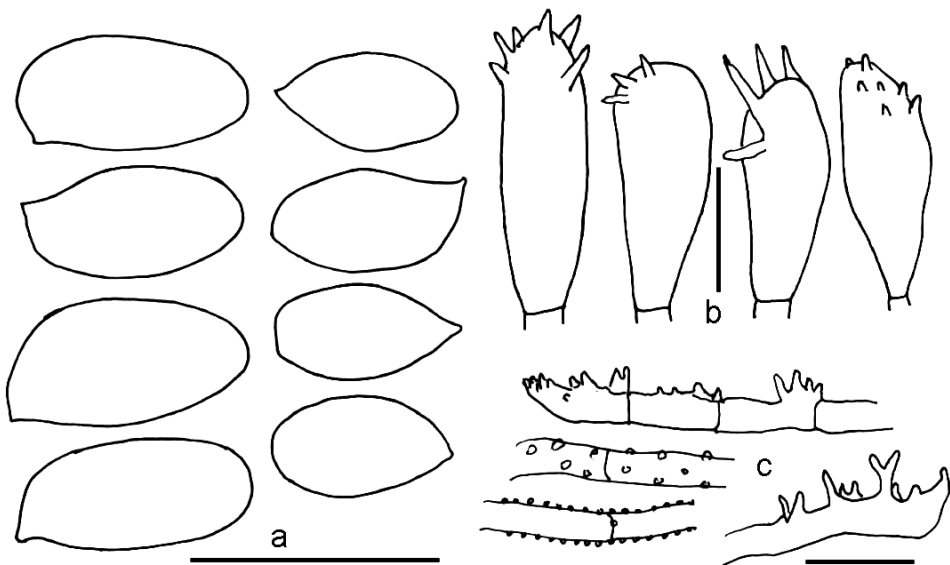
Basidiospores (6)7–9(10)  $\times$  4–5  $\mu$ m, ellipsoid, smooth, hyaline, inamyloid. Basidia 18–30  $\times$  6–8  $\mu$ m, clavate, 2- or 4-spored. Pleurocystidia absent. Cheilocystidia 18–25  $\times$  4–7  $\mu$ m, clavate with apical finger-like diverticula or appendages which are rod-shaped to claviculate. Pileipellis of mostly repent elements, with contrasting pigment incrustations, radially arranged but with some occasional ascendent hyphal ends, diverticulate, or with nodulose outgrowths forming a distinct *Rameales*-structure. Hyphae 4–4.5  $\mu$ m in diam. Lamellae trama regular. Caulocystidia not observed. Clamp connections in all tissues.

**Habitat.** Gregarious on leaves and twigs of dicotyledons.

**Specimens examined.** Guangdong Province, Chebaling National Nature Reserve, 14 July 2008 leg. H. Huang (GDGM 26434); 11 Aug. 2009 leg C.Y. Deng (GDGM 26607); 12 Aug. 2009 leg. C.Y. Deng (GDGM 26547).

**Discussion.** The holotype of *Marasmius purpureus* was revised by Singer (1973, 1975), Dennis (1951, 1961) and Pegler (1987). The published descriptions give two ranges of basidiospores and pileus size. Singer (1973, 1976) mentioned a broad, purple, obviously sulcate pileus of 18 mm, lamellae purple, basidiospores  $9.5\text{--}10 \times 4\text{--}4.5 \mu\text{m}$ , and growth on dead wood. Dennis (1961) compared material collected from Trinidad with the following characters: pileus 10–40 mm broad, deep dull lavender, smooth to weakly striate, lamellae light yellow, basidiospores  $6\text{--}8(10) \times 4\text{--}5 \mu\text{m}$ , and growth on dead leaves or wood. Pegler (1987) also mentioned features of his collection: pileus up to 19 mm broad, basidiospores  $8\text{--}9.8 \times 4\text{--}4.5 \mu\text{m}$ , and growth on dead wood. Therefore, the above-mentioned collections differ especially in macroscopic characters except for the smaller basidiospores published by Dennis (1961).

Comparing the material collected in China, specimen GDGM 26434 has a large and darker coloured pileus, while GDGM 26607 and GDGM 26547 have a slightly smaller pileus and lighter pileus colour, but the size of basidiospores,  $(6)7\text{--}9(10) \times 4\text{--}5 \mu\text{m}$ , is identical in all specimens. In the authors' opinion, the differences are based on the age of the basidiocarps, as the pileus colour of this species becomes dull and darker with age.



**Fig. 5.** *Marasmiellus purpureus*. **a** – basidiospores; **b** – cheilocystidia; **c** – pileipellis. Bars = 10 $\mu\text{m}$ .

ACKNOWLEDGEMENTS

The authors thank Vladimír Antonín (Moravian Museum, Brno, Czech Republic) for his consultation in this matter. Thanks are also to L. S. Wang, Herbarium of Cryptogams, Kunming Institute of Botany, Chinese Academy of Sciences (KUM) and T. Z. Wei, Institute of Microbiology, Chinese Academy of Science (HMAS) for allowing us access to the relevant specimens in their herbaria. This study was supported by the National Natural Science Foundation of China (No. 30870019, 30970023).

REFERENCES

- ANTONÍN V., NOORDELOOS M.E. (2010): A monograph of marasmioid and collybioid fungi in Europe. – 480 p. Eching.
- BI Z.S., ZHENG G.Y., LIANG J.Q., LI C., LI T.H., ZHENG W.L., LIAN M.Z. (1983): Taxonomic studies on *Marasmiellus* from Dinghu Mountain of China. – *Acta Mycologica Sinica* 2(1): 26–33. [in Chinese]
- BI Z.S., ZHENG G.Y., LI T.H., WANG Y.Z. (1990): Macrofungus flora of the mountainous district of north Guangdong. – 450 p. Guangzhou. [in Chinese]
- BI Z.S., ZHENG G.Y., LI T.H. (1994): Macrofungus flora of Guangdong Province. – 879 p. Guangzhou. [in Chinese].
- BI Z.S., LI T.H., ZHANG W.M., SONG B. (1997): A preliminary agaric flora of Hainan Province. – 388 p. Guangzhou. [in Chinese]
- CORNER E.J.H. (1996): The agaric genera *Marasmius*, *Chaetocalathus*, *Crinipellis*, *Heimiomyces*, *Resupinatus*, *Xerula*, and *Xerulina* in Malasia. – *Beih. Nova Hedwigia* 111: 1–164.
- CHANG S.T., MAO X.L. (1995): Hong Kong mushrooms. – 464 p. Hong Kong. [in Chinese]
- CHEN M.S., HE Y.Z., XU X.S., LO G.J. (1999): Color illustrated mushrooms of Guandauchi Forest (I). – 127 p. Taiwan [in Chinese].
- HORAK E. (1986): *Tetrapyrgos* Horak (nom. et gen. nov.) replacing *Pterospora* Métrod (1949; nom. preocc.). – *Sydowia* 39: 101–103.
- HUANG N.L. (1998). Colored illustration of macrofungi (mushrooms) of China. – 336 p. Beijing. [in Chinese]
- HUANG N.L., WU J.L. (1978): Colored illustration of fungi of Hujian. Vol. 2. – 560 p. Fuzhou. [in Chinese]
- KESSLER K., LOHWAG H. (1937): Fungi in Handel-Mazzetii. – *Symbolae Sinicae* 2: 1–79.
- KIRK M.P., CANNON P.F., MINTER D.W., STALPERS J.A. (2008): Dictionary of the fungi. 10th ed. – 771 p. Oxon.
- LI J.Z., HU X.W., PENG Y.B. (1993): Macrofungus flora of Hunan. – 418 p. Changsha. [in Chinese]
- LI T.H., BI Z.S., ZHENG G.Y. (1994): Species of *Marasmiellus* from Guangdong and Hainan Province. – *Acta Mycologica Sinica* 13(4): 255–259. [in Chinese].
- MATA J.L., PETERSEN R.H. (2003): Type studies of Neotropical *Collybia* species. – *Mycotaxon* 86: 303–316.
- MAO X.L. (1985): The resources of macrofungi from the Mt. Namjagbarwa region in Xizang (Tibet) China. – *Acta Mycologica Sinica* 4(4): 197–207. [in Chinese]
- MAO X.L. (2000): The macrofungi of China. – 719 p. Zhengzhou. [in Chinese].
- MATA J.L., PETERSEN R.H. (2003): Type studies of Neotropical *Collybia* species. – *Mycotaxon* 86: 303–316.
- MONCALVO J.M., VILGALYS R., REDHEAD S.A., JOHNSON J.E., JAMES T.Y., AIME C., HOFSTETTER V., VERDUIN S.J.W., LARSSON E., BARONI T.J., THORN R.G., JACOBSSON S., CLÉMENÇON H., MILLER Jr. O.K.

- (2002): One hundred and seventeen clades of euagarics. – *Molecular Phylogenetics and Evolution* 23: 357–400.
- MURRILL W.A. (1915): *Agariceae*. – *North American Flora* 9: 237–296.
- PEGLER D.N. (1977): A preliminary agaric flora of East Africa. – 615 p. London.
- PEGLER D.N. (1983): Agaric flora of the Lesser Antilles. – 668 p. London.
- PEGLER D.N. (1986): Agaric flora of Sri Lanka. – 519 p. London.
- REDHEAD S.A., LIU B. (1982): New species and new records *Tricholomataceae* (*Agaricales*) from China. – *Canadian Journal of Botany* 60(8): 1479–1486.
- SAWADA K. (1942): Descriptive Catalogue of Taiwan (Formosa) fungi. Vol. VII. 83: 1–159.
- SAWADA K. (1959): Descriptive Catalogue of the Taiwan Fungi. Vol. XI. Special Publication No. 8 of the College of Agriculture. – 268 p. Taipei.
- SHAO L.P., XIANG C.T. (1997): Forest mushrooms of China. – 652 p. Haerbin. [in Chinese]
- SINGER R. (1951): The *Agaricales* (mushrooms) in modern taxonomy. – *Lilloa* 22: 1–832.
- SINGER R. (1973): The genera *Marasmiellus*, *Crepidotus* and *Simocybe* in the Neotropics. – *Beih. Nova Hedwigia* 44: 1–517.
- SINGER R. (1986): The *Agaricales* in modern taxonomy. 4<sup>th</sup> ed. – 981 p. Koenigstein.
- TAKAHASHI H. (2000): Two new species of *Marasmiellus* from eastern Honshu, Japan. – *Mycoscience* 41: 467–472.
- TAKAHASHI H., DEGAWA Y. (2006): Two new *Marasmiellus* species found on the bark of living coniferous and broad-leaved trees in Japan. – *Mycoscience* 47(5): 257–262.
- TAI F.L. (1979): *Sylloge fungorum sinicorum*. – 1527 p. Beijing. [in Chinese].
- TOLGOR B. (2004): Mycodiversity in Daqinggou Nature Reserve of Inner Mongolia. – 186 p. Hohhot. [in Chinese].
- WILSON A.W., DESJARDIN D.E. (2005): Phylogenetic relationships in the gymnopoid and marasmioid fungi (Basidiomycetes, euagaric clade). – *Mycologia* 97: 667–679.
- YANG Z.L., ZANG M. (2003): Tropical affinities of higher fungi in Southern China. – *Acta Botanica Yunnanica* 25(2): 129–144.
- YING J.Z., MAO X.L., MA Q.M., ZONG L.C., WEN H.A. (1987): Illustrated handbook of Chinese medicinal mushrooms, 1<sup>st</sup> ed. – 579 p. Beijing. [in Chinese].
- ZHANG S.T., MAO X.L. (1995): Hong Kong mushrooms. – 470 p. Hong Kong. [in Chinese].