

The genus *Scutellinia* (Pyronemataceae) from China with a key to the known species of the country

ZHUANG Wen-Ying*

State Key Laboratory of Mycology, Institute of Microbiology, Chinese Academy of Sciences, Beijing 100101, China

Abstract: Recent collections and herbarium specimens of the genus *Scutellinia* from different regions of China were examined. Thirty-one species were recognized. Among them, *S. neokorfiana*, *S. oblongispora* and *S. pseudovitrea* are described as new species. The occurrence of *S. erinaceus*, *S. olivascens* (as *S. lusatae*) and *S. lusatae* in China are doubtful. Based on examinations of the related specimens, the previous Chinese records of *S. barlae*, *S. superba* and *S. vitreola* are based on mis-identifications, which should be excluded from the Chinese fungus flora. A key to the known species of the genus from the country is provided.

Key words: new species, morphology, taxonomy

中国盾盘菌属分类研究

庄文颖*

中国科学院微生物研究所真菌学国家重点实验室 北京 100101

摘要: 对我国盾盘菌属馆藏标本和近年来采集的材料进行分类学研究表明, 中国已知该属 31 种。描述了 3 个新种, 命名为柯氏盾盘菌、长孢盾盘菌和假小孢盾盘菌, 对新种与其相近种的区别进行了讨论; 根据前人的形态描述, 对 *S. erinaceus*, *S. olivascens* 和 *S. lusatae* 在中国的分布提出了质疑; 根据对相关馆藏标本的观察, 指出 *S. barlae*、*S. superba* 和 *S. vitreola* 在我国的报道系基于错误鉴定, 它们应从中国物种名录中排除。文中提供了该属中国已知种的分种检索表。

关键词: 新种, 形态学, 分类

INTRODUCTION

Scutellinia (Cooke) Lambotte is a characteristic genus among the operculate cup-fungi and widely

distributed in the world, especially north temperate. Studies of the genus in China started by Teng (1934) when *S. scutellata* [as *Patella scutellata* (L.)

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*Corresponding author. E-mail: zhuangwy@im.ac.cn

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Morgan] and *S. crinita* (Bull.) Lambotte (as *Patella fimetaria* Seaver) were first reported, and more records were subsequently added by Teng (1963), Liou & Chen (1977), Tai (1979), Zang (1983), Korf & Zhuang (1985), Cao & Moravec (1988) and Zhuang & Korf (1989). Following the world monographic treatment of *Scutellinia* by Schumacher (1990), Zhuang (1994) provided a brief taxonomic review of the genus from the country. To explore species diversity of the genus and clarify the taxonomic and nomenclatural problems of the old Chinese records, specimens filed under the generic name "*Lachnea*" on deposit in the Mycological Herbarium of the Chinese Academy of Sciences were re-examined and 3 new taxa of *Scutellinia* were discovered (Zhuang 2005a). In recent years, additional species were described based on the Chinese materials (Liu & Peng 1996; Wang 1998; Zhuang & Wang 1998; Yu *et al.* 2000; Zhuang 2005b; Zhuang & Yang 2008). In connection with the current study on Pyrenomataceae of China, more specimens of the genus have been identified, three new species are here described. Till now, thirty-one species are distributed in twenty provinces and autonomous regions and two cities of the country. Among them, *S. scutellata*, *S. subhirtella*, *S. kerguelensis* var. *microspora*, *S. pennsylvanica* and *S. pseudovitrea* are common and widespread in China. In contrast, *S. ahmadii*, *S. ahmadiopsis*, *S. beijingensis*, *S. crucipila*, *S. fujianensis*, *S. minutella*, *S. setosiopsis*, *S. setosa*, *S. sinensis* and *S. trechispora* are rare.

1 MATERIAL AND METHODS

Recently collected material and the herbarium specimens of *Scutellinia* from different regions of China were studied. Apothecia on nature substrates were rehydrated and sectioned at a thickness of 20–30µm with a freezing microtome (YD-1508A,

Yidi Medical Instrument Co.). Measurements were taken from the sections and from squash mounts in lactophenol cotton blue solution. Photographs were taken by a digital camera (Canon G5) connected with a microscope (Zeiss Axioskop 2 plus). The collections studied were deposited in the Mycological Herbarium, Chinese Academy of Sciences (HMAS) and the Cryptogamic Herbarium of the Kunming Institute of Botany, Chinese Academy of Sciences (HKAS).

2 TAXONOMY

2.1 New species

Scutellinia neokorfiana W.Y. Zhuang, sp. nov.
Fig. 1

Fungal Name: FN171540

Etymology: The specific epithet refers to the distinguished mycologist Dick Korf.

Diagnosis: Differing from *Scutellinia sinensis* in shorter hairs 85–230×13–23µm with a single rootlet; larger asci 282–343×(28–)30–36.5(–38)µm; and larger ascospores 19–24.5µm diam.

Apothecia discoid, sessile, up to 4mm in diam., with a distinct margin, hymenium surface red when fresh, margin and flanks covered with brown hairs; hairs rooting, arising from inner excipular tissue, setaceous, ventricose, with a single rootlet, thick-walled, brown to light brown below and sometimes paler at apical portion, septate, 85–230µm long, 13–23µm wide, walls ca. 5µm thick; ectal excipulum of textura angularis, 105–165µm thick, cells polygonal to nearly isodiametric, 23–65×15–46µm or up to 51µm in diam.; medullary excipulum of textura intricata, ca. 100–180µm thick, hyphae subhyaline, 3–9µm wide; subhymenium not clearly distinguishable; hymenium ca. 400–450µm thick; asci 8-spored, subcylindrical, J– in Melzer's reagent, 282–343×(28–)30–36.5(–38)µm; ascospores spherical, with

large warts on surface, eguttulate or guttules not obvious, some with a de Bary bubble, uniseriate, 19–24.5 μm in diam. (excluding spore ornamentations), warts 2–5 μm in diam. and 2–3 μm high; paraphyses filiform and enlarged at apex, 6–13 μm wide at apex and 2.5–4.5 μm below, exceeding the asci by 58–90 μm .

Holotype: China. Sichuan, Kangding, on mossy soil near stream, 25 VIII 1997, Z. Wang 2518, HMAS 72804 (previously filed under *Scutellinia barlae*).

Notes: Among the known species of the genus, *Scutellinia neokorfiana* is similar to *S. barlae* (Boud.) Maire, *S. paludicola* (Boud.) Le Gal and *S.*

sinensis M.H. Liu in spherical and ornamented ascospores, as well as short rooting hairs (Schumacher 1990; Liu & Peng 1996). The new species differs significantly from *S. barlae* in smaller apothecia (up to 4mm vs. 3–10mm in diam. when fresh), hairs brown to light brown at the lower portion and paler at apical portion instead of brownish black in color, and large-sized spore ornamentations [2–5 μm in diam. and 2–3 μm high vs. up to 1.8 μm in diam. and 0.6–1.4(–1.8) μm high]. *Scutellinia neokorfiana* is easily separated from the other two species by size of ascospores and width of asci. Its spore size is in between that of *S. paludicola* (25–28 \times 26–30 μm) and *S. sinensis* [(14.5–)16–18.5

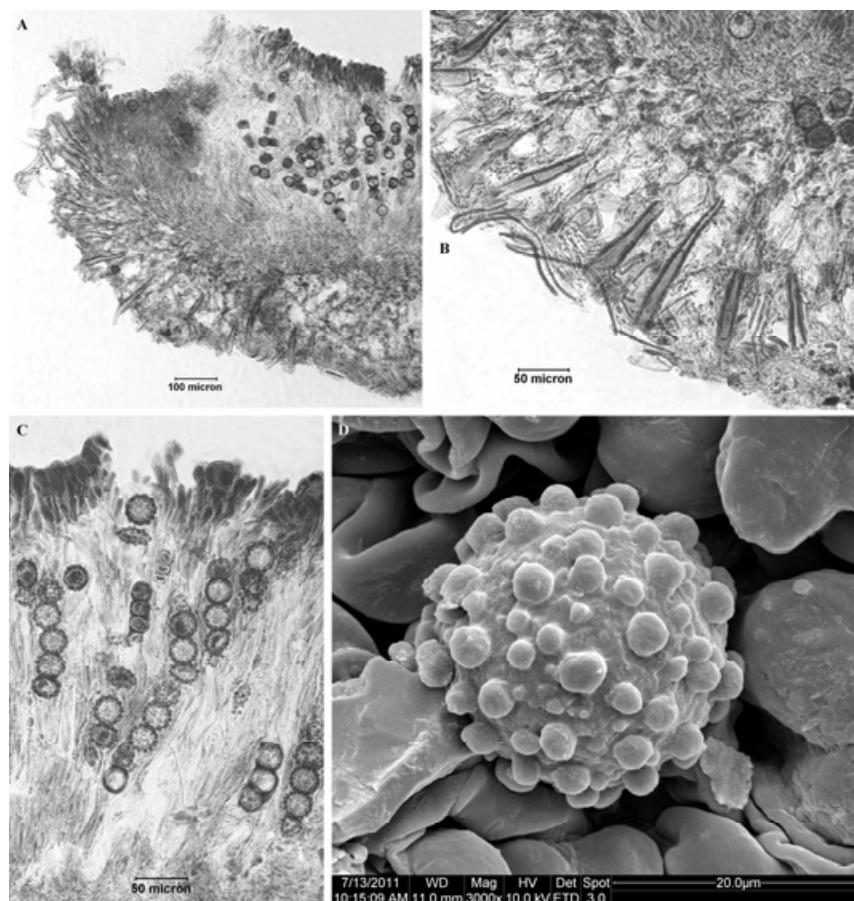


Fig. 1 *Scutellinia neokorfiana* (holotype). A: Anatomic structure of apothecium near margin; B: Portion of excipulum showing the rooting hair base; C: Portion of hymenium; D: SEM photograph of ascospore.

(–19)µm in diam.], and its spore markings are much larger than those in these two species. The Kangding material represents a new species.

HMAS 72804 was previously recorded as “*Scutellinia barlae*” in the database of “Fungal diversity of the Hengduan Mountains”.

Scutellinia oblongispora W.Y. Zhuang, sp. nov.

Fig. 2

Fungal Name: FN113022

Etymology: The specific epithet refers to the

shape of ascospores.

Diagnosis: Differing from *Scutellinia pennsylvanica* in smaller apothecia 2–10mm diam., dirty orange hymenium surface; shorter and lighter hairs; narrower and oblong-ellipsoid ascospores, and smaller spore ornamentations.

Apothecia discoid, 2–10mm diam., margin indistinct, hymenium dirty orange when fresh, receptacle covered with brown hairs; hairs rooting, arising from inner excipular tissue, setaceous, stiff,

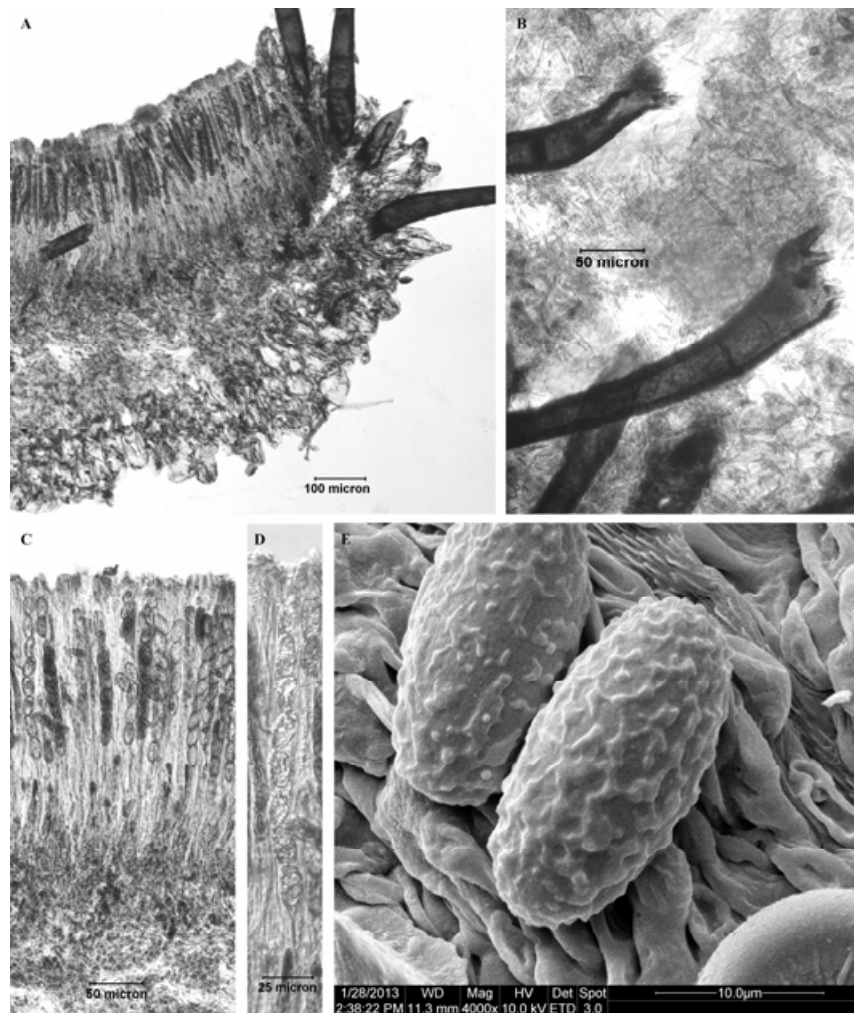


Fig. 2 *Scutellinia oblongispora* (holotype). A: Anatomic structure of apothecium at and near margin; B: Hair bases; C, D: Portion of hymenium; E: SEM photograph of ascospores.

thick-walled, brown, multiseptate, with a multifurcate rooting base, 208–1,700 μ m long and 27–54 μ m wide, walls 5–9 μ m thick; ectal excipulum of *textura angularis*, 60–320 μ m thick, cells 28–90 \times 20–73 μ m, cell walls hyaline to subhyaline; medullary excipulum of *textura intricata*, 150–320 μ m thick, hyphae 4–10 μ m wide; subhymenium not well-developed, 0–38 μ m thick; hymenium 280–320 μ m thick; asci subcylindrical, 8-spored, J– in Melzer’s reagent, 240–300 \times 13–18 μ m; ascospores oblong-ellipsoid, biguttulate to multiguttulate, 18.5–22.5 \times 10.5–12.5 μ m (excluding ornamentations), spore ornamentations consisting of irregular to angular warts and crests which are partially interconnected to form irregular and incomplete reticulum, 0.7–2 μ m wide, 0.5–0.8 μ m high; paraphyses filiform, slightly enlarged at apex, mostly 5–8 μ m at apical portion and 2.5–3.5 μ m below.

Holotype: China. Yunnan, Hekou, Daweishan, alt. 1,900m, 5 XI 1999, on rotten wood, W.Y. Zhuang & Z.H. Yu 3322, HMAS 264068.

Paratypes: China. Yunnan, Simao, Caiyanghe, alt. 1,300m, 13 X 1999, on rotten wood, W.Y. Zhuang & Z.H. Yu 3001, HMAS 264066; Yunnan, Hekou, Daweishan, alt. 1,900m, 5 XI 1999, on rotten bark, W.Y. Zhuang & Z.H. Yu 3311, HMAS 264067.

Notes: In the genus *Scutellinia*, the new species is similar to *S. cejpai* and *S. jungneri* in oblong-ellipsoid ascospore shape (Schumacher 1990). However, they have different types of spore ornamentations. *Scutellinia cejpai* has larger spores 22–25.6 \times 10.2–13.7 μ m, shorter hairs 100–550 \times 20–50 μ m, and orange to red hymenium surface. *Scutellinia jungneri* possesses smaller ascospores 16.8–19.4 \times 8.8–12.2 μ m, smaller asci 160–250 \times 11–15 μ m, shorter and narrower hairs 150–1,200 μ m

long and 15–40 μ m wide, and smaller apothecia 2–6 μ m in diameter. It is also similar to *S. pennsylvanica* in spore ornamentations, but the latter fungus has ellipsoid ascospores 16.2–22.8 \times 11.2–13.6 μ m, with higher and broader spore markings (0.5–3.2 μ m broad and 0.8–2.8 μ m high), bright red to orange-red hymenium surface, and dark brown to blackish hairs 200–2,300 \times 15–45 μ m. The Yunnan collections represent a new species.

Scutellinia pseudovitrea W.Y. Zhuang & Zhu L. Yang, sp. nov. Fig. 3

Fungal Name: FN178096

Etymology: The specific epithet refers to the similarity to *Scutellinia vitrea*.

Diagnosis: Differing from *Scutellinia vitrea* in hymenium orange, dirty orange to reddish orange when fresh, longer hairs 250–1,450 \times 22–44 μ m, smaller ascospore ornamentations which are not interconnected.

Apothecia discoid, sessile, up to 2–10mm in diam., with a distinct margin, hymenium surface orange, dirty orange to reddish orange when fresh, margin and flanks covered with brown hairs; hairs rooting, arising from inner excipular tissue, setaceous, ventricose or not, with 2–5 rootlets, thick-walled, brown to golden brown, septate, 250–1,450 μ m long, 22–44 μ m wide, walls 3–8 μ m thick; ectal excipulum of *textura angularis*, 100–180 μ m thick, cells polygonal to nearly isodiametric, 25–50 μ m in diam. or 15–61 \times 25–76 μ m; medullary excipulum of *textura intricata*, 110–420 μ m thick, hyphae subhyaline, 4–7.5 μ m wide; subhymenium 20(–25) μ m thick; hymenium 205–230 μ m thick; asci 8-spored, subcylindrical, J– in Melzer’s reagent, 203–229 \times 12.5–14.5 μ m; ascospores ellipsoid with blunt ends, with fine warts on surface, uniguttulate, biguttulate to

multiguttulate, uniseriate, 15–19.5×9.5–12.5µm (excluding ornamentations), warts evenly distributed on spore surface, 0.5–1.0µm diam. and 0.3–0.6µm high; paraphyses filiform and enlarged at apex, 4–9µm wide at apex and 2–3µm below.

Holotype: China. Yunnan, Kunming, Kunming Institute of Botany, alt. 1,900m, 3 IX 2008, on rotten fruits of *Platanus* sp., Z.L. Yang 5177, HKAS 54474.

Other specimens examined: **GANSU**, Tewo, alt. 2,300m, 12 IX 1992, on the ground covered with mosses, W.Y. Zhuang 1029, HMAS 61463. **HEILONGJIANG**, Dailing, Liangshui Forestry Farm, alt. 400m, 28 VIII 1996, on mossy wood, Z. Wang & W.Y. Zhuang 1316, HMAS 264084; Dailing, Liangshui Forestry Farm, alt. 400m, 29 VIII 1996, on rotten wood, Z. Wang & W.Y. Zhuang 1341, HMAS 264085. **HUBEI**, Shennongjia, Zhangbaohe, alt. 1,800m, 17 IX 2004, on rotten twig and wet soil, W.Y. Zhuang & C.Y. Liu 5781, HMAS 264051; Shennongjia, Longmenhe, alt. 1,800m, 18 IX 2004, W.Y. Zhuang & C.Y. Liu 5819, HMAS 264050. **JILIN**, Changbaishan, alt. 800m, 27 VII 2012, on rotten wood, T. Bau, W.Y. Zhuang *et al.* 8221, 8223, 8239, 8240, 8243, HMAS 264135, 264136, 264137, 264138, 264139; Dunhua, Dapucui, alt. 600m, 25 VII 2012, on rotten bark, T. Bau, W.Y. Zhuang *et al.* 8178, HMAS 264134; Jiaohe, alt. 400–500m, 23 VII 2012, on rotten wood, T. Bau, W.Y. Zhuang *et al.* 8066, HMAS 264131; Jiaohe, alt. 400–500m, 24 VII 2012, on rotten wood, T. Bau, W.Y. Zhuang *et al.* 8106, 8107, HMAS 264132, 264133; Jiaohe, Lafashan, alt. 500m, on rotten wood, T. Bau, W.Y. Zhuang *et al.* 8008, HMAS 264130; Changbaishan, alt. 2,000m, 11 IX 1998, on rotten wood chips, W.Y. Zhuang & S.L. Chen 2586, HMAS 78039; Dunhua, alt. 800m, 15 VIII 2000, on bark, W.Y. Zhuang, Z.H. Yu & Y.H.

Zhang 3485, 3497, HMAS 264087, 264088; Dunhua, Huangnihe, alt. 350m, 16 VIII 2000, on rotten wood, W.Y. Zhuang, Z.H. Yu & Y.H. Zhang 3532, 3534, HMAS 264089, 264090. **QINGHAI**, Huzhu, Nanmenxia, alt. 3,000m, 13 VIII 2004, on duff, W.Y. Zhuang & X.Q. Zhang 5269, HMAS 188578; Huzhu, Nanmenxia, alt. 3,000m, 13 VIII 2004, on mossy rotten wood, W.Y. Zhuang & C.Y. Liu 5301, 5306, HMAS 264091, 264092. **XINJIANG**, Jimsar, alt. 1,700m, 2 VIII 2003, on rotten wood, X.Q. Zhang, W.Y. Zhuang & Y. Nong 4671, HMAS 188586; Hemuxiang, alt. 1,100m, 5 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4689, 4690, HMAS 188587, 188588; Tianchi, alt. 1,900m, 31 VII 2003, on rotten wood, Fungal collecting team WYZ 4602, HMAS 188585; Xinyuan, Kapuhe, alt. 1,500m, 14 VIII 2003, on the ground, W.Y. Zhuang & Y. Nong 4935, HMAS 188592; Yili, Guozigou, alt. 1,800m, 11 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4888, 4893, HMAS 188593, 188594. **YUNNAN**, Pingbian, Daweishan, alt. 1,600m, 5 XI 1999, on rotten bark, W.Y. Zhuang & Z.H. Yu 3344, HMAS 264086; Xishuangbanna, 22 X 1988, R.P. Korf, M. Zang, K.K. Chen & W.Y. Zhuang 224, HMAS 72123.

Notes: This fungus is among the small-spored species of the genus (Schumacher 1990). Sizes of hairs, asci and ascospores of *Scutellinia pseudovitrea* are most similar to those of *S. vitrea*, whereas, the latter species has smaller apothecia (1–5mm diam.), brownish red hymenium surface when fresh instead of orange, dirty orange to orange red; brownish black hairs instead of brown to golden brown in color; and somewhat larger ascospore ornamentations (up to 1.5µm diam. and 1.2µm high) which are more or less interconnected instead of evenly distributed separate warts.

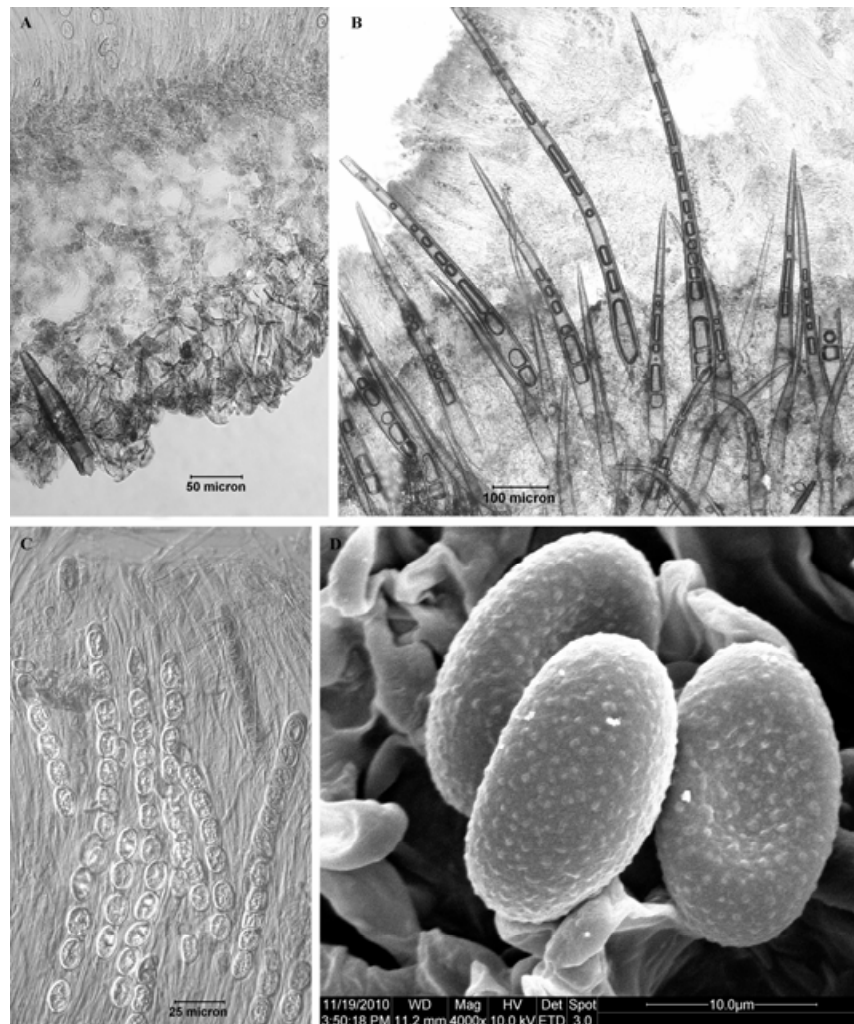


Fig. 3 *Scutellinia pseudovitreola* (holotype). A: Anatomic structure of excipulum; B: Hairs near apothecial margin; C: Portion of hymenium; D: SEM photograph of ascospores.

HMAS 61463 on mossy soil from Gansu Province was previously reported as *Scutellinia vitreola* Kullman (Zhuang 1994). The recent study revealed that the Chinese collection is different from materials of this fungus from Europe in spore ornamentations which are not “irregular and densely set angular warts to 1.5 μ m diam., with minor warts and sinuate plaques in between, towards the polar the warts are up to 1.2 μ m high, sometimes giving the impression of polar apiculi on the spores” as

described for *S. vitreola* (Schumacher 1990).

Among the large number of specimens examined, minor variations were observed in some of them, such as size of ascospore markings, whereas, the distinctions are too insignificant to treat them as distinct taxa.

2.2 Other species from China examined

Scutellinia ahmadii (E.K. Cash) S.C. Kaushal, in Kaushal, Kaushal & Rawla, *Bibliothca Mycol.* 91: 594, 1983.

Specimen examined: **YUNNAN**, Simao, alt. 1,000m, 24 IV 1957, on rotten bark, L.W. Xu & Q.Z. Wang 857, HMAS 24106.

Scutellinia ahmadiopsis W.Y. Zhuang, Fung. Divers. 18: 216, 2005.

Specimen examined: **SICHUAN**, Miyaluo, alt. 2,700m, 15 IX 1960, on duff, C.M. Wang, Y.X. Han & Q.M. Ma 1014, HMAS 30779 (holotype).

Scutellinia badioberbis (Berk. ex Cooke) Kuntze, Rev. Gen. Pl. 2: 869, 1891.

Specimens examined: **QINGHAI**, Huzhu, Nanmenxia, alt. 3,000m, on rotten wood on duff, 3 VIII 2004, W.Y. Zhuang & C.Y. Liu 5285, HMAS 264033. **SICHUAN**, Xiangcheng, Daxueshan, alt. 4,300m, on the ground, 25 VII 1998, Z. Wang 193, HMAS 75154 (filed as *Scutellinia kerguelensis*).

Notes: The Chinese material is similar to *Scutellinia badioberbis* in many aspects, especially ascospore shape, size and ornamentations. However, collections from other countries are reported having dark brown to black hairs which are wider (400–2,000×25–74µm vs. 127–1,300×20–43µm), and spore markings are somewhat higher and wider (up to 3.2µm high and 3.8µm wide vs. 0.7–1.5µm high and 1–3.5µm wide), which are here treated as infraspecific variations.

Shumacher (1990) pointed out that the South American and Japanese collections of the fungus are soil-inhabiting, which might represent a different species. The Chinese material might be similar to the Japanese ones. Further comparisons among materials from different regions of the world are needed.

Scutellinia beijingensis W.Y. Zhuang, Fung. Divers. 18: 217, 2005.

Specimen examined: **BEIJING**, Xiangshan, 31 VIII 1961, on bare soil, R.Y. Zheng & H.Z. Li,

HMAS 31073 (holotype).

Scutellinia colensoi Masee ex Le Gal, Bull. Soc. Mycol. France 83(2): 356, 1967.

Specimens examined: **BEIJING**, Baihuashan, 19 IX 1995, W.Y. Zhuang & Z. Wang 1237, 1210, 1239, 1240, on rotten wood, HMAS 70347, 70348, 70349, 71838. **HEILONGJIANG**, Dailing, Liangshui, 10 IX 1999, on rotten bark, K.Q. Pei, HMAS 76080. **HUBEI**, Wufeng, Houhe, alt. 800m, 13 IX 2004, on rotten wood, W.Y. Zhuang & C.Y. Liu 5573, 5605, HMAS 264053, 264054. **NINGXIA**, Liupanshan, Liangdianxia, alt. 1,800m, 24 VIII 1997, on rotten wood, W.Y. Zhuang & W.P. Wu 1692, 1693, HMAS 264061, 264062. **YUNNAN**, Gongshan, alt. 1,400m, 7 VIII 1982, on rotten wood, M. Zang 355, HKAS 12126 (filed as *Scutellinia scutellata*), HMAS 173272; Mengla, alt. 650m, 17 X 1999, on rotten wood, W.Y. Zhuang & Z.H. Yu 3111, HMAS 264063; 90–100km mark road between Jinghong and Mengla, alt. 850m, 18 X 1999, W.Y. Zhuang & Z.H. Yu 3127, HMAS 264064; 710km mark road between Kunming and Jinghong, alt. 1,000m, 20 X 1999, W.Y. Zhuang & Z.H. Yu 3170, HMAS 264065.

Scutellinia crinita (Bull.) Lambotte, Fl. Mycol. Belge, Suppl. 1: 301, 1887.

Specimens examined: **BEIJING**, Donglingshan, 18 VIII 1998, on soil, Z. Wang 241, HMAS 75868. **JILIN**, Changbaishan, 11 IX 1998, on mossy wood, W.Y. Zhuang & S.L. Chen 2611, HMAS 78027. **SICHUAN**, Qingchengshan, 8 VII 1983, W.Y. Zhuang 145, HMAS 45052. **YUNNAN**, Lijiang, 3 IX 1988, on wood in stream, W.Y. Zhuang 373, HMAS 61423.

Scutellinia crucipila (Cooke & W. Phillips in Cooke) J. Moravec, Česká Mykol. 38: 149, 1984.

Specimen examined: **BEIJING**, Baihuashan, 16 VI 1964, on soil, Y.C. Zong 20, HMAS 33959.

Scutellinia fujianensis J.Z. Cao & J. Moravec, Mycol. Helvet. 3(2): 184, 1988.

Specimen examined: **FUJIAN**, Wuyishan, 4 VIII 1986, on the ground in broadleaf forest, J.Z. Cao 908, HMAS 61363 (isotype).

Scutellinia hyalohirsuta W.Y. Zhuang, in Zhuang & Yang, Mycologia Montenegrina 10: 239, 2008.

Specimens examined: **QINGHAI**, Datong, alt. 3,000m, 17 VIII 2004, on mossy wood, W.Y. Zhuang & C.Y. Liu 5368, HMAS 264013. **SICHUAN**, Baiyu, alt. 3,900m, 20 VIII 2006, on duff near stream, Z.L. Yang 4845, HKAS 51656 (holotype), HMAS 97533 (isotype). **XINJIANG**, Altay Shan, alt. 1,100m, 7 VIII 2003, on rotten wood and soil, W.Y. Zhuang & Y. Nong 4794, HMAS 263995.

Notes: This species is characterized by discoid, more or less convex to somewhat saddle-shaped apothecia with pale colored hairs on receptacle surface; very short, narrow and subhyaline to light brown hairs; and ellipsoid to broadly ellipsoid and uniguttulate ascospores.

Scutellinia jilinensis Z.H. Yu & W.Y. Zhuang, in Yu, Zhuang & Chen, Mycotaxon 75: 404, 2000.

Specimens examined: **HEBEI**, Weixian, Xiaowutaishan, 8 VIII 1957, L.W. Xu, HMAS 30783. **JILIN**, Changbaishan, 10 IX 1998, on rotten wood, W.Y. Zhuang & S.L. Chen 2536, HMAS 78040 (holotype); Changbaishan, alt 800m, 27 VIII 2012, on rotten wood, T. Bau, W.Y. Zhuang, H.D. Zheng, Z.Q. Zeng, Z.X. Zhu & F. Ren 8220, HMAS 264118; Dunhua, alt. 800m, 15 VIII 2000, on rotten wood, W.Y. Zhuang, Z.H. Yu & Y.H. Zhang 3484, 3489, HMAS 264069, 264070; Jiaohe, alt. 800m, 28 VIII 1991, on wood, S.L. Chen & W.Y. Zhuang 756,

HMAS 61451 (paratype), Jiaohe, alt. 550m, 31 VIII 1991, on wet wood, W.Y. Zhuang 789, HMAS 61452 (paratype); Jiaohe, alt. 450m, 24 VII 2012, on rotten wood, T. Bau, W.Y. Zhuang *et al.* 8111, 8112, HMAS 264116, 264117. **YUNNAN**, Simao, 13 IV 1957, L.W. Xu 648, HMAS 30781.

Scutellinia kerguelensis var. *microspora* W.Y. Zhuang, Fung. Divers. 18: 220, 2005.

Specimens examined: **BEIJING**, Donglingshan, 16 IX 1998, on rotten wood, X.Q. Zhang & Z. Wang 2253, HMAS 75869. **GANSU**, Zhugqu, Shatan Forestry Station, alt. 3,100m, 4 IX 1992, on wet wood, W.Y. Zhuang 979, 980, 983, HMAS 61424, 61425, 61426 (paratypes); Zhouqu, Shatan Forestry Station, alt. 2,100–2,240m, 18 VII 1998, on rotten wood, S.L. Chen 35, HMAS 266495; Zhouqu, No. 2 Forestry Station, alt. 2,300–3,000m, 21 VII 1998, on soil and rotten wood, S.L. Chen 58, HMAS 266496; Zhouqu, No. 2 Forestry Station, alt. 2,300–3,000m, 21 VII 1998, on mossy rotten wood, S.L. Chen 67, HMAS 266497. **HEILONGJIANG**, Dailing, Liangshui Forestry Farm, alt. 400m, 29 VIII 1996, on rotten bark, W.Y. Zhuang & Z. Wang 1318, HMAS 264076. **HUBEI**, Shennongjia, Longmenhe, alt. 1,800m, 18 IX 2004, on soil, W.Y. Zhuang & C.Y. Liu 5821, HMAS 264060. **JILIN**, Changbaishan, 10 IX 1998, on rotten mossy wood, W.Y. Zhuang & S.L. Chen 2546, HMAS 78028. **INNER MONGOLIA**, Arxan, 4 IX 1992, on wet rotten wood, W.Y. Zhuang 677, HMAS 61447. **NINGXIA**, Liupanshan, Liangdianxia, alt. 1,800m, 24 VIII 1997, on rotten bark, W.Y. Zhuang & W.P. Wu 1679, HMAS 264077; Liupanshan, Liangdianxia, alt. 1,800m, 24 VIII 1997, on mossy wood, W.Y. Zhuang, H.A. Wen & S.X. Sun 1739, HMAS 264078. **QINGHAI**, Ledu, 11 IX 1959, on rotten wood, J.C. Xing & Q.M. Ma 1616, HMAS

27756. **SICHUAN**, Daocheng, 4 VII 1998, on duff, Z. Wang 30, HMAS 75939; Gonggashan, 19 VIII 1997, on rotten wood, Z. Wang 2098, HMAS 72047; Barkam, 6 IX 1997, on rotten wood, Z. Wang 2214, HMAS 74615; Jiuzhaigou, 18 IX 1992, on wet wood, W.Y. Zhuang 1046, HMAS 61427 (holotype); Miyaluo, 28 VII 1958, on charcoal associated with bryophytes, Q.L. Hu 92, HMAS 23753 (paratype) (as *Lachnea scutellata*); Miyaluo, alt. 3,000m, 19 IX 1960, on bare soil, C.M. Wang, Y.X. Han *et al.* 1157, HMAS 30777 (paratype) (as *Lachnea scutellata*); Xiangcheng, 19 VII 1998, on rotten wood, Z. Wang 150, HMAS 75167; Xiangcheng, 26 VII 1998, on rotten bark, Z. Wang 204, HMAS 75920; Xiangcheng, 9 VII 1998, on duff, Z. Wang 53, HMAS 75100; Xiangcheng, 10 VII 1998, on rotten wood, Z. Wang 71, HMAS 75105. **XINJIANG**, Yili, Guozigou, 11 VIII 2003, on mossy wood, W.Y. Zhuang & Y. Nong 4890, 4891, 4892, HMAS 188444, 188581, 188582; Yining, Qapqal, alt. 2,000m, 13 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4915, 4916, 4913, HMAS 188575, 188576, 188583. **XIZANG**, Medog, 19 VIII 1983, on trunk covered with soil, J.Y. Zhuang 28, HMAS 57697 (paratype). **YUNNAN**, Pingbian, Daweishan, alt. 1,900m, 4 XI 1999, on soil, W.Y. Zhuang & Z.H. Yu 3286, HMAS 264080; Pingbian, Daweishan, alt. 1,600m, 5 XI 1999, on duff (soil and rotten twig), W.Y. Zhuang & Z.H. Yu 3340, HMAS 264081; Xishuangbanna Botanical Garden, alt. 500m, 19 X 1999, on rotten bark, W.Y. Zhuang & Z.H. Yu 3145, HMAS 264079.

Notes: This fungus is wide-distributed in China. It is characterized by broadly ellipsoid and multiguttulate ascospores with small, very low and separate warts on surface, and relatively short hairs. Although color of hairs varies among collections examined, tenable morphological changes have not

been found. A somewhat broad concept of the taxon is therefore accepted. Further studies on DNA barcoding of the genus and sequence analysis may help to clarify whether hair color carries phylogenetic information.

Scutellinia korfiana W.Y. Zhuang, Mycotaxon 93: 99, 2005.

Specimens examined: **XINJIANG**, Burqin, Hemuxiang, alt. 1,100m, 6 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4760, 6742, HMAS 83558 (holotype), 83580 (paratype).

Scutellinia minor (Velen.) Svrček, Česká Mykol. 25: 85, 1971.

Specimens examined: **JIANGSU**, Nanjing, Baohuashan, 26 VI 1932, C.C. Cheo, HMAS 11849. **SICHUAN**, Derong, Xiangcheng, 25 VII 1998, on soil, Z. Wang 192, 194, HMAS 75150 (previously as *Scutellinia superba*), 75153 (previously as *Scutellinia barlea*). **XINJIANG**, Mt. Tomur, 1977, on rotten wood, H.A. Wen & X.L. Mao 86, HMAS 39275. **XIZANG**, Gongbo'g yamda, alt. 3,800m, 3 VIII 2004, on soil, Z.L. Yang 4280, HKAS 45659, HMAS 97535; Xigaze, 1 VIII 2012, on soil, P.J. Han 45, HMAS 188574.

Scutellinia minutella Svrček & J. Moravec, Česká Mykol. 23: 156, 1969.

Specimen examined: **SICHUAN**, Xichang, VII 1983, on soil, W.Y. Zhuang 50, HMAS 45050.

Scutellinia nigrohirtula (Svrček) Le Gal, Bull. Soc. Mycol. France 80: 23, 1964.

Specimens examined: **SICHUAN**, Derong, alt. 3,700m, 19 VII 2004, on rotten wood, Z.L. Yang 4152, HKAS 45538; Derong, 10 VII 1998, on duff covered with mosses, Z. Wang 72, HMAS 75106; Gonggashan, 20 VIII 1997, on rotten wood, Z. Wang 2106, HMAS 72051; Xiangcheng, 11 VII 1998, on

rotten wood, Z. Wang 74, 75, HMAS 75108, 75109; Xiangcheng, 16 VII 1998, on rotten wood, Z. Wang 120, 121, HMAS 75181, 75182; Xiangcheng, 16 VII 1998, on duff, Z. Wang 122, HMAS 75195; Xiangcheng, 16 VII 1998, on rotten bark, Z. Wang 114, HMAS 75197; Xiangcheng, 15 VII 1998, on duff, Z. Wang 98, HMAS 75199; Derong County, Xiagajinshan, alt. 3,700m, 19 VII 2004, on duff near stream, Z.L. Yang 4152, HKAS 45538; HMAS 97536 (sections). **XINJIANG**, Altay Shan, alt. 1,100m, 2003 VIII 7, on rotten wood, W.Y. Zhuang & Y. Nong 4785, HMAS 263996; Mt. Tomur, VII 1977, on the ground in woods, H.A. Wen & X.L. Mao 115, HMAS 39273.

Scutellinia patagonica (Rehm) gamundí, Lilloa 30: 318, 1960.

Specimens examined: **QINGHAI**, Datong, Dongxia, alt. 3,000m, 17 VIII 2004, on mossy soil and duff, W.Y. Zhuang & C.Y. Liu 5375, HMAS 264005. **YUNNAN**, Lijiang, alt. 2,900m, 2 XI 1988, on bare soil, R.P. Korf, L.S. Wang & W.Y. Zhuang 327, HMAS 61453.

Scutellinia pennsylvanica (Seaver) Denison, Mycologia 51: 619, 1959.

Specimens examined: **BEIJING**, Donglingshan, 21 VIII 1999, on rotten wood, Z. Wang 2282, HMAS 76046 (previously as *Scutellinia crinita*). **CHONGQING**, Wuxi, alt. 1,900m, 3 VIII 1994, on rotten wet wood, X.Q. Zhang 1909, HMAS 69625. **HUBEI**, Shennongjia, 30 VII 1984, on very rotten wood and soil, J.X. Tian 81, HMAS 53693; Shennongjia, 20 VII 1984, on rotten wood, J.X. Tian 161, 56465. **INNER MONGOLIA**, Arxan, alt. 1,500m, 6 VIII 1991, on rotten wood, W.Y. Zhuang 589, HMAS 61454; Arxan, alt. 1,500m, 9 VIII 1991, on rotten wood and soil, W.Y. Zhuang 611, HMAS 61455; Arxan, alt. 1,500m, 19 VIII 1991, on mossy rotten wood, W.Y. Zhuang 1068, HMAS 61462.

JILIN, Dunhua, Huangnihe, alt. 350m, 16 VIII 2000, on rotten wood, W.Y. Zhuang, Z.H. Yu & Y.H. Zhang 3519, 3535, HMAS 264074, 264075; Jiaohe, alt. 800m, 28 VIII 1991, on wet wood, W.Y. Zhuang 755, HMAS 61457; Jiaohe, 29 VIII 1991, on wet wood, W.Y. Zhuang 781, HMAS 61458. **SHAANXI**, Foping, alt. 1,300m, 26 IX 1991, on wet wood, W.Y. Zhuang 896, HMAS 61459; Taibaishan, 11 VIII 1963, on rotten wood, Q.M. Ma & Y.C. Zong 2949, HMAS 33292 (previously as *Scutellinia scutellata*); Zhenping, 15 VIII 1994, on mossy rotten wood, X.Q. Zhang, HMAS 69626. **GANSU**, Zhugqu, on rotten wood, 3 IX 1992, W.Y. Zhuang 941, HMAS 61460; Zhugqu, 4 IX 1992, on rotten bark, W.Y. Zhuang 982, HMAS 61461. **XIZANG**, Lhunze, 16 VII 1975, on mosses, M. Zang 292, HKAS 5292, HMAS 188435; Medog, 28 VIII 1983, on the ground in woods, X.L. Mao 1463, HMAS 52828. **YUNNAN**, Jizushan, 16 IX 1938, on duff, H.S. Yao 161, HMAS 17128; Baoshan, Gaoligongshan, alt. 2,100m, 22 IX 1959, on rotten wood, Q.Z. Wang 1277, HMAS 26041 (previously as *Lachea scutellata*).

Scutellinia scutellata (L.) Lambotte, Mém. Soc. Roy. Sci. Liège, Série 2 1: 299, 1887.

Specimens examined: **ANHUI**, Huangshan, 2 VIII 1957, on rotten wood, S.C. Teng 5039, HMAS 20326; Huangshan, alt. 1,300–1,700m, 27 IX 1993, on wet rotten wood, Y.R. Lin, Y. Wang, W.Y. Zhuang *et al.* 1120, HMAS 61852. **GANSU**, Zhugqu, alt. 2,400m, 3 IX 1992, on wet wood, W.Y. Zhuang 930, HMAS 61433; Zhugqu, alt. 2,430m, 3 IX 1992, on wet wood, W.Y. Zhuang 960, HMAS 61434; Zhugqu, alt. 3,100m, 4 IX 1992, on wet mossy wood, W.Y. Zhuang 975, HMAS 61435. **GUANGXI**, Lingle, Laoshan, 18 VII 1957, on rotten wood, L.W. Xu 574, HMAS 23752. **HEILONGJIANG**, Dailing, Liangshui Forestry Farm, alt 400–500m, 27 VIII 1996, on wet rotten wood, W.Y. Zhuang & A.Q. Luo

1286, HMAS 264093; Dailing, Liangshui Forestry Farm, alt 400–500m, 27 VIII 1996, on wet rotten wood, W.Y. Zhuang & Z. Wang 1287, 1288, HMAS 264094, 264095; Dailing, Liangshui Forestry Farm, alt 400m, 28 VIII 1996, on wet rotten wood, W.Y. Zhuang & Z. Wang 1298, 1301, 1302, 1304, 1305, HMAS 264096, 264097, 264098, 264099, 264100; Dailing, Liangshui Forestry Farm, alt 400m, 29 VIII 1996, on wet bark, Z. Wang & W.Y. Zhuang 1333, 1335, 1337, 1338, 1340, HMAS 264101, 264103, 264104, 264105, 264106; Dailing, Liangshui Forestry Farm, alt 400m, 29 VIII 1996, on rotten wood, W.Y. Zhuang & Z. Wang 1317, HMAS 264102; Dailing, Liangshui Forestry Farm, alt 400m, 30 VIII 1996, on wet wood, Z. Wang, W.Y. Zhuang & X.Q. Zhang 1346, HMAS 264107; Dailing, Liangshui Forestry Farm, alt 400m, 30 VIII 1996, on wet wood, Z. Wang, & W.Y. Zhuang 1350, HMAS 264108; Dailing, Liangshui Forestry Farm, alt 400m, 30 VIII 1996, on rotten bark, Z. Wang, & W.Y. Zhuang 1362, HMAS 264109; Dailing, Liangshui Forestry Farm, alt 400m, 31 VIII 1996, on rotten bark, W.Y. Zhuang & Z. Wang 1373, HMAS 264110. **HUBEI**, Wufeng, Houhe, alt. 800m, 12 IX 2004, on rotten wood, W.Y. Zhuang & C.Y. Liu 5483, HMAS 264052. **INNER MONGOLIA**, Yirshi, alt. 1,100m, 1 VIII 1991, on mossy rotten wood, W.Y. Zhuang 575, HMAS 61429; Arxan, alt. 1,210m, 14 VIII 1991, on wet mossy wood, W.Y. Zhuang 626, HMAS 61430; Arxan, alt. 1,250m, 16 VIII 1991, on mossy wet wood, Y.M. Jiang & W.Y. Zhuang 666, HMAS 61431; Arxan, alt. 1,500m, 19 VIII 1991, on mossy rotten wood, W.Y. Zhuang 689, HMAS 61432. **JILIN**, Changbaishan, 11 IX 1998, W.Y. Zhuang & S.L. Chen 2608, HMAS 78029; Changbaishan, 11 IX 1998, W.Y. Zhuang & S.L. Chen 2607, HMAS 78030; Changbaishan, alt. 750m, 10 IX 1998, on wet wood, X.L. Chen & W.Y.

Zhuang 2566, HMAS 78031; Changbaishan, alt. 1,000m, 13 IX 1998, on rotten wood, W.Y. Zhuang 2636, HMAS 78032; Changbaishan, alt. 1,100m, 26 VII 2012, on rotten wood, T. Bau, W.Y. Zhuang *et al.* 8200, 8201, 8206, 8207, 8213, 8214, HMAS 264121, 264122, 264123, 264124, 264125, 264126; Changbaishan, alt. 1,100m, 27 VII 2012, on rotten wood, T. Bau, W.Y. Zhuang *et al.* 8222, 8224, 8241, HMAS 264127, 264128, 264129; Dunhua, Huangnihe, alt. 350m, 16 VIII 2000, on mossy wood, W.Y. Zhuang, Z.H. Yu & Y.H. Zhang 3533, HMAS 264071; Huadian, 3 VII 1960, on dead bark, S.C. Teng 6177, HMAS 29548; Jiaohe, alt. 550m, 31 VIII 1991, on wet wood, W.Y. Zhuang 921, HMAS 61889; Jiaohe, alt. 450m, 24 VII 2012, on rotten wood, T. Bau, W.Y. Zhuang 8108, 8109, HMAS 264119, 264120. **NINGXIA**, Liupanshan, Liangdianxia, alt. 1,800m, 24 VIII 1997, on wet duff, H.A. Wen, S.X. Sun & W.Y. Zhuang 1684, HMAS 264111. **QINGHAI**, Datong, 1 VIII 1996, Y.L. Guo 67, HMAS 71967; Huzhu, Beishan, alt. 2,800–3,000m, 2004 VIII 15, on rotten wood, W.Y. Zhuang & C.Y. Liu 5326, HMAS 264036; Qilian, Zhamashi, alt. 3,000m, 21 VIII 2004, on mossy wood, W.Y. Zhuang & C.Y. Liu 5481, HMAS 264037; Xunhua, Tianchi, alt. 2,400m, 8 VIII 2004, on mossy wood, W.Y. Zhuang & C.Y. Liu 5226, HMAS 264038. **SHAANXI**, Taibaishan, 23 VII 1963, on wood, Q.M. Ma *et al.*, HMAS 33651. **SICHUAN**, Gonggashan, 14 VIII 1997, on rotten wood, Z. Wang 2005, HMAS 72025; Gonggashan, 16 VIII 1997, on rotten wood, Z. Wang 2038, HMAS 72030; Kangding, 27 VIII 1997, on soil, Z. Wang 2168-1, HMAS 72072. **XINJIANG**, Altay Shan, alt. 1,250m, 9 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4827, HMAS 264003; Kunes, alt. 2,170m, 16 VIII 2003, on mossy wood, W.Y. Zhuang & Y. Nong 4988, HMAS 264009;

Hemuxiang, alt. 1,100m, 5 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4717, 4688, 4715, HMAS 263999, 264010, 264011; Hemuxiang, alt. 1,100m, 6 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4758, 4761, 4763, 4759, HMAS 264000, 264001, 264002, 264012; Jimsar, alt. 1,700m, 2 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4664, HMAS 263998; Tianchi, alt. 1,900m, 31 VII 2003, on rotten wood, fungal collecting team WYZ 4612; HMAS 263997; Xinyuan, Kapuhe, alt. 1,500m, 14 VIII 2003, on mossy bark, W.Y. Zhuang & Y. Nong 4931, HMAS 188590; Xinyuan, Nalati, alt. 2,700m, 15 VIII 2003, on mossy wood, W.Y. Zhuang & Y. Nong 4955, HMAS 264008; Yili, Guozigou, alt. 1,800m, 11 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4844, 4887, HMAS 264006, 264007; Yining, Qapqal, alt. 1,200m, 13 VIII 2003, W.Y. Zhuang & Y. Nong 4917, HMAS 188591. **XIZANG**, Medog, 28 VII 1983, on the ground in forest, X.L. Mao 1463, HMAS 52828. **YUNNAN**, Xishuangbanna, 23 X 1988, on wet wood in stream, R.P. Korf, M. Zang, K.K. Chen & W.Y. Zhuang 255, HMAS 61428; Zhongdian, 3,900m, 9 IX 1985, M. Zang 10464, HKAS 14780.

Scutellinia setosa (Nees) Kuntze, Rev. Gen. Pl. 2: 869, 1891.

Specimen examined: **HEILONGJIANG**, Dailing, Liangshui Forestry Farm, alt. 400m, 27 VIII 1996, on wet rotten wood, W.Y. Zhuang & X.Q. Zhang 1285, HMAS 264073.

Notes: The name *Scutellinia setosa* was recorded repeatedly from China. Tai's record was based on a collection from Shaanxi Province on deposit in HMAS (Tai 1979). Zhuang's report of the fungus was based on Tai's record (Zhuang 1997, 2005c). Re-examination of the specimen indicated that it is not *S. setosa* but represents a different

species which was later named as *S. sinosetosa* (Zhuang & Wang 1998). Instead of having smooth-walled ascospores in *S. setosa* (Schumacher 1990), *S. sinosetosa* has fairly slender, reticulate spore ornamentations.

According to the database of "Biodiversity of the Hengduan Mountains and adjacent areas of south-central China", three collections from Xiangcheng, Sichuan Province (HMAS 75099, 75198, 85918) were listed as *S. setosa*. Re-examinations of HMAS 75099 and 85918 indicate that their spore surface is not nearly smooth but having small warts, and the correct name for the fungus is *S. subhirtella*. As to HMAS 75198, it is too young to determine the spore shape.

Up to now, the Heilongjiang collection is the only known specimen of *S. setosa* from China. This is a rare species characterized by the tiny apothecia often gregarious on nature substrate and the nearly smooth-walled ascospores.

Scutellinia setosiopsis W.Y. Zhuang, Mycotaxon 112: 38, 2010.

Specimen examined: **BEIJING**, Donglinshan, 4 IX 1999, on rotten wood, Z. Wang 320, HMAS 76074 (holotype).

Scutellinia sinensis M.H. Liu, Acta Mycol. Sinica 15: 98, 1996.

Specimen examined: **GUIZHOU**, Suiyang, alt. 1,450m, 1 VIII 1984, on wet soil in woods, M.H. Liu 0776, HMAS 70103 (isotype).

Scutellinia sinosetosa W.Y. Zhuang & Zheng Wang, Mycotaxon 69: 352, 1998.

Specimens examined: **HEBEI**, Weixian, Xiaowutaishan, 8 III 1935, X.Q. Deng 12582, HMAS 30784. **SHAANXI**, Meixian, 19 IX 1958, on rotten wood, S.J. Zhang 755, HMAS 31031

(paratype). **YUNNAN**, Lijiang, alt. 3,000m, 3 XI 1988, on wet wood, R.P. Korf, L.S. Wang & W.Y. Zhuang 370, HMAS 61437 (paratype); Xishuangbanna, alt. 600m, M. Zang, R.P. Korf, K.K. Chen & W.Y. Zhuang 300, HMAS 61436 (holotype).

Scutellinia subhirtella Svrček, Česká Mykol. 25(2): 85, 1971.

Specimens examined: **ANHUI**, Huangshan, 26 IX 1993, on the ground, Y.R. Lin, W.Y. Zhuang, Y. Wang, S.M. Yu & W.J. Wu 1088, HMAS 61851. **BEIJING**, Donglingshan, 19 VIII 1998, on duff, Z. Wang 204, HMAS 75870; Donglingshan, 16 VIII 1998, on soil, Z. Wang 2252, HMAS 75872; Donglingshan, 21 VIII 1998, on soil along stream, Z. Wang 2290, HMAS 76042. **CHONGQING**, Wuxi, alt. 1,300m, 9 VIII 1994, on rotten wood, X.Q. Zhang 1954, HMAS 69627; Wuxi, alt. 1,300m, 9 VIII 1994, on rotten wood, X.Q. Zhang 1957, HMAS 69628. **GANSU**, Wenxian, alt. 2,000m, 21 IX 1992, on wet and mossy soil, W.Y. Zhuang 1055, HMAS 61449; Zugqu, alt. 3,100m, 4 IX 1992, on mossy bark, W.Y. Zhuang 981, HMAS 61446; Zhouqu, alt. 3,100m, W.Y. Zhuang 977, HMAS 61448. **HENAN**, Luoning, 16 VI 1958, on soil, H.Y. Liu 200, HMAS 30778; Luoning, 18 VI 1958, on very rotten wood, H.Y. Liu 242, HMAS 30780 (previously as *Lachnea scutellata*). **HEILONGJIANG**, Dailing, Liangshui Forestry Farm, alt. 400m, 30 VIII 1996, Z. Wang & W.Y. Zhuang 1355, HMAS 264082; Yichun, IX 2002, on rotten wood, Y.C. Dai 3718. **HUBEI**, Wufeng, Houhe, alt. 800m, 2004 IX 12, on rotten wood, W.Y. Zhuang & C.Y. Liu 5505, 5506, HMAS 264055, 264056; Wufeng, Houhe, alt. 800m, 2004 IX 13, on rotten wood, W.Y. Zhuang & C.Y. Liu 5586, HMAS 264057; Wufeng, Houhe, alt. 800m, 12 IX 2004, on mossy leaves, W.Y. Zhuang & C.Y. Liu 5500,

HMAS 264058; Wufeng, Houhe, alt. 800m, 13 IX 2004, on rotten wood, W.Y. Zhuang & C.Y. Liu 5585, HMAS 264059. **JILIN**, Changbaishan, alt. 1,000m, 13 IX 1998, on rotten wood, S.L. Chen & W.Y. Zhuang 2632, HMAS 78024; Changbaishan, alt. 800m, 27 VII 2012, on rotten wood, T. Bau, W.Y. Zhuang *et al.* 8242, HMAS 264115. **INNER MONGOLIA**, Arxan, 8 VIII 1991, on mosses and rotten leaves, W.Y. Zhuang 600, HMAS 61443; Arxan, alt. 1,210m, 14 VIII 1991, on soil, Y.L. Guo & W.Y. Zhuang 631, HMAS 61444; Arxan, alt. 1,500m, 9 VIII 1991, W.Y. Zhuang 1069, HMAS 61450; Yirshi, alt. 1,100m, 1 VIII 1991, on rotten mossy wood, W.Y. Zhuang 576, HMAS 61441. **JILIN**, Changbaishan, alt. 750m, 11 IX 1998, on mossy wood, S.L. Chen & W.Y. Zhuang 2543, HMAS 78033; Changbaishan, alt. 1,500m, 11 IX 1998, on mossy bark, S.L. Chen & W.Y. Zhuang 2609, HMAS 78034; Changbaishan, alt. 750m, 10 IX 1998, on wet wood, S.L. Chen & W.Y. Zhuang 2556, HMAS 78035. **NINGXIA**, Liupanshan, Liangdianxia, alt. 1,800m, 24 VIII 1997, on rotten bark, W.Y. Zhuang 1722, HMAS 264083. **QINGHAI**, 22 VIII 1958, on soil, Q.M. Ma 619, HMAS 30782 (previously as *Lachnea scutellata*); Datong, 14 VIII 1996, J.Y. Zhuang 5685, HMAS 71961; Datong, alt. 3,000m, 17 VIII 2004, on mossy wood, W.Y. Zhuang & C.Y. Liu 5370, HMAS 264014; Datong, Dongxia, alt. 3,000m, 17 VIII 2004, on mossy wood, W.Y. Zhuang & C.Y. Liu 5371, 5372, HMAS 264039, 264040; Datong, Dongxia, alt. 3,000m, 17 VIII 2004, on mossy soil or duff, W.Y. Zhuang & C.Y. Liu 5374, 5381, 5398, HMAS 264041, 264042, 264043; Datong, Dongxia, alt. 3,000m, 17 VIII 2004, on soil, W.Y. Zhuang & C.Y. Liu 5399, 5401, HMAS 264044, 264046; Datong, Dongxia, alt. 3,000m, 17 VIII 2004, on mossy wood, W.Y. Zhuang & C.Y. Liu 5400, HMAS

264045; Huzhu, Beishan, alt. 2,800–3,000m, 15 VIII 2004, on soil, W.Y. Zhuang & C.Y. Liu 5320, 5321, HMAS 264047, 264048; Huzhu, Beishan, alt. 2,800–3,000m, 15 VIII 2004, on soil, W.Y. Zhuang & C.Y. Liu 5342, HMAS 264072; Menyuan, 5 VIII 1986, Y.L. Guo 55, HMAS 71968; Menyuan, alt. 2,800m, 19 VIII 2004, on mossy soil, W.Y. Zhuang & C.Y. Liu 5416, HMAS 264049; Xunhua, alt. 2,400m, 8 VIII 2004, on rotten wood, W.Y. Zhuang & C.Y. Liu 5201, HMAS 188579. **SHAANXI**, Liuba, alt. 950m, 21 IX 1991, on wet rotten wood, W.Y. Zhuang 845, HMAS 61445; Taibaishan, alt. 1,300m, 12 VII 1963, Q.M. Ma & Y.C. Zong, HMAS 33960. **SICHUAN**, Daocheng, 4 VII 1998, on duff, Z. Wang 25, HMAS 75938; Qingchengshan, 6 VII 1983, on bark, W.Y. Zhuang 121, HMAS 45051. **XINJIANG**, Beimuzhaertehe, 30 VII 1978, on rotten wood, S.X. Sun, H.A. Wen & X.L. Mao 455, HMAS 39274; Hejing, Kunes, alt. 2,170m, 16 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4999, HMAS 188595; Xinyuan, Kapuhe, alt. 1,500m, 14 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4943, HMAS 188596; Xinyuan, Narat, alt. 2,200m, 15 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4970, 4956, 4972, HMAS 188577, 188597, 188598; Yili, Guozigou, alt. 1,800m, 11 VIII 2003, on rotten wood, W.Y. Zhuang & Y. Nong 4886, HMAS 264004. **XIZANG**, Medog, 2,800m, 19 VIII 1982, on rotten wood, X.L. Mao, HMAS 52827. **YUNNAN**, Dali, alt. 2,100m, 5 XI 1988, on mossy soil, R.P. Korf, L.S. Wang & W.Y. Zhuang 403, 404, HMAS 61439, 61440; Lijiang, Yulongxueshan, alt. 3,400m, 6 VIII 1981, on rotten wood, X. Xiao & J.J. Su 149, HMAS 61474; Wuding, 1 VIII 1999, on duff, Z. Wang 2270, HMAS 75190; Wuding, 1 VIII 1999, on rotten wood, Z. Wang 2271, HMAS 75191; Xishuangbanna, 23 X 1988, on wet wood, W.Y.

Zhuang 281, HMAS 61438.

Scutellinia trechispora (Berk. & Broome) Lambotte, Fl. Mycol. Belge, Suppl. 1: 299, 1887.

Specimen examined: **HUBEI**, Wufeng, Houhe Nature Reserve, alt. 800m, 12 IX 2004, on the ground, W.Y. Zhuang & C.Y. Liu 5511, HMAS 264035.

Notes: The previous Chinese record of *Sphaerospora trechispora* (\equiv *Scutellinia trechispora*) (Teng 1963; Tai 1979) was based on mis-identifications. The spore ornamentations were described as small warts instead of conical spines with a pointed, blunt or truncate apex, and the spore size described from the Chinese material was much larger than that of the true *S. trechispora* (Schumacher 1990). The only collection found from Hubei fits well the description of the fungus from other regions of the world (Schumacher 1990).

2.3 Recorded species from China for which specimens were not examined

Scutellinia cejpui (Velen.) Svrček, Česká Mykol. 25: 83, 1971.

Known distribution: **TAIWAN**, Nantou, Meifeng (Wang 1998).

Scutellinia jungneri (P. Henn.) Clem., Bull. Torr. Bot. Club 30: 90, 1903.

Known distribution: **TAIWAN**, Pingtung (Wang 1998).

Scutellinia phymatodea S.C. Kaushal & R. Kaushal, Bibl. Mycol. 91: 594, 1983.

Known distribution: **TAIWAN**, Nantou, Meifeng (Wang 1998).

Scutellinia umbrorum (Fr.) Lambotte, Fl. Mycol. Belge, Suppl. 1: 300, 1887.

Known distribution: **TAIWAN**, Nantou, Meifeng (Wang 1998).

2.4 Previously recorded species for which distribution in China is doubtful

Scutellinia erinaceus (Schwein.) Kuntze, Rev. Gen. Pl. 2: 869, 1891.

Notes: Re-examination of the only collection of *Scutellinia erinaceus* on deposit in HMAS indicates that the correct name for the fungus is *S. subhirtella* (Zhuang 1994).

Scutellinia erinaceus was also reported from Mainling, Xizang by Zang (1983). Observation of the cited material (HKAS 5323) revealed that the correct name for the fungus is *S. kerguelensis* var. *microspora*. It was also reported by Zang (1996) from the Hengduan Mountains, unfortunately, no specimen was cited. Therefore, the distribution of *S. erinaceus* in China is doubtful.

Scutellinia lusatiae (Cooke) Kuntze, Revis. Gen. Pl. 2: 869, 1891.

=*Scutellinia olivascens* (Cooke) Kuntze, Revis. Gen. Pl. 2: 869, 1891.

Notes: According to world monographic treatment of the genus *Scutellinia* (Schumacher 1990), the correct name for *S. lusatiae* is *S. olivascens*.

Scutellinia lusatiae were reported repeatedly from China by different authors. Zhuang (1994) indicated that HMAS 27695 collected from Guangxi Province might be the specimen on which Teng's record was based (Teng 1963), however, re-examination of the specimen showed that the correct name for the fungus is *Geneosperma geneosporum* forma *guangxiense*.

The Chinese record of *S. lusatiae* was also reported from Lhunze County, Xizang on rotten leaves and small twigs among mosses (HKAS 5292) (Zang 1983). Re-examination of the collection showed that the ascospores are 17.6–18.6×

10–11.7μm which are much smaller than the typical material of *S. olivascens* (19.4–27.2×12.8–17.6μm) and possessing quite different spore ornamentations (Schumacher 1990). The correct name for this collection is *S. pennsylvanica*.

Scutellinia lusatiae from the Hengduan Mountains (Zang 1996) is based on a collection from Gongshan (HKAS 12126). My observation indicated that it is not *S. olivascens* but *S. colensoi*.

Zhao & Mao (1986) reported the distribution of *S. lusatiae* from Xinjiang in the northwestern China, and did not cite any specimens. Re-examination of a collection under this name from Xinjiang (HMAS 39273) indicated that the correct name is *S. nigrohirtula*.

It seems that the previous record of this species was possibly based on mis-identifications.

2.5 Previously recorded species which should be excluded from the Chinese fungus flora

Scutellinia barlae (Boud.) Maire, Publ. Junta Ciénsies Nat. Barcelona, Ser. Bot. 15(2): 19, 1933.

Notes: In the database "Biodiversity of the Hengduan Mountains and adjacent areas of south-central China", HMAS 72804 and 75153 was identified as "*Scutellinia barlae*". Re-examinations of these two collections indicated that the correct name for the former is *S. neokorfiana* and that of the latter is *S. minor*. Thus, *S. barlae* should be excluded from the Chinese fungus flora.

Scutellinia superba (Velen.) Le Gal, Bull. Soc. Mycol. France 80: 123, 1964.

Notes: The Chinese record of *Scutellinia superba* from Yunnan (HMAS 24106, Zhuang & Wang 1998) was later published as *S. ahmadii* (Zhuang 2005a), and the correct name for the other collection (HMAS 75150) is *S. minor*. *Scutellinia superba* should be excluded from the Chinese fungus flora.

Scutellinia vitreola Kullman, Scripta Mycol., Tartu 10: 92, 1982.

Notes: The Chinese record of *Scutellinia vitreola* was based on a single collection (HMAS

61463, Zhuang 1994) re-examination of the fungus indicates that it belongs to *S. pseudovitreola*.

2.6 A key to the known species of *Scutellinia* in China

- | | |
|---|-------------------------|
| 1. Ascospores spherical to subspherical | 1 |
| 1. Ascospores ellipsoid | 5 |
| 2. Spore ornamentations conical to spine-like with a blunt apex | <i>S. trechispora</i> |
| 2. Spore ornamentations hemispherical or warted | 3 |
| 3. Spore ornamentations 0.6–1.8–2µm wide, 0.5–0.8–1.5µm high | <i>S. minor</i> |
| 3. Spore ornamentations 2–5µm wide, 1.8–3.2µm high | 4 |
| 4. Ascospores 19–24.5µm diam. | <i>S. neokorfiana</i> |
| 4. Ascospores (14.5–)16–18.5(–19)µm diam. | <i>S. sinensis</i> |
| 5. Ascospore surface smooth or nearly so | 6 |
| 5. Ascospore surface ornamented | 7 |
| 6. Ascospores 18.5–22×10.5–13µm | <i>S. setosa</i> |
| 6. Ascospores (13–)14–17.5×7.5–9.5(–10)µm | <i>S. setosiopsis</i> |
| 7. Ascospore surface with very fine reticulum not easily detected under light microscope..... | <i>S. sinosetosa</i> |
| 7. Ascospore surface covered with obvious ornamentations | 8 |
| 8. Spore ornamentations reticulate or markings interconnected to form incomplete reticulum | 9 |
| 8. Spore ornamentations as isolated warts or partially interconnected, never reticulate | 12 |
| 9. Hairs less than 1,000µm long | 10 |
| 9. Hairs more than 1,000µm long | 11 |
| 10. Hairs yellow-brown; spore ornamentations as irregular crests and warts connected by fine stripes,
1.5–2.5(–3)µm wide and 2–3.7(–4.5)µm high | <i>S. fujianensis</i> |
| 10. Hairs brown; spore ornamentations as low warts and irregular crests which appear to be reticulate,
0.3–0.7(–1)µm wide and 0.2–0.5µm high | <i>S. korfiana</i> |
| 11. Hairs brown; ascospores 15–19×10–12.7µm, spore ornamentations connected by fine strips,
1–2.5µm wide and 1–2µm high | <i>S. jilinensis</i> |
| 11. Hairs dark brown; ascospores 17–21.7×10.5–13µm, spore ornamentations as irregular warts and
crests which are interconnected to form reticulum, 0.6–2.5(–2.8)µm wide and 0.3–1.5µm high | <i>S. pennsylvanica</i> |
| 12. Ascospores shorter than 20µm | 13 |
| 12. Ascospores longer than 20µm | 20 |
| 13. Ascospores 12–15×7.2–8µm | <i>S. minutella</i> |
| 13. Ascospores larger | 14 |
| 14. Hairs at apothecial base with 2–3 arms, asteroid | <i>S. crucipila</i> |
| 14. Hairs not asteroid | 15 |

15. Spore ornamentation as irregular warts and crests, sometimes interconnected *S. colensoi*
15. Spores ornamentations as isolated warts 16
16. Ascospores 14.2–17.5×10–12.2µm *S. beijingensis*
16. Ascospores larger 17
17. Spore ornamentations 2–4µm wide and 2–4µm high *S. phymatodea*
17. Spore ornamentations smaller 18
18. Ascospores ellipsoid to broadly ellipsoid, (17.5–)19–20×(11.5–)12.7–14µm *S. ahmadiopsis*
18. Ascospores ellipsoid to oblong ellipsoid 19
19. Hymenium orange to orange-red; ascospores ellipsoid, 15–19.5×9–12.5µm *S. pseudovitrea*
19. Hymenium yellow-orange; ascospores oblong ellipsoid, 16.8–19.4×8.8–12.2µm *S. jungneri*
20. Spore ornamentations as irregular warts, some interconnected 21
20. Spore ornamentations as regular warts, not interconnected 24
21. Spore ornamentations 1–3.5µm wide and 0.7–1.5µm high *S. badioberbis*
21. Spore ornamentations smaller 22
22. Hymenium dirty orange; ascospores oblong ellipsoid, 18.5–22.5×10.5–12.5µm *S. oblongispora*
22. Hymenium other color; ascospores ellipsoid 23
23. Hairs 100–550µm long and 20–50µm wide; ascospores 22–25.6×10.2–13.7µm *S. cejpii*
23. Hairs 215–2,000µm long and 15–48µm wide; ascospores 16–22(–23)×10–13µm *S. scutellata*
24. Spore ornamentations 0.5–2.5µm wide and 0.8–1.8µm high *S. umbrorum*
24. Spore ornamentations smaller 25
25. Hairs 190–1,200(–1,400)µm long *S. crinita*
25. Hairs shorter than 1,000µm 26
26. Hairs very short, 35–120µm long and 13–20µm wide *S. ahmadii*
26. Hairs longer 27
27. Ascospores ellipsoid, 17–23.5×10.5–14.5µm *S. subhirtella*
27. Ascospores broadly ellipsoid 28
28. Hairs nearly hyaline to pale brown especially at apex, 100–370µm long and 10–27µm wide; ascospores uniguttulate *S. hyalohirsuta*
28. Hairs brown to light brown, somewhat longer; ascospores multiguttulate 29
29. On soil; ascospores broadly ellipsoid to ovoid, 17–24×13–18.3(–19.5)µm *S. patagonica*
29. On duff or rotten wood; ascospores broadly ellipsoid 30
30. Ascospores 17.5–24.5(–26)×12–17(–18)µm, spore ornamentations 0.3–0.7µm wide and 0.2–0.3µm high *S. kerguelensis* var. *microspora*
30. Ascospores 19–26×13.5–17µm, spore ornamentations 0.3–0.9µm wide and 0.3–0.5µm long *S. nigrohirtula*

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