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Species diversity of *Lachnum* (Helotiales, Hyaloscyphaceae) from temperate China*

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Abstract: Twenty-three temperate China species of *Lachnum*, *Lachnum abnorme*, *L. angustum*, *L. brevipilosum*, *L. calosporum*, *L. calyculiforme*, *L. carneolum*, *L. ciliare*, *L. controversum*, *L. flavidulum*, *L.* cf. *fushanese*, *L. indicum*, *L. kumaonicum*, *L. lushanese*, *L. minutum*, *L. montanum*, *L.* cf. *pteridophyllum*, *L. pygmaeum*, *L. sclerotii* var. *sclerotii*, *L. sclerotii* var. *sichuanense*, *L. subpygmeaum*, *L. tenuissimum*, *L. virgineum* and *L. willisii* are reported, whose main characteristics are given in a formula of the described species, some of which are discussed below.

Key words: *Lachnum*, Species diversity, Formula of described species
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INTRODUCTION

A large number of *Lachnum* species have been reported from diverse regions of the world (Dennis, 1949; 1961; Galán and Raitviir, 1994; Haines, 1980; 1992; Haines and Dumont, 1984; Haines and Kaneko, 1984; Sharma, 1986; Singh, 1975; Spooner, 1987; Tai, 1979; Teng, 1934; 1963; Wu *et al*., 1998; Wu and Haines, 1999; Zhuang and Hyde, 2001). The earliest records of *Lachnum* in China dated back to 1934 when the Chinese mycologist Teng (1934) reported two species from Zhejiang and Yunnan Provinces. In the two eminent works, "Fungi of China" by Teng (1963) and "Sylloge Fungorum Sinicorum" by Tai (1979), four species were recorded. Recently, new taxa of the genus in tropical China were successively found (Zhuang and Wang, 1998a; 1998b; Zhuang and Hyde, 2001), whereas only a few regions of temperate China were surveyed (Zhuang, 1997; 2000; Ye and Zhuang, 2003).

China has vast territory and abundant resources in most provinces and autonomous regions which are located in the temperate zone, where temperature varies greatly from south of the Arctic Circle to north of the Tropic of Cancer, and where rich species diversity of *Lachnum* occurs.

This is only a report of *Lachnum* from limited regions of temperate China, with more species expected to be discovered in future.

MATERIALS AND METHODS

Collections of *Lachnum* and a few related genera are deposited in the Mycological Herbarium, Institute of Microbiology, Academia Sinica (HMAS) from Anhui, Beijing, Hebei, Hubei, Jiangxi, Jilin, Sichuan and Yunnan. An apothecium selected was rehydrated in water for a few minutes. Sections were made using a freezing microtome and mounted in lactophe-

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nol-cotton blue solution. Ascospore iodine reaction was determined in Melzer's reagent, only a small number of samples were pretreated in 2.5% (*w*/*V*) KOH. Twenty-three *Lachnum* species were identified, with their main characteristics being shown in the formula of the described species, including apothecia diam, colour of hymenium, length×width of hairs, size of cell in ectal excipulum, thickness of medullary excipulum and hymenium, size of asci, shape and size of ascospores, width of paraphyses and length of paraphyses exceeding the asci.

RESULTS AND DISCUSSION

Lachnum abnorme (Mont.) (Haines and Dumont, 1984; Tai, 1979; Korf and Zhuang, 1985; Wu *et al*., 1998)

1. Formula of described species

The formula of described species=0.5~4+yellow to light yellow+20~165×(2~) 2.6~5.2 (~5.5)+(3.5~) 6~12 (~20)×(2~) 4~10 (~16)+42~405+(83~) 100~150 (~208)+(56~) 80~119 (~125)×(5~) 6~9 (~10.4)+cylindric+(36~) 40~61 (~68)×(1.2~) 1.5~2 (~2.2)+1.5~2.5 (~3)+0~13.

2. Specimens examined

On bark, Chengong, Yunnan, C.C. Cheo 56, 25 VII 1938, HMAS 17043; on twig, Xuanwei, Yunnan Q.H. Wang 4, 23 VI 1938, HMAS 17044; on bark, Xishan, Kunming, Yunnan, C.C. Cheo 48, 16 VII 1938, HMAS 17045; on twig, Xishan, Kunming, Yunnan, G.Z. Jiang 221, 4 VII 1945, HMAS 17046; on bark, Xishan, Kunming, Yunnan, C.C. Cheo 38, 15 VII 1938, HMAS 17047; on twig, Xishan, Kunming, Yunnan, C.C. Cheo 12, 1 VII 1938, HMAS 17048; on bark, Xishan, Kunming, Yunnan, C.C. Cheo 19, 12 VII 1938, HMAS 17049; on bark, Xishan, Kunming, Yunnan, C.C. Cheo 35, 15 VII 1938, HMAS 17051; on duff, Xishan, Kunming, Yunnan, C.C. Cheo 13, VII 1938, HMAS 17052; on twig, Xishan, Kunming, Yunnan, W.F. Qiu, 22 VII 1942, HMAS 17053; on twig, Jiezhusi, Kunming, Yunnan, G.Z. Jiang 219, 20 VI 1945, HMAS 17055; on withered wood of a broadleaf tree, Luolin, Henan, H.Y Liu 216, 17 VI 1958, HMAS 24096; on rotten wood, Nanjing, Fujian, S.C. Teng 5888, 14 VI 1958, HMAS 24097; on withered wood of a broadleaf tree, Huayuancun, Wulingshan, Hebei, Y.Z. Wang 6219, 21 VIII 1957, HMAS 26023; on fallen twig, Nanjing, Fujian, S.C. Teng 5859, 13 VI 1958, HMAS 27666; on fallen wood, Lushan, Jiangxi, S.C. Teng, 18 VI 1959, HMAS 27669; on rotten wood, Huayuancun, Wulingshan, Hebei, K.G. Ji 161, 8 IX 1958, HMAS 27670; on living bark, Changbaishan, Jilin, alt. 1750 m, Y.C. Yang and J.R. Yuan 422, 25 VII 1960, HMAS 28103; on withered wood, Wenmiaoshan, Sichuan, alt. 800 m, Q.M. Ma, C.M. Wang and Y.X. Han 19, 13 VI 1960, HMAS 29384; on twig, Qingchengshan, Sichuan, Q.M. Ma and C.M. Wang 146, 21 VI 1960, HMAS 29385; on bark and wood, Xichang, Sichuan, alt. 2000 m, W.Y. Zhuang 37, 19 VI 1983, HMAS 45065; on rotten wood, Xichang, Sichuan, S.X. Seng 44, 19 VI 1983, HMAS 45066; on bark and wood, Xichang, Sichuan, W.Y. Zhuang 48, 21 VI 1983, HMAS 45068; on rotten bark and wood, Emeishan, Sichuan, alt. 1000 m, W.Y. Zhuang 83, 27 VI 1983, HMAS 45070; on bark and wood, Qingchengshan, Sichuan, W.Y. Zhuang 114, 6 VII 1983, HMAS 45071; on bark, Qingchengshan, Sichuan, alt. 1200 m, W.Y. Zhuang 136, 7 VII 1983, HMAS 45072; on bark, Qingchengshan, Sichuan, alt. 1000 m, W.Y. Zhuang 99, HMAS 45088; on bark of small stump and root, Qingchengshan, Sichuan, R.P. Korf 2370, 17 IX 1981, HMAS 51843; on dead stump, Xichang, Sichuan, W.Y. Zhuang 40, 19 VI 1983, HMAS 51844; on wood, Pingli, Sichuan, H.A. Wen, 20 VIII 1994, HMAS 69633; on rotten wood, Donglingshan, Beijing, Y.Q. Huang 1591, 20 VII 1996, HMAS 71787; on stump, Jiouhuashan, Anhui, X.K. Teng 9060, 29 IV 1935, HMAS 7199.

3. Discussion

This fungus is distributed widely in diverse regions of China. Compared with the British material (Dennis, 1949), the subhymenium of the Chinese material is not clearly differentiated and asci are longer [80~119 (~125) μm vs (77~) 85~96 (~105) μm]. HMAS 71787 differs from the others in being much wider [2~4 μm vs 1.5~2 (~3) μm] and having longer paraphyses exceeding the asci by 16~25 (~34) μm instead of 0~13 μm. It might represent a new variety of *L. abnorme* but the material is in too poor condition to be a type.

Lachnum angustum (Ye and Zhuang, 2003)

1. Formula of described species

The formula of described species=1~2.5+orange

to reddish orange+(64~) 102~208 (~299)×2~3 (~3.5)+8~14 (~20)×3~5 (~7)+21~430+125~145+(69~) 88~110×(4.2~) 5~5.5 (~6)+narrowly cylindric-clavate+(9~) 12~18 (~22.5)×(1.5~) 2~2.6 (~3)+1.5~3+0~16.

2. Specimens examined

On rotten bark, Gonggashan, Sichuan, alt. 200 m, Z. Wang 2046, 16 VIII 1997, HMAS 72033; on rotten bark, Kangding, Sichuan, alt. 3700 m, Z. Wang 2166, 27 VIII 1997, HMAS 72073; on twigs, Luhe, Sichuan, alt. 3600 m, 3 IX 1997, Z. Wang 2198, HMAS 74619; on rotten twigs, Luding, Sichuan Province, alt. 2580 m. Z. Wang 2096, 19 VIII 1997 HMAS75903; on an unidentified twig, Dadingzishan, Jiaohe Forest Station, Jilin Province, alt. 800 m. W.Y. Zhuang 766, HAMS 81379.

3. Discussion

This species is very similar to *L. berggrenii* Spooner (1987) in length of asci and size of ascospoers. It is different from the latter in having longer [(64~) 102~208 (~299) μm vs 60~90 μm] and narrower hairs [2~3 (3~3.5) μm vs 2.5~3.5 μm], narrower asci [(4.2~) 5~5.5 (~6) vs 7~8 μm], paraphyses exceeding the asci by 8~13 (~16) μm instead of rarely exceeding the asci.

***Lachnum brevipilosum* (Baral and Krieglst, 1985)**

1. Formula of described species

The formula of described species=0.2~0.4+orange (dry)+40~92×2~3+8~11×3~6+26~105+64~70+(38~) 42~50×(3.5~) 4~4.5+cylindric-clavate+6~8×1.5~1.8+1.8~2.2+8~11.

2. Specimen examined

On stems of *Rubus* sp., Kaiyuan, Yunnan, Y. Tsiang 722, 21 III 1934, HMAS 9246.

3. Discussion

This collection fits the description of *Dasyscyphus brevipilosum* Le Gal given by Dennis (1949) but its hairs are longer (92 μm vs 50 μm) and have no enlarged tip.

***Lachnum calosporum* (Pat. and Gaillard) (Haines and Dumont, 1984; Zhuang and Wang, 1998a)**

1. Formula of described species

The formula of described species=1~3+light yellow to yellow+28~126×3.8~5.2+5.2~12 (~20)×4~9 (~16)+104~140+78~107×(5~) 7.5~9+(5~) 7 (~10, ~11, ~13, ~14)+cylindric+(41~) 52~78 (~83)×1.5~2.5 (~2.8)+2~4+5~13.

2. Specimens examined

On rotten wood, Beijing, China, alt. 1100 m, X.Q. Zhang and A.Q. Luo 2031, 16 VII 1996, HMAS 75785; on bark, Xiaolongmen Forestry Station, Beijing, alt. 1000 m, X.Q. Zhang and A.Q. Luo 1590, 20 VII 1996, HMAS 71786.

3. Discussion

This fungus differs from *Lachnum calosporum* (Pat. and Gaill.) Haines and Dumont (1984) in having redish brown hairs instead of buff hairs, not having yellow incrustations resembling crystals at the hair tips, having smaller asci [78~107×(5.0~) 7.5~9 μm vs 100~150×10~15 μm], with (5~) 7 (~14) septate instead of 17-septate, smaller ascospores [(41~) 52~78 (~83)×1.5~2.5 (~2.8) μm vs (70~) 80~100 (~130)×(1.9~) 2.1~2.8 (~3.2) μm] and wide paraphyses (2~4 μm vs 2~3 μm).

***Lachnum calyculiforme* (Schumach.: Fr.) (Tai, 1979)**

1. Formula of described species

The formula of described species=0.2~0.8 (dry)+dark brown (dry)+48~173×3.5~4.5+48~173×3.5~4.5+8~12×6~10+42~166+83~104+56~58×3~3.5+fusoid to clavate+6~9×(1.2~) 1.5~2+3.5~5+10~17 (~21).

2. Specimen examined

On fallen twig, Changbaishan, Jilin, alt. 1700 m, Y.C. Yang *et al*. 445, 27 VII 1960, HMAS 33842.

***Lachnum carneolum* (Sacc.) (Zhuang and Hyde, 2001)**

1. Formula of described species

The formula of described species=0.2~0.4+white+42~85×(2.5~) 3~4 + 7~13×(3~) 4~11+41~145+58~74+(32~) 35~52×3~4+cylindric-clavate+(4.5~) 5~7 (~8)×(0.9~) 1.2~1.8+4~6 (~8.5)+15~24.

2. Specimens examined

On fallen leaves, Emeishan, Sichuan, W.Y. Zhuang 66, VI 1983, HMAS 45079; on twig, Donglingshan, Hebei, Y.Q. Huang, 20 VII 1996, HMAS 71788.

3. Discussion

These two collections fit the description of *L. carneolum* provided by Dennis (1949) but the former has slightly longer paraphyses exceeding the asci by 18~24 μm instead of 15 μm.

***Lachnum ciliare* (Schrad.: Fr.) (Korf and Zhuang, 1985)**

1. Formula of described species

The formula of described species=0.1~0.2 (dry) +pure white+31~75 (~110)×3~5+5~15×3.5~10+10~66 (~118)+52~78+46~77×5~7.5+(11~) 15~21×(2~) 2.5~3+long-fusiform+(11~) 15~21×(2~) 2.5~3+1.5~2.2+0~13.

2. Specimens examined

On leaves of *Quercus* sp., Liupanshan, Ningxia, alt. 1800 m, W.Y. Zhuang and W.P. Wu 1735, 24 VIII 1997, HMAS 72732; on leaf blade, Qingchengshan, R.P. Korf 2437, 19 IX 1981, HMAS 51845; on of *Quercus* sp. leaf, Donglingsi, Lushan, Jiangxi, Z. Wang and W.Y. Zhuang 1454, 17 X 1996, HMAS 81382; on leaves of *Quercus* sp., Donglingsi, Lushan, Jiangxi, Z. Wang and W.Y. Zhuang 1447, 17 X 1996, HMAS 81383.

3. Discussion

Ascus pore J+ of HMAS 1383 react in Melzer's reagent after pretreatment in 2.5% KOH.

***Lachnum controversum* (Cooke) (Ye and Zhuang, 2002)**

1. Formula of described species

The formula of described species=0.3~1.5+light yellow to white+21~101×2~3 (~3.5)+6~15×3.5~8 (~11)+12~83 (~132)+54~89+(28~) 35~55×3~4 (~4.5)+fusoid to clavate+(4~) 5~7 (~10.5)×1.2~1.8 (~2)+3~5+8~25 (~34).

2. Specimens examined

On rotten stems of grasses, Donglingshan, Beijing, alt. 1300 m, Z. Wang 1615, 6 VI 1997, HMAS 75891; on rotten stems of grasses, Donglingshan, Beijing, alt 1300 m, Z. Wang 1617, 6 VI 1997, HMAS 75892; on rotten stems of grasses, Donglingshan, Beijing, alt. 1300 m, Z. Wang 1616, 8 VI 1997, HMAS 75889; on stems of a monocotyledon, Jinggangshan, Jiangxi, alt. 800 m, W.Y. Zhuang and Z. Wang 1545, 25 X 1996, HMAS 82384; on stems of grasses, Lushan, Jiangxi, Z. Wang and W.Y. Zhuang 1445, 17 X 1996, HAMS 81385.

3. Discussion

These collections differ from the British ones (Dennis, 1949) in buff instead of pinkish hymenium, longer and narrower hairs [21~101×2~3 (~3.5) μm vs 50~60×3.5~4 μm], and shorter ascospores [(4~) 5~7×1.2~1.8 (~2) μm vs 8~10 (~11)×1.5 μm].

***Lachnum flavidulum* (Rehm) (Wu *et al*., 1998)**

1. Formula of described species

The formula of described species=0.2~0.3+brown (dry)+22~58×2~3 (~3.5)+8~10×2.5~3+12~60+47~53+32~36×3~3.6+cylindric-clavate to fusoid +6~9×1.2~1.5+1.5~2.1+8~13.

2. Specimen examined

On fern, Qingchengshan, Sichuan, R.P. Korf 2417, 19 IX 1981, HMAS 51847.

3. Discussion

This collection differs from material of Taiwan Province (Wu *et al*., 1998) in shorter hairs (58 μm vs 88 μm) and smaller asci [32~35×3~3.6 μm vs (25~) 31~41 (~48)×(2.5~) 4.7~5.7 (~7.7) μm].

***Lachnum* cf. *fushanense* (Wu and Haines, 1999)**

1. Formula of described species

The formula of described species=0.1~0.3+yellow+38~79×2~4+8~14×3~3.5+26~60+62~70+(42~) 47~55×4~5+cylindric+25~35×(0.8~) 1~1.3+1.5~2 (~3)+0.

2. Specimen examined

On fallen leaves of a dicotyledon, Taihuasi, Xishan, Kunming, Yunnan, S.J. Shen, 5 VII 1945, HMAS 17054.

3. Discussion

This collection is close to *L. fushanesis* from Taiwan Province (Wu and Haines, 1999) in size of asci and width of ascospores but differs from the latter in white instead of light reddish brown hairs tipped with ruby-red resin-like matter, with more septa (2~4 vs 0~2) and many guttules in the hairs, slightly wider asci [(42~) 47~55×4~5 μm vs (42~) 48~53 (~54)×3~4 μm], and shorter ascospores [25~35×0.8~1.3 μm vs (32~) 35~38 (~41)×0.8~1.3 μm]. It might be a new variety but the material is in too poor condition to be a type.

***Lachnum indicum* (E.K. Cash) (Haines and Dumont, 1984)**

1. Formula of described species

The formula of described species=1~3+yellow+38~64×2.5~4.5+6~8×4~5+40~158+132~145+97~110×8~10+cylindric+55~80×2~2.5+2.2~3+5~13.

2. Specimen examined

On bark and wood, Emeishan, Sichuan, alt. 1000 m, W.Y. Zhuang 82, 27 VI 1983, HMAS 45069.

3. Discussion

Compared with the description of *Lachnum indicum* given by Haines and Dumont (1984) this collection has longer ascospores [55~80×2~2.5 μm vs (35~) 40~55 (~70)×(1.8~) 2.1~2.5 (~3) μm] with more septa [5~7 (~8) vs 0~7].

***Lachnum kumaonicum* (M.P. Sharma) (Sharma, 1986)**

1. Formula of described species

The formula of described species=0.2~0.3 (dry)+yellowish pink (dry)+24~83×2.5~3.5+12~15×4~5+20~93+145~166+80~108×8~10+cylindric+63~76 (~84)×2~3+2~2.5+8~13.

2. Specimen examined

On bamboo culms, Shengnongjia, Hubei, H.Z. Li, 30 VII 1984, HMAS 54020.

3. Discussion

This collection is different from the description of *L. kumaonicum* given by Haines (1992) in shorter hairs (24~83 μm vs 50~125 μm), longer cells in the ectal excipulum (12~15 μm vs 10 μm), longer asci (80~108 μm vs 70~95 μm) and paraphyses exceeding the asci 8~13 μm instead of 25 μm.

***Lachnum lushanense* (Zhuang and Wang, 1998a)**

1. Formula of described species

The formula of described species=0.4~1.2+white+21~100×2~3+4~23×3~7+25~150+50~62+40~50×3~4.5+narrowly fusiform+10~18×1~1.5+1.5~2+3~8.

2. Specimen examined

On dead leaf sheath at stem base of an unknown grass, Lushan, Jiangxi, W.Y. Zhuang and Z. Wang 1462, 18 X 1996, HMAS 71903.

***Lachnum minutum* (Ye and Zhuang, 2003)**

1. Formula of described species

The formula of described species=0.2~0.3+white+40~81×2~2.5+8~10×2.8~7+15~40+103~116+(68~)87~97 (~107)×(7~) 8~9 (~10.5)+elongate-fusoid to subclavate+(17~) 26~35 (~38)×3~3.5+1.5~2.1+5~10.

2. Specimen examined

On leaf sheath of cogongrass, Ciping, Jiangxi Province, alt. 860 m, W.Y. Zhuang and Zheng Wang 1577, HMAS 81376.

3. Discussion

Lachnum minutum is very close to *L. sclerotii* (Haines and Dumont, 1984) in length of asci and ascospoers. It differs from the latter in wider asci [(7~)8~9 (~10.5) μm vs (6~) 7~8 (~9.4) μm], wider ascospores [3.0~3.5 (~4.0) μm vs (2~) 2.3~3 μm], wider hairs (2~2.5 μm vs 2.5~3.8 μm), narrower paraphyses (1.5~2.1 μm vs (2~) 2.3~2.9 (~3.2) μm) and substates (on leaf of sheath of cogongrass instead of on wood or bark of hardwood twigs, stem or trunks). And its hair is white, without any resinous matter.

***Lachnum montanum* (Ye and Zhuang, 2003)**

1. Formula of described species

The formula of described species=0.3~0.5+light yellow+21~52×2~3+5~12×2.5~5+13~132+105~132+60~93×5~7.5 (~8.5)+ellipsoidal-fusoid+(10~) 14~19.5×2~3 (~3.5)+1.8~2.5+21~26.

2. Specimens examined

On stem of a monocotyledons, Jinggangshan, Jiangxi Province, alt. 800 m, W.Y. Zhuang and Z. Wang 1538, 25 X 1996, HMAS 81377; on stem of a monocotyledons, Ciping, Jiangxi Province, alt. 860 m, W.Y. Zhuang and Z. Wang 1538, 25 X 1996, HMAS 81378.

3. Discussion

This species is similar to *Lachnum euterpes* Cantrell and Haines (1997) in the size of apothecia, ascospores shape and width of paraphyses, and size of ectal excipulum cells. The former differs from the latter in having no red hymenium, shorter and narrower hairs (58×2~3 vs 110×3~4.5 μm), longer asci (60~93 μm vs 50~65 μm) and substrates (on stem of other monocotyledons instead of on the leaves of palms). In addition, it is very similar to *L. lushanense* Zhuang and Wang (1998a) in length of ascospores. It differs from the latter in shorter cell of ectal excipulum (5~12 μm vs 4~23 μm), wider ascospores [2~3 (~3.5) μm vs 1~1.5 μm], larger asci [60~93×5~7.5 (~8.5) μm vs 40~50×3.5~4.5 μm], paraphyses exceeding the asci by 21~26 μm instead of 5~8 μm, and without red amorphous matter capping the hairs.

***Lachnum* cf. *pteridophyllum* (Rodway) (Spooner, 1987)**

1. Formula of described species

The formula of described species=0.3~0.5+yellow+26~53×1.8~3+6~13×2.5~6.5+10~46+51~65+40~48×3.5~4+narrowly fusiform+8~11 (~12)×(1.2~)1.5~2+1.5~2.5+5~10.

2. Specimens examined

On fern, Qingchengshan, W.Y. Zhuang 138, 7 VII 1983, HMAS 45063; on rachis of *Dicranopteris*

dischotoma (Thumb.) Bernh, Qingchengshan, Sichuan, R.P. Korf 2414, 19 IX 1981, 51846.

3. Discussion

These two collections differ from Australasian material in shorter cells in the ectal excipulum (6~13×2.5~6.5 μm vs 12~20×3.5~5 μm) without slightly thickened walls, smaller asci [40~48×3.5~4 μm vs (47~) 52~65×4.5~5.5 μm] and much shorter ascospores [8~11 (~12) μm vs (12~) 14.5~19 (~24.5) μm]. It might be a distinct variety of *L. pteridophyllus* but the material is in too poor condition to be a type.

***Lachnum pygmaeum* (Fr.) (Korf and Zhuang, 1985)**

1. Formula of described species

The formula of described species=0.6~1.2 (~3)+bright yellow to pure white+21~83×3~4.5+6~21×2.5~17+20~125 (~342)+55~78+34~53×(3~) 3.5~4 (~4.5)+subcylindric to fusoid+(5~) 6~9×1.5~2+2.5~4 (~5)+5~12 (~20).

2. Specimens examined

On root, Qingchengshan, Sichuan, alt. 1100 m, W.Y. Zhuang 120, 6 VII 1983, HMAS 45073; on living bark of root, Qingchengshan, alt. 1000 m, W.Y. Zhuang 101, 5 VII 1983, HMAS 45075; on a root, Qingchengshan, Sichuan, R.P. Korf and R.Y. Zheng 2334, 16 IX 1981, HMAS 51849; on rotten bark, Yungusi, Huangshan, Anhui, alt. 800~1000 m, Lin, Wang, Zhuang, Yu and Wu 1091, 26 IX 1993, HMAS 81386.

3. Discussion

These materials differ from the British ones (Dennis, 1949) in longer hairs (21~83×3~4.5 μm vs 20~40×4~5 μm) and smaller asci [34~53×(3~) 3.5~4 (~4.5) μm vs 60~70×5~6 μm].

Lachnum sclerotii* (A.L. Sm.) (Haines and Dumont, 1984) var. *sclerotii

1. Formula of described species

The formula of described species=0.5~2.2+buff to yellow+34~162×2.5~4+(4~) 6~15×4~11+26~208+80~125+60~89×(4~) 5~6 (~8)+fusiform+16~26 (~31)×(1.5~) 1.8~3+1.5~2.5+5~12 (~21).

2. Specimens examined

On bark, Shengnongjia, Hubei, alt. 2500 m, J.X. Tian 33, 10 VII 1984, HMAS 56470; on fallen twig, Zhenping, Shaanxi, alt. 1400 m, J.Y. Zhuang 5389, 15 VIII 1994, HMAS 69634; on fallen twig, Zhenping, Shaanxi, alt. 1500 m, X.Q. Zhuang 1982, 15 VIII 1994, HMAS 69635; on rotten wood, Ciping, Jiangxi, alt. 860 m, Z. Wang and W.Y. Zhuang 1561, 26 X 1996, HMAS 81387; on twig, Cingping, Jiangxi, alt. 860 m, Z. Wang and W.Y. Zhuang 1565, 26 X 1996, HMAS 81388.

***Lachnum sclerotii* (A.L. Sm.) (Haines and Dumont, 1984) var. *sichuanense* (Ye and Zhuang, 2003)**

1. Formula of described species

The formula of described species=0.5~2+yellow to light yellow+43~275×2.5~4+5~21×3~13+42~180+145~196+(93~) 105~135×(7~) 7.8~9.5+fusiform+18~26 (~36)×(2.6~) 3.4~4+2~3+0.

2. Specimens examined

On twigs of *Rosa* sp., Gonggashan, Sichuan Province, alt. 2920 m, Z. Wang 2112, 20 VIII 1997, HMAS 72055; on rotten twigs of *Rosa* sp., Luding, Sichuan Province, Z. Wang 2029, HMAS 75904.

3. Discussion

This fungus is very similar to *L. sclerotii* (Haines and Dumont, 1984) in size of apothecia, width of asci and size of ascospores. It differs from the latter in discoid instead of shallow cup-shaped apothecia, very refractive excipulum, snow-white and longer instead of buff to ochreous and shorter hairs, without any lump of amber-colored and resinous matter, hairs walls slightly thick to thick not thin, longer asci [93~135 μm vs (75~) 82~90 (~100) μm], paraphyses subcylindric to lanceolate, rarely exceeding the asci instead of exceeding the asci by 12 μm.

***Lachnum subpygmeaum* (Zhuang, 1998)**

1. Formula of described species

The formula of described species=1.5~3+yellow+42~144×(2~) 2.5~3.5 (~4)+8~16×2.5~10+21~500+(85~) 103~125+71~87×(3.5~) 4~5+fusiform to fusoid+7~12.5×1.5~2+(1.5~) 2~3.5+5~12.

2. Specimens examined

On fallen twig, Dadian, Taibaishan, alt. 2230 m, Q.M. Ma and S.C. Zong 2581, 20 VII 1963, HMAS 33305; on fallen twig, Pingansi, Taibaishan, alt. 2740 m, Q.M. Ma and S.C. Zong 2581, 22 VII 1963, HMAS 33306; on wood with bryophyte, Taiziping, Emeishan, Sichuan, alt. 3000 m, C.M. Wang, Q.M. Ma *et al*. 338, 10 VII 1960, HMAS 33743; on rotten wood, Dadian, Taibaishan, alt. 2300 m, 21 VII 1963, HMAS 34700; on bark, Houzishi, Shengnongjia,

Hubei, J.X. Tian 80, 30 VII 1984, HMAS 56471.

3.Discussion

The above collections differ from the Guangxi ones (Zhuang, 1998) in having yellow instead of cream hymenium, refractive ectal excipulum tissues, longer and wider hairs [42~144×(2~) 2.5~3.5 (~4.0) μm vs 38~90×2.5~3 μm], narrower asci (65~) 71~87 (~92)×(3.5~) 4~5.2 μm vs 65~81× 6.5~7 μm) and ascospores (7~11 (~13)×1.5~2 μm vs 10~13.1× 2.3~2.8 μm) and wider paraphyses [(1.5~) 2~3.5 μm vs 1.8~2 μm].

***Lachnum tenuissimum* (Quél.) (Korf and Zhuang, 1985)**

1. Formula of described species

The formula of described species=0.2~0.3+ yellow (dry)+21~66×3~3.5+6~11×5~6+5~13+55~ 67+35~41×3.5~4+narrowly fusiform to cylindric-clavate+6~9 (~10)×1~1.5 (~1.8)+3~5+16~26.

2. Specimen examined

On a grass blade, Qingchengshan, Sichuan, R.P. Korf and R.Y. Zheng 2331, 16 IX 1981, HMAS 51848.

3. Discussion

The Sichuan material is different from the British one (Dennis, 1949) in longer asci (35~41 μm vs 26~33 μm) and paraphyses exceeding the asci by 16~26 μm instead of 10 μm.

***Lachnum virgineum* (Batsch: Fr.) (Teng, 1934; Zhuang and Wang, 1998b)**

1. Formula of described species

The formula of described species=0.3~1.3+ white, ivory to yellow+21~83 (~105)×(2~) 2.5~4.5 (~5)+6~13×3~10 (~13)+12~132+42~79+(32~) 40~ 53×(3~) 3.5~5+fusoid to cylindric-clavate+5~9× 1.5~2 (~2.5)+3~5 (~6)+5~21 (~26).

2. Specimens examined

On bark, Xichang, Sichuan, alt. 2000 m, W.Y. Zhuang 38, 19 VI 1983, HMAS 45074; on bark, Qingchengshan, Sichuan, alt. 1200 m, W.Y. Zhuang 137, 7 VII 1983, HMAS 45077; on bark, Qingchengshan, Sichuan, W.Y. Zhuang 141, 7 VII 1983, HMAS 45078; in cracks of bark of living *Cryptomeria* sp., Qingchengshan, Sichuan, R.P. Korf 2363, 17 Ix 1981, HMAS 51850; on bark, Qingchengshan, Sichuan, W.Y. Zhuang 124, 6 VII 1983, HMAS 51851; on pine cone, Liupanshan, Ningxia, alt. 1800 m, W.Y. Zhuang and W.P. Wu 1650, 23 VIII 1997, HMAS 72731; on twig, Hill near Hot Spring, Anning, Yunnan, alt. 1850 m, R.P. Korf, Z. Wang and W.Y. Zhuang 415, 7 XI 1988, HMAS 81389; on twig, Hill near Hot Spring, Anning, Yunnan, alt. 1850 m, R.P. Korf, Z. Wang and W.Y. Zhuang 412, 7 XI 1988, HMAS 81390; on twig, Yungusi, Huangshan, Anhui, alt. 800~1000 m, Y.R. Ling, Y. Wang, W.Y. Zhuang, S.M. Yu and M.J. Wu 1087, HMAS 81391; on twig, Ciping, Jiangxi, alt. 860 m, Z. Wang and W.Y. Zhuang 1566, 26 X 1996, HMAS 81392; on twig, Hill near Hot Spring, Anning, Yunnan, alt. 1850 m, R.P. Korf, Z. Wang and W.Y. Zhuang 424, 7 XI 1988, HMAS 81393; on twig, Jinggangshan, Jiangxi, alt. 1300 m, Z. Wang and W.Y. Zhuang 1526, 24 X 1996, HMAS 81394; on twig, Qongzhusi, Kunming, Yunnan, alt. 2000 m, Korf, Yang, Liu and Zhuang 458, 9 XI 1988, HMAS 81395.

***Lachnum willisii* (G.W. Beaton) (Spooner, 1987; Zhuang, 1998)**

1. Formula of described species

The formula of described species=0.5~1.2+light brown+33~77×3~5.5+8~11×6~8+10~26+47~53+30~ 35×3~4+subcylindric to cylindric-clavate+5~7.5× 1.5~1.8+(2~) 3~4+6~13.

2. Specimen examined

On rotten leaves of *Juglans* sp., Donglingshan, Beijing, alt. 1200 m, Z. Wang 1603, 4 VI 1997, HMAS 75890.

3. Discussion

The Beijing collection differs from *Lachnum willisii* reported by Spooner (1987) in having smaller asci (30~35×3~4 μm vs 37~43×4.5~5 μm) and shorter ascospores [5~7.5×1.5~1.8 μm vs (5.5~) 7.5~10 (~11) μm].

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