

Studies in the Hyaloscyphaceae VI: The genus *Lachnum* (ascomycetes) of the Guayana Highlands*

by

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With 2 figures

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Abstract: Specimens of the discomycete genus *Lachnum* were collected between 1984 and 1989 in Cerro de la Neblina, Venezuela, and in northern Brazil and Guyana in the region delimited as the Guayana Highlands. *Lachnum* was the only genus of Hyaloscyphaceae identified from the material gathered by the collectors involved in this study. No previous publications have dealt with the Hyaloscyphaceae from this region, so all fourteen species included here represent new reports for the Guayana Highlands. *L. abnorme* (Mont.) Haines & Dumont, *L. brasiliense* (Mont.) Haines & Dumont, and *L. sclerotii* (A.L. Smith) Haines & Dumont on woody substrates, and *L. flavidulum* (Rehm) Haines in Korf & Zhuang, *L. pteridophyllum* (Rodw.) Spooner, and *L. fimbriifer* (Berk. & Curt.) Haines comb. nov. on ferns are common to most tropical regions. *L. albidulum* (Penz. & Sacc.) M.P. Sharma and *L. kumaonicum* (M.P. Sharma) M.P. Sharma are not rare but have not previously been reported by these names from the neotropics before. *L. patena* (Lév.) Haines & Dumont, *L. attenuatum* Haines & Dumont and *L. macrospora* (Penz. & Sacc.) Haines comb. nov. are relatively uncommon, but are now confirmed to be in the Guayana Highlands. Three previously unknown species are described. *L. haematinum* spec. nov. is a foliicolous fungus with small, narrowly fusiform ascospores and distinctive dark red-brown masses on the hairs. *L. neblinensis* spec. nov. from palm fronds has curved, cylindrical-ellipsoid ascospores and *L. stipulicolum* spec. nov. from the sheathing stipules of bamboo is similar to *Dasyscypha bambusae*, but with significantly smaller ascospores and other hymenial features. A new combination was made for *Lachnum bambusae* (Rick) comb. nov., even though it was not collected within the study area.

Introduction

Although the Guayana Highlands lie within the neotropics, the inoperculate discomycetes found there are not totally representative of that wider region. There appears to be a relatively high percentage of endemic species of these saprophytic fungi in the highlands. A few of these endemic fungi are described for the first time in the present work, and some of the more widespread tropical species are included here as long as they occur in the geographical confines of the Guayana Highlands.

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The new species are to be found at Cerro de la Neblina massif in Departamento Rio Negro in the Amazonas region of Venezuela and at Mt. Wokomung in Guyana while some of the more common species come from the lower elevations of the same regions. This study was done from specimens provided by Drs. Amy Rossman, Gray Samuels and Teresita Iturriaga. They are deposited in herbaria BPI, NY, VEN and BRG, with a few duplicates at NYS. Although the author has not personally visited the area under study, he is familiar with the inoperculate discomycetes of the western cordillera of Venezuela and Colombia.

The genus *Lachnum* is predominant among the tropical members of the family Hyaloscyphaceae. In the specimens collected for this study it was the only genus represented. Species of *Lachnum* are very common throughout the tropics and they are among the most abundant sporocarp-producing fungi during and immediately after rainy seasons. Almost all species are host-specific to some degree, and there is very little crossover between broad categories of hosts such as wood, grass, palm, fern etc. That fact will be used here to produce a practical key for identifying species.

A key to the species of *Lachnum* from the Guayana Highlands

On wood or bark of dicotyledonous plants.

Spores 60-90 μm long. *L. patena*

Spores 35-60 μm long.

Spores tapered at one end only, 7-septate at maturity.

Spores 1.5-2.0 μm wide, hairs buff. *L. abnorme*

Spores 3.0-4.2 μm wide, hairs white. *L. attenuatum*

Spores 25-32 μm long. *L. sclerotii*

On dicot leaves, spores 9-16 μm long.

Hairs white. *L. albidulum*

Hairs brown or with dark red resin. *L. haematinum*

On fern stipes.

Hairs cylindrical, yellow or with reddish resin.

Spores 5-10 μm *L. flavidulum*

Spores 11-18 \times 1-2 μm *L. pteridophyllum*

Spores 36-56 μm in length. *L. mycosporum*

Hairs tapered, white. *L. fimbriifer*

On palm, hairs yellow, spores 17-22 \times 4 μm *L. neblinensis*

On bamboo.

Spores 9.5-16 \times 1-2 μm *L. stipulicolum*

Spores 50-75 \times 1.5-2.2(-3.0) μm *L. kumaonicum*

Lachnum abnorme (Mont.) Haines & Dumont, Mycotaxon 19: 10, 1984

= *Peziza abnormis* Montagne, Ann. Sci. Nat. Bot., sér. 2, 3: 351. 1835.

= *Peziza leucophaea* Berk. & Curt., Proc. Amer. Acad. Arts 4: 128. 1860.

= *Lachnum longisporum* Hedwigia 28: 1898.

= *Erinella corticola* Masee, Bull. Misc. Inform., 1898: 115. 1898.

= *Erinella avellaneomellea* Stårback, Bih. Kongl. Svenska Vetensk.-Acad. Handl. 25 Afd. III, No. 1, 6. 1899.

= *Erinella isabellina* Stårback, Bih. Kongl. Svenska Vetensk.-Akad. Handl. 25 Afd. III, No. 1, 6. 1889.

= *Dasyscyphella schroeterianus* Rehm, Hedwigia 39: 95. 1900.

= *Erinella heterotricha* Spegazzini, Bol. Acad. Ci. 23: 511. 1919.

Apothecia occurring singly or in swarms on bark or bare wood, up to 2 or 3 mm in diam. Interior of cup pale yellow to bright orange, surrounded by white hairs at the margin which become light brown on the underside of the cup, supported on a short stipe which may be devoid of hairs and black-brown at the base. Hairs mostly $35\text{--}70 \times 2.2\text{--}3.7 \mu\text{m}$, cylindrical, thin-walled, septate, straw-colored, densely covered with minute granules up to $0.4 \mu\text{m}$ in diam. Ectal exciple of hyphae forming *textura prismatica* and oriented away from the surface at a low angle to form the hairs. Asci cylindrical $85\text{--}96 \times 7\text{--}9 \mu\text{m}$, tipped with a distinct pore plug which blues in Melzer's solution with or without KOH pretreatment. Ascospores (39-)45-57(-67) $\times 1.5\text{--}2.0 \mu\text{m}$, cylindrical above, tapered below, vermiform, usually 7-septate. Paraphyses narrow lanceolate, $2.0\text{--}3.0 \mu\text{m}$ wide at the widest point, exceeding the asci by $8\text{--}12 \mu\text{m}$ in the hymenium.

Specimens examined: Iturriaga 382 (= VEN 210531); 663 (= VEN 210567) Venezuela, Territorio Federal Amazonas, Cerro de la Neblina massif, Camp 7. elev. 1770-1850 m, on woody twig (VEN).

Discussion: This is one of the most common wood-inhabiting species of middle elevation (ca. 1000-3000 m) new and old world tropics. It is recognizable in the field with a good lens by its yellow disc and brown hairs without resing granules. Microscopically it has long, cylindrical, septate, vermiform spores with a tapered base. They are like no other in the genus *Lachnum*. See Haines and Dumont (1984) for an illustration of the species.

Lachnum albidulum (Penz. & Sacc.) M.P. Sharma, Nova Hedwigia 43: 401. 1986
Fig. 1, A-D

= *Dasyscyphus albidulus* Penz. & Sacc., Malpighia 1901, p. 220.

Apothecia formed on the underside of leathery leaves, up to 0.5 mm across, covered with long, bright white hairs, often tipped with lumps of pale yellow resin, with a light to bright yellow disc not covered by hairs even in dried specimens, with a long, hairy stipe. Hairs mostly $50\text{--}90\text{--}(120) \times 3\text{--}6 \mu\text{m}$, cylindrical or tapered to a blunt hemispherical tip $2\text{--}3 \mu\text{m}$, straight, thin-walled, septate, densely covered with colorless granules, often covered at the tip with a yellow resinous-appearing substance. Ectal exciple of elongate, thin-walled cells up to $22 \times 10 \mu\text{m}$ forming *textura prismatica*. Asci (28-)40-50 $\times 3.5\text{--}4.5 \mu\text{m}$, cylindrical with a basal crozier when young and a mi-

nute apical pore that stains blue in Melzer's solution with or without KOH pretreatment, when mature. Ascospores $10-15 \times 1.2-1.7 \mu\text{m}$, fusiform or needle-shaped, straight, sometimes with refractive inclusions. Paraphyses lanceolate with a blunt apex, $2-3 \mu\text{m}$ across at the widest point, barely surpassing the asci in the hymenium.

Specimens examined: Iturriaga 267, Venezuela, Territorio Federal Amazonas, Neblina base camp on Rio Mawarinuma, $00^{\circ}50' \text{N}$, $66^{\circ}10' \text{W}$, elev. ca. 140 m, 25-28 Nov. 1984 (VEN); Rossman 2253 & 2260, Venezuela, Territorio Federal Amazonas, Cerro de la Neblina, 6.2 km NNE of Pico Phelps (= Neblina), 1390-1515 m elev., $00^{\circ}51'45'' \text{N}$, $65^{\circ}58'52'' \text{W}$, on leaves of Rubiaceae, 22 Feb. 1985, Coll. A.Y. Rossman (BPI); Rossman 2278, as previous collection but 23 Feb. 1985, on unidentified leaves (BPI); Rossman 2325, Venezuela, Territorio Federal Amazonas, Neblina base camp on Rio Baria (= Rio Mawarinuma), 140 m elev., $00^{\circ}49'50'' \text{N}$, $66^{\circ}09'40'' \text{W}$, on leaves of Rubiaceae, 02 Mar. 1985, Col. A.Y. Rossman (NYS, BPI).

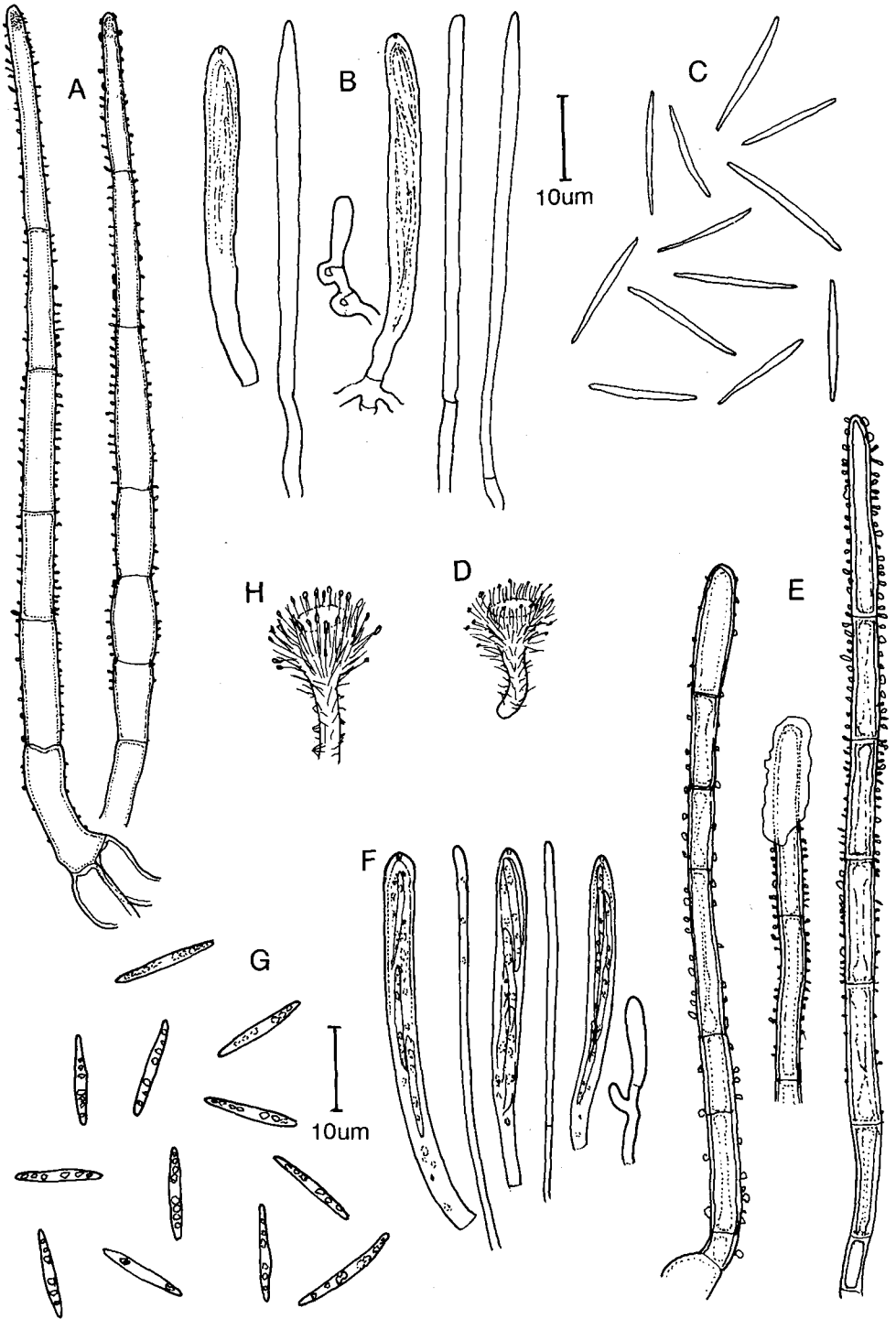
Discussion: This name has been the cause of some confusion among the many species of *Lachnum* on leaves of tropical dicots. A variety *longisporus* of *Dasyscyphus albidulus* was described by Dennis (1964) based on Venezuelan material. It was differentiated from Penzig's description of *Dasyscyphus albidulus* as having longer spores. Neither Dennis nor the present author has been able to examine Penzig's type material, but the author has examined numerous collections from South America and has found two similar foliicolous species which can be distinguished by hair characteristics. One of these, like the type of Dennis' var. *longispora*, has short cylindrical to clavate hairs while the other has long, tapered hairs with yellow resin. The author has also seen this latter species from near the type locality of *L. albidulum* in Java in Southeast Asia and assumes that it is Penzig's species even though the spores are slightly longer than stated in his description. The confusion comes because they are not conspecific. This does not affect the name of Penzig's, species which is used here for Neblina material, but it may require a new species name for Dennis' fungus which is outside the scope of the present work.

Lachnum albidulum, as interpreted here, is common on leathery dicot leaves in the low to middle elevations of the old and new world tropics. It is distinguished macroscopically by its long straight, white hairs often with yellow resin at the tips, its long stipe and yellow disc. Microscopically it can be confirmed by its long, tapered hairs, needle-shaped spores and short, lanceolate paraphyses.

***Lachnum attenuatum* Haines & Dumont, Mycotaxon 19: 35. 1984**

Apothecia on bark of deciduous trees, up to 0.7 mm diam., disc dull orange, occasionally breaking up due to infolding of the margin in old apothecia, exterior of cup covered with white hairs sometimes with ochre-colored resin near the tips, short

Fig. 1. *Lachnum albidulum* and *L. haematinum*. A-D *L. albidulum* from Rossman #2325. A. Hairs. B. Asci and paraphyses. C. Spores. D. Apothecia. E-H *L. haematinum* from holotype. E. Hairs. F. Asci and paraphyses. G. Spores. H. Apothecium.



stipe that does not darken at the base. Hairs. 50-90(-120) \times 2.8-4.2 μm , cylindrical, straight or curved, thin-walled, septate, completely hyaline, densely covered with minute granules. Ectal exciple hyaline *textura prismatica*. Asci 79-99 \times 7-12 μm , clavate with a tapered base, tipped with a distinct pore plug that turns blue in Melzer's solution. Ascospores 39-54 \times 3.0-4.2 μm , narrowly clavate, rounded above, pointed below, straight or curved but not flexuous, commonly 7-septate at maturity, filled with refractive bodies which disappear in KOH. Paraphyses clavate-filiform, 1.3-2.4 μm at the widest point near the apex.

Specimens examined: Samuels, Projecto Flora Amazonica 1030, Brazil, Amazonas, Serra Araca, west-facing slope, central serra, elev. ca. 670 m, 21 Mar. 1984 (NY).

Discussion: This is less common than the other wood inhabiting lachniums described in this paper, but it has been collected in three widespread tropical regions, Peru, India and northern Brazil. It is similar in macroscopic appearance to *L. brasiliense*, but tends to be smaller, shorter stipitate, and buff due to the resin. It is distinguished microscopically by its wide clavate, 7-septate spores. See Haines & Dumont (1984) for an illustration.

Lachnum brasiliense (Mont.) Haines & Dumont, Mycotaxon 19: 23, 1984

- = *Cenangium brasiliense* Montagne, Ann. Sci. Nat. Bot., Sér. 371. 1856.
- = *Peziza illota* Berk. & Curt. in Berk., J. Linn. Soc. Bot. 10: 368. 1868.
- = *Peziza raphidofera* Berk. & Curt. in Berk., J. Linn. Soc., Bot. 10: 368. 1868.
- = *Peziza simillima* Berk. & Br., J. Linn. Soc., Bot. 14: 105. 1873.
- = *Erinella similis* Bres., Hedwigia 35: 296. 1896.
- = *Dasyscypha gigantospora* Rehm, Hedwigia 39: 219. 1900.
- = *Erinella cognata* Pat. in Duss., Cham. Guadeloupe, p. 67. 1903.
- = *Erinella africana* H. & P. Sydow, Fungi in Wissenschaftliche Ergebnisse der Deutschen Zentral-Africa-Expedition 1907-1908, II, p. 100, 1910.

Apothecia occurring singly or in swarms on bark or wood of trees, goblet to plate-shaped, up to 2.5 mm in diam., with yellow disc exposed even in dried material, outer portion of cup covered with bright white hairs without resinous secretions, stipitate with the base of the stipe often devoid of hairs and blue-black. Hairs up to 80(-140) \times 2.5-3.5 μm , cylindrical with hemispherical tips, flexuous, septate thin-walled, completely hyaline, densely covered with minute granules. Ectal exciple composed of two layers, the inner of sparingly septate hyphae parallel to the surface, the outer of frequently septate hyphae oriented at about 45° to the surface, forming *textura prismatica*. Asci (80-)92-108(-125) \times 5-9 μm , cylindrical, without obvious basal croziers, with an obvious apical pore plug that stains blue in Melzer's solution with or without KOH pretreatment. Ascospores (27-)34-48(-59) \times 2.2-2.9(-3.5) μm , fusiform with narrow tips, bipolar in symmetry straight, slightly curved or kinked, but not vermiform, 0-1 septate, often filled with refractive matter which eventually disappears in KOH. Paraphyses filiform-clavate or very narrowly lanceolate, (1.8-)2.0-3.0(-3.4) μm wide at the widest dimension, superseding the asci by 8-15 μm in the hymenium.

Specimens examined: Rossman #1970, Venezuela, Territorio Federal Amazonas, Cerro de la Neblina, 5.1 km NE of Pico Phelps (= Neblina), 1730-1850 m elev.,

00°50'40''N, 65°58'10''W, 05 Feb 1985, Coll. A.Y. Rossman (BPI); Samuels 1222; 1278, Venezuela, Cerro de la Neblina, Summit Camp #5, valley at N base of Pica Phelps, cloud forest, 00°49'N, 66°00'W, 1000-1250 m elev., 12-13 Apr. 1984 (NY).

Discussion: Together with *L. abnorme* these are the two most common wood inhabiting Hyaloscyphaceae of the Old and New World tropics. *L. brasiliense* can be distinguished macroscopically from other species of wood and bark by its robust apothecia, yellow disc, bright white hairs without resin deposits and blue-black stipe base. Microscopically it is distinguished by its large, straight or kinked, 0-1 septate, fusiform spores. It is most common under 1500 m. See Haines and Dumont (1984) for an illustration of this species.

***Lachnum fimbriifer* (Berk. & Curt.) Haines comb. nov.**

= *Peziza (Dasyscypha) fimbriifer* Berk. & Curt., J. Linn. Soc. Bot. 10: 377. 1868.

= *Dasyscyphus fimbriifer* (Berk. & Curt., Sacc., Syll. Fung. 8: 452. 1889.

= *Atractobolus fimbriifer* (Berk. & Curt.) O. Kuntze, Revis. Gen., Pl. 3: 445. 1898.

Apothecia on rachis of large tropical ferns, funnel or goblet shaped, up to 0.6 mm diam., stipitate, covered with long, white hairs without resin masses that point upward over the cream-colored disc in dry specimens. Hairs long and tapered near the margin, mostly $75-200 \times 4-5 \mu\text{m}$, shorter, mostly $30-75 \times 4-5 \mu\text{m}$ below, hyaline, septate, thin-walled, densely covered with minute, rod-shaped granules. Ectal ex-ciple of hyaline *textura porrecta*.

Asci $60-85 \times 6-8 \mu\text{m}$, with conspicuous pore plug that stains blue in Melzer's solution. Spores $(13-15-30(-33) \times 2.0-3.0(-3.7) \mu\text{m}$, fusiform with blunt to pointed tips, nearly symmetrical, usually non-septate, rarely 1- or 3-septate, straight or slightly curved. Paraphyses filiform, $1.5-2.0 \mu\text{m}$, superseding the asci by $5-10 \mu\text{m}$.

Specimens examined: Samuels 1387, Venezuela, Cerro de la Neblina, summit camp #6, ridge at Venezuela/Brazil divide, ca. 35 km W of Pico Zoloaga, 00°54'N, 65°15'W, ca. 2000 m elev., 15, 16 Apr. 1984 (NY); (VEN).

Discussion: The Neblina collection consists of only a few apothecia, but sufficient to notice that the spore tips are more acute than those of the Venezuelan specimen figured previously by the author (Haines 1980). The holotype at K and the isotype at FH contain only a few immature or damaged apothecia, and the examination made earlier by the author did not reveal spores. The pointed and rounded spore tips on otherwise identical fungi are treated for the time being as morphological variants within one species.

***Lachnum flavidulum* (Rehm) Haines in Korf & Zhuang, Mycotaxon 22: 501. 1985**

= *Dasyscyphus flavidulus* Rehm, Ann. Mycol. 7: 542. 1909.

= *Dasyscyphus varians* Rehm, Hedwigia 39: 94. 1900. non *Lachnum varians* Saut.) Rehm, Rabenh. Kryptogamenfl. I, 3: 869.

= *Erinella citrina* P. Henn., Hedwigia 36: 233. 1897. non *Lachnum citrinum* Vel., Monogr. Discom. Bohem I, p. 246, 1932.

= *Lachnum gleicheniae* Cash, Mycologia 30: 105. 1938.

Apothecia on petioles of large tropical ferns mostly of the family Cyatheaceae, up to 0.6 mm across, goblet or funnel-shaped, stipitate, occasionally with two or more apothecia from a branched stipe, completely covered with short, pale buff to lemon yellow hairs, usually with amber to ruby red, water soluble resin lumps at the tips, ochre-colored disc usually obscured by the hairs in dried material. Hairs mostly $25-70 \times 2.8-5.0 \mu\text{m}$, cylindrical with a hemispherical tip and slightly narrowed base, pale straw-yellow by transmitted light, often coated with refractive, yellow resinous matter which does not dissolve in 3% KOH, septate, thin-walled, covered with minute rod-shaped particles. Ectal exciple thin to thick-walled, hyaline, short-celled, *textura prismatica*. Asci $40-53 \times 3.8-5.1 \mu\text{m}$, cylindrical with a tapered base and hemispherical apex with a minute pore plug that turns blue in Melzer's solution with or without KOH pretreatment, croziers not observed. Ascospores $6-11 \times 1.6-2.2 \mu\text{m}$, elliptical with rounded tips, slightly narrower in the basal portion, non-septate, often with two conspicuous, refractive inclusions. Paraphyses narrowly lanceolate or cylindrical with a tapered apex, $1.5-2.6 \mu\text{m}$ wide at the widest portion, barely superseding the asci in the hymenium.

Specimens examined: Iturriaga # 380 (-VEN 210543), Venezuela, Territorio Federal Amazonas, Cerro de la Neblina massif. Camp 7, 1770-1850 m elev., 29 Nov. - 1 Dec. 1984. (VEN); Rossman 1906, Venezuela, Territorio Federal Amazonas, Cerro de la Neblina, 5.1 km NE Pico Phelps (= Neblina), 1730-1850 m elev., $00^{\circ}50'40''\text{N}$, $65^{\circ}58'10''\text{W}$, 05 Feb. 1985 (BPI).

Discussion: This is the most common species of Hyaloscyphaceae growing on large tropical ferns. It is frequently collected between 600 and 2000 m elevation, but it may prove to be throughout its host's range. Macroscopically, it can be identified only as one of a group of related fern-inhabiting species that are funnel-shaped, yellow, and with dark red, water-soluble, resin lumps. The color can vary considerably with age as the pigment which makes the hairs yellow to begin with concentrates into dark red lumps and leaves the hairs white. Microscopically, it is readily identifiable to species by its distinctive small, elliptical spores. It is very similar to *Lachnum pteridophyllum* except that the latter has narrow, fusiform spores. See Haines (1980) for illustration under *Dasyascyphus varians*.

***Lachnum haematinum* Haines spec. nov.**

Fig. 1, E-H

Apothecia ad folia dicotyledonae tropica, usque ad 0.8 mm lata, cyathoida, stipitata et pilis vestitum. Pili plerumque $60-120 \times 4-5 \mu\text{m}$, cylindrici vel leniter attenuati, rigida, tenuitunicati, crassegranulati et rubro-brunnea, resinosa massula capitata. Asci poro on Melzero caerulescente. Ascosporae $9.0-13.5 \times 0.9-1.3 \mu\text{m}$, anguste fusiformae, non-septatae. Paraphyses filiforme vel anguste lanceolati, asci subaequans.

Type: G.J. Samuels # 6456, B.M. Broom, G. Bacchus, Guyana, Mt. Wokomung, Wokomung Base Camp, ca. 8 hr walk NE of Kopinang Village, in tall wet forest dominated by Euphorbiaceae, $05^{\circ}05'\text{N}$, $59^{\circ}50'\text{W}$, 1070 m elev., Jun.-Jul. 1989, on leaves of Leguminosae. Holotype (NYS); isotypes (BRG); (NY).

Apothecia occurring on coriaceous leaves of Leguminosae, goblet-shaped, up to 0.8 mm diam., stipitate, up to 1.2 mm high, covered with hairs that have a water soluble

reddish-brown pigment that may color the whole hair or concentrate at the hair tips in blood-red masses leaving the remainder of the hair pinkish-white, disc buff-yellow, covered by margin of cup when dry. Hairs mostly $60-120 \times 4-5 \mu\text{m}$, cylindrical or slightly tapered to a hemispherical tip ca. $3 \mu\text{m}$ across, septate, thin-walled but straight and rigid, densely covered with relatively coarse, slightly elongate granules up to $1.0 \times 1.5 \mu\text{m}$, hyaline to buff in aqueous mounting media. Ectal exciple hyaline to buff *textura oblita* blending to thick-walled *textura prismatica* near the margin of the cup. Asci $35-45 \times 2.5-4.0 \mu\text{m}$, cylindrical, with a small but distinct pore plug which turns blue in Melzer's solution. Ascospores $9-13.5 \times 0.9-1.3 \mu\text{m}$, narrowly fusiform or needle-shaped with sharp tips, symmetrical about both the median and longitudinal axes, straight, non-septate. Paraphyses filiform to narrowly lanceolate $1-2 \mu\text{m}$ wide, equal to or superseding the asci by no more than $5 \mu\text{m}$.

Discussion: The name for this species derives from the appearance of the resin-like matter on the hairs which looks like dried blood in dry specimens. Of the many species of *Lachnum* growing on leaves, *L. haematinum* is distinguished by resin of this color, narrowly fusiform spores, and coarse granulations on the hairs.

Lachnum kumaonicum (Sharma) Sharma, Sydowia, Ann. Mycol. Ser. II, 33: 289. 1980

= *Dasyscyphus kumaonicus* Sharma in Sharma & Rawla, Nova Hedw. 42: 82, 1986.

Apothecia occurring on decaying bamboo culms, up to 1 mm in diam., goblet-shaped, with a stout stipe, disc cream or buff, covered externally with mousegrey hairs usually tipped with clear or yellow, water-soluble resin masses, fading to almost white with age. Hairs $50-125 \times 2.5-3.0 \mu\text{m}$, cylindrical with slightly narrowed or hemispherical tips, straight or curved, septate, slightly thick-walled, densely covered with small granules, buff to cinereous, sometimes turning green in KOH. Ectal exciple irregular, hyaline, thin- to thick-walled *textura prismatica* composed of cells ca. $5 \times 10 \mu\text{m}$, overlaying a thicker layer of narrow, thin-walled, parallel hyphae. Asci $70-95 \times 6-10 \mu\text{m}$, overlaying a thicker layer of narrow, thin-walled, parallel hyphae. Asci $70-95 \times 6-10 \mu\text{m}$, cylindrical with a narrowed base and conical to hemispherical tip with a pore plug which turns blue in Melzer's solution, no croziers observed. Ascospores $57-75 \times 1.5-2.2(-3.0) \mu\text{m}$, cylindrical with rounded apex and tapered base, curved or kinked especially in the apical portion, 7-septate at maturity, sometimes packed with guttules and appearing to have more septa. Paraphyses very narrowly lanceolate or filiform with a pointed apex, $1.5-2.2(-3.0) \mu\text{m}$ at the widest point, exceeding the asci by up to $25 \mu\text{m}$.

Specimens examined: Samuels 6578, Guyana, Mt. Wokomung, at base of exposed rock wall of main peak, $05^{\circ}05' \text{N}$, $59^{\circ}50' \text{W}$, 1540-1570 m elev., 11 Jul. 1989 (NY).

Discussion: This species, although described slightly more than a decade ago, is one of the common discomycetes on bamboo. It has been collected in India, Colombia, Venezuela, China and the Philippines. The original description of *L. kumaonicus* does not mention the distinctive resin deposits and described the spores as up to 17-septate, but examination of more than a dozen specimens has not shown them

to be more than 7-septate. It is very distinctive by its bamboo host, mouse-gray hairs with yellow crystals, and light-colored disc. Microscopically it is distinctive due to its long, basally tapered, 7-septate spores and the occasional green reaction of its hairs in KOH.

Lachnum macrosporum (Penz. & Sacc.) Haines comb. nov.

Basionym: *Arenaea macrospora* Penz. & Sacc., *Malpighia* 15: 211. 1901.

= *Dasyscyphus oncospermatis* var. *macrospora* (Penz. & Sacc.) Haines, *Mycotaxon* 11: 214. 1980.

Apothecia on rachis of tree ferns, cup-shaped, up to 0.3 mm across, narrowed to a short, cylindrical stipe, covered with white to pale straw-colored hairs, disc light orange, covered by hairs in dried material. Hairs mostly $50-120 \times 3-5 \mu\text{m}$, cylindrical with hemispherical tips, some longer hairs with slightly tapered tips, septate, thin-walled, hyaline or pale yellow, covered with minute, slightly elongate granules. Ectal exciple composed of short-celled, hyaline, thin-walled cells, up to $7 \times 12 \mu\text{m}$, *textura prismatica*. Asci $53-65 \times 6.5-13.5 \mu\text{m}$, cylindrical to narrowly ellipsoid, croziers not observed, conspicuous pore plug stained blue in Melzer's solution, 8-spored, spores lying parallel in a bundle. Ascospores $38-52 \times 2.0-3.0(-3.7) \mu\text{m}$, nearly fusiform but slightly larger in the upper half, acute tip on both ends, non-septate or with a single median septum, filled at maturity with numerous refractive bodies. Paraphyses filiform, sometimes with a slightly enlarged apical portion, ca. $2 \mu\text{m}$.

Specimens examined: G.J. Samuels 6520 & 6561, B.M. Boom, G. Bacchus, Guyana, Mt. Wokomung, at base of exposed rock wall of main peak, $05^{\circ}05' \text{N}$, $50^{\circ}59' \text{W}$, elev. 1540-1570 m, 11 Jul. 1989 (NY).

Discussion: *L. macrosporum* is distinguished from other species on tropical ferns by its long fusiform spores. It was previously treated by the author (Haines 1980) as a variety of *L. oncospermatis* and is related to *L. flavidulum*, *L. pteridophyllum* and other species that grow on tropical ferns and have a water-soluble pigment that is yellow when dispersed on the hairs and dark red when concentrated into lumps on the hair tips visible with a hand lens. Spore size and shape are used to separate these fern-inhabiting species. Although the species was previously known only from the two collections from Java, there is no reason to think that this fungus is restricted to that region when the other species in the complex are found throughout the range of the large tropical fern hosts. The decision to return this taxon to the rank of species is based on a change of view of the author rather than on new information about the fungus.

Lachnum neblinensis Haines spec. nov.

Fig. 2,A-C

Apothecia ad palmarum, cyathoidae usque ad 1 mm diam., flavida, puberula. Pili cylindracei, $50-100(-130) \times 2.1-2.7 \mu\text{m}$ diam., granulati flexuosi, straminei, septati. Asci $98-127 \times 10-13 \mu\text{m}$, pori ope jodi tenuiter caerulescens. Ascosporae $17-22 \times 3.7-4.1 \mu\text{m}$, cylindric-ellipsoide, interdum uniseptatae. Paraphyses apicibus anguste lanceolatis, ascos superantes.

Holotype: Rossman 1969, Venezuela, Territorio Federal Amazonas, Cerro de la Neblina, 5.1 km NE Pico Phelps (= Neblina), 1730-1850 m elev., 00°50'40''N, 65°58'10''W, 05 Feb. 1985, on leaf sheath of unidentified palm, Coll.: A. Y. Rossman (VEN); Isotypes (NYS; BPI).

Apothecia up to 1.0 mm in diam. by up to 0.7 mm high, scattered to closely crowded on palm leaf sheaths, goblet-shaped when dry, planate when moistened, yellow when fresh, reddish brown and covered with buff hairs when dry, releasing faint yellow pigment when mounted in 3% KOH, stipitate, Stipe stout, 0.1-0.25 mm diam. \times 0.2-0.4 mm high, covered with hairs except at the base which appears darker where the hairs are absent. Disc buff to light brown in dried material, exposed even when dry, circular in outline. Hairs mostly 50-100(-130) \times 2.1-2.7 μ m, evenly cylindrical with hemispherical tips, thin-walled, straw-colored, very flexible, evenly and thickly covered with spherical or slightly flattened granules up to 0.5 μ m in diam., septate with thin cross walls forming cells 15-25 μ m long, arising from the ends of the prismatic cells of the outer excipulum. No crystalline or resinous masses were seen to be associated with the hairs. Hairs from the exciple and those from the margin are similar. Ectal exciple of irregular, hyaline *textura prismatica* formed of barrel-shaped cells ca. 12 \times 3 μ m with walls 0.5-1.3 μ m thick, the outermost rows of cells giving rise to the hairs. Asci 98-127 \times 8-13 μ m, cylindrical-clavate tapering slightly in the bottom half to a basal septum 3.5-5.0 μ m across, lacking identifiable croziers, 8-spored, with hemispherical apices containing a distinct, tapered pore plug ca. 2 μ m diam. Pore plug stains very weakly with Melzer's solution, not enhanced by KOH pretreatment. Ascospores 17-22(-25 \times (2.7-3.7-4.1(-46) μ m, cylindrical-ellipsoidal, bipolar, slightly curved, ca. 40% with a single median septum, hyaline, thin-walled, lacking conspicuous inclusions. Paraphyses cylindrical with clavate to narrowly lanceolate upper portion and rounded apex, 2.2-3.1 μ m at the widest point ca. 10 μ m below the apex, tapered to 1.6-2.0 μ m in the lower half, hyaline, unbranched, septate, thin-walled and lacking conspicuous inclusions, superseding the asci by up to 20 μ m in the hymenium.

Specimens examined: See type specimen above.

Discussion: Although it is not usually well advised to describe a species from a single collection, the specimen in this instance is extremely abundant, in excellent condition and is distinctive. It is placed in the genus *Lachnum* on the basis of its exciple of *textura prismatica*, its roughened, cylindrical, septate hairs, and its sometimes lanceolate paraphyses and stipitate, superficial apothecia. Its spore and ascus shapes are similar to those of *Lasiobelonium* and *Perrotia*, but its hair characters exclude it from the former and its distinct pore plug from the latter.

Within *Lachnum* it is readily distinguished by its small diameter, coarsely roughened hairs, its large, bipolar, cylindrical-ellipsoidal (nearly allantoid), sometimes septate spores, its long asci and its habitat and range.

The lanceolate shape of some of the paraphyses could easily be overlooked if they were not fully hydrated, and the spore septum could also be missed because it is so thin, but both characters can easily be observed after the section has been left overnight in lactophenol or chloral hydrate.

Lachnum patena (Lév.) Haines & Dumont, Mycotaxon 19: 33. 1984

= *Peziza patena* Léveillé, Ann. Sci. Nat. Bot., Ser. 4. 20: 1963.

= *Dasyscyphus patena* (Lév.) Sacc., Syll. Fung. 10: 22. 1892.

Apothecia on wood or bark of living or recently killed trees in tropical regions, goblet-shaped, stipitate, 0.5-2.5(-4.0) mm diam., covered with bright white hairs, with yellow disc that is obscured in small specimens. Hairs mostly $60-90 \times 2.0-4.0 \mu\text{m}$, cylindrical, hyaline, granulate, septate. Asci mostly $90-128 \times 6-11 \mu\text{m}$, cylindrical with a distinct pore plug that stains blue in Melzer's solution. Spores mostly $60-100 \times 1.8-2.8 \mu\text{m}$, very narrowly fusiform, curved or sigmoid, 7-13-sepate, usually filled with refractive contents which disappear in KOH or lactophenol. Paraphyses filiform to narrowly lanceolate, $1.5-3.2 \mu\text{m}$, superseding the asci by ca. $10 \mu\text{m}$.

Specimens: G.J. Samuels 1277, Venezuela, Cerro de la Neblina, Summit Camp #, valley at N base of Pico Phelps, cloud forest, $00^{\circ}49' \text{N}$, $66^{\circ}00' \text{W}$, ca. 1350 m elev., 12-13 Apr. 1984 (NY).

Discussion: This species is distinguished from other wood inhabiting lachnums by its long spores. The Neblina specimen, like others examined by the author (Haines 1984) are on very sound, unrotted twigs. It differs in occurring at a lower altitude than previously known specimens and it also has very slender hairs and small apothecia.

Lachnum pteridophyllum (Rodw.) Spooner, Bibliotheca Mycologica 116: 470. 1987

= *Dasyscypha pteridophylla* Rodw., Pap. and Proc. Roy. Soc. Tasmania 1920: 158. 1921.

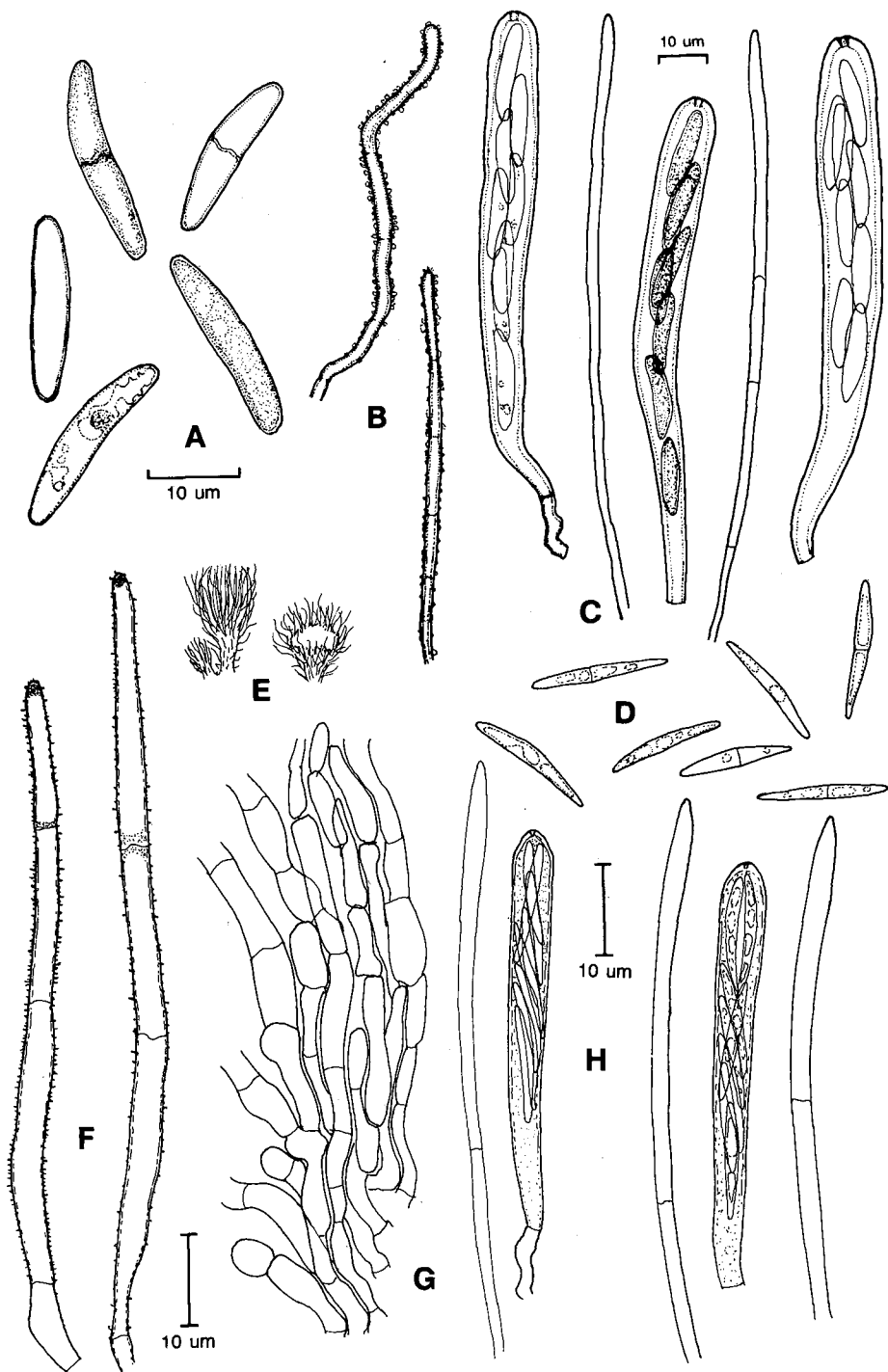
= *Dasyscyphus varians* var. *pteridophyllum* (Rodw.) Haines, Mycotaxon 11: 209, 1980.

= *Lachnum varians* var. *pteridophyllum* (Rodw.) Sharma, Nova Hedwigia 43: 411. 1986.

Apothecia, Hairs, and Ectal exciple are indistinguishable from those of *L. flavidulum* above. Asci $40-50 \times 4-5 \mu\text{m}$, cylindrical with a narrowed base and small apical pore plug that turns blue in Melzer's solution; at least one specimen appears to have croziers at the basal septum. Ascospores $11-17(-24.5) \times 1.2-1.9 \mu\text{m}$, fusiform with bipolar symmetry, both ends narrowed to sharp points, nonseptate but often filled with 2-4 refractive bodies which almost take up the interior except for the very middle. Paraphyses lanceolate, with blunt apex, $2-3 \mu\text{m}$ wide at the widest point, superseding the asci by $5-10 \mu\text{m}$.

Specimens examined: Rossman 1831; Rossman 1858, Venezuela, Territorio Federal Amazonas, Cerro de la Neblina, 5.1 km NE of Pico Phelps (= Neblina), 1730-1850 m elev., $00^{\circ}50'40' \text{N}$, $65^{\circ}58'10' \text{W}$, 03 Feb. 1985 (BPI); Rossman 2053, Venezuela, Territorio Federal Amazonas, Cerro de la Neblina, 5.1 km NE of Pico Phelps (= Neblina), 1730-1850 m elev., $00^{\circ}50'40' \text{N}$, $65^{\circ}50'40' \text{W}$, 12 Feb. 1985 (BPI);

Fig. 2. *Lachnum neblinensis* and *L. stipulicolum*. A-C *L. neblinensis* from holotype. A. Spores. B. Hairs. C. Asci and paraphyses. D-H *L. stipulicolum* from holotype. D. Spores. E. Apothecia. F. Hairs. G. Exciple. H. Asci and paraphyses.



Iturriaga # 602, Venezuela, Cerro de la Neblina massif, camp 7, elev. 1770-1850 m, 29 Nov. - 1 Dec. 1984, on fern (NYS) (VEN); Iturriaga # 671 (= VEN 210577) same information as # 602 (VEN).

Discussion: This species is very closely related to *L. flavidulum* which also grows on tropical ferns. The two are not distinguishable macroscopically, but they can readily be distinguished on the basis of spore shape. *L. flavidulum* has elliptical spores with definitely rounded tips and *L. pteridophyllum* has fusiform spores with definitely pointed tips. While Haines (1980) and Sharma (1986) have previously treated the latter as a variety of that species, Spooner (1987) treated it as a distinct species and cites its spore measurements as $(12.0)14.5-19.0(-24.5) \times 1.2-1.8 \mu\text{m}$ and hair diameter under $3.5 \mu\text{m}$ for Australasian specimens. Until further studies, including biogeography and ecology, can be done on these taxa, I will avoid making the new combination with *Lachnum* that would be necessary to treat *L. pteridophyllum* as a variety of *L. flavidulum*. Caution is advised in the strict use of spore size to distinguish species in these taxa, as it can vary considerably.

***Lachnum sclerotii* (A.L. Smith) Haines & Dumont, Mycotaxon 19: 17. 1984**

= *Belonidium sclerotii* A.L. Smith, J. Linn. Soc. Bot. 35: 14. 1901.

= *Erinella subcorticalis* Pat. in Duss, Champ. Guadeloupe p. 67. 1903.

= *Erinella subcervina* Bres. in Rick, Ann. Mycol. 4: 390. 1906.

Apothecia on bark and wood of tropical dicotyledonous trees, goblet to salver-shaped, 0.5-2.0(-3.0) mm in diam., stipitate, buff to brown hairs often tipped with water-soluble, amber resin masses, buff to yellow disc. Hairs mostly $35-70 \times 2.5-3.8 \mu\text{m}$, cylindrical with hemispherical tips, septate, buff, densely covered with tiny granules. Ectal excipulum cuboid-celled, hyaline to buff, slightly thick-walled, *textura prismatica* to *angularis* overlaying a layer of long-celled, thin-walled, hyaline compact hyphae. Asci mostly $82-90 \times 7-8 \mu\text{m}$, cylindrical with a narrowed base and hemispherical apex with a distinct pore plug that stains blue in Melzer's solution. Spores mostly $25-32 \times 2.3-3.0 \mu\text{m}$, fusiform, straight or slightly curved, not flexuous, 3-septate at maturity. Paraphyses narrow-lanceolate with blunt apices, mostly $2.3-2.9 \mu\text{m}$ at their widest point, superseding the asci by up to $12 \mu\text{m}$, usually without conspicuous contents.

Specimens examined: Rossman 2241, Venezuela, Territorio Federal Amazonas, Cerro de la Neblina, 6.2 km NNE of Pico Phelps (= Neblina), 1390-1515 m elev., $00^{\circ}51'45''\text{N}$, $65^{\circ}58'52''\text{W}$, 22 Feb. 1985, Col. A.Y. Rossman (BPI).

Discussion: This common wood-inhabiting species is related to *L. abnorme*, but can sometimes be distinguished in the field by the presence of amber-colored resin masses on the hair tips. These are not known to occur on *L. abnorme*. *L. sclerotii* is more common at elevations under 1500 m while *L. abnorme* is more common from 1000-3000 m. Microscopically *L. sclerotii* is readily distinguished by its 3-septate, fusiform spores averaging ca. $30 \mu\text{m}$. For an illustration see Haines & Dumont (1984).

Lachnum stipulicolum Haines spec. nov.

Fig. 2, D-H

Apothecia ad stipules bambusina, circa 0.2 mm lata, obsita cum longi, niveum pili. Pili plerumque $50-130 \times 3.5-60 \mu\text{m}$, cylindracei aut attenuati, granulati, hyalini, recti. Asci $39-50 \times 3.9-5.5 \mu\text{m}$. Ascosporae $9.5-16 \times 1-2 \mu\text{m}$, fusiformae, subsymmetrcae, arcuatae. Paraphyses sublanceolati vel clavati.

Holotype: Rossman 2062, Venezuela, Territorio Federal Amazonas, Cerro de la Neblina, 5.1 km NE of Pico Phelps (= Neblina), 1730-1850 m. elev., $00^{\circ}50'40''\text{N}$, $65^{\circ}56'10''\text{W}$, 12 Feb. 1985, coll. A.Y. Rossman (VEN); isotypes (NYS; BPI).

Apothecia on sheathing stipule of large unidentified bamboo, mostly ca. 0.2 but up to 0.3 mm in diam. by up to 0.4 mm high, scattered, occasionally caespitose, 2-3 arising together, very light buff-yellow, infundibuliform, almost completely covered by long, white hairs, stipitate. Stipe cylindrical ca. 0.1 mm across \times 0.2 mm high, covered with hairs. Disc light yellow, exposed when moist, exposed or covered by hairs when dry, circular in outline. Hairs mostly 50-130, (up to 175) \times 3.5-6.0 μm , cylindrical, tapered toward the tips to a rounded apex 2.0-3.5 μm , granulate with vertically oriented, rod-shaped particles up to $1.0 \times 0.3 \mu\text{m}$, thin-walled, septate with thin septa forming cells 15-40 μm with the longest cells at the tip. Tips often contain a small deposit of material which appears dark with phase contrast. Ectal exciple of small-celled, thin-walled, hyaline textura prismatica. Asci $39-50 \times 3.9-5.5 \mu\text{m}$, average of $20-45 \times 4.7 \mu\text{m}$, cylindrical slightly tapered toward a basal septum 2-3.5 μm across, lacking discernable croziers, thin-walled, 8-spored with an apical pore that stains blue in Melzer's solution. Ascospores $9.5-16 \times 1.0-2.0 \mu\text{m}$, average of $20-13.2 \times 1.5 \mu\text{m}$, fusiform, slightly asymmetric about the median axis with one end being slightly more tapered, non-septate or about 40% of spores with a single median septum, straight or slightly curved, usually with 2 or more large, refractive inclusions. Paraphyses narrowly lanceolate or clavate, with a slightly rounded apex, 2-2.8 μm at the widest portion, exceeding the asci by up to 10 μm .

Specimens examined: Rossman #2062. (See "holotype" above).

Discussion: The name of this new species derives from its substrate, the sheathing stipules of bamboo. *L. stipulicolum* is closely related to the more common *Dasyscypha bambusae* but differs in being significantly smaller in most of its features. They are both distinguished macroscopically from other lachnums on bamboos and other grasses by their apothecia being covered with erect, long, straight, pure white hairs. They resemble *Albotricha andina*, which occurs on herbaceous substrates, in outward appearance. Microscopically, they are distinguished from other species on bamboo by their fusoid spores and straight, tapered, granulate hairs. *L. stipulicolum* is readily distinguished by having spores 9.5-16.0 μm long while *D. bambusae* has spores from 16-24 μm .

D. bambusae has not been reported in the literature except from the type collection from South Brazil (Rick 1931; Dennis 1950), but about 10 collections have been made and identified by the author from northern Venezuela. It needs a combination in *Lachnum*, since neither *Dasyscypha* nor *Dasyscyphus* is any longer tenable for Hyaloscyphaceae with lanceolate paraphyses. The new combination is made here: **Lachnum bambusae** (Rick) Haines comb. nov. Basionym: *Dasyscypha bambusae* Rick, Broteria, Serie Botanica 25: 204. 1931.

Three additional collections, Rossman # 1861, 2249 and 2302, of what appear to be an orange-yellow species of *Arachnopeziza* were sent to the author for identification. The specimens are all small and in very poor condition but appear to represent an undescribed taxon. No attempt will be made to form a new taxon based on this material, but it appears to be another endemic Neblina species.

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