

Hyaloscyphaceae in Japan (2)*: Glassy-haired members of the tribe Hyaloscypheae

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Fungal specimens of discomycetes in the family Hyaloscyphaceae were collected from across Japan and identified. In this report, glassy members of the tribe Hyaloscypheae, subfamily Hyaloscyphoideae are described and illustrated. The 7 species involved include two new species (*Urceolella brunneola* and *U. pseudopani*), and five species new to Japan (*Hyalopeziza millepunctata*, *H. pygmaea*, *Mollisia uncinata*, *Urceolella carestiana* and *U. crispula*). Cultural studies were carried out, and the anamorph is discussed for *M. uncinata*.

Key Words—discomycetes; Hyaloscyphaceae; Japan; new species; tribe Hyaloscypheae.

This is the second report in a series of papers describing the family Hyaloscyphaceae in Japan. This paper concerns glassy-haired members of the tribe Hyaloscypheae, subfamily Hyaloscyphoideae. The glassiness of the hairs has been recognized by various authors and many genera have been erected based on their morphology (Dennis, 1949, 1981; Raitviir, 1970; Korf, 1973). The histo-chemical reaction to KOH was first stressed by Raschle (1977), and their taxonomic significance was discussed by Korf and Kohn (1980). As a result of their studies, genera with glassy hairs were arranged into: *Hyalopeziza* Fuckel, *Urceolella* Boud. and *Mollisia* Höhn. None of them has been reported in Japan.

Materials and Methods

Collection, isolation, and observation procedures followed Hosoya and Otani (1997).

Descriptions

1. *Hyalopeziza millepunctata* (Lib.) Raitv., Scripta Mycol. 1: 34. 1970. Figs. 1, 2
Peziza millepunctata Lib., Pl. Crypt. Ard., Fasc. 2: 128. 1832.
Pseudohelotium millepunctatum (Lib.) Sacc., Syll. Fung. 8: 294. 1889.
Hyaloscypha millepunctata (Lib.) Boud., Hist. Classific. Discom. d'Eur. 126. 1907.
Unguicularia millepunctata (Lib.) Dennis, Mycol. Pap. 32: 79. 1949.
Peziza cirrata Cr., Flor. Finist. p. 51. 1867.
Trichopeziza cirrata (Cr.) Sacc., Syll. Fung. 8: 404. 1889.
Urceolella cirrata (Cr.) Boud., Hist. Classific. Discom.

- d'Eur. p. 130. 1907.
Unguicularia cirrhata (Cr.) Le Gal, Rev. Mycol. 18: 99. 1953.
Peziza scrupulosa P. Karst., Not. Sällsk. Fauna Flora Fenn. Förh. 10: 178. 1869.
Helotium scrupulosum (P. Karst.) P. Karst., Myc. Fenn. 1: 152. 1871.
Lachnella scrupulosa (P. Karst.) W. Phillips, Brit. Discom. p. 272. 1887.
Pseudohelotium scrupulosum (P. Karst.) Sacc., Syll. Fung. 8: 293. 1889.
Pezizella scrupulosa (P. Karst.) Rehm, Rab. Kryptogamenfl. 2 Aufl. 1: 671. 1892.
Dasyscypha scrupulosa (P. Karst.) Masee, Brit. Fung. Flora 4: 365. 1895.
Unguicularia scrupulosa (P. Karst.) Höhn., Sitzungsber. K. Akad. Wiss. Wien, Mat.-nat. Kl. Abt. 1, 115: 1279. 1906.
Urceolella scrupulosa (P. Karst.) Boud., Hist. Classific. Discom. d'Eur. p. 129. 1907.
Peziza elaphines Berk. & Broome, Ann. Mag. Nat. Hist., Ser. 4, 7: 434. 1871.
Mollisia elaphines (Berk. & Broome) Gill., Champ. France, Discom. p. 131. 1879–83.
Pseudohelotium elaphines (Berk. & Broome) Sacc., Syll. Fung. 8: 301. 1889.
Dasyscypha elaphines (Berk. & Broome) Masee, Brit. Fung. Flora 4: 366. 1895.
Urceolella elaphines (Berk. & Broome) Boud., Hist. Classific. Discom. d'Eur. p. 129. 1907.
Lachnella grisella Cooke & W. Phillips in W. Phillips, Brit. Discom. p. 260. 1887.
Trichopeziza grisella (Cooke & W. Phillips) Sacc., Syll. Fung. 8: 413. 1889.
Pyrenopeziza grisella (Cooke & W. Phillips) Boud., Hist. Classific. Discom. d'Eur. p. 135. 1907.
Dasyscypha carmichaeli Masee, Brit. Fung. Fl. 4: 363.

*(1): Mycoscience 38: 171–186, 1997.

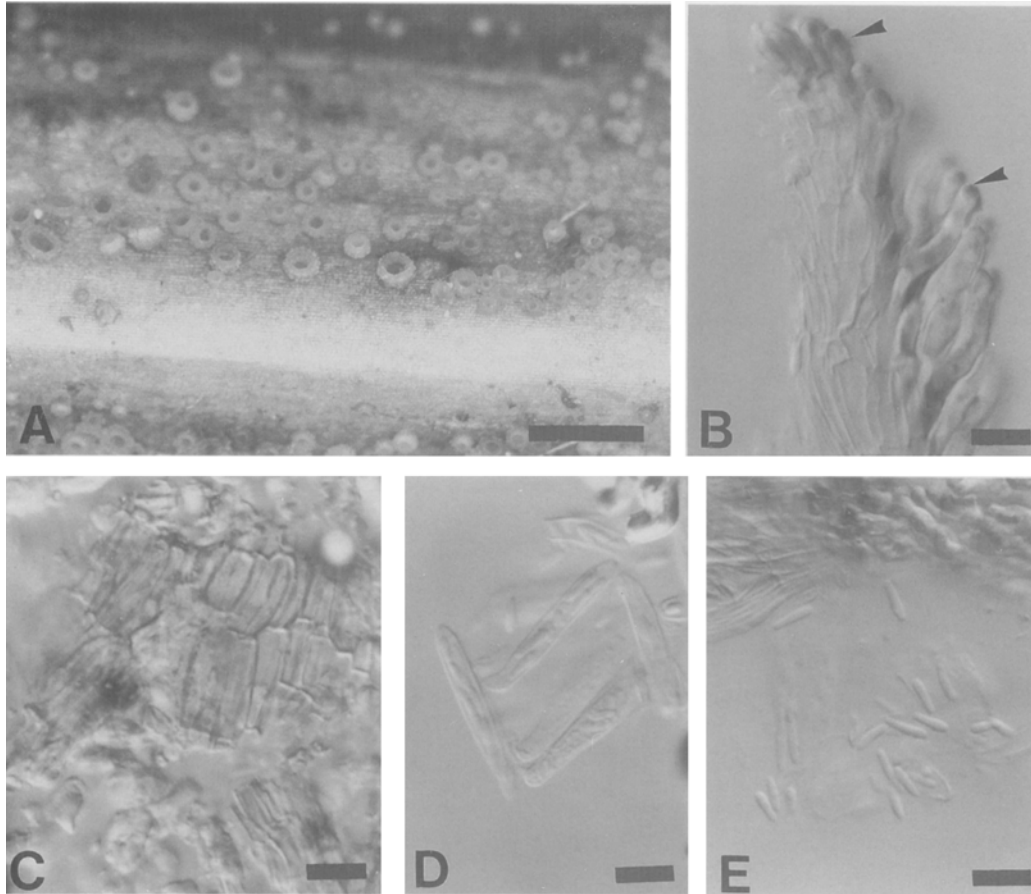


Fig. 1. *Hyalopeziza millepunctata* (A: TRL-1031; B: TRL-1003; C-E: TRL-1032).

A. Fresh apothecia. B. Close up of apothecial margin showing hairs from the outermost cells and inner protrusions from the innermost cells. Note MLZ+ reaction of hairs in MLZ mount (arrowhead). C. Ectal cells in crush mount. D. Asci with ascospores. E. Ascospores.

Scales. A, 1 mm; B-E, 10 μm .

1895.

Pezizella subhirsuta Feltgen, *Ascom.* 2. Nachtr. p. 40. 1901.

Pezizella dematiicola Feltgen, *Ascom.* 3. Nachtr. p. 48. 1903.

Dasyscypha digitalincola Rehm, *Ann. Mycol.* 3: 224. 1905.

Unguicularia digitalincola (Rehm) Höhn., *Sitzungsb. K. Akad. Wiss. Wien, Math.-nat. Kl. Abt. 1*, 127: 609. 1918.

Catinella disseminata Kirschst., *Vert. bot. Ver. Brandenb.* 66: 24. 1924.

Olla ulmariae Velen., *Monogr. Discom. Bohem.* p. 287. 1934.

Unguicularia ulmariae (Velen.) Dennis, *Kew Bull.* 30: 352. 1975.

Chytrella cosmia Kirschst., *Hedwigia* 80: 134. 1941.

Apothecia scattered to gregarious, superficial, minute, sessile, seated on a broad base occasionally narrowed to a point; disc deep cupulate to urceolate, up to 200 μm in diam; receptacle coarsely rough to costate by row of hairs, pale grey (1B1) to light brown (7D5), occasionally nearly white when dried, paler to nearly white

around the margin; margin far raised beyond the hymenium, externally fringed by hairs. Ectal excipulum thin-walled *textura prismatica*, several cell-layered, composed of thin-walled cells 11–17 \times 4–7 μm at the middle flank; cells at the margin becoming thinner, innermost cells bearing short papillate protrusion up to 3 μm long, the outermost cells externally vested by fine resinous granules, MLZ+ without KOH pretreatment. Hairs ascending, cylindrical, almost straight or irregularly undulating, obtuse at the tip, mostly 15–20 \times 4–5, up to 35 \times 5 μm , glassy. Glassiness and the structure stable in 10 or 50% KOH, crispy and easily broken when strongly crushed under cover slip, hyaline to light amber in distilled water; basal cavity occasionally present; narrow lumen infrequently indistinctly present in the middle; glassy portion CR–, MLZ++ without KOH pretreatment, partially strongly stained. Asci 21–37 \times 4–5 μm , cylindrical clavate to saccate, base broad and occasionally rounded, arising from simple septa, 8-spored; apex conical to rounded, pore MLZ+ without KOH pretreatment. Ascospores 4–6(–7.5) \times 1–2 μm , ellipsoid to clavate, aseptate, hyaline, biseriolate in the asci. Paraphyses filiform, straight, 1.5–2 μm thick, simple or branched at

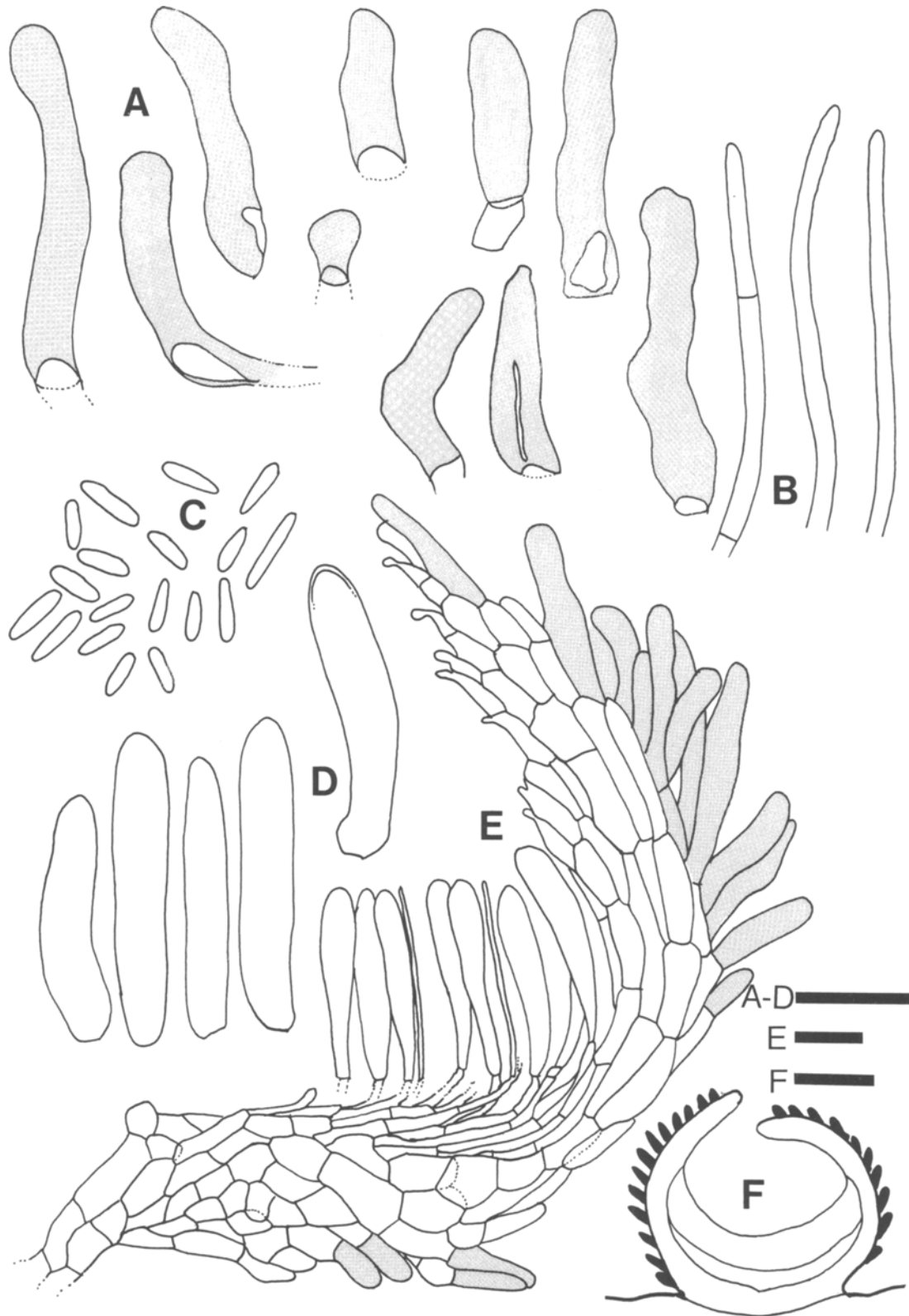


Fig. 2. *Hyalopeziza millepunctata* (TRL-1032).

A. Hairs. Note lumen varies but mainly basally preserved. B. Paraphyses. C. Ascospores. D. Asci. E. Vertical section of apothecium showing the margin and part of hymenium. F. Diagrammatic section of apothecium showing outline of the structure. Scales. A-E, 10 μ m; F, 50 μ m.

the base, occasionally septate, not exceeding the asci.

Specimens examined. HONSHU: Ohmura, Shizukuishi-cho, Iwate Pref., on herbaceous stem, 10-V-94, TRL-1003; Mt. Daisen, Tottori Pref., on herbaceous stem, probably *Polygonum*, 28-V-94, TRL-1031; Mt. Daisen, Tottori Pref., on herbaceous stem, 28-V-94, TRL-1032; Ohmura, Shizukuishi-cho, Iwate Pref., on herbaceous stem, 15-V-95, TRL-1159.

Notes. The species is distributed world-wide and probably one of the most common species in the genus *Hyalopeziza* Fuckel. It is commonly found on decaying herbaceous stems in spring.

Our specimen of *Hyalopeziza millepunctata* shows good agreement with previous descriptions given by Raschle (1977), Breitenbach and Kränzlin (1984), and Raitviir and Galan (1993). The gross morphology is also in good agreement with that given by Boudier for *Urceolella costata* Boud. (Icon. Mycol. pl. 532), which is currently known as *Hyalopeziza costata* (Boud.) Dennis (Korf, 1985). The rib-like structure, reported on the ex-

cipulum external in *H. costata*, is observed in the present fungus. *Hyalopeziza millepunctata* is, however, distinguished from *H. costata* in having smaller apothecia, hairs, asci, and ascospores (Raitviir, 1970). *Hyalopeziza costata*, though not frequently reported, is clearly a morphologically similar species, as indicated by Raschle (1977), and comparative studies are needed to assure their identity.

The genus *Hyalopeziza* is reported for the first time from Japan.

2. *Hyalopeziza pygmaea* (Mouton) Huhtinen, Mycotaxon **29**: 279; figs. 4, 5. 1987. Figs. 3, 4

Trichopeziza pygmaea Mouton, Bull. Soc. Roy. Bot. Belg. **36**: 19. 1897.

Hyaloscypha pygmaea (Mouton) Boud., Hist. Classific. Discom. d'Eur. p. 127. 1907.

Unguicularia pygmaea (Mouton) Svrček, Česká Mykol. **39**: 217. 1985.

Hyalopeziza subtilis Velen. var. *drupacea* Velen.,

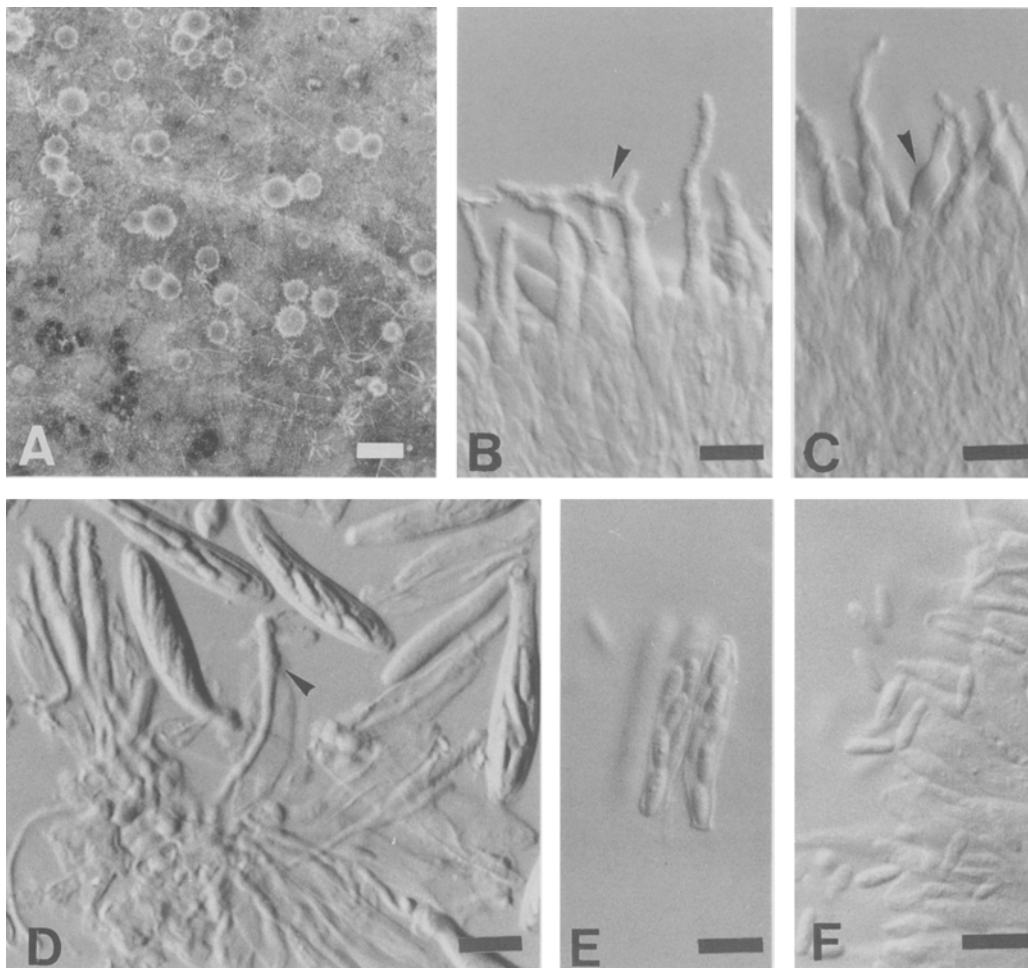


Fig. 3. *Hyalopeziza pygmaea* (A-D, F: TRL-1189; E: TRL-1164).

A. Fresh apothecia. B. Hairs. Note one branched at the apex (arrowhead). C. Hairs. Note short lageniform hair with encrusted apex (arrowhead). D. Paraphyses and asci. Note paraphyses with expanded and encrusted apex (arrowhead). E. Asci with ascospores. F. Ascospores.

Scales. A, 1 mm; B-F, 10 μm.

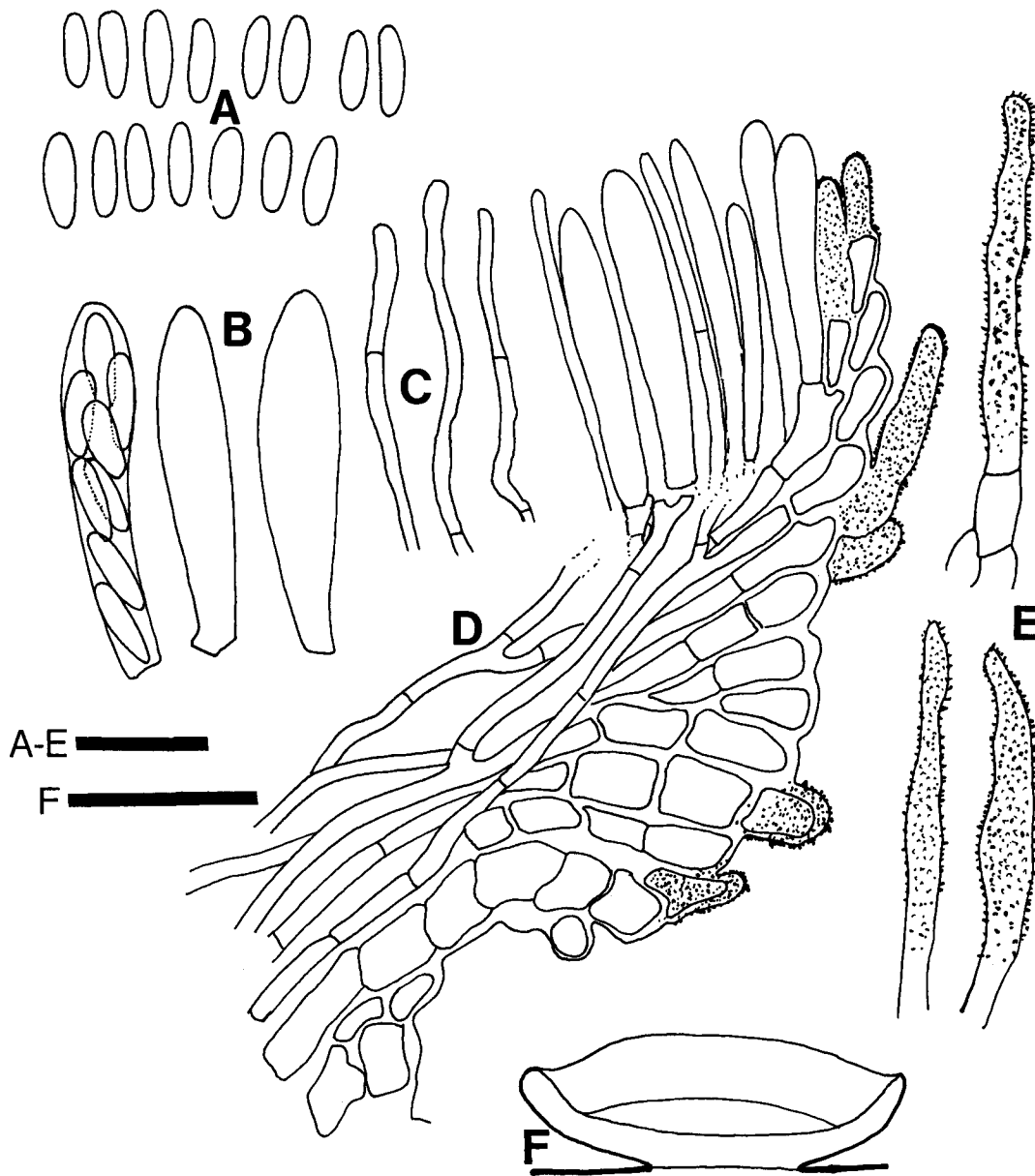


Fig. 4. *Hyalopeziza pygmaea* (TRL-1189).

A. Ascospores. B. Asci. C. Paraphyses. D. Section of apothecium showing hymenium, ectal and medullary excipulum, and hairs. E. Hairs. F. Schematic drawing of the apothecial section showing outline of the structure. Hairs not drawn. Scales. A-E, 10 μm ; F, 50 μm .

Monogr. Discom. Bohem. p. 273. 1934.

Apothecia gregarious, only on lower surface of the leaf, superficial, sessile, leaving a black circle, as those seen in *Calycellina* Höhn. at the base when detached; disc 40–100 μm in diam, flat or slightly convex, white to watery transparent when fresh, shallow cupulate, pruinose, white when dried; margin slightly elevated, fringed by white denticulate hairs. Ectal excipulum poorly developed, composed of thin- to thick-walled rectangular to almost isodiametric cells, 5–8 \times 3–6.5 μm , pale brown, arranged at an angle to the surface near the base, becoming hyaline toward the margin, arranged

parallel to the surface at the margin, MLZ–. Hairs mostly cylindrical, less frequently bladder-like or lageniform, mostly simple, rarely apically branched, up to 30 μm long, 2.5–4 μm thick at the widest point, mostly aseptate, less frequently 1-septate near the base, indistinctly glassy, MLZ–, CR+. Glassiness and the structure stable in KOH; wall thin, externally vested by short to long KOH-stable granules up to ca. 0.5 μm high; apex obtuse, rarely branched. Asci 25–28 \times 5–6.5 μm , clavate with a broad base, arising from croziers; apex rounded, pore MLZ+ with or without KOH pretreatment, 8-spored. Ascospores 6–7 \times 2 μm , ellipsoid to cuneiform, narrowed

to the lower tip, one-celled, hyaline, often containing two guttulae at both ends or less frequently with three guttulae observed in MLZ. Paraphyses sparse, typically cylindrical, flexuose, 2 μm thick; apex obtuse, occasionally expanded and encrusted to form hair-like structure, not exceeding the asci.

Colonies of SANK 17596, 17696, 17796 on PDA identical, low, dense, radially and concentrically sulcate, floccose, context soft, exudate of yellowish brown (5D8) present, yellowish brown (5E5) from the surface, yellowish brown (5F4) or darker from the reverse. Sectors and zonation absent. Aerial mycelium white, developed all over the surface. Margin distinct, nearly entire, superficial. Soluble pigment not produced.

Specimens examined. HONSHU: San-no-sawa, Mt. Daisen, Tottori Pref., on lower surface of leaves of *Quercus mongolica* Fischer var. *grosseserrata* (Blume) Rehd. & Wils., 28-V-94, TRL-1038 (culture SANK 17696); Ohmura, Shizukuishi-cho, Iwate Pref., on lower surface of leaves of *Q. mongolica* var. *grosseserrata*, 15-V-95, TRL-1164 (culture SANK 17596); Tazawa-lake, Akita Pref., on lower surface of leaves of *Q. mongolica* var. *grosseserrata*, 16-V-95, TRL-1189 (culture SANK 17796).

Notes. The hair characteristics of the present fungus agree with Svřček (1985), Huhtinen (1987) and Raitviir and Galan (1993).

The hymenium of this species is morphologically similar to those of *Pezicula* Tul. & C. Tul., Dermatiaceae when dried due to its pruinose texture. The fungus has pale brown *t. angularis-t. globulosa* structure at the base, suggesting the relationship to Dermatiaceae.

The solid glassy portion at the tip of the hairs is hard to recognize and may be overlooked. The hairs show diverse morphology (Huhtinen, 1987; Raitviir and Galan, 1993). Judging from these variations, the hairs appear to develop from cystidia-like smooth bodies, then become encrusted, and elongate at the apex. The refractiveness of the solidifying matter qualitatively differs from those in *H. millepunctata*.

The apex of the paraphyses sometimes turns into a hair-like structure, often indistinguishable from the real hairs. The same phenomenon is observed in *Urceolella hammulata* (Rehm) Korf & Kohn (Korf and Kohn, 1980).

3. *Mollisia uncinata* Arendholz & R. Sharma, Mycotaxon 20: 657; pl. 10: 1-7; pl. 11: 1-6. 1984.

Figs. 5A-H, 6

Apothecia gregarious, borne on lower surface of the leaf, 100-200 μm in diam, on discolored area, associated with anamorph, sessile to very short stipitate, arising from black ring encircling the base; disc plane to shallow cupulate, off-white to pale yellow (3A3), finely pruinose when dried; receptacle scurfy, off-white when dried. Ectal excipulum thick-walled *textura prismatica*, cells 5-12 \times 10-20 μm , rectangular to almost isodiametric, becoming smaller, thicker-walled and clearly prismatic toward the margin. Medullary excipulum *textura porrecta*, composed of compact, somewhat intricately thick hyphae of 3-4 μm wide. Hairs short, up to 20 μm long,

more abundant at the margin than on excipulum external, basically conical, gradually tapered to beaked or uncinately elongation at the apex; the apex often solidified by glassy matter, short branched or protruded irregularly in the lower half; glassy matter stable in KOH, not stained by MLZ; lumen present in most of the hairs, wider at the base, narrowed to the apex, well stained by CB; at the excipulum external, hairs reduced to protrusions without a lumen, arising from cell walls, irregularly protruding and short branched. Asci 35-40 \times 6-7 μm , clavate to cylindrical clavate, 8-spored; apex round, pore MLZ+, occasionally MLZ++ without KOH pretreatment. Ascospores 13-15 \times 1.5-2 μm , fusoid to cylindrical fusoid, hyaline, with rounded ends, occasionally somewhat curved, aseptate to 1-septate, guttulate, obliquely biserial in the asci. Paraphyses cylindrical, septate, 2.5-3 μm wide, obtuse at the tip.

Anamorph: *Chalara* sp.

Figs. 5 I-K, 7

Colony of SANK 16596 on PDA radially sulcate, umbonate, velvety, with concentric zonation, context tough, gelatinous, black from the surface, black with some shade of olive brown (4F8) from the reverse. Short aerial mycelium developed to give velvety appearance, not forming mycelial strands. Margin distinct, almost entire but weakly undulate. Soluble pigment absent.

Conidiophores on the substrate gregarious, upright, straight, mostly 200-450 \times 5-6.5 μm , arising from a convex disc of 25-35 \times 8-12 μm at the base, multi-septate, brown; in culture, straight or curved to undulating, multi-septate, smooth, not constricted at the septa, dark brown, terminating in a phialide. Phialides lageniform, 24-35 \times 2-4 μm , with globose to subcylindrical venter and cylindrical collarete. Conidia borne in chains, bacilliform to short clavate, 3-4.5 \times 1.5-2 μm , truncate at the base, truncate to slightly rounded at the apex, aseptate, hyaline.

Specimens examined. HOKKAIDO: Experimental forest of Tokyo Univ., Furano-shi, on *Quercus* leaves, 13-IX-95, TRL-1343 (culture SANK 16596).

Notes. The morphological features and habitat in Arendholz and Sharma (1984) agreed well with those of the present fungus. The present specimen, however, has a larger L/W ratio than previously presented (plate 11, op. cit.). To determine the species delimitation more clearly, comparative studies using more specimens including the type material are required.

Arendholz and Sharma (1984) reported the association with *Chalara* and its possible teleomorph-anamorph relationship with *M. uncinata*. But they did not give mycological features of the anamorph, and did not confirm the relationship under culture. The relationship was positively confirmed with a single-ascospore isolate from the present specimen. The germination of the conidia of *Chalara* anamorph, however, was not observed even after 1 wk on PDA.

The difference in anamorphic morphology between that in nature and that in culture should be noted: conidiophores are straight and bristle-like in nature, becoming thinner-walled and reduced in culture.

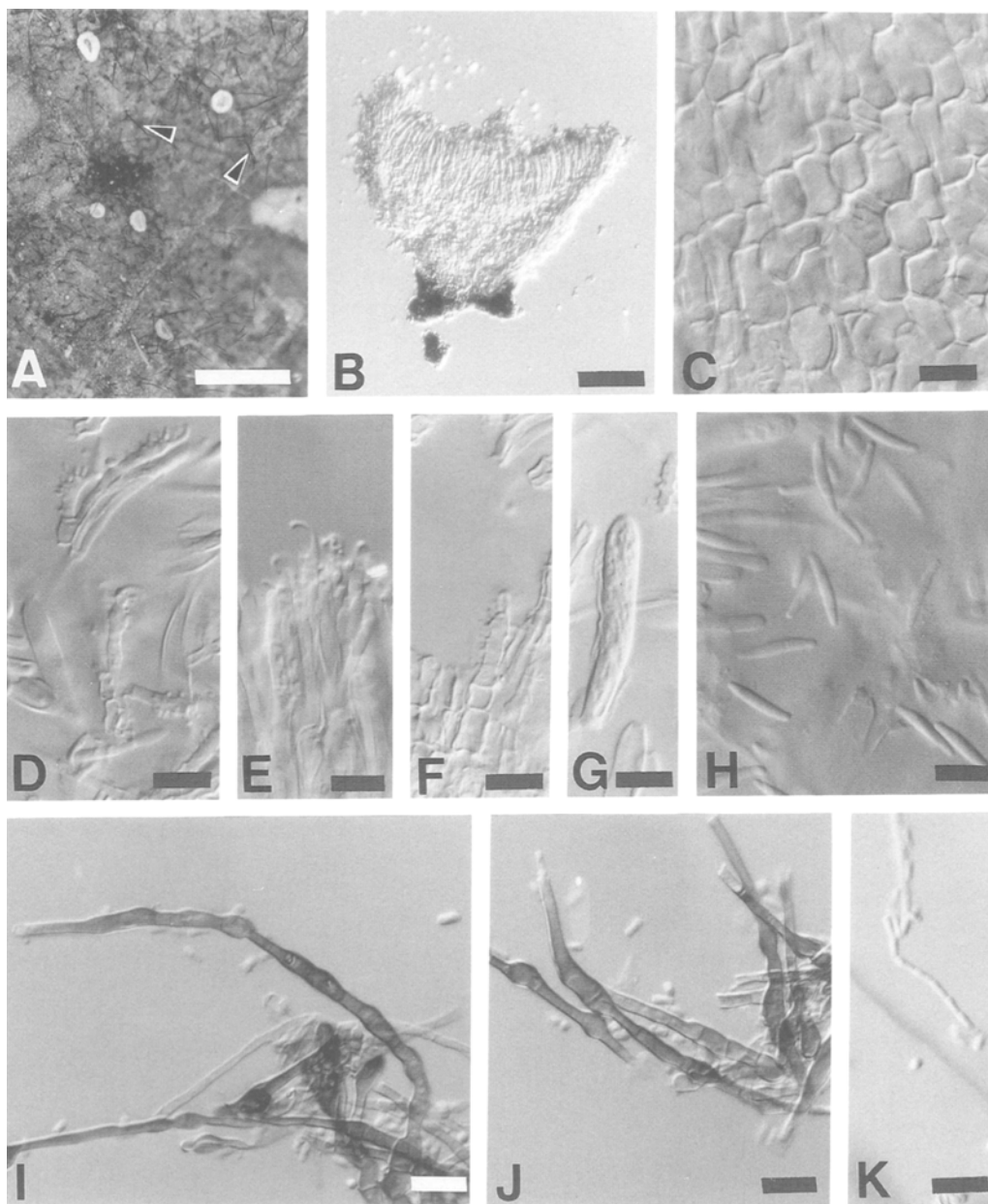


Fig. 5. *Mollisia uncinata* (A-H: TRL-1343; I-K: SANK 16595).

A. Dried apothecia together with the conidiophores (arrow heads, showing only two representatives). B. Section of the apothecium. Note the black portion at the base. C. Ectal cells. D. Hairs with dendroid protrusion and uncinuate apex. E. Hairs with dendroid protrusion and uncinuate glassy apex. F. Hair with septation and dendroid protrusion. G. Ascus. H. Ascospores. I, J. Elongated and multi-septate conidiophores, produced under culture (on WSH, 23°C, 2 wk). K. Conidia produced in chain under culture.

Scales. A, 0.5 mm; B, 50 μ m; C-K, 10 μ m.

4. *Urceolella brunneola* Hosoya, sp. nov. Figs. 8, 9

Apothecia gregaria, sessilia, minuta, 200–300 μ m diam, profunde cupulata vel urceolata, brunneo-aurantiaca. Excipulum ectale “textura prismatica,” ex cellulis 8–13 \times 6–8 μ m et saepe 10–12 \times 6–7 μ m tenuiter vel mediocriter tunicatis 2–3-stratosis pallide brunneis compositum, margine super hymenium summo-pere elevatis extrinsecus cum pilis brevibus, et e cellulis intimis cum protuberantibus papillati. Pili ascendentes,

cylindraceo-conici, interdum undulati, versus apicem acuminatum paulatim angustati, 40–60 μ m longi, aseptati, vitrei, hyalini; substantia vitrea solubilis in 10% KOH, cum lumine basi grandio et versus apicem indistincto praedita. Asci 32–45 \times 5–7 μ m, cylindraceo-clavati vel sacciformes, basi rotundati, apice conici, ex hamulis surgentes, octospori, poro iodo coerulescenti. Ascosporae 7–13 \times 2–3 μ m, ellipsoideae vel cylindricae, interdum aliquanto curvatae, aseptatae, hyalinae. Paraphyses cylin-

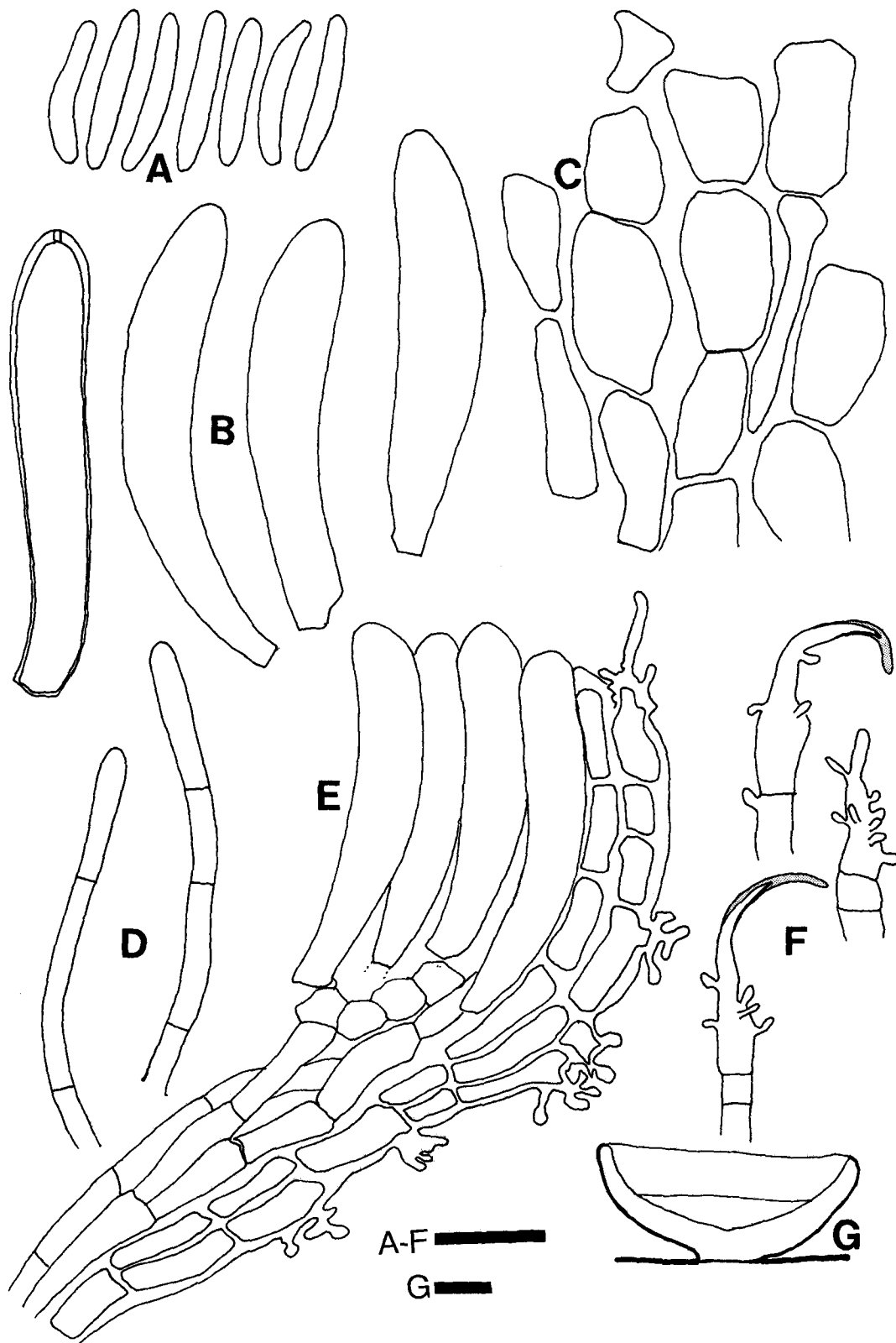


Fig. 6. *Mollisia uncinata* (TRL-1343).

A. Ascospores. B. Asci. That at left showing the typical apical structure stained by MLZ. C. Ectal cells. D. Paraphyses. E. Section of apothecium showing the ectal and part of medullary excipulum. F. Hairs. Two showing glassy portions at the tip, indicated by gray tone. G. Schematic drawing of the apothecial section showing the outline of structure. Hairs not drawn. Scales. A-F, 10 μm ; G, 50 μm .

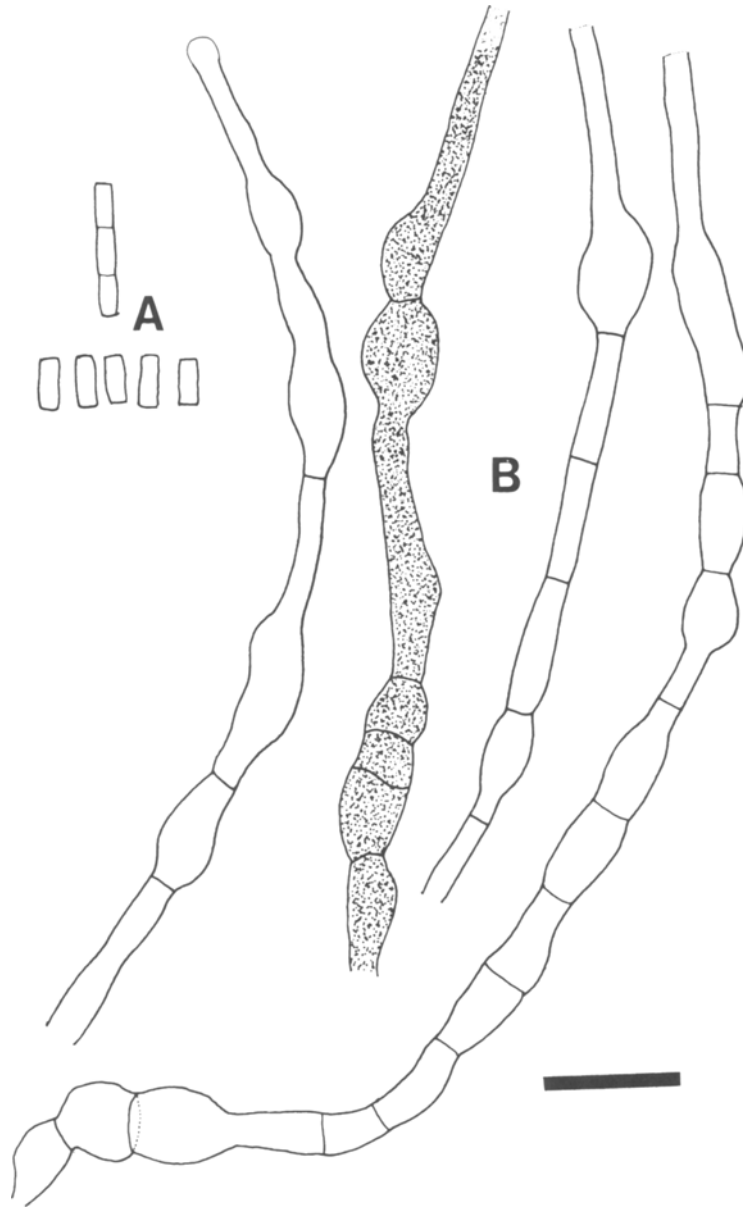


Fig. 7. *Chalara* anamorph of *Mollisia uncinata*, produced on WSH (SANK 16595).
A. Conidia. B. Conidiophores. Coloration indicated only for one representative. Scale. 10 μm .

dricae, 1.5–2 μm latae, septatae, ascos non superantes.

Holotypus. HONSHU: Mt. Daisen, Tottori Pref., on fern remain, 28-V-94, col. T. Hosoya, TRL-1028, TNSF-181595 (culture SANK 16496).

Etymology. Latin, *brunneolus*, refers to the color of the apothecia.

Apothecia gregarious, sessile, minute; disc 200–300 μm in diam, deeply cupulate to urceolate, brownish orange (6C5), occasionally concealed by incurving margin, leaving a slit-like opening; margin concolorous, extending upward beyond the hymenium, with short hairs to the outside, with papillate protuberances from the innermost cells; receptacle greyish orange (6B4) to brown (6E6), coarse to glandular due to the hairs. Ec-

tal excipulum *textura prismatica*, two to three cell-layered, of thin to medium thick-walled prismatic cells 8–13 \times 6–8 μm , mostly 10–12 \times 6–7 μm , with walls becoming thinner toward the inside; hairs ascending, cylindrical conical, sometimes undulating, gradually tapered to a pointed apex, 40–60 μm long, aseptate, solidified by glassy matter; glassy matter stable in 3% KOH, but dissolved explosively in 10% KOH, leaving a thin deformed membranaceous hair outer wall; lumen clearly present at the base, inconspicuously present along its length toward the tip, MLZ– or very indistinctly MLZ+; surface finely coarse, finely granulated by small particles or layer of resinous matter of MLZ+. Asci 32–45 \times 5–7 μm , cylindrical clavate or saccate, rounded at the base, aris-

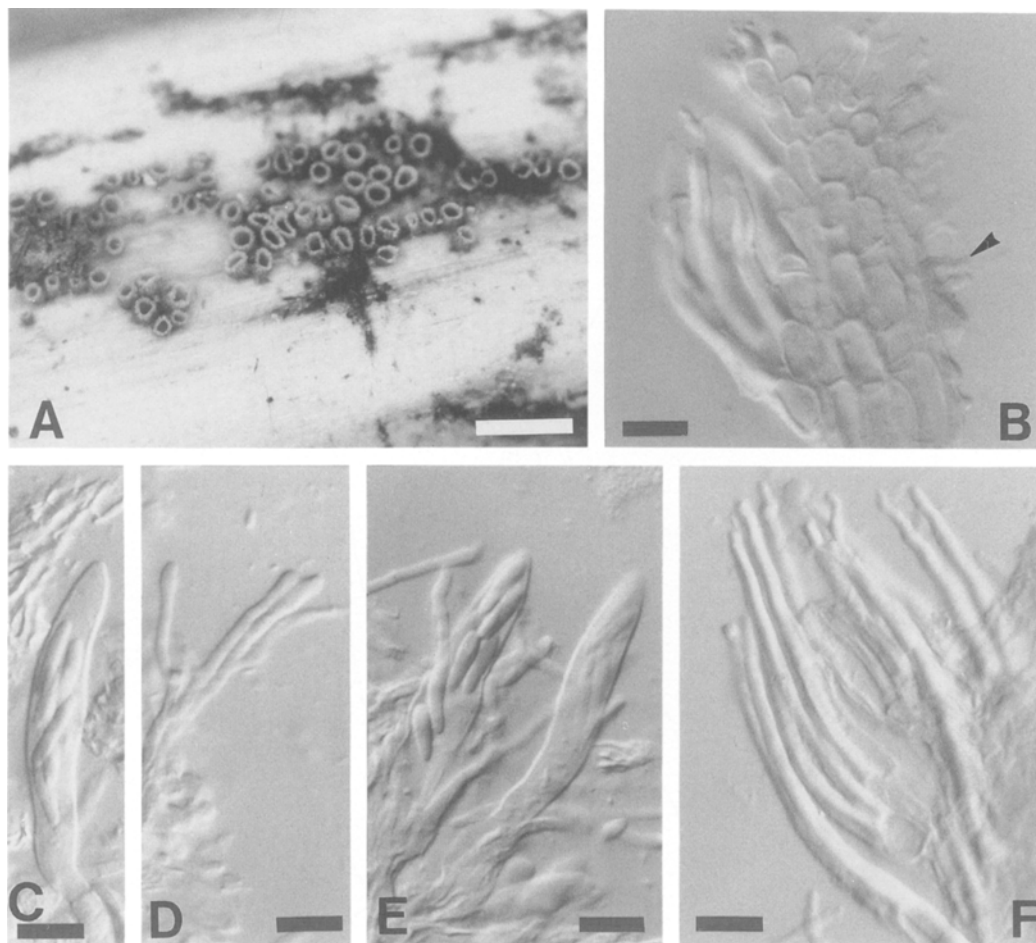


Fig. 8. *Urceolella brunneola* (TRL-1028).

A. Fresh apothecia. B. Close up of margin. Note papillate protrusion on the innermost cells (arrowhead). C. Ascus with ascospores. D. Paraphyses. E. Asci. F. Hairs. Scales. A, 1 mm; B-F, 10 μ m.

ing from indistinct croziers, 8-spored; apex conical, pore MLZ+ without KOH pretreatment. Ascospores 7–13 \times 2–3 μ m, ellipsoid to cylindrical, occasionally somewhat curved, aseptate, hyaline. Paraphyses cylindrical, 1.5–2 μ m thick, septate, not exceeding the asci.

Colonies of SANK 16496 and 17196 on PDA identical, low, dense, pruinose to floccose, weakly radially sulcate, pale yellow (4A3) from the surface, brownish yellow (5C7) at the center, becoming paler toward the margin from the reverse. Context tough and glutinous. Zonation absent. Aerial mycelium white, developed all over or in sectors, covering the surface, not forming strands. Margin distinct, weakly undulate, half submerged. Soluble pigment not produced. Anamorph not seen.

Specimens examined. HONSHU: Tazawa Lake, Akita Pref., on fern remain, 16-V-95, TRL-1188 (culture SANK 17196).

Notes. As the glassiness of the hairs is dissolved in 10% KOH, the present species is clearly a member of the genus *Urceolella* Boud. according to Korf and Kohn's (1980) concept. A large lumen at the base of hairs is a

generic character for *Unguicularia* Höhn., which is now synonymized under *Hyalopeziza* Fuckel by Korf and Kohn (1980). Recent literature dealing with glassy-haired Hyaloscyphaceae (Raschle, 1977; Huhtinen, 1987, 1988; Olsen et al., 1993), contained no descriptions of species with the above combination of characteristics in *Unguicularia* or *Urceolella*.

In the key given by Raschle (1977), the closest species to the present species was *Urceolella saxifragae* Svrček (Svrček, 1967; Raschle, 1977). The present species, however, could be distinguished from *U. saxifragae* by its host, its iodine-positive ascular pores, and the color of its apothecia. *Urceolella brunneola* is classified as *Urceolella* subgen. *Urceolella* in Korf and Kohn's (1980) concept.

The genus *Urceolella* is reported for the first time from Japan.

5. *Urceolella carestiana* (Rabenh.) Dennis, Kew Bull. 17: 335. 1963. Figs. 10, 11
Peziza carestiana Rabenh., Hedwigia 5: 189. 1866.
Helotium carestianum (Rabenh.) P. Karst., Bidr. Finl.

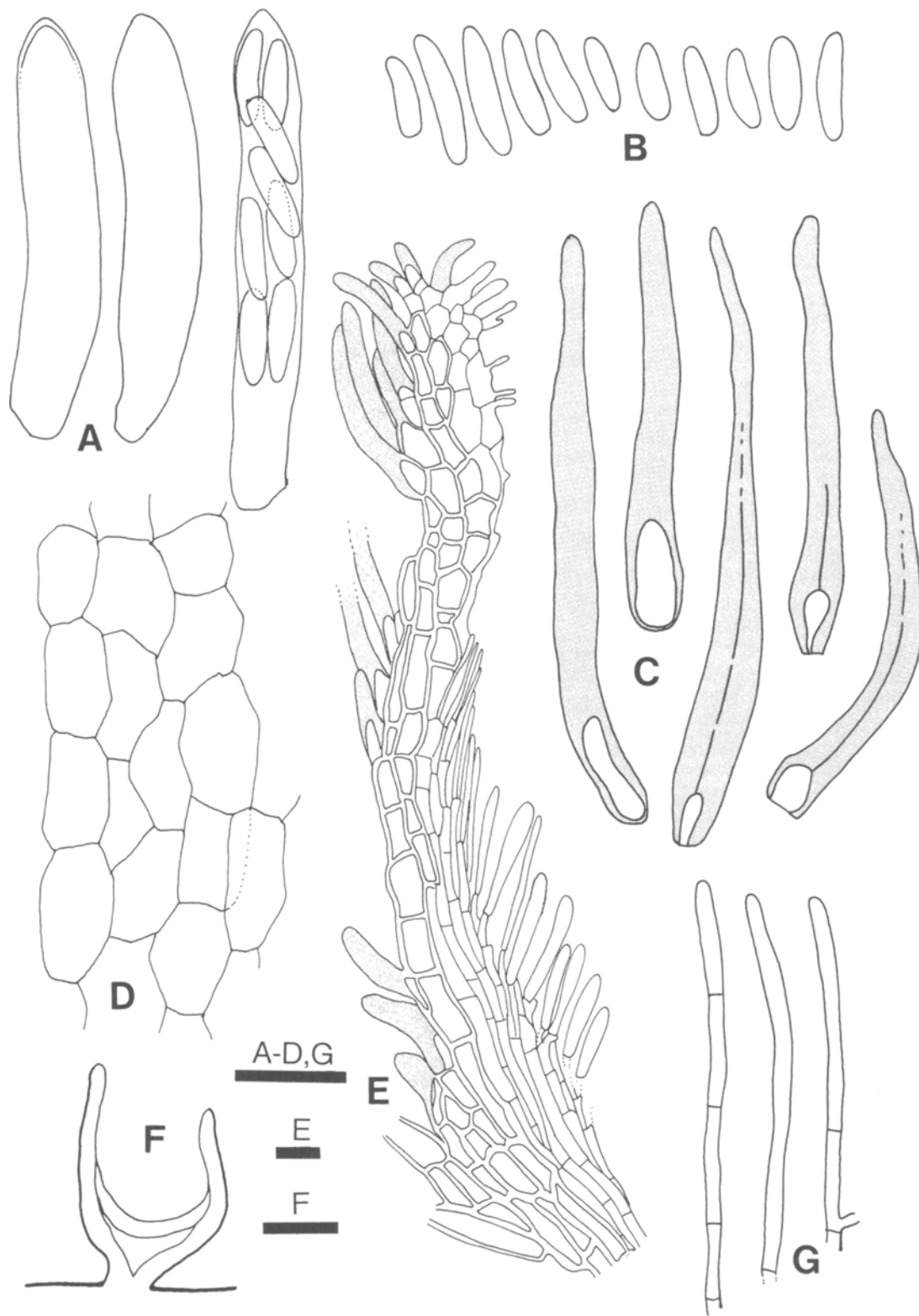


Fig. 9. *Urceolella brunneola* (TRL-1028).

A. Asci. That at right with ascospores. That at left showing apical thickening. B. Ascospores. C. Hairs. Glassy portion indicated by grey tone. Lines show indistinct lumen at the middle. D. Ectal cells observed in squash mount. E. Vertical section of apothecium showing the margin. F. Schematic drawing of the apothecial section showing outline of the structure. Hairs not drawn. G. Paraphyses.

Scales. A-E, G, 10 μ m; F, 100 μ m.

- Nat. Folk **19**: 161. 1871.
Lachnella carestiana (Rabenh.) P. Karst., Acta Soc. Fauna Flora Fenn. **2**: 132. 1885.
Dasyscypha carestiana (Rabenh.) Sacc., Syll. Fung. **8**: 452. 1889.
Micropodia carestiana (Rabenh.) Boud., Hist. Clasific. Discom. d'Eur. p. 128. 1907.
Unguicularia carestiana (Rabenh.) Höhn., Sitzungsber. K. Akad. Wiss. Wien, Mat.-nat. Kl. Abt. 1, **118**: 391. 1909.
Hyalopeziza carestiana (Rabenh.) Raitv., Scripta Mycol. **1**: 33. 1970.
Peziza hexagona Fuckel, Fungi rhenani Nr. 2076. 1867.
Unguicularia hexagona (Fuckel) Dennis, Persoonia **2**: 176. 1962.
Peziza struthiopteridis Saut., Mitth. Gesellsch. Salzbr. Landeskunde **18**: 106. 1878.
Trichopeziza struthiopteridis (Saut.) Sacc., Syll. Fung. **8**: 432. 1889.
Lachnum struthiopteridis (Saut.) Rehm, Rab. Kryptogamenfl. 2. Aufl. **1**: 887. 1896.
Urceolella struthiopteridis (Saut.) Boud., Hist. Clasific. Discom. d'Eur. p. 130. 1907.
Trichopeziza winteriana Rehm, Hedwigia **24**: 230. 1885.
Dasyscypha winteriana (Rehm) Rehm, Rab. Kryptogamenfl. 2. Aufl. **1**: 840. 1896.
Unguicularia winteriana (Rehm) Nannf., Trans. Br. Mycol. Soc. **23**: 251. 1939.
Urceolella winteriana (Rehm) Dennis, Kew Bull. **17**: 379. 1963.
Hyalopeziza winteriana (Rehm) Raitv., Scripta Mycol. **1**: 35. 1970.
Trichopeziza carinata Cooke & Masee, Grevillea **21**: 121. 1892.
Dasyscypha carinata (Cooke & Masee) Masee, Brit. Fung. Fl. **4**: 339. 1895.
 Apothecia scattered to gregarious, sessile or narrowed to a small stem-like base, 150–200 μm high; disc

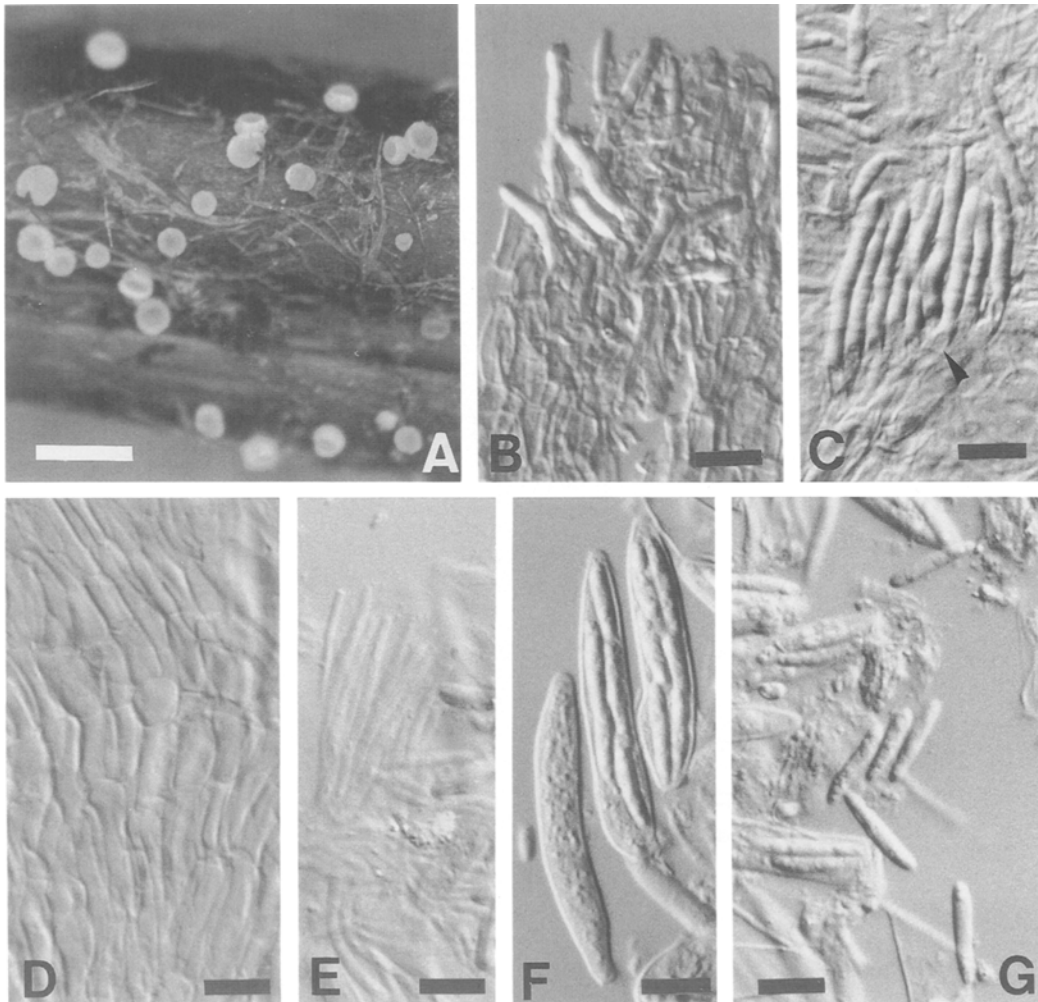


Fig. 10. *Urceolella carestiana* (A: TRL-964; B, D–E: TRL-959; C, F, G: TRL-1153). A. Fresh apothecia on the host. B. Hairs and excipulum. C. Hairs. Note the lumen preserved at their bases (arrowhead). D. Ectal excipulum. E. Paraphyses. F. Asci with ascospores. G. Ascospores. Scales. A, 1 mm; B–G, 10 μm .

deep cupulate to urceolate, 150–200 μm in diam, white; margin occasionally incurved, otherwise extended vertically straight beyond the hymenium; receptacle con-

colorous, becoming greyish orange (6B4), paler toward the margin, finely pruinose to striate, concealing the disc when dried. Ectal excipulum thin-walled *textura pris-*

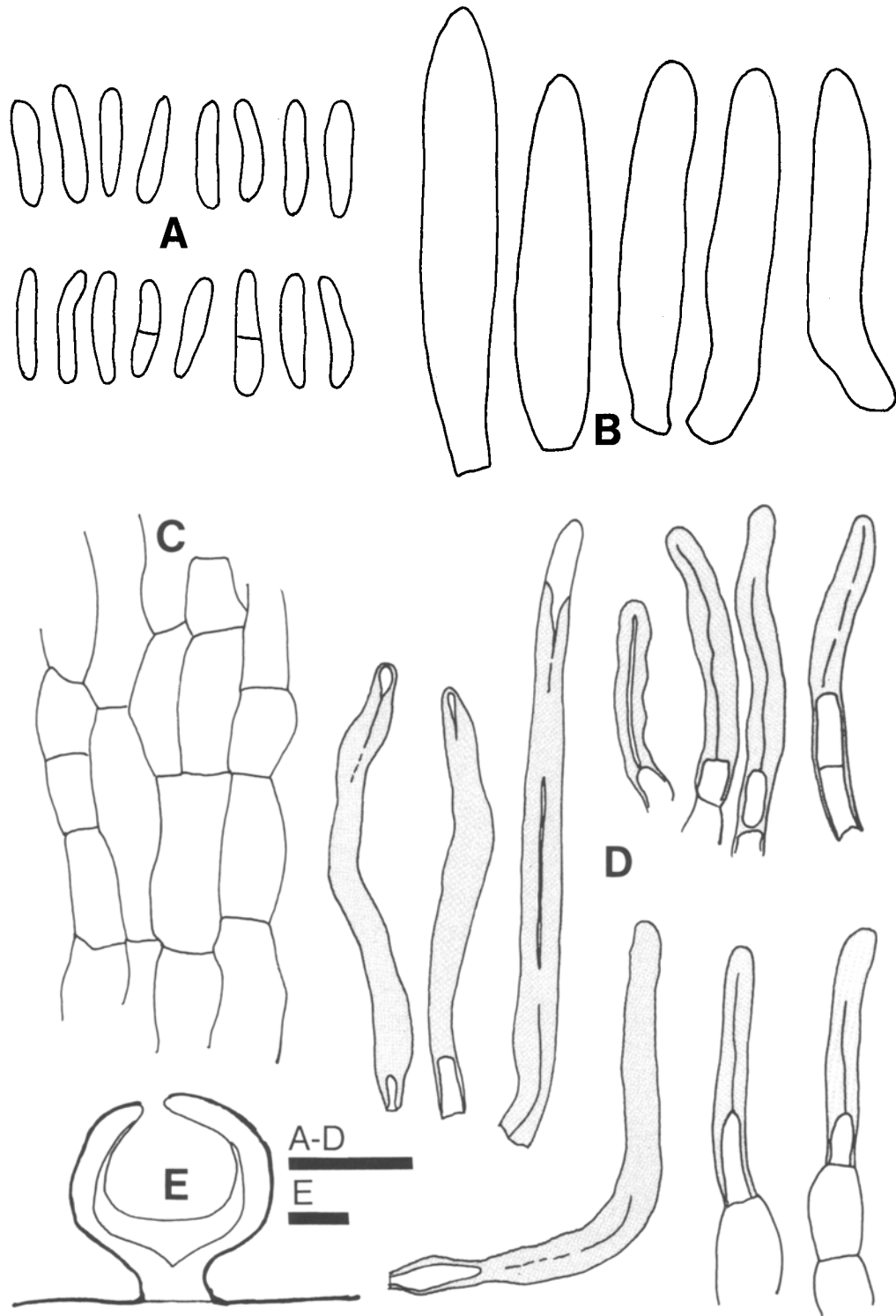


Fig. 11. *Urceolella carestiana* (A–C: TRL-959; D–E: TRL-960).
 A. Ascospores. Two showing septation. B. Asci. C. Ectal cells observed in squash mount. D. Hairs showing lumen at various positions. E. Schematic drawing of the apothecial section showing outline of the structure. Hairs not drawn.
 Scales. A–D, 50 μm ; E, 50 μm .

matica, hyaline, composed of cells $7-12 \times 4-6 \mu\text{m}$. Hairs cylindrical with obtuse apex, almost straight, slightly undulate or occasionally curved, hyaline, glassy, $20-50 \times 3-4 \mu\text{m}$; glassiness lost and hair shape deformed when treated with 10% KOH, MLZ+ with or without KOH pretreatment; lumen preserved clearly at the base, inconspicuously narrowed or lost along its length, occasionally expanded again at the apex, such variations occur within a single apothecium. Asci $30-60 \times 5-6.5(-8) \mu\text{m}$, clavate with a broad base, 8-spored; apex roundish conical, pore MLZ+ without KOH pretreatment. Ascospores $8-12(-15) \times 1.5-2(-3) \mu\text{m}$, varying considerably with specimens, from elliptic fusiform to fusiform-clavate, straight or slightly curved, hyaline, non-septate or one-septate, biseriate in the asci. Paraphyses filiform, $1-1.5 \mu\text{m}$ thick, aseptate to one-septate, apex obtuse, not exceeding the asci.

Specimens examined. HONSHU: Suwa-no-sawa, Aomori-shi, Aomori Pref., on *Dryopteris* stem, 6-V-94, TRL-959, TRL-960 and TRL-964; Shizukuishi-cho, Iwate Pref., on unidentified decaying fern stem, 15-V-95, TRL-1153 and TRL-1155.

Notes. Böhler (1974) studied *U. carestiana* and regarded *U. winteriana* as synonymous. A large variation occurs in the present species as indicated by Böhler (1974) and Raschle (1977). TRL-1153 and TRL-1155 have larger asci and ascospores than TRL-959 and TRL-960, though they all have similar hair characteristics and all the specimens are within the variations presented by Böhler (1974). The species is very common on ferns in Japan.

Because the present species is characterized by glassy hair, the glassiness of which is lost by pretreatment with KOH, and by paraphyses with no apical thickening, it belongs to the genus *Urceolella*, subgen. *Urceolella* in the concept of Korf and Kohn (1980).

6. *Urceolella crispula* (P. Karst.) Boud., Hist. Classific. Discom. d'Eur. p. 130. 1907. Figs. 12, 13
Peziza crispula P. Karst., Not. Sällsk. Fauna Flora Fenn. Förh. 10: 181. 1869.

Helotium crispulum (P. Karst.) P. Karst., Not. Sällsk. Fauna Flora Fenn. Förh. 11: 241. 1870.

Lachnella crispula (P. Karst.) P. Karst., Acta Soc.

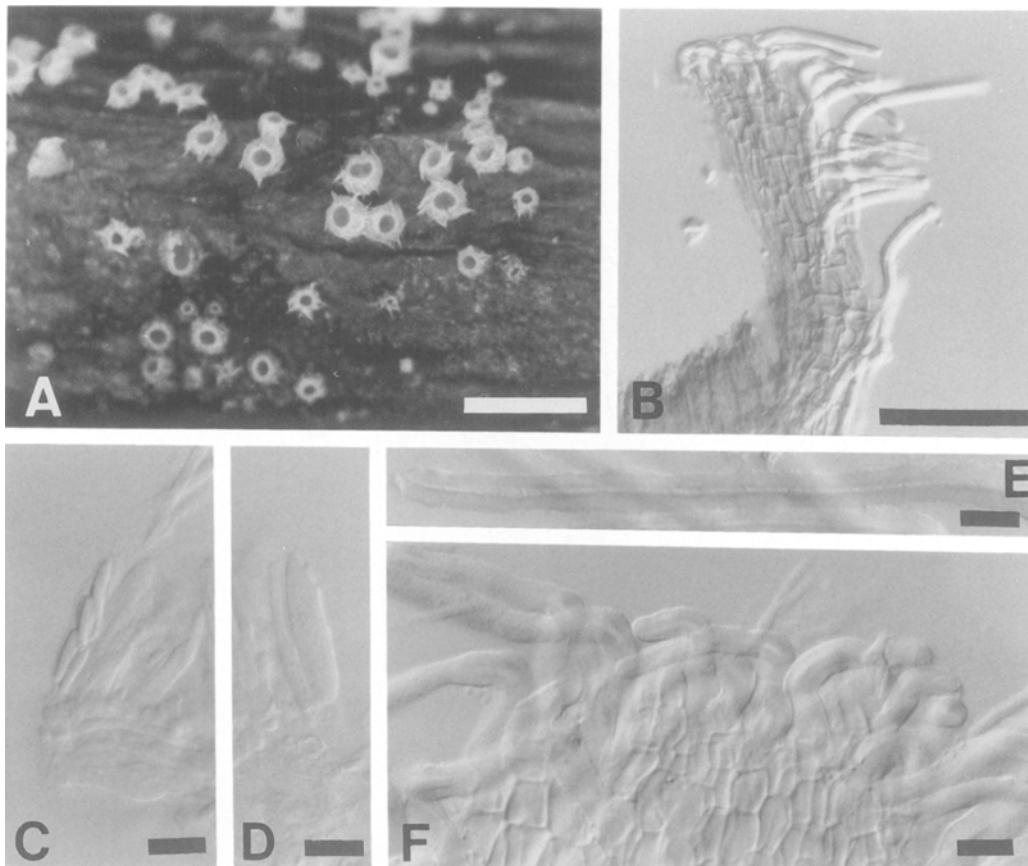


Fig. 12. *Urceolella crispula* (TRL-966).

A. Dried apothecia on the host. Note urceolate shape of the apothecia with spike-like hairs around their openings. B. Vertical section of apothecium, showing margin and part of hymenium. Hairs are broken and only their bases remain. C. Ascus with ascospores. D. Immature asci and paraphyses. E. Close-up of a hair. Note the lumen preserved from the base (right) to the apex (left). F. Close-up of the excipular margin showing the basal portion of the hairs. Note the perpendicular curving of the hairs at their bases.

Scales. A, 1 mm; B, 50 μm ; C-F, 10 μm .

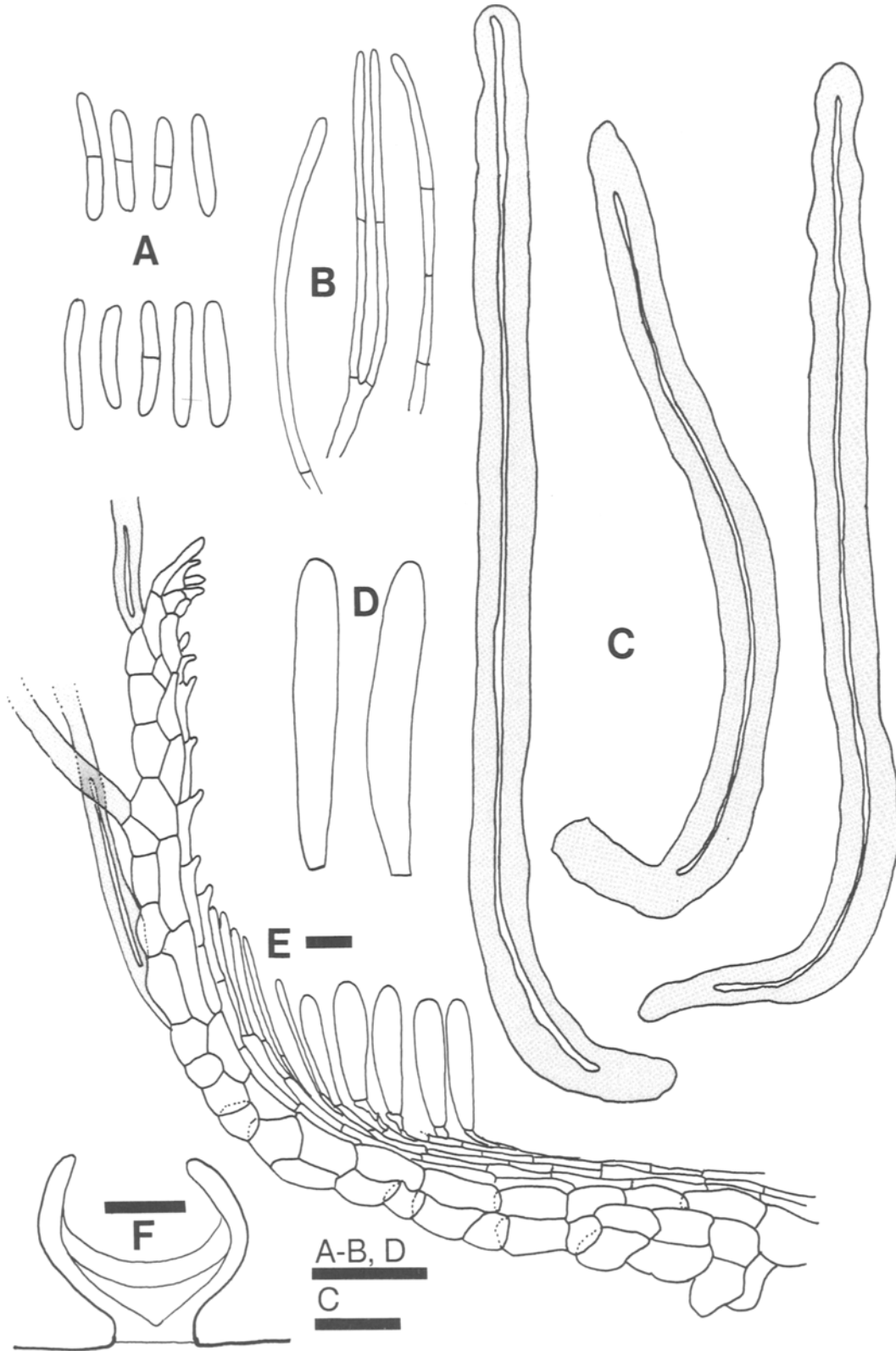


Fig. 13. *Urceolella crispula* (TRL-966).

A. Ascospores. B. Paraphyses. C. Hairs showing narrow lumen in the middle. Glassy area shown in gray tones. D. Asci. E. Section of apothecium showing the ascending margin and ectal cells with inner protrusion. F. Diagrammatic section of apothecium showing outline of the structure. Hairs not drawn. Scales. A-E, 10 μm ; F, 100 μm .

- Faun. Flor. Fenn. 2: 132. 1885.
Trichopeziza crispula (P. Karst.) Sacc., Syll. Fung. 8: 403. 1889.
Urceolella crispula (P. Karst.) Boud., Hist. Classific. Discom. d'Eur. p. 130. 1907.
Unguicularia crispula (P. Karst.) Nannf., Svensk. Bot. Tidskr. 20: 138. 1928.
Hyalotricha crispula (P. Karst.) Dennis, Mycol. Pap. 32: 77. 1949.
Pilatia crispula (P. Karst.) Svrček, Česká Mykol. 16: 96. 1962.
Hyalopeziza crispula (P. Karst.) Raitv., Scripta Mycol. 1: 34. 1970.
Peziza spirotricha Oudem., Nedel. Kruidkund Archief, Ser. 2, 1: 182. 1872.
Dasyscypha spirotricha (Oudem.) Rehm in 26th Ber. nat. Ver. Augsburg. p. 123. 1881.
Lachnella spirotricha (Oudem.) W. Phillips, Brit. Discom. p. 266. 1887 (ut "*spirotricha*").
Trichopeziza spirotricha (Oudem.) Sacc., Syll. Fung. 8: 405. 1889.
Urceolella spirotricha (Oudem.) Boud., Hist. Classific. Discom. d'Eur. p. 130. 1907 (ut "*spirotricha*").
Unguicularia spirotricha (Oudem.) Höhn., Strasser in Verh. Zool. bot. Ges. Wien 65: 166. 1915.
Peziza asterostoma W. Phillips, Grevillea 7: 140. 1879.
Urceolella asterostoma (W. Phillips) Boud., Bull. Soc. Mycol. France 1: 119. 1885.
Dasyscypha asterostoma (W. Phillips) Masee, Brit. Fung. Flora 4: 399. 1895.
Trichopeziza longiciliata Rehm in 26th Ber. nat. Ver. Augsburg. p. 123. 1881.
Pilatia spirotricha Velen., Monogr. Discom. Bohem. p. 289. 1934.
Pilatia minima Velen., Monogr. Discom. Bohem. p. 290. 1934.

Apothecia gregarious, mostly sessile, sometimes substipitate, arising from a broad base; disc deeply cupulate to urceolate, up to 250 μm in diam, fringed by remarkably long white hairs radiating horizontally at the margin, pure white when fresh, becoming pale orange (5A3) when dried; receptacle concolorous, paler toward the margin, coarsely fibrous due to hairs. Ectal excipulum *textura prismatica*, several cell-layered, composed of cells 4.5–17 \times 6–8.5 μm , walls as thick as 0.5 μm , MLZ– without KOH pretreatment, becoming small and thinner-walled toward the margin. Hairs cylindrical, hyaline, glassy and very brittle, aseptate, 6–7.5 μm wide, up to 120 μm long, slightly narrowed at the tip, sharply bent near the base to lie in a horizontal plane when fresh, attached to the receptacle when dried, surface covered by rough resinous granules, lumen reduced to a very fine canal which almost reaches the tip; basal cavity rarely present; faintly MLZ+ for area lining the lumen without KOH pretreatment, MLZ– for other part without KOH pretreatment. In 10 % KOH, glassy portion dissolved and hair deformed, leaving a line of lumen vestiges. Asci 28 \times 4 μm , cylindrical clavate, arising from croziers, 8-spored; pore MLZ+ without KOH pretreatment. Asco-

spores 7–11 \times 1.5–2 μm , clavate, long ellipsoid to cylindrical, occasionally curved, hyaline, aseptate, occasionally one-septate, biseriolate in the asci. Paraphyses filiform, septate, 1–1.5 μm in width, not exceeding the asci.

Specimens examined. HONSHU: Suwa-no-sawa, Aomori-shi., Aomori Pref., on decaying *Aconitum* stem, mixed with *Trichopezizella* sp., 6-V-94, TRL-966.

Notes. This is a remarkable species with very long hairs that lose their glassiness and deform in KOH. Dennis (1949) established the new genus *Hyalotricha* Dennis for three species with long straight hairs including *H. crispula*. The genus, however, was not accepted by later authors, and *Hyalotricha* was synonymized under *Hyalopeziza* by Raitviir (1970) with *Unguicularia*, *Urceolella*, *Olla* Velen., *Pilatia* Velen., and *Pseudoolla* Velen. Korf and Kohn (1980) placed this species in *Urceolella* subgen. *Urceolella*. The reaction of the hairs in 10% KOH is remarkable. The glassy portion dissolves and the hair deforms immediately upon exposure to KOH solution, leaving a vestige of the lumen, which is observed as an unclear linear structure within the hair wall, which becomes delicate. Due to this reaction, the species without doubt belongs to the genus *Urceolella*. *Urceolella crispula* is thought to be closely related to *U. carestiana*, but is distinguished from the latter mainly by its hair morphology and its host.

7. *Urceolella pseudopani* Hosoya, sp. nov. Figs. 14, 15

Apothecia gregarialia, superficialia, sessilia vel raro subsessilia, plana vel vadosa cupulata, ad 300 μm diam, pallide flava vel griseo-flava, margine leviter elevato. Excipulum ectale "textura prismatica," tenuitunicatum vel crassitunicatum, hyalinum, ex cellulis 11.5–16 \times 3–6.5 μm in strato ad exterium fere perpendiculariter disposito compositum. Pili breves, ad 28 μm longi, conici vel lageniformes apice 10–15 μm longi, angustati vel rostriformes, hyalini, laeves, aseptati, vitrei, apice uncinati, iodo non caerulescentes; lumen tantum basale vel usque ad medium nunquam ad apicem attingens; substantia vitrea solubilis in 10% KOH, sed forma pili non deformans. Asci 31–36 \times 6 μm , cylindraco-clavati, ex hamulis surgentes, octospori, apice rotundati, poro iodo non caerulescenti. Ascospores 6–7.5 \times 2–3 μm , ellipsoideae, hyalinae, aseptatae, uni- vel bi-guttulatae. Paraphyses cylindricae, flexuosae, 2–3 μm crassae, septatae, sparsae, apice interdum conicae et vitreae.

Holotypus. HONSHU: Iizuna-kogen, Nagano Pref., on unidentified decaying wood, 5-X-93, col. Hosoya, TRL-818, TNSF-181596.

Etymology. Latin, *pseudo*+*pani*, refers to the morphological similarities reported for *U. pani* (Velen.) Huhtinen (Huhtinen, 1988).

Apothecia gregarious, sessile or rarely subsessile; disc flat to shallow cupulate, pruinose, up to 300 μm in diam, light yellow (4A4) to greyish yellow (4B6), with well-defined margin slightly elevated than the hymenium when dried; receptacle concolorous or paler, finely pruinose when dried. Ectal excipulum thin- to thick-walled *textura prismatica*, hyaline, cells 11.5–16 \times 3–6.5 μm , arranged almost perpendicular to the surface.

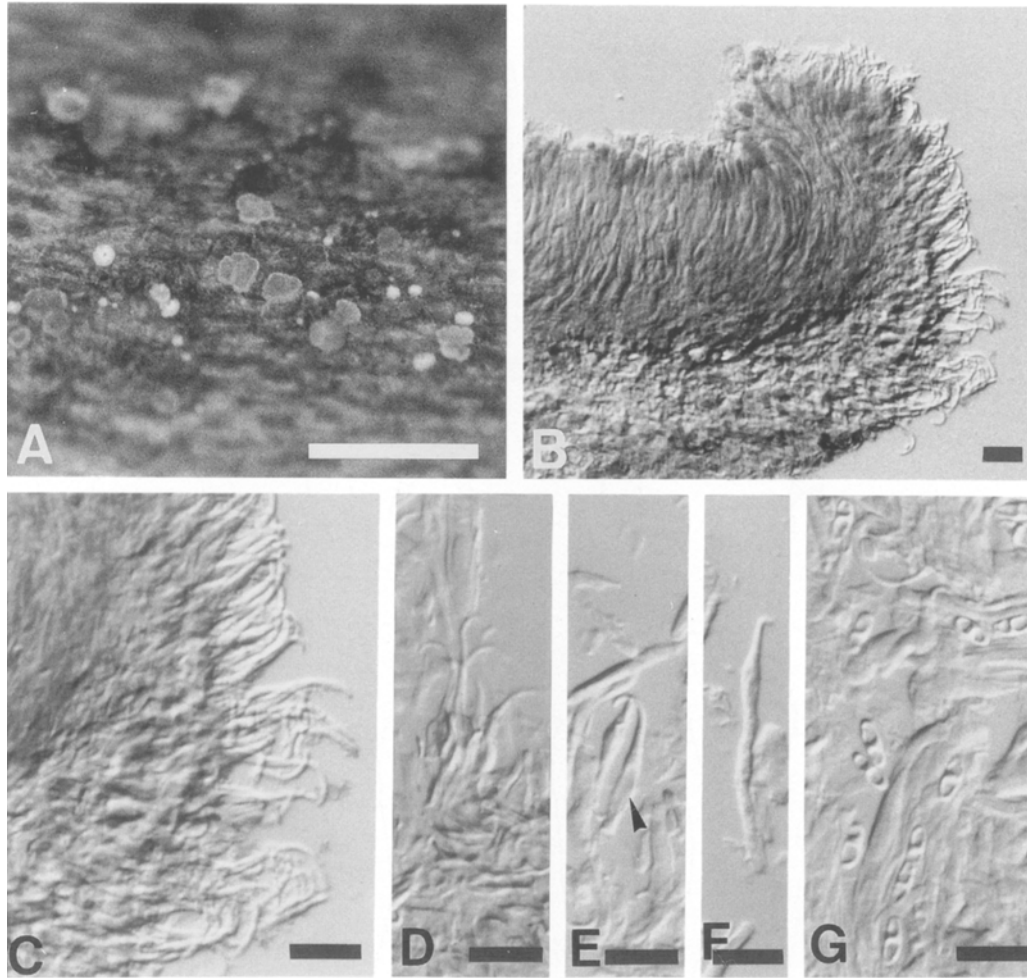


Fig. 14. *Urceolella pseudopani* (TRL-818).

A. Dried apothecia. B. Vertical section of apothecium showing margin, hymenium and ectal excipulum. C. Close-up of part of ectal excipulum with uncinulate hairs. D. Hairs with apical beaks. E. Hair with a lumen (arrowhead). F. Paraphysis with a cinctate apex. G. Ascospores with two large guttules. Scales. A, 1 mm; B–G, 10 μ m.

Hairs short, up to 28 μ m long, mostly 18–25 μ m long, conical or lageniform, gradually tapered to a conical or beaked apex of 10–15 μ m long, hyaline, smooth, aseptate; apex slightly curved or often uncinulate, solidified by glassy matter, MLZ– without KOH pretreatment; lumen preserved at the base or along its length to the middle of the beak, but never reaches to the apex; morphology of the hair unchanged in 10% KOH, although glassiness was lost. Asci 31–36 \times 6 μ m, cylindrical clavate, often broader at the upper half, arising from croziers, 8-spored; apex round, MLZ– with or without KOH pretreatment. Ascospores 6–7.5 \times 2–3 μ m, ellipsoid, hyaline, aseptate, with one or two large guttulae observed in MLZ. Paraphyses cylindrical, flexuose, 2–3 μ m wide, septate, sparse, occasionally becoming conical or developing a solidification to form hair-like structure at the apex.

Notes. The present specimen has very similar morphological characteristics to *Urceolella pani* (Velen.) Huhtinen (Huhtinen, 1988), *Unguicularia xylemicola* Böhler (Böhler, 1974) and *Hyalopeziza pani* (Velen.) L. &

K. Holm (Holm and Holm, 1981), except for its habitat and the shape and dimension of its ascospores. *Urceolella pani* is found on ferns (*Dryopteris* Adans. and *Lycopodium* L.), whereas the present fungus is found on decaying wood. Ascospores of the present fungus are longer and more elongated than previously given for *U. pani*. Chemical reaction of the ascal apex differs (MLZ+ in *U. pani*, MLZ– in the present specimen).

A close morphological similarity is also noted with *Unguicularia dilatopilosa* Graddon (Graddon, 1974; Raschle, 1977). *Unguicularia dilatopilosa*, however, has darker apothecia and slender ascospores. Some features of *Unguicularella robergei* (Desm.) Dennis (Dennis, 1955) are similar to those of the present fungus: hair morphology, ascospore morphology, and J– asci. After examining the type of *U. robergei* deposited in Kew, *U. robergei* proved to be distinct from the present fungus in its larger hairs, apothecia, and darker-colored ectal excipulum. Many species with hairs like the present fungus are listed in Dennis (1981). The taxonomic position

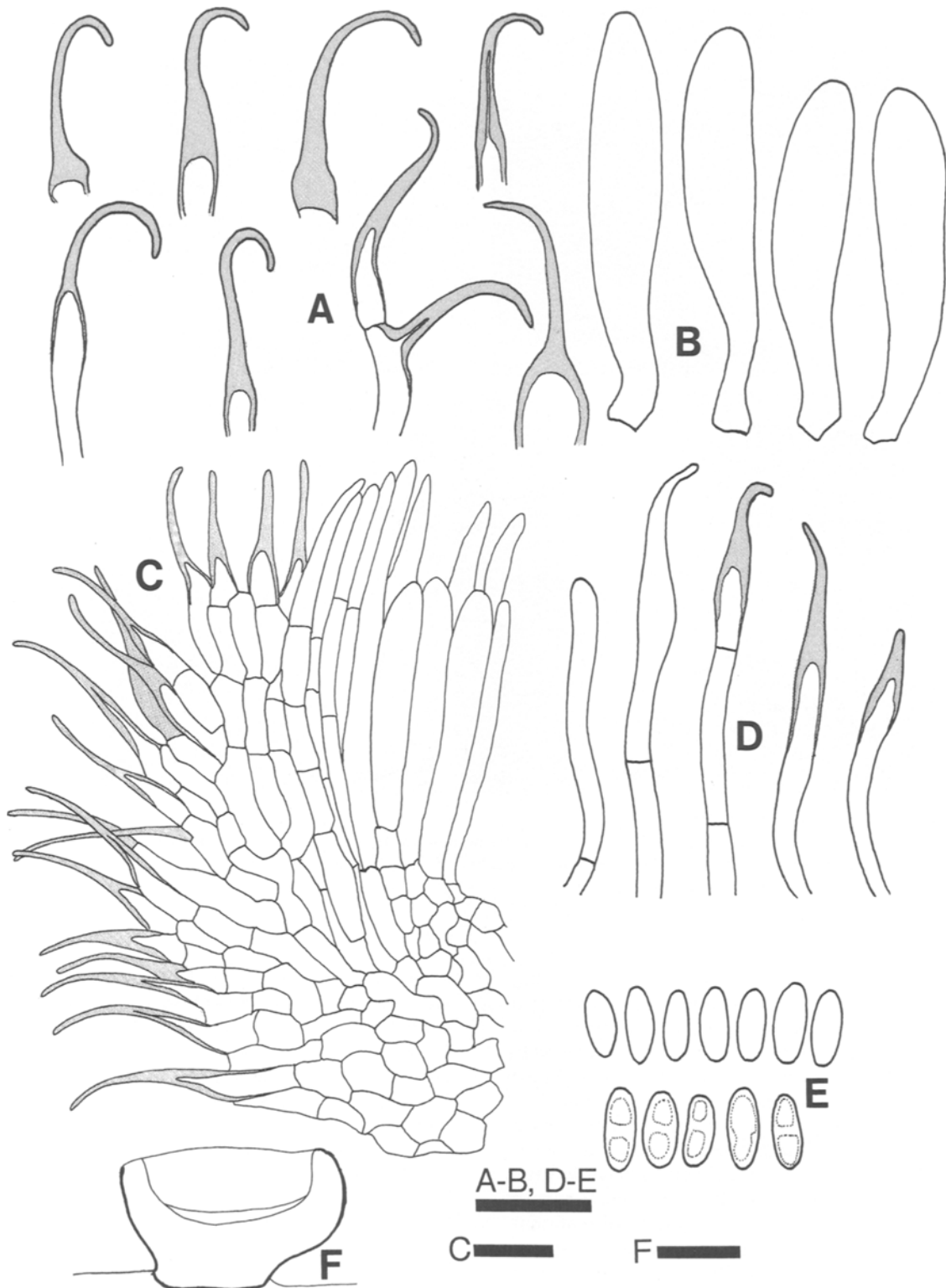


Fig. 15. *Urceolella pseudopani* (TRL-818).

A. Hairs with uncinately apex. That at upper right showing a narrow lumen nearly reaching the apex. Glassy portion indicated by gray tones. B. Asci. C. Section of apothecium showing ectal excipulum and hairs. D. Paraphyses of various types. Apex of that at left remained obtuse and not solidified; apices of three at right became tapered and solidified. E. Ascospores. Guttules shown only in the lower row. F. Schematic drawing of the apothecial section showing the outline of structure. Hairs not drawn. Scales. A-E, 10 μm ; F, 50 μm .

of these species including the present fungus, should be discussed in the future based upon a larger numbers of specimens with their cultures.

Urceolella pseudopani is classified as *Urceolella* subgen. *Urceolella* proposed by Korf and Kohn (1980).

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