

KEY TO THE SPECIES OF *HELEOCOCCUM*modified from Udagawa *et al.* (1995)

1. Ascospores 22.5–25.5 × 9–10.5 μm, pale yellow, not constricted at the septum, with an irregular gelatinous sheath; anamorph unknown; on moist soil; known from England and Denmark *H. aurantiacum*
1. Ascospores less than 22 μm long, hyaline; anamorph *Acremonium*-like or *Trichothecium*-like; isolated from soil or wood immersed in sea water; known from Indonesia, Japan, or the Philippines 2
2. Ascospores 18–21 × 10–13 μm, smooth or slightly roughened; anamorph *Trichothecium*-like; isolated from wood immersed in sea water; known from Japan *H. japonense* Tubaki
2. Ascospores less than 18 μm long; anamorph *Acremonium*-like; isolated from soil; known from Indonesia or the Philippines 3
3. Ascospores 10–11 × 5–6 μm, slightly verrucose to striate, surrounded by a sheath; known from the Philippines *H. inapertum* Udagawa *et al.*
3. Ascospores 6–8 × 3–3.5 μm, slightly verrucose, with 2–3 longitudinal, wing-like ridges; known from Indonesia *H. alatosporum* Udagawa *et al.*

HOLOTYPE.— DENMARK. Botanical Garden of the University of Copenhagen, in the moor, on moist soil, Autumn 1921, L. Kolderup Rosenvinge (C; NY, slides of holotype). Culture CBS 201.35

ILLUSTRATIONS.— Dennis (1978, Pl. 44J); Jørgensen (1922, Figs. 1–2); Tubaki (1967, Pl. 2E–F).

NOTES.— The holotype specimen and slides of *Heleococcum aurantiacum* were examined, on which the few remaining ascomata were broken, apparently disintegrating, revealing globose asci and loose ascospores in the centrum. The above description is based on this fragmentary type specimen, the original description, and the description and illustrations based on the type specimen by Tubaki (1967).

A second species, *Heleococcum japonense*, was described by Tubaki (1967) that occurs on submerged wood in a marine habitat and produces a *Trichothecium*-like anamorph (culture CBS 397.67). Two additional species of *Heleococcum* both having *Acremonium*-like anamorphs have been described recently by Udagawa *et al.* (1995) who included a key to the four species of *Heleococcum*.

HYDROSPHAERA Dumort., *Comment. bot.* p. 90, 1822.

Type: *H. peziza* (Tode : Fr.) Dumort. (= *Sphaeria peziza* Tode : Fr.).

= *Nectria* subgenus *Hyphonectria* Sacc., *Syll. Fung.* 2: 501, 1883.

= *Hyphonectria* (Sacc.) Petch, *J. Bot.* 75: 220, 1937. — Lectotype, designated by Samuels (1976a): *Nectria peziza* (Tode : Fr.) Fr. (= *Sphaeria peziza* Tode : Fr.), recognized as *Hydropisphaera peziza* (Tode : Fr.) Dumort.

= *Neuronectria* Munk, *Dansk Bot. Ark.* 17 (1): 56, 1957. — Type: *N. peziza* (Tode : Fr.) Munk (= *Sphaeria peziza* Tode : Fr.), recognized as *H. peziza*.

= *Neohenningsia* Koord., *Verh. Kon. Ned. Akad. Wetensch. Afd. Natuurk., Sect. 2*, 13: 164, 1907. — Type: *N. stellatula* Koord. (= *Nectria stellatula* (Koord.) Höhn., a synonym of *H. rufofusca*).

= *Perrotiella* Naumov, *Bull. Soc. Oural. Amis Sci. Nat.* p. 26, 1916. — Type: *P. uralensis* Naumov, a synonym of *H. peziza*.

Ascomata superficial, non-stromatic, pale yellow, orange or umber, KOH –, globose to subglobose or doliform, usually collapsed and deeply cupulate, smooth or with fasciculate hairs. Ascomatal wall generally over 25 μm thick, of two regions: outer region of thin-walled, globose cells. Asci clavate. Ascospores ellipsoid, 1- to multiseptate, hyaline, generally finely to coarsely striate, rarely smooth or spinulose. Anamorph, where known, *Acremonium*-like. On dead herbaceous or woody monocotyledonous or dicotyledonous substrata.

NOTES.— Within the *Nectria*-like fungi of the *Hypocreales*, *Hydropisphaera* is unique in ascomatal wall structure in which the wall is relatively thick, generally over 25 μm, and up to 100 μm thick in *H. pachyderma*, and is composed of large, thin-walled, globose cells often over 15 μm diam. This ascomatal wall structure results in a characteristic deeply cupulate collapse of the ascumata upon drying (Booth, 1959; Rossman, 1983; Samuels, 1976b). The ascospores of *Hydropisphaera* are one- to multiseptate, often finely to coarsely striate although also spinulose or smooth. The anamorphs have been placed in *Acremonium* or, if the conidia are septate, in *Cephalosporiopsis*, always having simple conidiophores and relatively long, tapering, phialidic conidiogenous cells. Species of *Hydropisphaera* often occur as saprobes on decaying monocotyledonous plants and ferns, although there are many exceptions in-

cluding *H. boothii* (on *Oenanthe* (*Apiaceae*), England), *H. erubescens* (various dicotyledonous herbaceous substrata in temperate regions), *H. gigantea* (on *Conium* and other herbaceous stems, Argentina and Ecuador), *H. haematites* (on unidentified woody plant, Africa), *H. peziza* (on decaying wood, polypores, bark, soil, and other organic substrata, cosmopolitan) and *H. pachyderma* (on bark of unidentified twig, Colombia). In his molecular study of *Fusarium* and related fungi, O'Donnell (1993) included *H. peziza* (as *N. peziza*) and found that this species grouped most closely with other pallid *Nectria*-like species now placed in the *Bionectriaceae*.

At the time the generic name *Hydropisphaera* was proposed, almost all pyrenomycetes were included in the one family *Sphaeriaceae* and the name had been ignored until recently. In proposing *Nectria* for conservation against *Hydropisphaera* and *Ephedrosphaera* Dumort., Cannon & Hawksworth (1983) unearthed *Hydropisphaera* as the oldest name available for the *Nectria peziza*-group when recognized at the generic level.

Saccardo (1883) established *Nectria* subgenus *Hyphonectria* Sacc. in which he included nine species. When Petch (1937) raised the subgenus to generic rank, he made reference to Saccardo's subgeneric taxon and included four additional species (*Hyphonectria violacea*, *H. berkeleyana*, *H. aureonitens*, and *H. solani*). Neither Saccardo (1883) nor Petch (1937) designated a type species. Samuels (1976a) discussed the problem of typification of *Nectria* subgenus *Hyphonectria* and the genus *Hyphonectria* and lectotypified this taxon with *Nectria peziza* as one of the original nine species included in *Nectria* subgenus *Hyphonectria* by Saccardo (1883). Samuels (1976a) considered the reference by Petch to the nine species originally included in *Nectria* subgenus *Hyphonectria* to constitute inclusion in *Hyphonectria* at the generic rank even though Petch did not specifically transfer any of the species to the genus.

Neohenningsia was initially placed in the *Aspergillaceae*, *Eurotiaceae*, despite the presence of an ostiole. Although Koorders (1907) suggested a relationship with *Charonectria* Sacc. and *Baculospora* Zúkal in the *Hypocreales*, he differentiated his genus from these in stating that *Neohenningsia* had superficial ascumata with fasciculate appendages, thin-walled asci, and septate ascospores. Von Höhnelt (1909a) placed the type species of *Neohenningsia* in *Nectria*. Samuels (1976b) reviewed the history of *Neohenningsia* and unsuccessfully sought the type specimen of *N. stellulata* at BO and FH; it does also not exist at B. Based on the original description, *Neohenningsia stellulata* is herein neotypified and this species is regarded as a synonym of *H. rufofusca*.

Perrotiella was described as a discomycete in the

Pezizaceae. Nannfeldt (1932) examined authentic material of the type species and confirmed that *P. uralensis* is a synonym of *Nectria peziza*, thus *Perrotiella* is a synonym of *Hydropisphaera*.

Neuronectria was described for species of *Nectria* having striate ascospores. This character is not unique to any particular group of nectrioid fungi as evidenced by Samuels (1988). He included thirty species of *Nectria* having pallid ascumata and hyaline, striate ascospores in seven different groups of *Nectria sensu lato*, and Rossman (1989) documented three of the 28 species in the *Nectria sensu stricto* having striate ascospores. Many genera of nectrioid fungi include species having striate ascospores.

***Hydropisphaera peziza* (Tode : Fr.) Dumort., Comment. bot. p. 90. 1822.**

≡ *Sphaeria peziza* Tode : Fr., Tode, Fungi Mecklenb. Sel., Fasc. 2: 46. 1791 : Fries, Syst. Mycol. 2: 452. 1823.

≡ *Nectria peziza* (Tode : Fr.) Fr., Summa Veg. Scand. p. 388. 1849.

≡ *Dialonectria peziza* (Tode : Fr.) Cooke, Grevillea 12: 110. 1884.

≡ *Cucurbitaria peziza* (Tode : Fr.) O. Kuntze, Rev. Gen. Pl. 3: 461. 1898.

≡ *Neuronectria peziza* (Tode : Fr.) Munk, Dansk Bot. Ark. 17 (1): 58. 1957.

= *Nectria fimicola* Fuckel, Jahrb. Nassauischen Vereins Naturk. 23-24: 179. 1869 [1870].

≡ *Byssonectria fimicola* (Fuckel) Cooke, Grevillea 12: 109. 1884.

≡ *Cucurbitaria fimicola* (Tode : Fr.) O. Kuntze, Rev. Gen. Pl. 3: 461. 1898.

= *Nectria pezicula* Speg., Michelia 1: 232. 1878.

≡ *Byssonectria pezicula* (Speg.) Cooke, Grevillea 12: 109. 1884.

= *Nectria epigaea* Cooke, Grevillea 8: 10. 1879.

≡ *Byssonectria epigaea* (Cooke) Cooke, Grevillea 12: 109. 1884.

= *Nectria rimicola* Cooke, Grevillea 11: 108. 1883.

≡ *Cucurbitaria rimicola* (Cooke) O. Kuntze, Rev. Gen. Pl. 3: 461. 1898.

= *Nectria umbellulariae* Plowr. & Harkn., Bull. Calif. Acad. Sci. 1: 26. 1884.

≡ *Cucurbitaria umbellulariae* (Plowr. & Harkn.) O. Kuntze, Rev. Gen. Pl. 3: 462. 1898.

= *Nectria perforata* Ellis & Holw., in Arthur, Geol. Nat. His. Surv. Minnesota Bull. 3: 33. 1887.

≡ *Cucurbitaria perforata* (Ellis & Holw.) O. Kuntze, Rev. Gen. Pl. 3: 461. 1898.

= *Nectria consanguinea* Rehm, Hedwigia 26: 92. 1887.

= *Nectria importata* Rehm, Hedwigia 27: 171. 1888.

≡ *Cucurbitaria importata* (Rehm) O. Kuntze, Rev. Gen. Pl. 3: 461. 1898.

= *Nectria henningsii* Rehm, Hedwigia 28: 352. 1889.

= *Nectria betulina* Rehm, Ann. Mycol. 3: 519. 1905 [1906].

= *Nectria sphagnicola* Kirschst., Verh. Ver. Prov. Brandenburg 48: 59. 1906.

= *Nectria fallax* Rick, Ann. Mycol. 4: 309. 1906.

= *Perrotiella uralensis* Naumov, Bull. Soc. Oural. Amis Sci. Nat. p. 26. 1916.

ANAMORPH: *Acremonium* sp.

Mycelium not visible or white, surrounding the ascomatal base, subtending hyphae unbranched, thin-walled, ca 4 μm wide. Ascomata superficial or basally immersed, solitary to gregarious, subglobose, globose to urniform or almost discoidal, becoming cupulate when dry, 370–420 μm high \times (250–)370–430(–550) across the flat tops, yellow to orange, smooth or slightly furfuraceous, papilla lacking or short and acute, of cylindrical, septate, unbranched hyphae with rounded tips, ca 3 μm wide; periphyses 20–30 μm long. Ascomatal wall 30–50(–70) μm thick, of two regions: outer region 15–30(–50) μm thick, cells broadly ellipsoid to globose, 10–15 μm diam, thin-walled; inner region ca 15 μm thick, cells flattened and compacted; cells in surface view spherical, 15–25 μm diam, thin-walled. If present, hairs short, orange, consisting of septate, unbranched, thin-walled hyphae, occasionally forming triangular fascicles. Asci clavate, (49–)60–75(–100) \times (5–)8–10(–14) μm , apices flat, 8-spored, ascospores biseriate above, uniseriate below. Ascospores broadly ellipsoid, (9–)11–14(–17) \times (3–)5–7 μm , equally 2-celled, not constricted or slightly constricted at the septum, hyaline, conspicuously longitudinally striate.

HABITAT.— On well-rotted wood, bark, dung, decaying cloth, and basidiocarps of polypores.

DISTRIBUTION.— Cosmopolitan, especially common in temperate regions.

LECTOTYPE, designated here.— SWEDEN. On rotten wood, Sclerom. Suec. 24 no. 235. 1822 (BPI, in Sbarbaro collections in bound centuries 1–3). The specimens of Tode were destroyed, thus none of the specimens of *S. peziza* examined by Tode are still in existence. Fries (1823) mentioned several specimens following the description of *S. peziza*, including Sclerom. Suec. 24 no. 235. Booth (1959) stated that the specimen of this number at K was in poor condition. The specimen at BPI is in excellent condition.

ILLUSTRATIONS.— Booth (1959, Fig. 32, as *Nectria peziza*); Dennis (1978, Pl. 32C, as *N. peziza*); Dingley (1951b, Fig. 1, as *N. peziza*); Ellis & Ellis (1985, Fig. 135); Hanlin (1963a, Figs. 1–47, as *Neuronectria peziza*); Malençon (1979, Fig. 1A, as *Nectria peziza*); Samuels, (1976b, Figs. 16A, 17A–E, as *N. peziza*).

NOTES.— Hanlin (1963a) studied the centrum development of *H. peziza* as *Neuronectria peziza*. Gams (1971) and Samuels (1976b) described the anamorph in culture.

SEVENTEEN ADDITIONAL SPECIES are included in *Hydropisphaera* as follows:

Hydropisphaera arenula (Berk. & Broome) Rossman & Samuels, *comb. nov.*

\equiv *Sphaeria arenula* Berk. & Broome, Ann. Mag. Nat. Hist., Ser. 2, 9: 320. 1852.

\equiv *Nectria arenula* (Berk. & Broome) Berk., Out. Brit. Fung. p. 394. 1860.

\equiv *Dialonectria arenula* (Berk. & Broome) Cooke, Grevillea 12: 110. 1884.

\equiv *Cucurbitaria arenula* (Berk. & Broome) O. Kuntze, Rev. Gen. Pl. 3: 460. 1898.

\equiv *Calonectria transiens* Rehm, Hedwigia 39: 225. 1900.

This species was described and illustrated in Booth (1959), Samuels (1978), and Schmid & Schmid (1991), each as *Nectria arenula*.

Hydropisphaera arenuloides (Samuels) Rossman & Samuels, *comb. nov.*

\equiv *Nectria arenuloides* Samuels, New Zealand J. Bot. 14: 254. 1976.

This species was described and illustrated in Samuels (1976b).

Hydropisphaera boothii (D. Hawksw.) Rossman & Samuels, *comb. nov.*

\equiv *Nectria boothii* D. Hawksw., Trans. Brit. Mycol. Soc. 74: 572. 1980.

This species was described and illustrated in Hawksworth & Minter (1980) as *N. boothii*.

Hydropisphaera cyatheae (Dingley) Rossman & Samuels, *comb. nov.*

\equiv *Nectria cyatheae* Dingley, Trans. Roy. Soc. New Zealand 83: 652. 1956 (as '*cyathea*').

This species was described and illustrated in Dingley (1956) and Samuels (1976b) as *N. cyatheae*. Culture CBS 575.76.

Hydropisphaera dolichospora (Penz. & Sacc.) Rossman & Samuels, *comb. nov.*

\equiv *Nectria dolichospora* Penz. & Sacc., Malpighia 11: 513. 1897.

This species was described and illustrated in Samuels (1976a) and Samuels *et al.* (1990) as *N. dolichospora*.

Hydropisphaera erubescens (Desm.) Rossman & Samuels, *comb. nov.*

\equiv *Sphaeria erubescens* Desm., Ann. Sci. Nat., Bot., Sér. 3, 6: 72. 1846.

\equiv *Calonectria erubescens* (Desm.) Sacc., Michelia 1: 309. 1878.

≡ *Amphinectria erubescens* (Desm.) Sacc. ex Speg., Bol. Acad. Ci. (Cordoba) 26: 347. 1927.
 = *Calonectria umbelliferarum* Seaver, Mem. New York Bot. Gard. 6: 507. 1916.
 = *Calonectria venezuelensis* Syd. & P. Syd., Ann. Mycol. 33: 88. 1935.
 = *Calonectria crescentiae* Seaver & Waterston, Mycologia 32: 404. 1940.

This species was described and illustrated in Rossman (1983) and Samuels (1978), as *N. erubescens*. Cultures CBS 333.76–335.76.

Hydropisphaera gigantea (Speg.) Rossman & Samuels, *comb. nov.*

≡ *Lasionectria gigantea* Speg., Anal. Mus. Nac. Buenos Aires 3, 1: 77. 1902.
 ≡ *Nectria gigantea* (Speg.) Sacc. & D. Sacc., Syll. Fung. 17: 792. 1905.

This species was described in Samuels (1976a) as *N. gigantea*, based on the type specimen from Argentina.

A specimen additional to the type has been collected, examined, and is reported here: ECUADOR, Prov. Zamora: ca 21 km from Zamora, on the Zamora-Yanzoza Road, elev. ca 1,000 m, on herbaceous stem, 31 July 1975, K.P. Dumont (Dumont-EC 1779), S.E. Carpenter & P. Buritica (NY).

Hydropisphaera haematites (Syd. & P. Syd.) Rossman & Samuels, *comb. nov.*

≡ *Nectria haematites* Syd. & P. Syd., in Mildbraed, Wiss. Ergebn. Deutsch. Zent. Afrika Exped. 2, Bot. prior to 99. 1914.

This species was described and illustrated in Samuels (1976a) as *N. haematites*.

Hydropisphaera hypoxantha (Penz. & Sacc.) Rossman & Samuels, *comb. nov.*

≡ *Nectria hypoxantha* Penz. & Sacc., Malpighia 11: 513. 1897.

This species was described and illustrated in Samuels *et al.* (1990) as *N. hypoxantha*.

Hydropisphaera leucotricha (Penz. & Sacc.) Rossman & Samuels, *comb. nov.*

≡ *Nectria leucotricha* Penz. & Sacc., Malpighia 11: 512. 1897.

This species was described and illustrated in Samuels *et al.* (1990) as *N. leucotricha*.

Hydropisphaera macrarenula (Samuels) Rossman & Samuels, *comb. nov.*

≡ *Nectria macrarenula* Samuels, Mem. New York Bot. Gard. 59: 83. 1990.

This species was described and illustrated in Samuels *et al.* (1990) as *N. macrarenula*.

Hydropisphaera multiloculata (Samuels) Rossman & Samuels, *comb. nov.*

≡ *Nectria multiloculata* Samuels, New Zealand J. Bot. 16: 78. 1978.

This species was described and illustrated in Rossman (1983) and Samuels (1978) as *N. multiloculata*. Cultures CBS 339.77–341.77.

Hydropisphaera multiseptata (Samuels) Rossman & Samuels, *comb. nov.*

≡ *Nectria multiseptata* Samuels, New Zealand J. Bot. 16: 77. 1978.

This species was described and illustrated in Rossman (1983) and Samuels (1978) as *N. multiseptata*. Cultures CBS 336.77–338.77.

Hydropisphaera nymaniana (Henn.) Rossman & Samuels, *comb. nov.*

≡ *Nectria nymaniana* Henn., Monsunia 1: 161. 1899.

This species was described and illustrated in Samuels (1976a) and Samuels *et al.* (1990) as *N. nymaniana*.

Hydropisphaera pachyderma (Rossman) Rossman & Samuels, *comb. nov.*

≡ *Nectria pachyderma* Rossman, Mycol. Pap. 150: 75. 1983.

This species was described and illustrated in Rossman (1983) as *N. pachyderma*.

Hydropisphaera rufofusca (Penz. & Sacc.) Rossman *et al.*, Mycologia 85: 702. 1993. — Plate 2, b.

≡ *Nectriella rufofusca* Penz. & Sacc., Malpighia 11: 507. 1897. — Holotype: INDONESIA, Java: Tjibodas, in caulibus emortuis *Elettariae*, 6 Feb 1897, No. 436 p.p. (PAD).

= *Neohenningsia stellatula* Koord., Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Reeks, Sect. 2, 13: 164. 1907. **Neotype** here selected: BRAZIL, Parà: in foliis *Monsterae* sp., Dec. 1907, Baker, (FH, also holotype of *N. brasiliensis*).

≡ *Nectria stellatula* (Koord.) Höhn., Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl., Abt. 1, 118: 819. 1909.
 = *Neohenningsia brasiliensis* Henn., Hedwigia 48: 102. 1909 (1908).

≡ *Nectria brasiliensis* (Henn.) Höhn., Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl., Abt. 1, 118: 1186. 1909.

≡ *Pseudonectria brasiliensis* (Henn.) Weese, Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturw. Kl. Abt. 1, 125: 518. 1916.

This species was described and illustrated in Samuels *et al.* (1990) as *Nectria brasiliensis*.

Hydropisphaera suffulta (Berk. & M.A. Curtis) Rossman & Samuels, *comb. nov.*

= *Nectria suffulta* Berk. & M.A. Curtis, J. Linn. Soc., Bot. 10: 378, 1868.

= *Nectria musae* Pat., J. Bot. (Morot) 11: 369, 1897.

= *Nectria pezizelloides*, Rehm, Hedwigia 37: 192, 1898.

= *Nectria calamicola* Henn. & E. Nyman, in Warburg, Mon-
sunia 1: 161, 1900 [1899].

= *Nectria ornata* Masee & E.S. Salmon, Ann. Bot. (London)
16: 75, 1902.

= *Nectria setosa* Ferd. & Winge, Bot. Tidsskr. 29: 11, 1908.

= *Neohenningsia confluens* Petch, Ann. Roy. Bot. Gard. (Per-
adeniya) 7: 114, 1920.

This species was described and illustrated in Samuels
(1976a) and Samuels *et al.* (1990) as *N. suffulta*. Cul-
ture CBS 122.87.

KEY TO THE SPECIES OF *HYDROPISPHAERA*

- | | | |
|---------|---|-------------------------|
| 1. | Ascospores 3- or more-septate; ascomata without hairs | 2 |
| 1. | Ascospores 1-septate; ascomata with or without hairs | 5 |
| 2 (1). | Ascospores 3-septate, smooth-walled to faintly striate | 3 |
| 2. | Ascospores more than 3-septate, smooth to faintly or coarsely striate | 4 |
| 3 (2). | Ascospores 18–26 × 4–5 μm, fusiform; ascomata orange to brown, glabrous to slight-
ly scurfy | <i>H. erubescens</i> |
| 3. | Ascospores 65–92 × 6–8 μm, very long fusiform; ascomata orange to dark umber or
brown-vinaceous, glabrous | <i>H. pachyderma</i> |
| 4 (2). | Ascospores 50–70 × 6–7 μm, 15–20-septate, striate; ascomata orange to brown, smooth
..... | <i>H. multiloculata</i> |
| 4. | Ascospores 28–38 × 4–6 μm, 5–7(–10)-septate, faintly striate; ascomata yellow to or-
ange, smooth to slightly scaly | <i>H. multiseptata</i> |
| 5 (1). | Ascomata without hairs, smooth, slightly scaly or warty | 6 |
| 5. | Ascomata with solitary, flexuous or fasciculate hairs | 11 |
| 6 (5). | Ascospores more than 23 μm long | 7 |
| 6. | Ascospores less than 23 μm long | 8 |
| 7 (6). | Ascomata yellow-orange to orange-red, with a flattened apex; ascospores 23–27 ×
5–6 μm, striate | <i>H. nymaniana</i> |
| 7. | Ascomata orange, with a broadly rounded apex; ascospores 23–30 × 5.5–7.5 μm, striate
..... | <i>H. macrarenula</i> |
| 8 (6). | Ascospores 11–14 × 5–6 μm, striate or coarsely striate | 9 |
| 8. | Ascospores averaging more than 14 μm long and less than 5 μm wide; smooth or
striate | 10 |
| 9 (8). | Ascospores striate; ascomata yellow to orange, often with yellow subtending hyphae,
entirely superficial..... | <i>H. peziza</i> |
| 9. | Ascospores coarsely striate; ascomata orange to reddish-orange, surrounded by erect,
yellow hyphae, basally immersed in the substratum | <i>H. hypoxantha</i> |
| 10 (8). | Ascospores 14–16 × 3.5–4 μm, ellipsoid-fusiform to fusiform, smooth or striate; as-
comata orange, becoming brown | <i>H. arenula</i> |
| 10. | Ascospores 19–22 × 4–4.5 μm, fusiform, striate; ascomata white, becoming orange
..... | <i>H. arenuloides</i> |

- 11 (5). Ascospores averaging more than 25 μm long 12
 11. Ascospores averaging less than 25 μm long 14
- 12 (11). Ascomata dark red with red hairs; ascospores 27–30 \times 7–8 μm , spinulose to spinulose-striate *H. haematites*
 12. Ascomata dark orange to brown with concolorous hairs; ascospores smooth-walled 13
- 13 (12). Ascospores 48–55 \times 6–7 μm ; ascomata dark orange with orange hairs *H. gigantea*
 13. Ascospores 25–38 \times 5–7 μm ; ascomata brown with brown hairs ... *H. dolichospora*
- 14 (11). Ascomata with white or orange, fasciculate hairs; ascospores averaging more than 17 μm long 15
 14. Ascomata with white, fasciculate hairs; ascospores averaging less than 17 μm long 16
- 15 (14). Ascomata yellow to orange or nearly brown with white hairs; ascospores 16–22 \times 4–5 μm , striate or spinulose *H. leucotricha*
 15. Ascomata orange with orange hairs; ascospores 17–23 \times 5–7 μm , striate *H. cyatheae*
- 16 (14). Ascospores striate, 12–17 \times 4–5 μm ; ascomata pale yellow to yellow *H. suffulta*
 16. Ascospores smooth or spinulose, not striate; ascomata orange to dark orange 17
- 17 (16). Ascospores 12.5–17.5 \times 3.5–4 μm , spinulose; warm temperate and tropical
 *H. rufofusca*
 17. Ascospores 12–15 \times 4–5 μm , smooth; known only from England *H. boothii*

IJUHYA Starbäck, Bih. Kongl. Svenska Vetensk.-Akad. Handl. 25: 30. 1899.

Type: *I. vitrea* Starbäck, a synonym of *I. peristomialis*.

= *Peristomialis* (W. Phillips) Boud., Hist. Classif. Discom. Europe p. 116. 1907.

= *Mollisia* subgenus *Peristomialis* W. Phillips, Man. Brit. Discom. p. 201. 1887.

= *Cyathicula* subgenus *Peristomialis* (W. Phillips) Sacc., Syll. Fung. 8: 306. 1889. — Type: *P. berkeleyi* Boud., a nomenclatural synonym of *I. peristomialis*.

= *Lepidonectria* Speg., Revista Fac. Agron. Univ. Nac. La Plata 6: 97. 1910. — Type: *L. chilensis* Speg., recognized as *I. chilensis*.

Ascomata solitary or in small groups, superficial, non-stromatic, white to pale yellow, KOH–, globose to subglobose, usually with a discoidal apex; disk formed of intertwined hyphae that often develop into triangular fasciculate hairs forming an apical crown, rarely apex discoidal without hairs or with short, sinuous hairs. Ascumatal wall usually less than 20 μm thick, of one region of thick-walled, relatively small cells, often forming *textura epidermoidea* in surface view. Asci clavate, 8-spored. Ascospores clavate or fusiform to long fusiform, one- to multiseptate or muriform, hyaline, smooth to striate. Anamorph, where known, *Acremonium*-like. On decaying herbaceous debris or wood, also on black stroma, hyphae, and ascomata of pyrenomycetous fungi.

NOTES.— *Ijuhya* was originally placed in the *Gymnoascaceae*; later it was considered a member of the *Sphaeriaceae* (Müller & von Arx, 1973) as well as the *Hypocreaceae* (Rogerson, 1970). Samuels (1976b) examined the type specimen and determined *Ijuhya vitrea* to be a synonym of *Nectria peristomialis*.

Phillips (1887) described *Mollisia* subgenus *Peristomialis* for one species having triangular hairs on the ascumata and fusiform, multiseptate ascospores. *Mollisia peristomialis* was the only species included in the subgenus, thus, when raised to generic rank, the taxon is automatically typified by that species. When raising the subgenus to generic rank, Boudier (1907) proposed a new epithet for the type species in order to avoid a tautonym. He included six species in *Peristomialis*. Samuels (1976b) examined the type specimen and regarded the type species as *Nectria peristomialis*, thus he considered *Peristomialis* to be a synonym of *Nectria*. Although listed as a synonym of *Peristomialis* by Samuels (1976b), *Ijuhya* has priority over *Peristomialis*.

Spegazzini (1910) described one species in the genus *Lepidonectria*. Based on the presence of 'squamules' on the ascumata of *L. chilensis*, Spegazzini may have intended his species to be in *Nectria* subgenus *Lepidonectria* Sacc.; however, no reference is made to that taxon. Spegazzini was the first to use the name *Lepidonectria* at the generic level which constitutes the valid publica-