

Jafnea, a New Genus of the Pezizaceae

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In 1949 I had the pleasure of several long discussions on discomycete problems with Professor J.A.F. Nannfeldt in his laboratory at Uppsala University. In discussing the genus *Helvella* Fr. and its allies, which make up the tribe Acetabuleae (Nannfeldt, 1937, 1938), we were in agreement that the two North American species treated by Durand (1906) in *Macropodia* Fuckel and by Seaver (1928) in *Paxina* Kuntze have nothing to do with the other species placed there (mostly species of *Helvella* to our mind). He suggested to me that these two species might well deserve a genus of their own, but that since he had not seen them in living condition, it would be more appropriate for an American to work on the problem.

Five years later I proposed the generic name *Jafnea* in his honor for these species (Korf, 1954), but no diagnosis was published and the name remained a *nomen nudum*. At that time I had seen only the type species in living condition. Only once in the intervening six years have I seen living material of the second American species. It is apparently common in the mid-western United States but very rare in our north-eastern flora. In addition I have now collected four times an apparently undescribed species from Japan which I place in the genus.

The new genus is characterized by the possession of a rather thick and most characteristic excipulum. The ectal excipulum consists of cells arranged in parallel rows, each cell elongated perpendicularly to the outer surface of the apothecium. The outermost cells are brown, while the inner cells of the ectal layer may be brown (Fig. 1, 2) or nearly hyaline (Fig. 3). I know of but one genus of the Pezizaceae in which a somewhat similar tissue structure occurs, *Sowerbyella* Nannf., but that genus appears to be quite distant from *Jafnea*. It is something of a surprise to me to find that the genus which appears to be most closely related is *Genea* Vitt., an unquestioned member of the Tuberales! (Compare Fischer, 1897 : Fig. 204 A, 1938 : Fig. 6 A with Fig. 2, 3 of this paper.)

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At the base of the apothecia are branching, woolly hyphae (Fig. 1) which enmesh particles of soil and debris to form a columnar mass or pseudostipe. It is presumably this character which led Durand (1906) and Seaver (1928) to include the American species in the helvelloid series. The structure of the excipulum is so widely divergent from other species of "*Macropodia*" and "*Paxina*" (i.e., cupulate *Helvella*) that the species must surely belong not only to another genus but to another tribe. (The ascospores of *Jafnea* are also equally ill-fitting for the Acetabuleae.)

Just where *Jafnea* will fit best within the Pezizaceae remains problematical. The two American species are provided with short, brown, superficial, excipular outgrowths which might well be termed hairs (Fig. 2, 3), though these are lacking in the new Japanese species. The nearly hyaline basal hyphae in all three species are very reminiscent of similar flexuous hairs in the genus *Sepultaria* (Cooke) Boud. and in some species of *Trichophaea* Boud. Saccardo (1889), in fact, included the two known species in *Lachnea* Fr. non L. on the basis of the pilose excipulum. Despite the fact that *Jafnea* does not seem closely related to either *Humaria* Fuckel *sensu stricto** or to *Sepultaria*, I am inclined to include *Jafnea* for the time being in the admittedly heterogeneous tribe Ciliarieae (Korf, 1954, 1958 : I).

The ascospores of the new genus are also characteristic, being large, and marked at maturity with warts (Fig. 4, 5, 6) which stain deeply in cotton-blue dyes when heated (Korf, 1952, 1958 : I, 1960). In youth the spores have two large guttules (Fig. 7, 8, 9), but these disappear at maturity. In the new Japanese species (Fig. 4) the markings can be seen to be limited by a membrane enclosing also an only slightly staining exospore material similar to that previously described in other Pezizaceae by L  Gal (1947). The warts tend to be largest near the ends of the spore. This is particularly evident in the type species, where they take the form of cushion-shaped apiculi (Fig. 6).

The genus is known thus far only from North America, Japan, and India (Batra, 1960). The following key points out the major distinguishing characters among the species.

- A. Apothecia deep-cupulate; hymenium and excipulum some shade of tan ; exposed excipulum covered with short, brown hairs.
1. Apothecia small, usually not exceeding 2 cm. diam.; ascospores fusoid, lightly marked, often apiculate, (29-) 30.8-37.1 (-44) × 9.1-10.9(-11.8) μ. (North America, Japan, India)**J. fusicarpa**
 2. Apothecia large, usually 2-5 cm. diam. ; ascospores fusiform-ellipsoid, more

* I join with Denison (1956, 1960) in designating *Humaria hemisphaerica* (Wigg. ex Gray) Fckl. as the **LECTOTYPE** of *Humaria* Fckl., Jahrb. Nass. Ver. Naturk. 23-24 : 320. 1870.

strongly marked, non-apiculate, 23.5-30.8(-33) × 9.1-12.7 μ. (North America)

.....**J. semitosta**

- B. Apothecia cupulate or turbinate when young, discoid at maturity; hymenium light brown to brownish green, excipulum reddish brown to drab greenish brown; exposed excipulum devoid of hairs, distinctly pustulate; apothecia small, not exceeding 1.5 cm. diam.; ascospores ellipsoid, with huge warts, (19-) 20.8-23.5 (-25.3) × (9.1-) 10-11.8 (-12.7) μ. (Japan).....**J. imaii**

JAFNEA Korf, gen. nov. (Pezizaceae, Ciliarieae)

Apothecia discoid to deep cupulate, 0.5-8 cm. diam.; ectal excipulum composed of cells elongated perpendicularly to the outer surface of the apothecium, outermost cells brown-walled, inner cells hyaline or brown; hairs absent, or if present superficial, short, brown; basal hyphae abundant, nearly hyaline, enmeshing particles of soil to form a pseudostipe or cushion; asci operculate, 8-spored, J-; ascospores large, hyaline, biguttulate in youth, non-guttulate at maturity, marked with small to large warts. On soil and duff.

ETYMOLOGY: A cryptogram from the initials of Professor J.A.F. Nannfeldt, +
-ea for euphony. Gender: feminine.

SPECIES HOLOTYPICA: *Peziza fusicarpa* Gerard.

Jafnea fusicarpa (Gerard) Korf, comb. nov.

Basionym: *Peziza fusicarpa* Ger., Bull. Torrey Bot. Club 4: 64. 1873.

NOTES: The descriptions by Durand (1906) and Seaver (1928) are adequate, except that neither author described the spore-markings in detail (cfr. Fig. 6). I have examined an authentic specimen of *Peziza fusicarpa* Ger. and type specimens of *P. pubida* Berk. and Curt. in Berk., and *P. morgani* Massee in Morgan in the Durand herbarium at Cornell, and agree with the synonymy presented by Durand. (Seaver also lists *Sepultaria aspera* Clements in synonymy, but I have not seen a type specimen.) The only known Japanese specimen, indistinguishable from North American material, was sent to me by Dr. K. Tubaki: HONSHU, *Yamagata*: Fungi of Japan 1500, CUP, TNS, R.P.K. (Tubaki 45-25).

Jafnea semitosta (Berk. & Curt. in Berk.) Korf, comb. nov.

Basionym: *Peziza semitosta* Berk. & Curt. in Berk., Grevillea 3: 153. 1875.

NOTES: Again I only wish to add an illustration of the spore markings (Fig. 5) to the descriptions by Durand (1906) and Seaver (1928). I have examined the type specimens of *Peziza semitosta* Berk. & Curt. in Berk. and *P. hainesii* Ellis in the Durand herbarium, and agree with Durand's synonymy. (Seaver lists *Sepultaria*

gigantea Clements as a synonym, but I have seen no type.) The species was abundantly collected by the author and others on the Mycological Society of America foray in Bloomington, Indiana, in 1958, but most of the material is immature. The species is not known from Japan.

Jafnea imaii Korf, sp. nov.

Apothecia turbinate to cupulate when young (3-8 mm. diam.), at maturity discoid, 1-1.5 cm. diam.; *receptacle* light reddish brown to drab greenish brown, pustulate above, below giving rise to hyphae which enmesh soil particles; *disc* light brown with an olive-green tint to light olive-green to brownish green, concave to nearly plane. *In section*: *hymenium* ca. 375 μ thick; *subhymenium* ca. 70 μ thick, of compact, light-brown *textura intricata*, hyphae 3.6-9.1 μ diam.; *medullary excipulum* 0-375 μ thick, of loose, light-brown *textura intricata*, hyphae very thin-walled, 5.4-8.2 μ diam.; *ectal excipulum* 100-190 μ thick, of *textura prismatica* to *textura angularis*, cells brown-walled, mostly 21.7-29 \times 12.7-25.3 μ ; *conical pustules* formed of thicker-walled and more spherical excipular cells, pustules ca. 100-125 μ wide at the base, 40-65 μ high; *basal emmeshing hyphae* branched, nearly hyaline, smooth, 4.5-5.4 μ diam. *Asci* 281-366 \times 12.9-19.3 (-21.4) μ , arising from croziers. *Ascospores* ellipsoid, (19-) 20.8-23.5 (-25.3) \times (9.1-) 10-11.8 (-12.7) μ excluding markings, with large warts (Fig. 4) at maturity, in youth with two large guttules (Fig. 7) which disappear at maturity. *Paraphyses* filiform-clavate, hyaline or slightly colored, about as long as the asci, ca. 3.6 μ diam., septa infrequent. On soil and duff.

ETYMOLOGY: In honor of Professor Sanshi Imai, Yokohama National University, in whose company I obtained all four of the collections I have seen in living condition.

TYPE SPECIMEN: S. Imai, M. Hamada, T. Hongo & R.P. Korf. 23. X. 1957. On duff. Between Kiyomizu Temple and Maruyama Park, Kyoto, Kyoto Pref., HONSHU. Fungi of Japan 184, CUP (HOLOTYPE), TNS, R.P.K. (ISOTYPES).

OTHER SPECIMENS EXAMINED: HONSHU, Chiba: F. of J. 1035, CUP, TNS, R.P.K.; Gumma: F. of J. 1499 (in formalin), TNS, R.P.K.; Shiga: F. of J. 221, CUP, TNS, R.P.K.; Tochigi: F. of J. 61, CUP, TNS, R.P.K.; Yamagata: D. Shimizu, Yonezawa, ca. 350 m., 4. VII. 1958, Korf & Shimizu Disc. Jap. 5 (with illustration), R.P.K.

Latin Diagnoses

Jafnea Korf, gen. nov. (Pezizaceae, Ciliarieae)

Apothecia patellata vel urceolata, 0.5-5(-8) cm. diam., excipulo exteriori e *textura prismatica* vel *angulari*, cellulis perpendiculariter ad apothecii faciem exteriori elongatis, exterioribus brunneis, interioribus hyalinis vel brunneis; pilis superficialibus,

brevibus, brunneis, vel in specie una absentibus; hyphae basales abundantes, subhyalinae, humi granula amplectentes et pseudostipitem isto modo efficientes; asci operculati, octospori, apicibus in Iodo non caerulescentibus; ascosporae grandae, hyalinae, primum biguttulatae deinde non guttulatae, verrucis minutis vel grandis ornatae. In humo et residuis vegetabilium. Holotypus : *Peziza fusicarpa* Gerard.

Jafnea imaii Korf, sp. nov.

Apothecia primum cupulata vel turbinata, deinde patellata, 1–1.5 cm. diam., excipulo pallide rubido-brunneo vel sordide viridi-brunneo, supra pustulato, infra humi granula amplectentes hyphas efferente, hymenio pallide brunneo vel brunneo-viride; subhymenium ca. 70 μ latum, e textura intricata pallide brunnea, hyphis 3.6–9.1 μ diam.; excipulum medullare 0–375 μ latum, e textura intricata pallide brunnea, hyphis 5.4–8.2 μ diam.; excipulum exterius 100–190 μ latum, cellulis elongatis parietibus brunneis instructis, plerumque 21.7–29 \times 12.7–25.3 μ ; hyphae basales ramosae, subhyalinae, 4.5–5.4 μ diam.; asci 281–366 \times 12.9–19.3 (–21.4) μ , e lituis nati; ascosporae ellipsoideae, (19–) 20.8–23.5 (–25.3) \times (9.1–) 10–11.8 (–12.7) μ verrucis exclusis, juvenilibus duos guttulos magnos postea evanescentes contentibus, maturis verrucis grandis ornatis (Fig. 4); paraphyses hyalinae vel leviter coloratae, filiformi-clavatae, ca. 3.6 μ diam., septis infrequentibus. In humo et residuis vegetabilium. Holotypus : CUP, Fungi of Japan 184.

Literature Cited

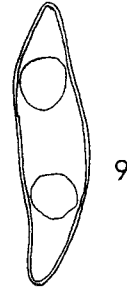
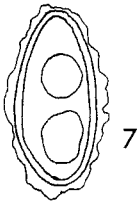
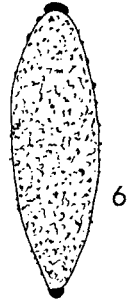
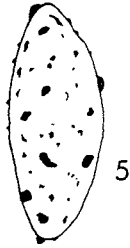
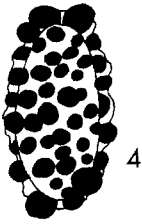
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Pl. I. Korf : **Jafnea**

- Fig. 1-3. Photomicrographs of freezing microtome sections through apothecia of species of *Jafnea*, ×50. Fig. 1, *J. imaii*, showing basal hyphae. Fig. 2, *J. semitosta*. Fig. 3, *J. fusicarpa*.
- Fig. 4-9. Ascospores of species of *Jafnea*, drawn at ×1580 with the aid of a camera lucida and reduced in reproduction to ×1000. Fig. 4-6. Mature ascospores, in surface view, markings deep blue from staining in heated cotton-blue in lactophenol. Fig. 7-9. Immature spores in optical section, before deeply staining markings have appeared. Fig. 4, 7, *J. imaii*. Fig. 5, 8, *J. semitosta*. Fig. 6, 9, *J. fusicarpa*.

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20 μ

