

Flavoscypha, a new genus of the Pezizales for *Otidea cantharella* and *O. phlebophora*

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HARMAJA, H. 1974: *Flavoscypha*, a new genus of the Pezizales for *Otidea cantharella* and *O. phlebophora*. — *Karstenia* 14: 105—108.

The two species *Otidea cantharella* (Fr.) Sacc. and *O. phlebophora* (Berk. & Br.) Sacc. are shown to possess in common some characters which differentiate them from the other species of *Otidea*, including the type of the genus, *O. onotica* (Fr.) Fuck. The most important differences relate to the ectal excipulum, which in the two species is composed of only one layer, viz. *textura prismatica* with rather small cells and clavate end cells (corresponding exactly to the *Helvella* type of excipulum), and which possesses no cyanophilic intercellular matter. These species also display a bright yellow colour, especially externally, in their fresh apothecia, the basal parts of which are ribbed, either having branching and anastomosing ribs and pits or are less conspicuously rugose-venose and pitted, features which are also lacking in the rest of *Otidea*. The two species may possibly also differ by the general features of their ecology and distribution from the bulk of *Otidea*. The differences observed are considered so significant that the new genus *Flavoscypha* Harmaja is established for the two species, *Peziza phlebophora* Berk. & Br. being designated as the type. The specific differences of the two closely related *Flavoscypha* species are also described. Both species have recently each been collected once in SW Finland, and are here reported as new to this country. Two new combinations are made: *Flavoscypha cantharella* (Fr.) Harmaja and *Flavoscypha phlebophora* (Berk. & Br.) Harmaja.

In the course of my studies in *Otidea* (Pers.) Bon. I was struck by the deviating structure of the ectal excipulum of *O. cantharella* (Fr.) Sacc. and *O. phlebophora* (Berk. & Br.) Sacc., the latter of which I had shortly before found for the first time in Finland. Later some less important features were observed in which both these species differed from *Otidea*, and it became evident that they deserved a genus of their own.

The new genus shares many of the well-known features of *Otidea*. The ascocarp is principally cupulate, being entire or split, the asci have inamyloid walls, the spores are smooth, uninucleate in both species (according to my studies; the nuclei stained fairly well with acetocarmine after the KOH soa-

king described in HARMAJA 1974b), and contain two oil drops towards maturity (which do not merge easily when boiled in cotton blue), the paraphysis cells were found to possess 2 (—3) nuclei, the ental excipulum is composed of *textura intricata*, the outermost cells of the excipulum are heavily encrusted (best seen in KOH, since the encrustations lose their colour in heated cotton blue, as is the case in *Otidea* and *Tarzettia* according to HARMAJA 1974b), and a part of the paraphyses become apically curved with age. As concerns more recently observed features, my studies have revealed that the nuclei of the mature spores from dry apothecia are carminophobic in *Flavoscypha* also (see HARMAJA 1974b). The spo-

res of both species of the new genus are also otherwise of exactly the same type as those of *Otidea*. They possess a thin but distinct strongly cyanophilic perispore-periplasm complex when immature, but have none when mature, being completely hyaline in heated cotton blue, as their contents are cyanophobic (cf. HARMAJA 1974a). Similarly, a proportion (a minority in *Flavoscypha*) of the mature spores contain one de Bary bubble each, mostly a lateral one (cf. HARMAJA 1974b).

The most important characters differentiating *Flavoscypha* from *Otidea* are anatomical. Firstly, in *Flavoscypha* the whole ectal excipulum outside the ental layer of *textura intricata* is composed of only one kind of tissue, viz. *textura prismatica*, or radiately orientated chains of slightly elongated cells, changing fairly gradually to the ental layer of *t. intricata*. In *Otidea* the ectal excipulum comprises two different layers, an inner \pm sharply delimited layer of *textura angularis*, with cells tightly connected with each other in all directions, and a discontinuous outer layer of *t. globulosa* to *t. prismatica*, with somewhat smaller cells (HARMAJA 1974b). Secondly, the cells of the *t. prismatica* of *Flavoscypha* are smaller than those of the *t. angularis* of *Otidea*, being ca. $25 \times 12 \mu\text{m}$ at most. Thirdly, all or at least most of the terminal cells (often also 1—2 following ones, too) of the hyphal chains of the ectal excipulum of *Flavoscypha* are pyriform or clavate, ca. $10\text{--}20 \times 5\text{--}15 \times 2\text{--}6 \mu\text{m}$ in size (length \times broadest point \times narrowest point), so that the whole excipular structure is identical with that of *Helvella* (the cell size being, however, smaller than in that genus)! The difference between the excipular structures of *Otidea* and *Flavoscypha* is readily demonstrated by a comparison of the figures 38 (*Pustulina catinus*; it should be remembered that in *Otidea* the cells of the »warts» are mostly elongated to a greater or lesser degree, and not spherical) and 41 (*Helvella crispa*) in ECKBLAD (1968). The fourth difference is that the more or less filamentous hyphae which commonly emerge from the outermost cells of the excipulum in *Otidea* (HARMAJA 1974b) are lacking in *Flavoscypha*. Lastly, a very important feature is that there are no cyanophilic deposits on the hyphal walls in the ectal excipulum of the *Flavoscypha* species, whereas in *Otidea* such

deposits make the *t. angularis* layer particularly conspicuous (HARMAJA 1974b). Even the normal cyanophilic septal collars (HARMAJA 1973: 55, 1974b) are very infrequent in the ectal excipulum of *Flavoscypha*. The anatomical differences between the two genera may also be expressed in the following way: 1) the *t. angularis* layer present in *Otidea* (and, according to my observations, also e.g. in *Sowerbyella* Nannf. and *Tarzetta* (Cooke) Lamb.) is lacking in *Flavoscypha*, and 2) the outermost discontinuous *t. globulosa* to *t. prismatica* layer of *Otidea* is homologous with the *t. prismatica* layer of *Flavoscypha*, but the latter differs in being continuous and, to a greater or lesser degree, in the shapes of the cells, especially the terminal ones, which tend to form a real palisade.

Two macroscopic differences between the genera can be observed in the ascocarp. The sterile surface, or the exterior, of the apothecium is more or less bright yellow, or vitelline, in *Flavoscypha*, while in *Otidea* this particular colour is lacking. In drying the colour characteristically turns more brownish. The fresh hymenium is also yellow, but not so bright. Further, in the species referred to *Flavoscypha* the basal parts of the outside of the cup are either pitted and beset with branching and anastomosing ribs, somewhat in the mode of *Helvella acetabulum* (NANNFELDT, 1966, has also emphasized this distinguishing character in *O. phlebophora*), or are less conspicuously wrinkled-venose and pitted (as in *O. cantharella*). By themselves, these two features would not be diagnostic at the generic level, but they seem to possess significance as being correlated with the anatomical characters which apparently are very critical in the generic taxonomy of the *Pezizales*.

The perispore-periplasm coating in immature spores may be somewhat thicker (ca. $0.3 \mu\text{m}$) in *Flavoscypha* than generally in *Otidea* (ca. $0.2 \mu\text{m}$; cf. also HARMAJA 1974b).

Both species of *Flavoscypha* seem to be rare and critical studies and even floristic reports on them are very few indeed. For some reason even DENNIS (1968) fails to mention about *O. phlebophora* though that species has originally been described on the basis of two British specimens. The two Finnish finds of this genus were made in the southwestern corner of Finland in the hemiboreal, or oak zone, i.e. within the

natural area of the oak (*Quercus robur* L.). On both occasions the fungus was growing on very fertile bare mull (apparently mixed with clay) in the company of southern and calciphilous vascular plants. NANNFELDT (1966) writes that »spruce woods with thick needle mould and/or mosses are the typical habitat for most species» of *Otidea*, which accords with my field observations. It remains to be ascertained whether the two genera show general differences in their distribution or ecological demands. The *Flavoscypha* species may tend to have a more southern distribution than the species of *Otidea*.

The two species of *Flavoscypha* are very closely related and have similar spores, which in both species measure ca. 10—12 × 5—6 μm and are mostly ellipsoid-oblong, a few being subfusiform. They are also very slightly inequilateral. So far I have been unsuccessful in seeking for any sporal differences between them. The apothecium of *O. phlebophora* is, however, smaller, hardly exceeding a diameter of 1.5 cm, with thinner flesh, is not split but becomes with age usually somewhat irregular and horizontally compressed, and its basal parts have distinct branched and anastomosed ribs and pits. The fruit body of *O. cantharella* is somewhat larger and fleshier and split on one side, and is less conspicuously rugose-venose to pitted basally. In both species the paraphyses are more or less clavate and ca. 3—6 μm in diameter at the apex, but probably a greater proportion of those of *O. cantharella* are curved apically. The ectal excipulum may also differentiate the two species from each other: In *O. cantharella* this layer is slightly thicker, ca. 90—150 μm, the cell-chains in its outermost part may be arranged in indistinct loose tufts, or fascicles, and the terminal cell is slightly more variable in shape though mostly clavate or pyriform. In *O. phlebophora* the ectal excipulum is ca. 70—100 μm thick, the cell-chains end at approximately equal distances, thus not forming distinct fascicles, and the terminal cells are practically invariably club-shaped to pear-shaped, and form a ± regular palisade.

The only specimen of *O. phlebophora* from Finland bears the following label notes: »*Flavoscypha phlebophora* (Berk. & Br.)

Harmaja/prov. Varsinais-Suomi, Lohja rural commune, Jalassaari, Alho near the Ahtiala manor (60° 12'; 23° 52'). In grass-herb forest on bare fertile mull in a diffuse row, together with cultivated *Quercus robur* (also very near to indigenous trees) and *Larix sibirica*, *Corylus avellana*, *Prunus padus*, *Betula alba* coll., *Mercurialis perennis*, *Epipactis latifolia*, *Lactarius pyrogalus*, *Humaria hemisphaerica* and *Otidea alutacea* (later also e.g. *Tricholoma sulphureum* was found). /leg. 1967-08-30 Harri Harmaja» (H).

The translated label notes of the likewise sole Finnish specimen of *O. cantharella* run: »*Otidea*/prov. Varsinais-Suomi, Turku town, Katariinanlaakso, grass-herb forest./leg. 13. IX. 1968 Esteri Kankainen [now Ohenoja]» (TUR).

***Flavoscypha* Harmaja, n. gen.** — *Genus ex ordine Pezizales, valde similis generis Otideae. Ab ea differt colore vitellino partis exterioris ascocarpi, basi venoso-foveolato vel venoso-rugoso ascocarpi, et textura dissimili partis exterioris excipuli quae solum e textura prismatica constituta sine substantia cyanophila inter parietes cellularum earum.* — *Type: Peziza phlebophora* Berk. & Br.

***Flavoscypha cantharella* (Fr.) Harmaja, n. comb.**

Peziza cantharella Fr., Systema Mycologicum 2: 48. 1822. — *Otidea cantharella* (Fr.) Sacc., Sylloge Fungorum 8: 96. 1889. — *Type*: No original designation. No original specimens existing. A neotype has not yet been proposed. One Swedish specimen examined (Uppland, Uppsala, 13.IX. 1932 legg. M.A. Donk, S. Lundell & J.A. Nannfeldt; UPS).

***Flavoscypha phlebophora* (Berk. & Br.) Harmaja, n. comb.**

Peziza phlebophora Berk. & Br., Ann. Magaz. Nat. Hist. III: 18: 122. 1866. — *Otidea phlebophora* (Berk. & Br.) Sacc., Sylloge Fungorum 8: 97. 1889. — *Type*: Lectotype (K) studied.

Otidea concinna (Pers.) Sacc. f. *integra* Bres., Fungi Tridentini 2: 70. 1898.

Otidea cantharella (Fr.) Sacc. v. *minor* Boud., Icon. Mycol. 4: 181. 1905—1910.

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