

Ain RAITVIIR

### THE GENUS *DASYSCYPHELLA*

The genus *Dasyscyphella* was established by Tranzschel (1897) for a single species, *Dasyscyphella cassandrae* Tranzsch. The main difference between *Dasyscyphus* and *Dasyscyphella* was stated to lie in the filiform ascospores of the latter. Jaczewski (1913) has transferred *Erinella aeruginosa* P. Hennings to the genus, but this species is in fact a long-spored hairy *Chlorosplenium*. Some subsequent authors have recognized the genus and ascribed to it several long-spored tropical and subtropical *Dasyscyphus* species having thin-walled rough hyaline hairs similar to those of *Dasyscyphus virginicus* S. F. Gray.

Tranzschel's type collection and the only original collection of *D. cassandrae* is now in the Herbarium of the Komarov Institute of Botany in Leningrad (LE), where I had an opportunity to re-examine it. The material agrees well with the description, excluding asci which I found slightly shorter,  $80-90 \times 7-8.5 \mu$ . The hairs of this species are of particular interest. They were described as smooth or minutely granulate, which is next to true since the hairs are exactly of the same type as those of *Dasyscyphus niveus* (Fr.) Sacc. and related species. With a comparatively long and smooth apical portion, they greatly resemble the hairs of the type specimens of *Peziza distinguenda* Karst. and *Peziza dryina* Karst.

This long misinterpreted genus was recently redescribed by the author (Raitviir, 1970) and recognized a convenient home for *Dasyscyphus*-like species characterized by slender granulate hairs with distinctly smooth tips. In the species of this genus, a dimorphism of ascospores could be observed (Raitviir, 1970a). This character is, however, not easily observed in the routine taxonomic examination, and so it is of inconsiderable practical value.

Four species were recognized in the emended genus *Dasyscyphella* (Raitviir, 1970). Subsequent investigations have revealed some new species, and so a key for the identification and description of seven species is given in the present study.

The author is greatly indebted to Dr. C. R. Benjamin (BPI), Dr. C. T. Rogerson (NY), Dr. J. H. Haines and Dr. S. J. Smith (NYS) for the loan of valuable specimens and to Dr. W. Matheis (Münchwilen, Switzerland) for the interesting collections from Switzerland.

*Dasyscyphella* Tranzschel, Trav. Soc. Imp. Nat. St.-Pétersbourg 28: 296 (1897) emend. Raitv., Scripta Mycol. 1: 71 (1970).

Apothecia stipitate, cup-shaped, white or pigmented, externally covered with long hairs. Hairs hyaline or with a coloured content, multiseptate, cylindrical, granulate but with completely smooth and slightly clavate tips of various length, sometimes incrustated with crystal masses or massive conglomerates of amorphous matter dissolving in KOH and usually not visible in light microscope mounts. Asci cylindrical-clavate with amyloid pore. Spores ellipsoid, fusoid or filiform, aseptate. Paraphyses cylindrical with pointed tips to narrowly lanceolate, rarely exceeding the asci.

Type species: *Dasyscyphella cassandrae* Tranzsch., Trav. Soc. Imp. Nat. St.-Pétersbourg 28: 296 (1897).

All Eurasian species of the genus are white or light yellow when fresh, and only *D. nivea* turns light orange when dried. There are, however, two underscribed dark-coloured species of the genus in North America, which I have discovered examining North American collections of *Belonidium corticale* group under names *Lachnella albolutea* and *Peziza varicolor*. These species are described as new ones in the present paper.

The species of *Dasyscyphella* are all lignicolous. I have, however, collected a *Dasyscyphella* on fallen leaves and another on *Rubus* canes, both closely related to *D. nivea*, but the material is unfortunately too scanty to make any taxonomic decisions.

#### Key to the included species

1. Spores filiform, 37–53  $\mu$  long — *D. cassandrae*
- Spores ellipsoid to fusiform, up to 14  $\mu$  long ..... 2
2. Apothecia brown or dark purple ..... 3
- Apothecia white or light yellowish or orange when dried ..... 4
3. Apothecia brown, cells of ectal excipulum and hairs with brown content — *D. cinnamomea*
- Apothecia dark purple, cells of ectal excipulum and hairs with purple content — *D. purpurea*
4. Spores 11–14  $\mu$  long — *D. dryina*
- Spores up to 11  $\mu$  long ..... 5
5. Apothecia orange when dried — *D. nivea*
- Apothecia permanently white ..... 6
6. Spores up to 2.2  $\mu$  wide, hair tips short and swollen — *D. montana*
- Spores over 2.2  $\mu$  wide, hair tips long and slender — *D. angustipila*

1. *Dasyscyphella cassandrae* Tranzsch., Trav. Soc. Imp. Nat. St.-Pétersbourg 28: 296 (1897).

Apothecia cup-shaped, stipitate, up to 1 mm in diameter, white when fresh, sordid white to pale yellowish when dry, externally covered with long white hairs. Hairs typical of the genus, 150–180  $\times$  2.5–3.5  $\mu$ . Asci cylindrical, 80–90  $\times$  7–8.5  $\mu$ . Paraphyses cylindrical with pointed tips, not exceeding the asci, 1.5–2  $\mu$  in diameter. Spores filiform, aseptate, 37–53  $\times$  2  $\mu$ .

Growing on dead twigs of *Chamaedaphne calyculata*.

General distribution: Europe, Asia.

This species had long been known only from the type locality until H. Remm collected it also on *Chamaedaphne calyculata* from Hotangai, the Yakutian A.S.S.R., June 20, 1968. *D. cassandrae* seems to be a rare species, restricted to moors.

## 2. *Dasyscyphella cinnamomea* Raitv. species nova

Apothecia stipitata, cupulata, 1 mm in diam., umbrina, extus longe pilosa. Excipulum ectale cellulis prismaticis contentu brunnei. Pili cylindracei, multicellulares, basaliter granulosa, contentu brunnei, apicibus glabris, clavatis, contentu hyalini, granulis brunneis incrustati,  $80-115 \times 1.5-2.5 \mu$ . Asci cylindraceo-clavati,  $58-66 \times 5 \mu$ . Sporae ellipsoideae, lateraliter applanatae,  $6.6-11.6 \times 2.5 \mu$ , unicellulares, hyalinae. Paraphyses anguste cylindraceae, acutae, ascos non superantes.

Ad lignum putridum crescit.

Holotypus: On dead wood, West Chester, Pennsylvania, E. H. J. & G. No. 390 (NY, paratypus in NYS).

Ab aliis species generis colorem brunneum differt.

Apothecia stipitate, cupulate, up to 1 mm in diam., dark umber when dry. Ectal excipulum of slender prismatic cells which, in outer layer, have a brown content. Hairs cylindrical, multiseptate, basally granulate and with brown content, apically clavate, smooth, hyaline, incrustated with brown granules of amorphous matter,  $80-115 \times 1.5-2.5 \mu$ . Asci cylindrical-clavate,  $58-66 \times 5 \mu$ . Spores ellipsoid, slightly inequilateral, aseptate, hyaline,  $6.6-11.6 \times 2-2.5 \mu$ . Paraphyses narrowly cylindrical with acute tips, no longer than the asci.

Growing on dead wood.

General distribution: North America.

This species is known only from the type locality in Pennsylvania, U.S.A.

## 3. *Dasyscyphella purpurea* Raitv. species nova

Apothecia stipitata, cupulata, 1 mm in diam., atro-purpurea, extus longe pilosa. Excipulum ectale cellulis prismaticis contentu purpurei. Pili cylindracei, multicellulares, basaliter granulosa, contentu purpurei, apicibus glabris, clavatis, contentu hyalini, substantiam resinosam atro-purpuream incrustati,  $60-100 \times 2 \mu$ . Asci cylindraceo-clavati,  $55-70 \times 5 \mu$ . Sporae ellipsoideae, lateraliter applanatae,  $8.3-13.3 \times 2.5-3 \mu$ . Paraphyses anguste cylindraceae, acutae, ascos non superantes.

Ad lignum putridum crescit.

Holotypus: "Peziza varicolor", in wood, Mycological Herbarium of Eugene A. Rau, Bethel, Pa., Donated Oct. 1928. Collected by him in vicinity of Bethel (BPI).

Ab aliis species generis colorem purpureum differt.

Apothecia stipitate, cupulate, up to 1 mm in diam., dark purplish-red when dry, externally covered with long hairs. Ectal excipulum of prismatic cells which, in outer layer, have a purple content. Hairs cylindrical, multiseptate, basally granulate and with purple content, apically clavate, smooth, hyaline, incrustated with large lumps of dark purple amorphous matter,  $60-100 \times 2 \mu$ . Asci cylindrical-clavate,  $55-70 \times 5 \mu$ . Spores ellipsoid, slightly inequilateral, aseptate, hyaline,  $8.3-13.3 \times 2.5-3 \mu$ . Paraphyses narrowly cylindrical, with acute tips, no longer than asci.

Growing on dead wood.

General distribution: North America.

This species is also represented in Ellis' collection (without locality and date) in NY, under the name *Lachnella albolutea* (*P. varicolor*). *D. purpurea* as well as *D. cinnamomea* are known only from old incompletely labelled collections under the name of completely different species

bearing only a superficial resemblance to them. The true *Peziza varicolor* Fr. belongs to the genus *Belonidium*. *D. purpurea* and *D. cinnamomea* are quite distinct species; however, some fresh collections should be needed for a complete study of them.

4. *Dasyscyphella dryina* (Karst.) Raitv., Scripta Mycol. 1: 72 (1970).  
Syn.: *Dasyscypha distinguenda* (Karst.) Sacc. Syll. Fung. 8: 434 (1889). *Dasyscypha lundellii* LeGal, Rev. Mycol. 4: 50 (1939).

Apothecia cupulate, shortly stipitate, 1–2 mm in diameter, whitish to yellowish, externally covered with white hairs. Hairs typical of the genus, hyaline,  $83\text{--}116 \times 2.5\text{--}3 \mu$ . Asci cylindric-clavate,  $63\text{--}71 \times 5\text{--}7 \mu$ . Spores fusiform,  $9.6\text{--}11.0 \times 2\text{--}2.5 \mu$ . Paraphyses narrowly cylindrical, pointed, up to  $13 \mu$  longer than asci,  $1.5\text{--}2.5 \mu$  in diameter.

On rotten deciduous wood.

General distribution: Europe, North America.

This species is characterized by rather massive fruitbodies, large asci and spores. The colour of the fresh fruitbodies may vary from whitish to bright citrine yellow. It seems to be a rarer species than *D. nivea* and probably more common in the northern regions of Europe. The only locality in the USSR is from the Lenkoran Mountains in the Transcaucasus; from North America I have seen a collection from Ontario, Canada (R. F. Cain, 11783 in BPI).

5. *Dasyscyphella nivea* (Fr.) Raitv., Scripta Mycol. 1: 72 (1970).  
Syn: *Dasyscyphella crystallina* (Fuckel) Raitv., Scripta Mycol. 1: 72 (1970).

Apothecia cupulate, stipitate, up to 1 mm in diameter, pure white when fresh, externally covered with white hairs, turning orange to orange-brown after drying. Hairs typical of the genus, hyaline,  $61\text{--}108 \times 2\text{--}4.1 \mu$ , covered at tips with crystals of calcium oxalate and large lumps of hyaline amorphous matter turning orange when dry. Asci cylindric-clavate,  $38\text{--}43 \times 3\text{--}5 \mu$ . Spores fusiform to slightly clavate,  $6.8\text{--}7.5 \times 1.7\text{--}2.3 \mu$ . Paraphyses cylindrical with pointed tips to narrowly lanceolate, up to  $12 \mu$  longer than asci,  $1.7\text{--}3.3 \times 3 \mu$  in diameter.

On rotten deciduous wood.

General distribution: Europe, Asia, North America.

It is the commonest species of the genus. It prefers to grow on wood of *Quercus* and other broad-leaved trees, but it could also be found in subarctic regions. The change in colour when drying is a very characteristic feature, distinguishing it from the two following species which have also longer asci than *D. nivea*. *D. crystallina* is said to be different from *D. nivea* on the basis of lanceolate paraphyses, but the paraphyses are rather variable in all the light-coloured species of *Dasyscyphella*, ranging from pointed cylindrical to lanceolate. So *D. crystallina* should be regarded only as an extreme form of *D. nivea*.

#### 6. *Dasyscyphella montana* Raitv. species nova

Apothecia stipitata, cupulata, 1 mm in diam., pure albida, extus longe pilosa. Pili cylindranei, hyalini, multicellulares, basaliter granulosa, apicibus breviter glabris, clavatis,  $78\text{--}108 \times 2.5\text{--}3.3 \mu$ . Asci cylindraneo-clavati,  $46\text{--}53 \times 4.3\text{--}5.4 \mu$ . Sporae fusioideae,  $7.1\text{--}7.8 \times 1.8\text{--}2.2 \mu$ .

Paraphyses cylindraceae, acutae vel sublancoolatae, 1.7–18  $\mu$  ascos superantes, 1.8–2.7  $\mu$  in diam.

Ad lignum putridum crescit.

Holotypus: U.R.P.S.S., R.P.S.S. Kirghiziae, Tianschan interior, Montes Moldotau apud vallim fluvii Karatal, ad lignum putridum *Picea schrenkianae*, 2500 m alt., 28. VII 1967, A. et T. Raitviir legerunt (TAA-44488).

*D. niveae* similis, ascis longis et colore permanente albido differt.

Apothecia stipitata, cupulate, up to 1 mm in diameter, pure white when fresh and remaining white after drying, externally covered with white hairs. Hairs cylindrical, multiseptate, hyaline, granulate in the lower part, smooth and clavate at tips, 78–108  $\times$  2.5–3.3  $\mu$ . Asci cylindrical-clavate, 46–53  $\times$  4.3–5.4  $\mu$ . Spores fusiform, 7.1–7.8  $\times$  1.8–2.2  $\mu$ . Paraphyses cylindrical with pointed tips to narrowly lanceolate, up to 18  $\mu$  longer than asci, 1.8–2.7  $\mu$  in diameter.

Growing on dead decaying wood.

General distribution: Europe, Asia.

There are seven other collections of this species from the Tien-Shan Mountains, all growing on decaying wood of *Picea schrenkiana* (TAA-43388, 43455, 44402, 44654, 65130, 65172, 65223), and a collection sent to me by Dr. Matheis, collected on decorticated branches of *Quercus robur*, Güttingen TG, Kt. Thurgau, Switzerland, Nov., 17, 1973 (Matheis-346, TAA-63141). The fungus from the Alps differs from the Tien-Shan specimens only by its substrate, otherwise it is identical with them. All the listed collections serve as paratype specimens of this species.

While completing this paper I received three additional collections of this species from Dr. W. Matheis: Switzerland: on decorticated branch of *Quercus robur*, Barchetsee TG, NW v. See, January 27, 1974; on decaying twig of *Corylus* (or *Alnus glutinosa*?), Brienz BE, Westl. Dorf, 630 m, February 8, 1975. Italy: On decorticated branches of *Corylus*, Lago di Val di Noci, Prov. Genova, April 30, 1975. As already stated, no morphological differences between Tien Shan and European collections can be found. The only difference is the substrate. The substrate inversion from deciduous to coniferous wood in the different parts of their area of distribution is known, for example, in *Femsjonia luteo-alba* Fr. (*Dacrymycetales*) and *Laetiporus sulphureus* (Fr.) Bond. et Sing. (*Aphyllphorales*). Both of them grow on deciduous wood in Europe and on coniferous wood in the Far East. *D. montana* seems to be another example of this phenomenon.

*D. montana* as well as the following species is close to *D. nivea* and could be easily mistaken for it. There are, however, two major features distinguishing *D. montana* and *D. angustipila* from *D. nivea*. Firstly, the apothecia of *D. nivea* turn orange when dry, due to the colour change of incrusting granules on hairs, whereas both new species remain permanently white after drying. Secondly, the asci of *D. nivea* are considerably shorter than the asci of both new species. The differences between *D. montana* and *D. angustipila* will be discussed under the following species.

#### 7. *Dasyscyphella angustipila* Raitv. species nova

Apothecia stipitata, cupulata, 1 mm in diam., pure albida, extus longe pilosa. Pili cylindracei, hyalini, multicellulares, basaliter granulosa, apicibus longe glabris subclavatis, 96–183  $\times$  2–3  $\mu$ . Asci cylindraceo-clavati, 48–61  $\times$  4.8–5.8  $\mu$ . Sporae ellipsoideo-fusoideae, 7.3–9  $\times$  2.2–

—2.8  $\mu$ . Paraphyses cylindræ acutæ vel sublanceolatae, 1.7—11.6  $\mu$  ascis superantes, 1.7—2.5  $\mu$  in diam.

Ad lignum putridum crescit.

Holotypus: U.R.P.S.S., Regio Sacchalina, distr. Aniva, prope oppid. Juzhno-Sacchalinsk, ad ramum arboris coniferarum dejectum, 21. VIII 1971, E. Parmasto legit (TAA-55128).

*D. montanae* similis, sporis latis et formis apicum pilorum differt.

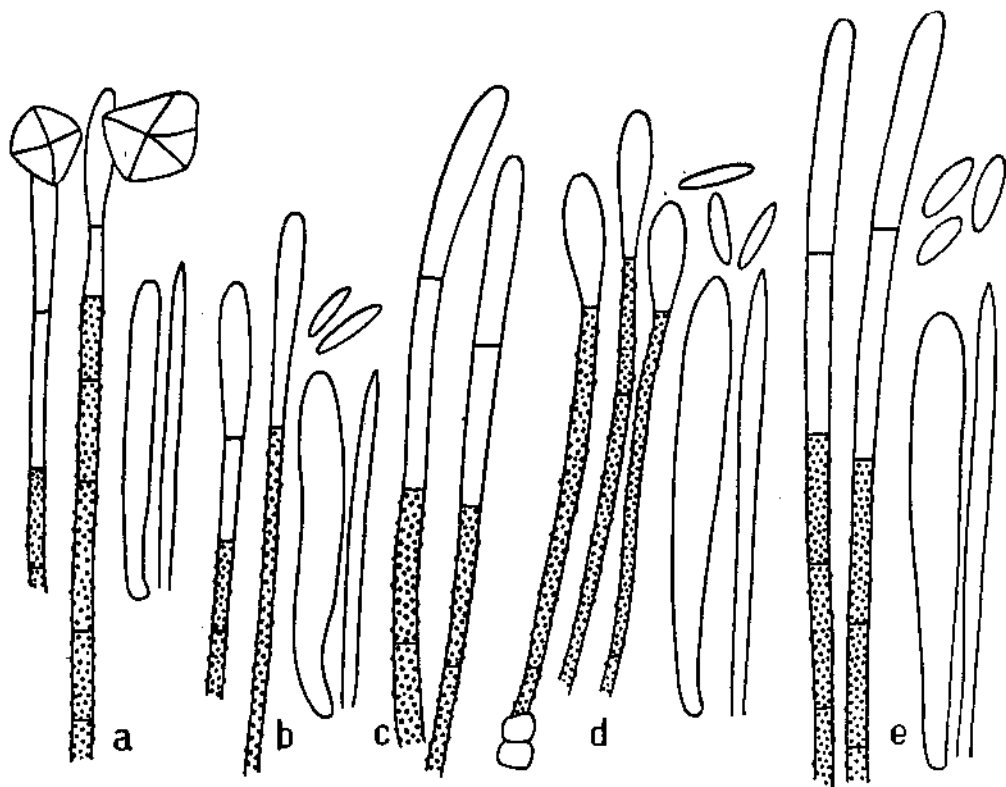
Apothecia stipitate, cupulate, up to 1 mm diameter, pure white or greyish-white when fresh, remaining white after drying, externally covered with long white hairs. Hairs cylindrical, hyaline, multiseptate, granulate in the lower part, smooth and subclavate at tips, 96—183  $\times$  2—3  $\mu$ . Asci cylindric-clavate, 48—61  $\times$  4.8—5.8  $\mu$ . Spores ellipsoid-fusiform, 7.3—9  $\times$  2.2—2.8  $\mu$ . Paraphyses cylindrical with pointed tips to narrowly lanceolate, up to 11.6  $\mu$  longer than asci, 1.7—2.5  $\mu$  in diameter.

Growing on dead wood.

General distribution: Europe, Asia.

There are six other collections of this species from Sakhalin (TAA-61886), the Primorsk Region (TAA-61297), the Altai Mountains (TAA-43934), the Ural Mountains (TAA-63142), the Lenkoran Mountains in the Transcaucasus (TAA-43159), and the Kola Peninsula (TAA-551).

*D. angustipila* is very close to the preceding species, from which it can be distinguished on the basis of spore width and the shape of hair tips (Figure). *D. angustipila* has wider ellipsoid spores, in contrast to



Hairs, asci and spores of three species of *Dasyscyphella*: *D. nivea* (a—c), *D. montana* (d) and *D. angustipila* (e). 1000  $\times$ .

the narrow fusiform spores of *D. montana*. The smooth hair tips are longer and slenderer in *D. angustipila* than in *D. montana*. There is also an evident difference between the geographical distributions of these two species. *D. montana* is a well-defined montane species, whereas *D. angustipila* belongs to the taiga element.

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PEREKOND *DASYSCYPHELLA*

## Resümee

Artiklis antakse ülevaade sugukonda *Hyaloscyphaceae* kuuluvast perekonnast *Dasyscyphella*. Kirjeldatakse 7 liiki, nelst 4 esmakordselt. *D. cinnamomea* ja *D. purpurea* erinevad perekonna ülejäänud liikidest intensiivselt värvunud viljakehade poolest ja nad esinevad Põhja-Ameerikas. *D. montana* ja *D. angustipila* erinevad liigist *D. nivea* jäädvalt valgete viljakehade ja pikemate eoskottide poolest. Omavahel saab neid euraasia areaaliga liike eristada eoste laiuse ja karvade tipu kuju põhjal.

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ПОД *DASYSCYPHELLA*

## Резюме

Приведен обзор рода *Dasyscyphella*, который принадлежит к гиалосцифовым грибам. Описывается 7 видов, причем 4 из них новые для науки. *D. cinnamomea* и *D. purpurea* отличаются от всех остальных видов этого рода интенсивно окрашенными плодовыми телами, они встречаются в Северной Америке. *D. montana* и *D. angustipila* отличаются от *D. nivea* неизменно белыми плодовыми телами и более длинными сумками. Эти виды с евразийским распространением различаются между собой шириной спор и формой верхушек волосков.

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