

## Two new species of Discomycetes (order Pezizales) from Graubünden, Switzerland

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*Helvella pulchra* and *Melastiza tetraspora* are described as new species. *H. pulchra* is a member of section *Macropus*. *M. tetraspora* is compared with the presumably closely related *Melastiza chateri*.

Additional keywords: Ascomycetes, taxonomy, scanning electron microscopy.

About 20 alpine and subalpine localities in Graubünden, Switzerland, were studied in the period of August–September in 1979, 1982 and 1984. A total of 120 species of Discomycetes (order Pezizales), of which ten are new to science, were collected. Two new species, viz., *Chalazion helveticum* and *Smardaea purpurea*, were published by Dissing (1980, 1984).

In this paper two new soil inhabiting species from Graubünden, *Melastiza tetraspora* (family Pyronemataceae) and *Helvella pulchra* (family Helvellaceae, section *Macropus*) are described and ecological data on both species are presented.

### Material and methods

Notes on habit and habitat were taken in Graubünden, based on fresh material. Coverslips for SEM microscopy were prepared from fresh material of *M. tetraspora* and *M. chateri*. Detailed studies of microscopic characters were performed on dried material revived in tap water overnight. For histology, the revived material was further fixed in 2.5 % glutaraldehyde and treated according to Dissing & Sivertsen (1988). Sections 2–3 µm thick were cut on a Reichert–Jung 2050 Supercut microtome. SEM photos were obtained on a Philips Scanning Microscope after coating with gold–palladium alloy. Holotypes are deposited at ZT. Duplicates of other collections are deposited in C and in the Herbarium of the University of Trondheim (TRH; *Melastiza tetraspora*).

*Helvella pulchra* Dissing, sp. nov.– Fig. 1.

Carposoma cupuliforme, stipitatum. Cupula regularis, depressa, 1–3 cm lata. Hymenium vivum saturate vel pallidius avellaneum. Cupula extra villosa, viva supra sepiaceo–avellanea vel laete sepiacea, infra in cinereo–album transiens. Stipes 0.3–1 cm longus, 0.1–0.2 cm latus, teres vel paulum compressus, villosus, lacteus, plerumque in solum immersus. Excipulum exterius 100–130 µm crassum, e cellulis 15–30 µm latis compositum. Excipulum

medullare 330–400  $\mu\text{m}$  crassum, e cellulis hyphoidibus, 4–12  $\mu\text{m}$  latis compositum. Subhymenium 30–50  $\mu\text{m}$  altum. Asci cylindrici, infra in bases pleurorhynchas sensim attenuati. Paraphyses septatae, supra ad 7–8  $\mu\text{m}$  incrassatae. Sporae siccae per noctem aqua tractatae 19.1–19.6–19.8 x 11.9–13.0–13.9  $\mu\text{m}$  magnae. Paucae sporae vivae in aqua mensae 19–20 x 13–14  $\mu\text{m}$  magnae, quaeque unam guttulam magnam centralem et complures minores ad polos sitas foventes.

Holotypus die 7 Septembris anni 1982 circiter 1100 m supra mare, loco Plattamala prope vicum Ramosch a ponte Resgiano in orientem sito sub numero Sch. 82.151 ab auctore lectus, in Herbario Academiae Technicae Turicensis (ZT) depositus.

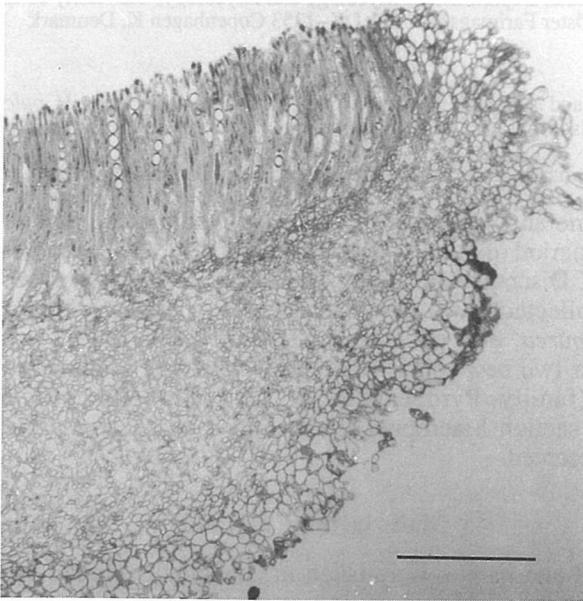


Fig. 1.—*Helvella pulchra*. Section of margin of apothecium (Holotype, Sch. 82.151, ZT).— Scale bar = 120  $\mu\text{m}$ .

Ascomata cup-shaped, stipitate.— Cup regular, 1–3 cm broad, low, when young compressed, then discoid, hymenium even, hazel to milky coffee when fresh, when dried date brown, outside villose, when fresh drab to light sepia above, below gradually becoming greyish white, when dried close to hazel.— Stipe short, 0.3–1 cm long, 0.1–0.2 cm broad, terete or slightly compressed, villose, cream, in most cases merged in the substrate.— Outer excipulum of *textura angularis*, 100–130  $\mu\text{m}$  thick, individual cells 15–30  $\mu\text{m}$  broad, on the outside with chains of elongated cells which form tufts of fascicled hyphae.— Medullary excipulum 330–400  $\mu\text{m}$  thick, forming a *textura intricata*, of densely interwoven hyphae-like cells, 4–12  $\mu\text{m}$  broad.— Subhymenium 30–50  $\mu\text{m}$  high.— Asci cylindric, below gradually tapering into a pleurorhynque base.— Paraphyses septate, above

enlarged to 7–8  $\mu\text{m}$  broad, when young the uppermost cells with many yellowish–grey guttules, or with homogeneous yellowish–grey content.—Spores measured from dried material placed overnight in  $\text{H}_2\text{O}$ , 19.1–19.6–19.8 x 11.9–13.0–13.9  $\mu\text{m}$ . A few spores measured from fresh material in water were 19–20 x 13–14  $\mu\text{m}$ , with one large central guttule and several smaller polarly arranged ones.

**Material examined.**—SWITZERLAND: Graubünden, Ramosch, east of the bridge, on rich soil, together with *Humaria hemisphaerica* (in hundreds), and *Tarzetta cupularis*, alt. ca. 1100 m, 7 Sept. 1982, leg. H. Dissing, Sch.82.150 (C).—*ibid.*, 27 Sept. 1982, Sch. 82.151 (Holotype, ZT).—S-charl, Val Sesvenna, among *Dryas*, under *Pinus*, alt. ca 2000 m, 31 Aug. 1984, leg. S. Readhead, Sch.84.56 (C).

*Helvella pulchra* is morphologically a member of section *Macropus*. A closely related species is probably *Helvella cupuliformis* Diss. & Nannf., but both habit and colours differ definitely. In addition, in the three collections of *H. pulchra* from Graubünden, the stipe is completely immersed in the soil, while *H. cupuliformis* and other species in the section have a free stipe. The species epithet *pulchra* has been chosen because especially the holotype and collection Sch.82.150 are very regular in shape and the colours are very harmonious. The time, however, has come when objective criteria such as isozyme or DNA analysis must be used to decide whether species concepts in the genus *Helvella* are correct.

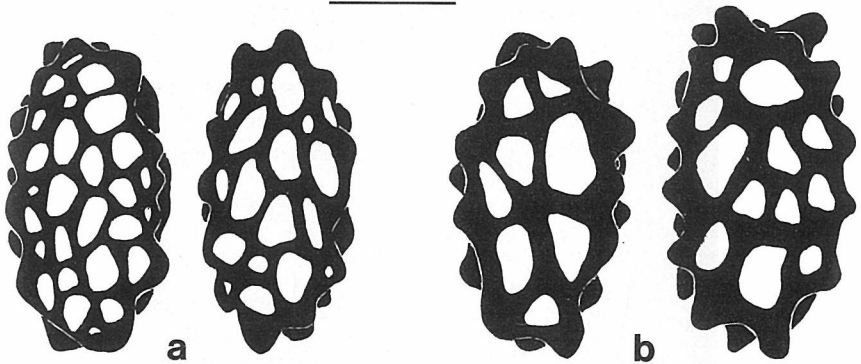


Fig. 2.— a. *Melastiza chateri*, ascospores (MO 73.73, C).— b. *Melastiza tetraspora*, ascospores (Sch. 84.45, ZT).— Scale bar = 10  $\mu\text{m}$ .

*Melastiza tetraspora* Dissing & Sivertsen, sp. nov.— Figs. 2b, 3a, 4b.

Carposoma 3–8 mm latum, cupuliforme, sessile, hymenio saturate miniato, margine manifesto, extra dilute fuscum, pilis fuscis, brevibus, appressis imprimis ad marginem versus vestitum. Excipulum exterius 50–70  $\mu\text{m}$  crassum, cellulis rotundate angulatis. Excipulum

medullare ad marginem paene nullum, ad basem versus ad 300–500  $\mu\text{m}$  crassum. Subhymenium manifestum, 15–25  $\mu\text{m}$  crassum. Hymenium 180–200  $\mu\text{m}$  altum. Asci tetraspori, 13–14.5  $\mu\text{m}$  lati, operculati, cylindrici, non amyloides, base aporhyncha. Paraphyses septatae, supra ad 4.5–6.5  $\mu\text{m}$  incrassatae. Sporae ellipsoideae, guttulis nullis, granulis pallide aurantiacis ad polos dispositis, 16.5–17.8–19.8 x 11.6–12.5–13.2  $\mu\text{m}$  magnae ornamento non incluso, reticulo crasso, irregulari, 3–6  $\mu\text{m}$  alto ornatae.

Holotypus die 30 Augusti anni 1984 circiter 2300 m supra mare in loco a faucibus Albula Pass in orientem sito regionis Helveticae Graubünden ab auctoribus sub numero Sch. 84.45 lectus, in Herbario Academiae Technicae Turicensis (ZT) depositus, isotypis in Herbario Hauniensi (C) et Herbario Nidrosiano (TRH).

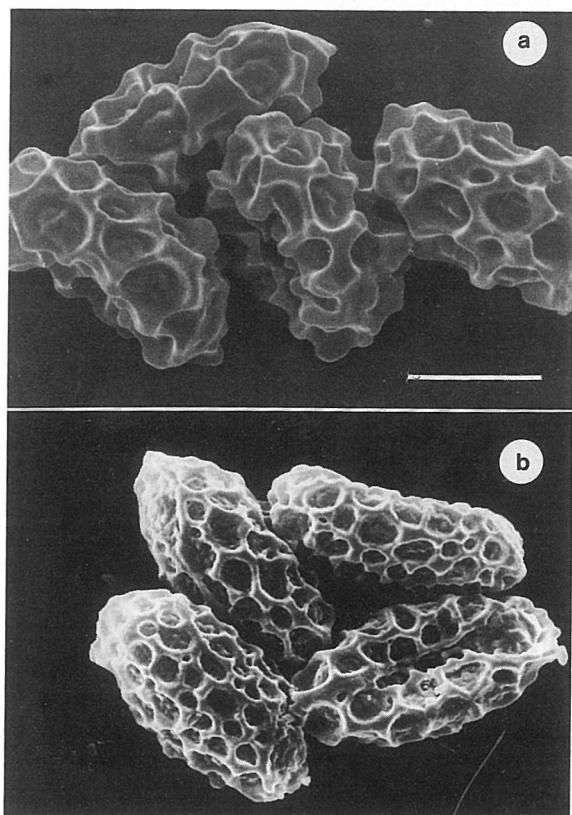


Fig. 3.— SEM photographs of ascospores. a. *Melastiza tetraspora* (Holotype, Sch. 84.45, ZT).— b. *Melastiza chateri* (MO 73.73, C).— Scale bar = 10  $\mu\text{m}$ .

Ascomata 3–8 mm broad, cup-shaped, sessile, regular, or irregular due to mutual pressure, hymenium even, dark scarlet, margin distinct, outside pale brownish, especially towards the margin with short, appressed, dark

brownish hairs.— Outer excipulum 50–70  $\mu\text{m}$  thick, composed of rounded, angular cells, disposed irregularly near the base, 15–20  $\mu\text{m}$  broad, towards the margin becoming larger, 15–30  $\mu\text{m}$  broad, thick-walled, tending to form subparallel rows, 15–30  $\mu\text{m}$  broad, which often have club-shaped terminal cells.— Medullary excipulum almost lacking at the margin, but towards the base gradually becoming 300–500  $\mu\text{m}$  thick, of a mixture of thin-walled, globose and hyphae-like cells.— Subhymenium distinct but thin, 15–25  $\mu\text{m}$  thick, composed of densely interwoven, small, thin-walled cells.— Hymenium 180–200  $\mu\text{m}$  high.— Asci 4-spored, 13–14.5  $\mu\text{m}$  broad, operculate, cylindric, non amyloid, with aporhynque base.— Paraphyses septate, enlarged above to 4.5–6.5  $\mu\text{m}$ , all cells with reddish orange content, which is strongly staining dark green in Melzer's reagent.— Spores ellipsoid, without guttules, but with polarly arranged pale orange granules, without ornamentation, 16.5–17.8–19.8  $\times$  11.6–12.5–13.2  $\mu\text{m}$ , ornamentation a coarse, irregular 3–6  $\mu\text{m}$  high net, which is strongly staining blue in Cotton Blue.

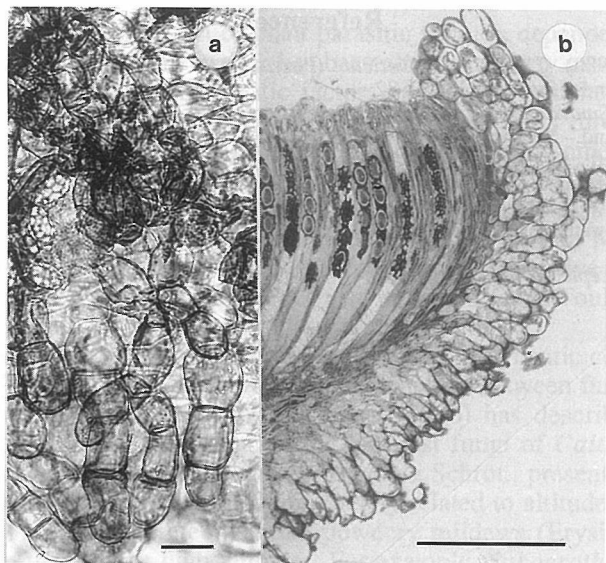


Fig. 4.— *Melastiza tetraspora* (Holotype, Sch. 84.45, ZT).— a. Hairs from outer excipulum; bar = 30  $\mu\text{m}$ .— b. Section of margin of apothecium; bar = 100  $\mu\text{m}$ .

Material examined.— SWITZERLAND: Graubünden, S-charl, Val Sesvenna, on a small "island" in the stream, together with *Cheilymenia* sp., alt. ca. 2350 m, 23 Aug. 1984, leg. H. Dissing, Sch. 84.07 (C).— Graubünden, east of Albula Pass, on soil among *Bryum*

sp. and *Drepanocladus* sp., in *Carex bicolor* vegetation, alt. ca. 2300 m, 30. Aug. 1984, leg. S. Sivertsen & H. Dissing, Sch. 84.45 (Holotype in ZT, isotypes in C,TRH).

*Melastiza tetraspora* is probably closely related to *Melastiza chateri* (W.G. Smith) Boud. (Figs. 2a, 3b) and *M. carbonicola* Moravec (1972), but both species possess 8-spored asci. In *M. tetraspora* some young asci are seen with initially up to eight spores, but four of these always degenerate. In addition, the spores of *M. tetraspora* are slightly broader, and the ornamentation is more coarse than in *M. chateri* and *M. carbonicola* (cf. Figs. 2 & 3). According to the author's observations *M. chateri* in Denmark, Norway, Sweden, Greenland, Alaska is usually growing on naked, sandy soil; *M. tetraspora* seems to prefer wet habitats among mosses.

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