

HELVELLA CUPULIFORMIS SP. NOV., H. VILLOSA
(HEDW. EX O. KUNTZE) COMB. NOV., H. MACROPUS
(PERS. EX FR.) KARST., AND THEIR ALLIES.

BY

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The new species *Helvella cupuliformis* is described. Its relationship to *H. villosa* (HEDW. ex O. KUNTZE) comb. nov., *H. macropus* (PERS. ex FR.) KARST., *H. corium* (WEBERB.) MASSEE and *H. queletii* BRES. is discussed.

The authors had the opportunity to discuss the species centering on *H. macropus* in Uppsala in December 1964 and May 1965. During our studies of Swedish collections in the Uppsala Herbarium we found ample material of a species hitherto undescribed, and it also became obvious that the species delimitation in the group raised some problems. After this preliminary survey, one of the authors (H. D.) took upon him to make a more detailed study of the available herbarium material, in the course of his examination of European *Helvella* species. This part of the studies was carried out in the Institute of Thallophyta, University of Copenhagen. The main purpose of the present paper is to describe *H. cupuliformis*, but it was found suitable and also necessary to redescribe the little known and probably much confused *H. villosa*. Specimens of *H. macropus* from North America and Japan have been compared with such from Europe. Though well known, some new information is added to the knowledge of this very widely distributed species. These three species, together with *H. corium* and *H. queletii*, are considered to form a natural group.

The treatment of the material and the terminology applied are in accordance with DISSING (1964). Material from the following Museums has been used: Universitetets Botaniske Museum, Copenhagen (C), Herbarium of the Royal Botanic Gardens, Kew (K), Museum National d'Histoire Naturelle, Paris (PC), Botanical Department of the

National Museum, Praha (PR), Institutum Botanicum Universitatis Carolinae, Praha (PRC), Naturhistoriska Riksmuseet, Stockholm (S), Universitetets Botaniska Museum, Uppsala (UPS). For loan of material the authors are much indebted to the Directors of the above mentioned Institutes. "Statens Almindelige Videnskabsfond" has supported H. D. by a grant. His travels to European Museums have partly been paid by "P. C. N. Friederichsens Legat", Copenhagen. Mr. TYGE CRISTENSEN M. Sc. has prepared the Latin diagnosis. Mrs. MARGARET STEENTOFT B. Sc. has corrected the English manuscript.

Helvella cupuliformis DISSING & NANNFELDT sp. nov. — Figurae 1, 2a. Pl. I: 1–2.

Pileus juvenis compressus, maturus acetabuliformis, 0.5–2.0 cm latus, 1–2 mm crassus, regularis, margine integer, raro in lobos dissectus, hymenio avellaneo vel sepiaceo, facie exteriore laevi, nullas costas exhibente, pubescenti, straminea vel cinereo-straminea. Stipes brevis, solidus, crassiusculus, in vivo teres vel subcompressus, in sicco teres vel raro 2–4 costis latis, parum manifestis ornatus, 0.8–1.5 cm altus, 0.2–0.6 cm crassus, subtiliter pubescens, in vivo lacteus vel stramineus, in sicco lacteus vel olivaceo-bubalinus.

Excipuli exterior pars 140–180 μ crassa, textura angulata, tincturam coeruleam anilineam ("Cotton Blue") praecipue juxta medullarem partem captans, pube ex hyphis fasciculatis in caespites congestis formata, cellulis dolioliformibus vel clavatis, parietibus subhyalinis; pars medullaris excipuli 600–780 μ crassa, textura intricata, hyphis hyalinis, intertextis, septatis, ramificatis, 3–4 μ crassis; subhymenium subtile, 50–70 μ crassum; hymenium 235–275 μ crassum, ascis 13–15 μ crassis, paraphysibus 4–6 μ crassis, ad apices versus paulum incrassatis, plasmate tincturam coeruleam irregulariter captante, saepe granulati, interdum reticulato (Fig. 2a). Sporae 18–18.6–20 μ longae, 11.5–12.2–13 μ latae, plasmate coeruleum avide captante.

Holotypus 30.VII.1936 in solo nudo sub *Abiete* sp. silvae coniferae densae prope vicum Kåbo oppido suecico Upsaliae vicinum cum circiter 100 isotypis a K. G. RIDELIUS lectus, in Herbario Upsaliensi depositus, isotypis in exsiccato LUNDELL & NANNFELDT "Fungi exsiccati suecici, praesertim upsalienses" distribuendis.

Pileus when young compressed, when adult cupshaped-discoid, 0.5–2.0 cm broad, 1–2 mm thick, regular, margin even, rarely splitting into lobes, hymenium pale brownish to yellowish-brown, outer surface even, without ribs, pubescent, greyish or yellowish-grey. Stipe short, compact, rather stout, when fresh terete or slightly compressed, when dry terete or rarely with 2–4 indistinct broad ribs, 0.8–1.5 cm high, 0.2–0.6 cm broad, delicately pubescent; colour varying from yellowish-white to cream when fresh, when dried yellowish-white to pale greyish-yellow.

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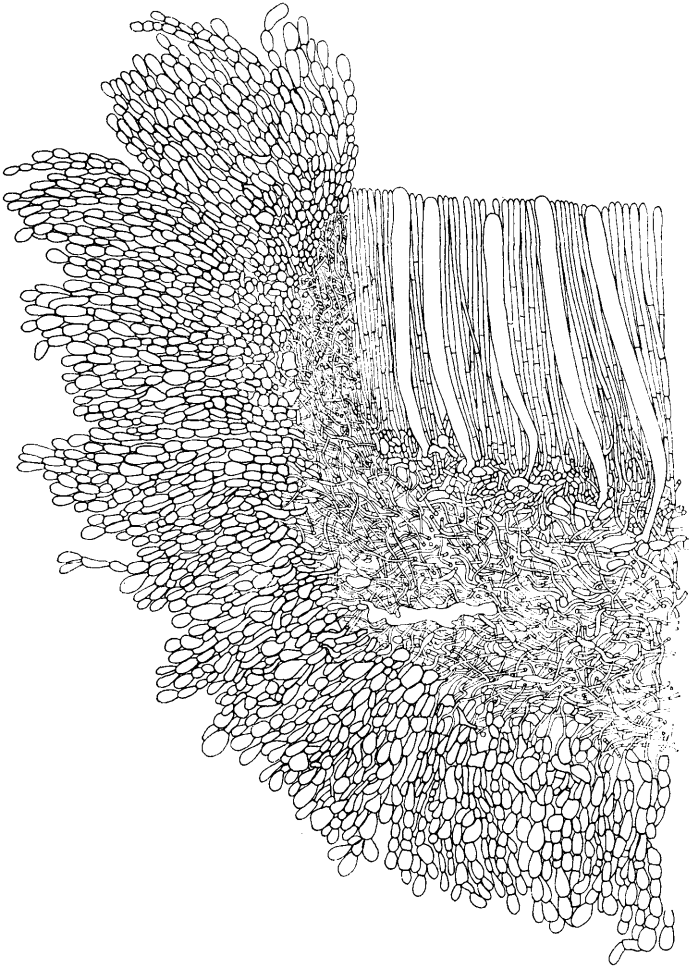


Fig. 1. *H. cupuliformis*. Marginal section of fruitbody. The outer excipulum is of the same type as in *H. queletii* (cfr. DISSING 1964: Fig. 12). (Type; $\times 150$)

Outer excipulum of *textura angulata*, 140–180 μ , staining in Cotton Blue, especially in the part bordering the medullary excipulum, the pubescence of the outer surface due to tufts of fasciculated hyphae, the single cells drumshaped to clubshaped, walls nearly hyaline; medullary excipulum 600–780 μ , of *textura intricata*, hyphae hyaline, interwoven, septate, branching, 3–4 μ ; subhymenium inconspicuous, 50–70 μ ; hymenium 235–275 μ , asci 13–15 μ broad, paraphyses 4–6 μ broad, slightly enlarged above, plasma irregularly staining in Cotton Blue, often granular, but sometimes forming a

reticulate pattern (Fig. 2a). Spores 18–18.6–20 × 11.5–12.2–13 μ , plasma deeply staining in Cotton Blue.

The description above is based on the type collection: Sweden, Uppland: Uppsala, near Kåbo, in dense coniferous forest, on bare soil, under *Abies sp.*, 30.vii.1936, leg. K. G. RIDELIUS.

Besides, the following two Swedish collections have been studied in detail: Uppland: Uppsala, Stadsskogen near Skogshall, 7.vii.1948, leg. J. ERIKSSON & R. MORANDER. This collection is also very large, and will also be distributed in the LUNDELL & NANNFELDT exsiccate. A specimen examined showed a slightly thicker outer excipulum, 180–240 μ , the spores 17–18–18.3 × 12–12.3–13 μ , otherwise it is identical with the type. — Uppland: Uppsala, Stadsskogen, 21.vii.1948, leg. J. ERIKSSON & R. MORANDER. Spores 17–17.9–18.5 × 11–11.9–13 μ . Otherwise identical with the type collection.

Material of *H. cupuliformis* has also been seen in several European museums. Detailed references will be given by H. D. in a paper under preparation. It seems likely that the species occurs in most European countries.

The cupshape of *H. cupuliformis* naturally places it close to *H. macropus*, *H. villosa* and *H. corium*. The very pale cream to greyish-yellow colour invariably found in our species is one of the leading characters separating it from *H. villosa*, which is darker, greyish or brownish. Besides the habit (i.e. the different stipe) (Pl. I & II: 1) the microscopic characters clearly separate the two species, cfr. the anatomy, paraphyses and spores. *H. cupuliformis* is easily distinguished from *H. macropus* on the spores and from *H. corium* on the colour, which in the latter species is always black. Though sometimes with a compressed stipe *H. cupuliformis* never has the deep furrows seen in *H. queletii*. In spite of these deep furrows *H. queletii*, however, is rather related to the above mentioned species than to *H. lacunosa* (as suggested by BRESADOLA 1881: 40 and HEIM & REMY 1932: 56, or to *H. acetabulum* (L. ex ST. AMANS) QUEL. (as suggested by BENEDIX 1962: 362). For a detailed discussion of these problems see also NANNFELDT (1937). The anatomy of *H. cupuliformis* and *H. queletii* is also of the same type (compare Fig. 1, and DISSING 1964: Fig. 12). It is interesting that the colours found in both *H. cupuliformis* and *H. villosa* can be found in *H. queletii*, which though normally greyish, is rather commonly cream to greyish-yellow in Sweden (cfr. text to Pl. II: 2). Such pale collections of *H. queletii* have been examined in detail but no correlated characters, justifying a new taxon, have been found, as were found in the case of *H. cupuliformis* and *H. villosa* (or *H. lacunosa* and *H. lactea* Boud.). This different

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value of the colours is curious and deserves a more detailed investigation.

In *H. cupuliformis* no spores with pustules have been seen, but this is probably not a reliable character. It seems probable that spores with pustules may occur in all species of the genus. — The middle figure given in the spore measurements is the average for 40 spores for all three collections of *H. cupuliformis*. Measurements given for collections of *H. villosa* and *H. macropus* are based on 20 spores only. Spores are usually considered to have little diagnostic value on a species level in the genus *Helvella*, because they vary very much in size, even in the same specimen. This great variability has been described in most groups of Ascomycetes, and also in the Basidiomycetes when two-spored forms occurs. In *Helvella* it is not rare that only two or four (or six) spores are well developed, and these are often considerably larger than "normal" spores. If, however, only spores from asci with 8 normal, mature spores are measured, spore-sizes can give some support in distinguishing closely related species. The measurements given in this paper are all based on spores from such asci.

When looking for a description to fit *H. cupuliformis*, the sometimes prominent stipe first leads us to look for species close to *H. queletii*. An examination of the type specimens of *Cyathipodia platypodia* BOUD., and *C. dupainii* (BOUD.) BOUD. revealed that these two species are both identical with *H. queletii*. Both collections were found in good condition in the BOUDIER herbarium (PC). A collection labelled "*Cyathipodia Dupainii*, Icon. pl. 543, Lamotte, St. Heray, misit D. DUPAIN" in BOUDIER's handwriting is evidently the type of *Acetabula dupainii* BOUD., Bull. Soc. Myc. Fr. 14: 17, Pl. 3, Fig. 1 (1898) ≡ *Cyathipodia dupainii* (BOUD.) BOUD., Hist. Class. Disc. d'Europe 39 (1907); Icon. Mycol. 2, Pl. 543 (1905–10). The two illustrations mentioned are nearly identical. — A collection labelled "*Cyathipodia platypodia*, Nice, Icon. Pl. 241" in BOUDIER's handwriting is considered to be the type of *C. platypodia* BOUD., Hist. Class. Disc. d'Europe 39 (1907); Icon. Mycol. 2, Pl. 241 (1905–10). — We have not seen any specimen of *Helvella falknerae* COPELAND, but judging from the description and drawings (COPELAND 1904: 509–510, Pl. 12, Figs. 6–7) this species is no doubt also identical with *H. queletii*. — In the BOUDIER herbarium was also seen *Cyathipodia villosa* (HEDW. ex O. KUNTZE) BOUD.; this turned out to be identical with another species hitherto unrecognized in Norden (see below). — An examina-

tion of an isotype of *Peziza subclavipes* PHILL. & ELLIS showed it to be synonymous to *H. macropus* (see p. 336).

Helvella villosa (HEDW. ex O. KUNTZE) DISSING & NANNF. comb. nov.
— Figs. 2b, 3, Pl. I: 3 & II: 1.

Syn.: *Fuckelina villosa* HEDW. ex O. KUNTZE, Rev. Gen. Pl. 2: 851 (1891).
≡ *Cyathipodia villosa* (HEDW. ex O. KUNTZE) BOUD., Hist. Class. Disc. d'Europe 39 (1907); Icones Mycol. 2, Pl. 240 (1905–10).

Non *Elvela villosa* SCHAEFF., Icones Fungorum 4: 114, Tab. 321 (1774), nec *Helvella villosa* RELH., Flora Cantabrigensis 463 (1785) =? *Thelephora hirsuta* (see FRIES, Syst. Myc. 1: 439, 1821) =? *Auricularia reflexa* (see GREVILLE, Scot. Crypt. Fl. 5: 256, 1827)].

Basionym: *Octospora villosa* HEDW., Species Muscorum Frondosorum 2: 54, Tab. 19, Fig. B. (1788).

Lectotype: Tab. 19, Fig. B. nr. 3 in HEDWIG l.c.

Fuckelina villosa HEDW. ex O. KUNTZE is an illegitimate combination, as the generic name *Fuckelina* O. KUNTZE (l.c.) is a later homonym of *Fuckelina* SACCARDO (Fungi veneti novi vel critici, Ser. 2 in Nuovo Giorn. Bot. Ital. 7: 326, 1875). But the prefriesian specific epithet is validated by KUNTZE's compilation (l.c.), according to the "International Code of Botanical Nomenclature" (1961).

Pileus when young compressed, later discoid, 1.0–2.5 cm broad, 1–1.5 mm thick, when adult often expanding, splitting into several irregular lobes; hymenium grey, dark greyish-brown to dark brown or steel grey; outer surface conspicuously pubescent (villose), even, without ribs, dark greyish to dark brownish. Stipe terete, 1–3 cm high, 2–4 mm thick, pubescent, above concolorous with outer surface, below gradually becoming paler to yellowish-white on the base, which is sometimes slightly thickened.

Outer excipulum of textura angulata, 200–300 μ , staining in Cotton Blue, the pubescence of the outer surface due to tufts of fasciculated hyphae, single cells of much varying size, mostly drumshaped–clubshaped, 20–40 \times 10–20 μ , walls often slightly brownish; medullary excipulum 400–600 μ , of textura intricata, hyphae hyaline, branching, septate, 3–8 μ ; subhymenium 60–120 μ ; hymenium 250–300 μ , asci 12–14 μ broad, paraphyses 5–6 μ , often clubshaped, plasma mostly deeply staining in Cotton Blue, walls sometimes slightly brownish. Spores 17–18.7–21 \times 9–10.5–12.5 μ (see Fig. 2b).

The above description is based on the following three collections: France: *Acetabula villosa* HEDW., "Bois de Beauchamp, ad terram arenosis graminoso. Bot. Tidskr., 60 (1966): 2

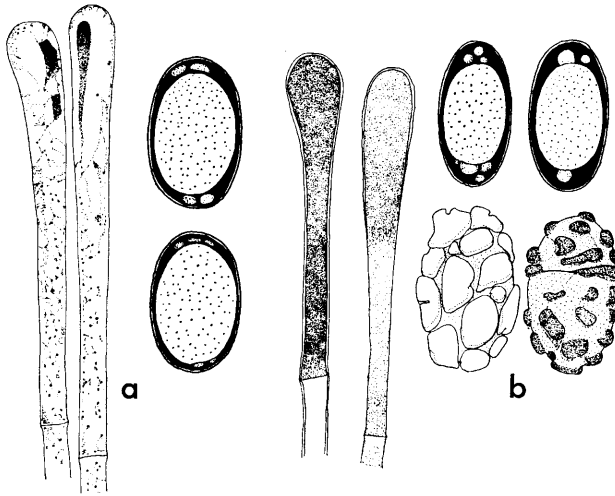


Fig. 2. Paraphyses and spores. *a* *H. cupuliformis* (Type); *b* *H. villosa* (LUNDELL & NANNFELDT exs.). In *H. villosa* the plasma in the paraphyses stains heavily in Cotton Blue, in *H. cupuliformis* not. In *H. cupuliformis* no spores with pustules have been seen (cfr. p. 329). In *b* the lower spore to the left is considered to be the youngest, its pustules stain very weakly. ($\times 1000$).

sis, 5.12.1885" (Herb. BOUDIER, PC). Spores $18-18.8-19.5 \times 9-10-10.5 \mu$. — Sweden: Halland: Onsala parish, Presse, Björkhamra, on nearly bare soil under deciduous trees, 8.VII.1956, leg. F. KARLVALL (UPS). Spores $18-19.5-21 \times 10-10.8-11.5 \mu$. This collection is large and will be distributed in the LUNDELL & NANNFELDT exsiccate. — Denmark: Zealand, Sorø, Feldskov, 12.IX.1965, leg. H. DISSING (coll. HD nr. 65.102, C). Spores $18-18.9-20 \times 11.5-12-12.5 \mu$.

Furthermore the following collection has been studied in detail: Australia: Victoria, Melba Fully, near Laeveis Hill, on mossy bark by stream, 9.III.1963 (K). Spores $17-18.2-19.5 \times 11-11.2-12.5 \mu$.

There could be some doubt as to what species is described by HEDWIG but he mentions (l.c.) that his species grows gregariously. This has been found to be characteristic for *H. villosa*, at least for the collections found in Denmark (see Pl. II: 1). This feature is very well illustrated by HEDWIG and since his figure (Fig. B nr. 3) also otherwise matches our plant very well it is hereby selected as lectotype. *Cyathipodia villosa* as depicted by BOUDIER (l.c.) is also the same. In the BOUDIER herbarium H. D. has seen several collections, *inter alia* that illustrated and described in the Icones Mycol. This collection has been studied in detail during this investigation. *H. villosa* probably has a wide distribution but may have been confused with *H. macropus*

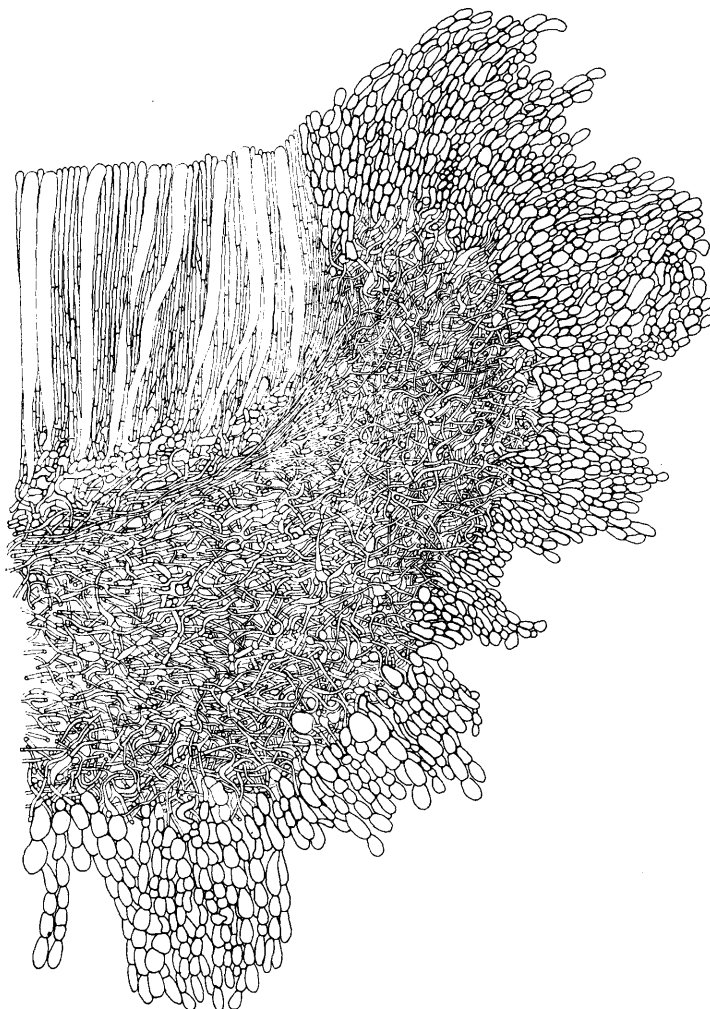


Fig. 3. *H. villosa*. Marginal section of fruitbody. The outer excipulum may be much more prominent than here. (LUNDELL & NANNFELDT exs.; $\times 150$)

on many occasions, at least in the field. *H. macropus* is found in nearly every sizeable floristic list from forays and excursions in Europe, but not found in the same (expected) amount in herbaria, thus misdeterminations are difficult to trace. Other possible "names" are *H. ephippium* LÉV. (as in Crypt. Cechosl. exs. 59 "Czechoslovakia: Moravia, 10.6.1951, leg. et det. SMARDA", PR, PRC, UPS), and *H. pezizoides* AFZ. ex FR. (as in REHM, Asc. exs. 1651 "*H. pezizoides* AFZ. Sv. Bot. Tidskr., 60 (1966): 2

var. *minor* BRES. Oberschlesien: Schwedenhügel bei Zülz, 6. 1905–06, leg. BUCHS", S). In the herbarium in Praha (PR) the following three VELENOVSKÝ species were found to be synonyms of *H. villosa*: *Macropodia minor* VEL., Mon. Disc. Boh. 342 (1934): "Siberia: Wasjuganje, *Prunus Padus* (ad folia), 15.8.1934, leg. KRAWTZEW, det. PILÁT" (PR 190494). The type of *M. minor* was not seen. — *Macropodia chinensis* VEL., Nov. Mycol. 200 (1939): "China: Pai N'a, 28.8.1930, leg. E. LICENT" (Typus, PR 151669). — *Helvella vacini* VEL., Nov. Mycol. Noviss. 156 (1947): "Czechoslovakia: Moravia, Zarosice, 8.1940" (Typus, PR 150871). — The collections of *Paxina calyx* (SACC.) O. KUNTZE at Kew, mentioned by DENNIS (1960: 7) represent all *H. villosa*. Authentic specimens of *Acetabula calyx* SACC., related to *H. leucomelas* (PERS.) NANNF. have been seen and are clearly different from *H. villosa*. *H. ephippium* is probably closely related to *H. villosa*, but its saddleshaped apothecia and several microscopic characters make a clear separation possible. This matter will be discussed in detail by H. D. in a separate paper.

Helvella macropus (PERS. ex FR.) KARST., in Not. Sällsk. F. Fl. Fenn. Förh. 11: 224 (1870). — Figs. 4, 5 & Pl. III.

Pileus cupshaped, regular, 2.0–3.0 cm broad, 1–1.5 mm thick; hymenium yellowish-brown to pale greyish-brown; outer surface conspicuously pubescent, concolorous with hymenium or grey. Stipe 2.5–4.0 cm high, 3–5 mm broad, thickened near the base and often compressed above, concolorous with outside, but often gradually becoming whitish below.

Outer excipulum of *textura angulata*, 200–300 μ (near the margin often up to 500 μ), staining in Cotton Blue, the strong pubescence of the outer surface due to long fasciculated rows of cylindrical cells, 25–35 \times 10–15 μ , innermost cells depressed, angular, 10–30 μ broad, nearly all cells with a heavily staining plasma, and often with brownish walls; medullary excipulum of *textura intricata*, with interwoven, branching hyphae, the hyphae giving rise to the cells in outer excipulum with brownish walls especially near the margin, septate, 3–4 μ , intermixed with long lemonshaped cells up to 18–20 μ broad; subhymenium very variable in thickness, 60–180 μ ; hymenium 250–300 μ , asci 13–18 μ broad, paraphyses 6–9 μ broad, slightly clubshaped, plasma in the uppermost cells mostly deeply staining in Cotton Blue. Spores 20–23.3–26 \times 9–10.3–12 μ , ellipsoid-fusoid, often with conspicuous pustules and/or delicately warted when

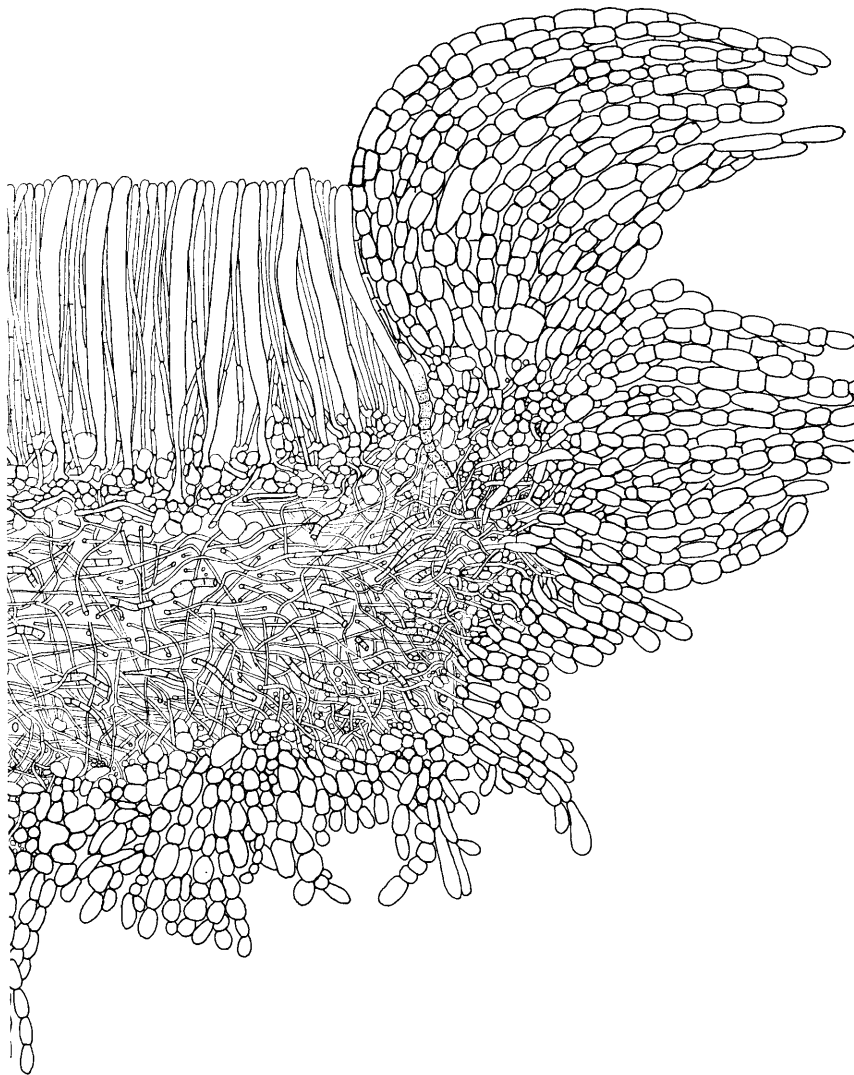


Fig. 4. *H. macropus*. Marginal section of fruitbody. The fasciculated rows of cells in tufts are very characteristic for the species, and have been seen in all collections mentioned p. 335. The thickwalled, dotted hyphae in medullary excipulum are brownish. (Michigan 2.viii.1961; $\times 150$.)

young, the plasma deeply staining in Cotton Blue. When fresh the elongated spores normally have three large guttulae, the central one being the largest. When dried the guttulae may be more or less confluent (see Fig. 5).

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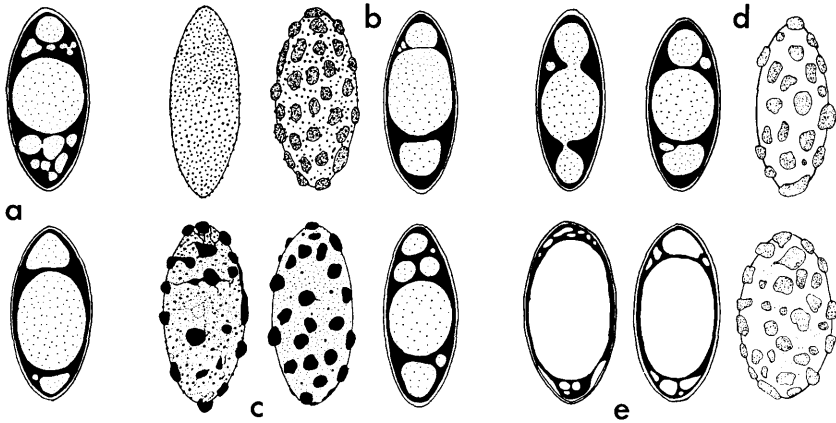


Fig. 5. *H. macropus*. Spores (a HD 64.200; b Michigan, 2.VIII.1961; c LUNDELL & NANNF. exs. nr. 370; d *H. ephippioides* IMAI; e Jamaica, 24.XII.1949.) Though the spores vary in broadness, they all have nearly the same length (cfr. spore measurements p. 335). Spores with delicate warts as seen in b & c have not been seen in any other *Helvella* species. When mature the spores are in all collections smooth. ($\times 1000$).

The description above is based on detailed examinations of the following six collections: Denmark: Zealand, Kongelunden, Amager, 12.VIII.1961, near path under *Quercus* sp., leg. H. DISSING (coll. HD nr. 61.132, C). Spores 20–23.1–25 \times 11–11.7–12 μ . — Zealand, Nordskoven, Jægerspris, 13.IX.1964, leg. P. MILAN PETERSEN (coll. HD nr. 64.200, C). Spores 21–22.2–24 \times 9.5–10.2–11 μ . — Sweden: Uppland: Uppsala, Stadsparken, 12. & 27.VIII.1936, on mossy tufts in dried-up bog, amongst *Ulmaria pentapetala* and *Equisetum hiemale*, and along sandy path in mixed wood, leg. SETH LUNDELL (= LUNDELL & NANNFELDT exs. 370, C). Spores 22–23.6–26 \times 9.5–10.6–11 μ . — North America: Jamaica, Cericon, Blue Mt., in a garden, 24.XII.1949, leg. R. W. G. DENNIS (coll. J.54, K). Spores 22–23.5–25 \times 10.5–11.1–12 μ . This collection is mentioned by DENNIS (1955: 417) as *Leptopodia pezizoides* (AFZ. ex FR.) BOUD. (see below). — Michigan, Tahquanenon, on wood!, 2.VIII.1961, leg. D. A. REID (K). Spores 22–23.5–25 \times 9–10.2–11 μ . — Japan: Hokkaido, Nooporo, Ishikari, 7.VIII.1927, ad terram in silvis, leg. S. IMAI (UPS). Spores 21–23.2–25 \times 9–9.3–10 μ . This is an isotype of *Helvella ephippioides* IMAI, Bot. Mag. Tokyo 46: 172 (1932).

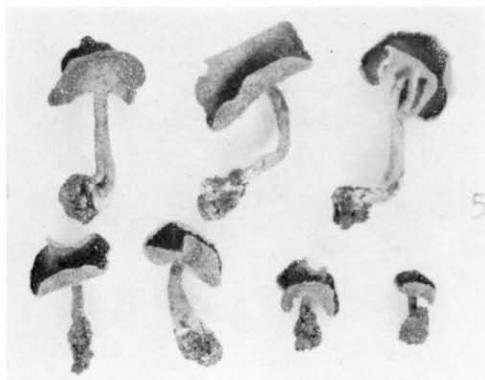
When typically developed this species is one of the most easily recognizable in the genus. It has a very wide distribution (Asia, Europe and North America), and in most characters it is very constant. The plants examined all have the very characteristic, prominent pubescent excipulum (Fig. 4 & Pl. III). The spores (Fig. 5a–e) are mostly very characteristic ellipsoid-fusoid. In the Jamaica collection the spores are somewhat different, broader than usual (Fig. 5e) and

this feature has probably lead DENNIS (l.c.) to name the species *H. pezizoïdes*. This collection has later (in 1964) been studied by RAITVIIR, Estonia, who has written on a label: "I am not sure what it really is. The spores (22.6–24.0 × 11.3–13.4 μ) are larger than those of *H. pezizoïdes* and they seem to be somewhat intermediate between *Helvella* and *Macropodia*. The ectal excipulum is very similar to that of *H. pezizoïdes*". The outer excipulum and the length of the spores, however, indicate *H. macropus*. The locality is the southernmost from which we have seen material. As a rule *H. macropus* grows on the ground, but, as seen from the Michigan collection, it may also inhabit wood. The cupshape of the apothecia is normally very constant, but monstrous or overripe forms with an ephippioid shape have been seen. — In Sweden and in France albino forms have been met with: Sweden, Småland: Femsjö parish, Hagtorpet, among grasses and *Trifolium* sp. under *Quercus* sp. and *Populus tremula*, 8.IX.1949, leg. S. LUNDELL & S. STORDAL nr. 2684 (UPS). France: "*Macropodia macropus* (PERS.) FUCK., forma entièrement blanche," 31.VII.1936, leg. L. JOACHIM (Herb. GRELET, PC). — Unfortunately different shape or large size have caused descriptions of "new" species, e.g. *H. ephippioides* IMAI (l.c.) and *H. affinis* VEL., Česke Houby 4–5: 890 (1922) (Czechoslovakia: Mnichovice, VII. & VIII. 1922, det. VELENOVSKÝ, PRC, in alc.). — A very small form is distributed in RABENHORST: Fung. Eur. 1414 as *Peziza macropus* forma *exigua* (K). — *Peziza subclavipes* PHILL. & ELL. (isotypes distributed in ELLIS, North Am. Fgi. 985) is also a synonym. The copy in UPS shows typical, cupshaped fruitbodies and "*macropus*" spores.

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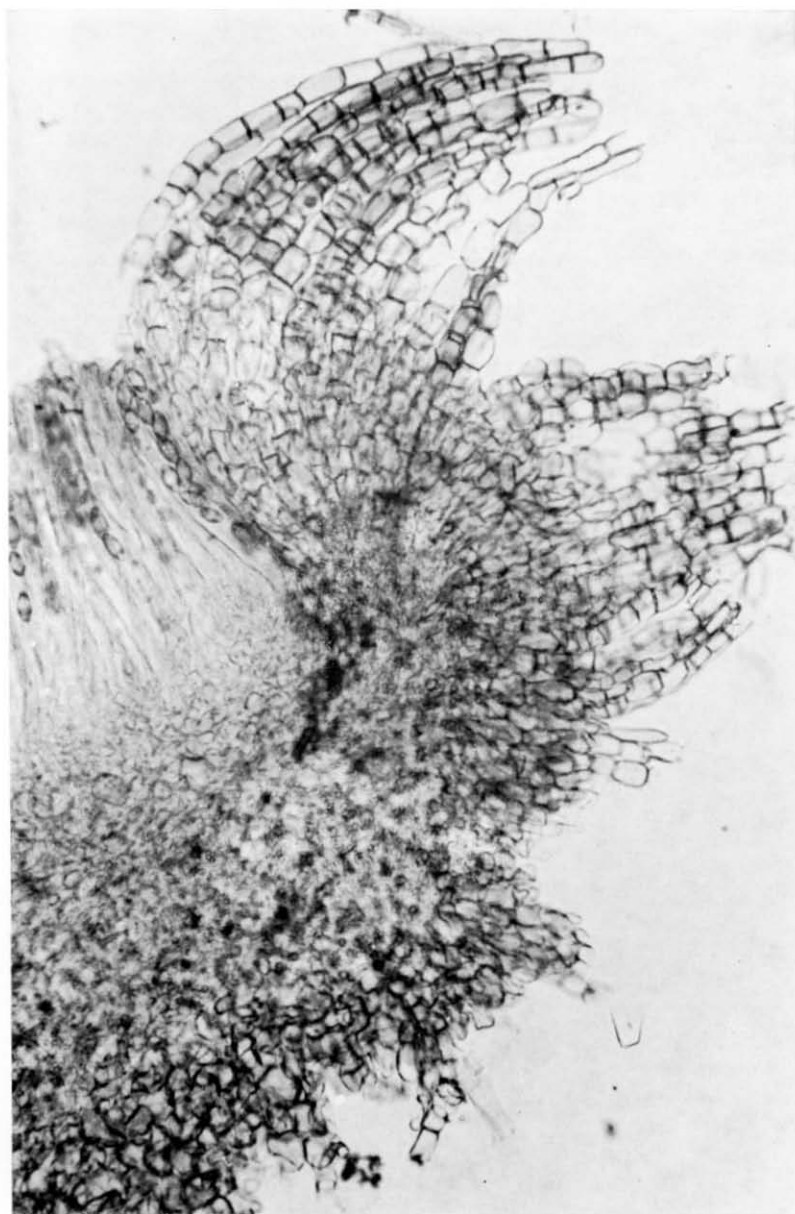
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Pl. I. 1. *H. cupuliformis*. Part of the type collection. (Dried material; $\times 1$). 2. *H. cupuliformis*. In this collection no specimen with a compressed stipe is seen. (21.vii.1948, dried material; $\times 1$). 3. *H. villosa*. Part of the collection to be distributed in the LUNDELL & NANNF. exsiccate. Compare with 1 & 2. The stipe is much more slender in *H. villosa*. (Dried material; $\times 1$)



Pl. II. 1. *H. villosa*. Part of the collection, showing the gregarious habit. Note the expanding specimen to the right. (HD 61.150, fresh material; $\times 1$.) 2. *H. queletii*. Part of one of the very pale collections found in Sweden, cfr. p. 328. (LUNDELL & NANNF. exs. ined., 13.VII.1942, dried material; $\times 1$.)



Pl. III. *H. macropus*. Marginal section of fruitbody. Compare Fig. 4. (Michigan 2.VIII.1961; \times ca. 170.)