

Helvella papuensis, a New Species from Papua New Guinea

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Summary. *Helvella papuensis* sp. nov. is described. *H. elastica* is reported for the first time from the southern hemisphere. *H. lacunosa* and *H. villosa* are shortly commented on. Finally, two small collections, resembling *H. pezi-zoides*, which may represent an undescribed taxon are shortly discussed.

The eight collections of *Helvella* presented in this paper were collected by Dr. E. HORAK, Zürich, during a stay in Papua New Guinea at periods in 1971 and 1972. They constitute at least 5 different taxa, of which only *H. lacunosa* and *H. villosa* were reported earlier from the area (KOBAYASI, OTANI, and HONGO, 1973). *H. lacunosa* subsp. *javanica* was described from Java by PENZIG & SACCARDO (1904). In agreement with KOBAYASI et al. (l. c.) I consider this taxon to be conspecific with *H. lacunosa*. Otherwise the genus *Helvella* has a very scattered representation in the southern hemisphere (cf. DISSING 1966a).

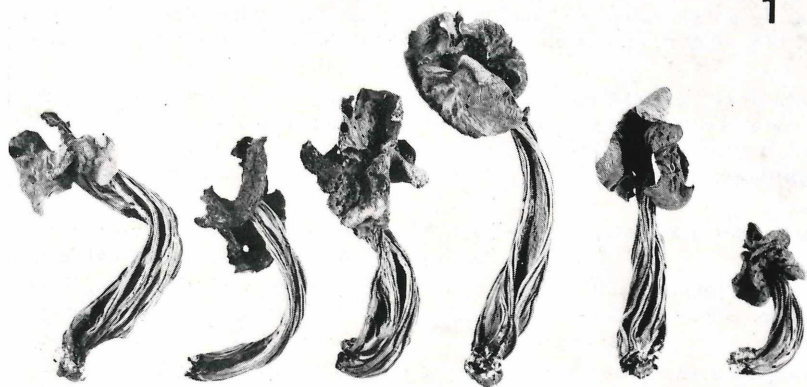
The treatment of the material and the terminology applied is in accordance with DISSING (1964), except for the spore measurements in which fragments of the pileus from near its center were soaked in water for about one hour before 20 spores were measured. The material collected by E. HORAK is recorded here under his collecting numbers, preceded by E. H. An asterisk after this number means that a colour photo (slide) was made of fresh material by E. HORAK. Figs. 3a—e are drawings made from these photos. Where field notes were provided, these are mentioned in brackets after the record.

All collections are deposited in Institut für Spezielle Botanik, Eidg. Technischen Hochschule, Zürich (ZT).

Helvella papuensis DISSING sp. nov.

Figurae 1 & 2.

Pileus 1.5—2.5 cm latus, irregulariter ephippioides; margo primum involutus, postea deflexus, semper liber; hymenium ochraceum vel paulum saturatius, rugose plicatum, maxime super stipitem; facies exterior pilei concolor vel paulum obscurior, leavis vel rugosula, villosa vel tomentosa. Stipes satis tenuis, 2.5—6 cm altus, 0.5—1 cm crassus, carinis longitudinalibus rotundatis plerumque duplicibus ornatus, villosus vel tomentosus, eodem ac pileo colore.



NG 141 ————— 2 cm

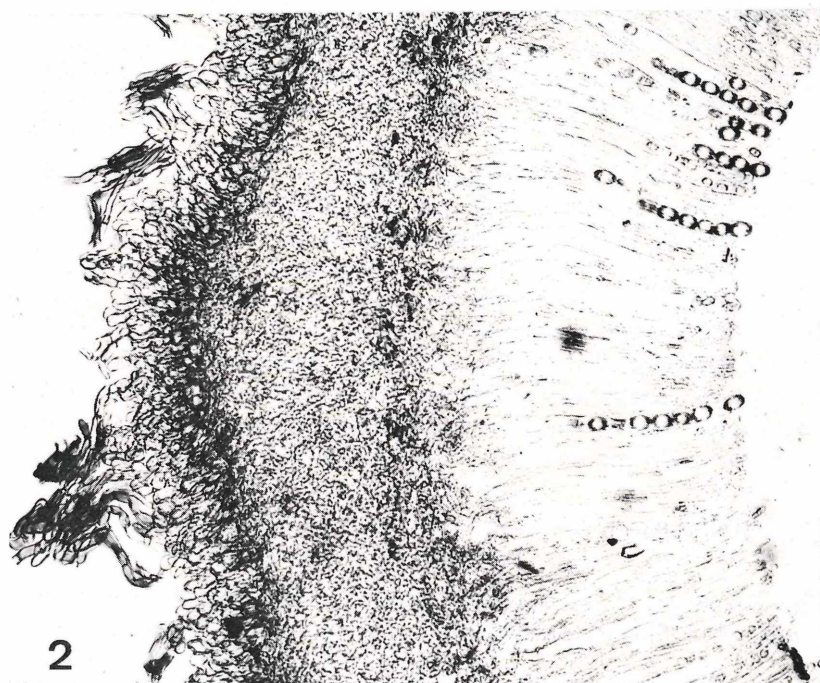


Fig. 1. *H. papuensis*, dried material, selected specimen from the Holotype, NG 141, $\times 0.65$

Fig. 2. *H. papuensis*, section of pileus near the margin, from Holotype, NG 141, $\times 155$

Excipuli exterior pars textura angulata vel globulosa, 50–66 μm crassa, cellulis 19–26 (–33) μm latis, ad superficiem sub recto angulo directis, superficialibus aut claviformibus aut saepius in cellulas elongatas 42×6 –7 μm magnas hyphas fasciculatas formantes transientibus, fasciculis ad 200–230 μm altis.

Excipuli interior pars a parte exteriore strato cellularum parvularum fuscidarum tinctura coerulea anilinea ("Cotton Blue") saturate coloratarum limitata, 165–190 μm crassa, textura intricata, cellulis 2–3 μm latis, colore nullo, tinctura coerulea anilinea paulum affectis, hyphas paulum ramificatas formantibus.

Subhymenium 33–50 μm crassum, e hyphis dense intertextis formatum, cellulis pallide fuscidis tinctura coerulea anilinea coloratis.

Hymenium 260–300 μm altum; asci 13.2–14.8 μm crassi, apice rotundati, basi pleurorhynchi; paraphyses 3.2–3.5 μm crassae, supra ad 6.5 μm incrassatae, septatae. Sporae 17.2 – 18.8 – 21.5×10.9 – 12.1 – 13.2 μm magnae.

Holotypus die 9 Maji anni 1972 in solo sub *Castanopsis* et *Lithocarpus* ad pagum Manki ab oppido Bulolo regionis papuensis Morobe in occidentem situm sub indice NG 141 ab E. HORAK lectus, in Herbario Turicensi (ZT) depositus.

Pileus 1.5–2.5 cm broad, irregularly saddle-shaped, margin first inrolled, later deflexed, always free, hymenium oxide yellow to brownish yellow, wrinkled-folded, especially over the stipe, outer surface of pileus concolorous or slightly darker, even or delicately wrinkled, villose to tomentose. Stipe rather slender, 2.5–6.0 cm high, 0.5–1.0 cm broad, with longitudinal, blunt, mostly double edged ribs, surface villose to tomentose, concolorous with outside of pileus.

Outer excipulum of textura angulata to textura globulosa, 50–66 μm thick, individual cells 19–26 (–33) μm broad, at right angles to the surface, outermost cells club-shaped, or more often giving rise to chains of elongated cells, 42×6 –7 μm , which make fascicles of hyphae. The fascicles bundles may be up to 200–230 μm high. The borderline between the outer and inner excipulum is made up of very small brownish cells. The content of these cells stains deeply in Cotton Blue. The inner excipulum proper is 165–190 μm broad, of textura intricata, individual cells 2–3 μm broad, only sparsely branching, without pigmentation, and weakly staining in Cotton Blue.

Subhymenium 33–50 μm broad, of densely interwoven, pale brownish cells which stains in Cotton Blue.

Hymenium 260–300 μm high, asci 13.2–14.8 μm broad, apex rounded, the base pleurorhynchous. Paraphyses 3.2–3.5 μm broad, above enlarged to 6.5 μm broad, septate.

Spores 17.2 – 18.8 – 21.5×10.9 – 12.1 – 13.2 μm .

Material On soil under *Castanopsis* and *Lithocarpus*, Manki, W of Bulolo, Morobe District, 9. v. 1972 (Holotype, in ZT), leg. E. HORAK (NG 141).

The above description is based on the dried material of the holotype, well preserved and counting eight specimen. Whereas the dried material was almost unicoloured brownish yellow all over, the fragments soaked in water showed the hymenium to be more yellow and in a contrast to the outside of the pileus with its warm dark brownish colour. Watersoaked fragments of the stipe showed the same pattern of variation, yellowish in the grooves and brown on the longitudinal ribs of the stipe. Sections of the pileus fragment showed distinct brownish zones between the outer and the inner excipulum, as well as in the subhymenium.

Helvella papuensis is considered to be a natural member of the section *Helvella* (= section *Crispae* DISSING 1966a). The colours distinguish it sufficiently from the type of the section: *Helvella crispa* SCOP. ex FR. *H. papuensis* is also much more villose than this species. *H. fusca* GILL. sensu BRES. has a much more delicately pubescent outside and the colours are also different. *H. maculata* WEBER (1975) has, according to the description, a mottled hymenial surface, the stipe is whitish when young, and it has a "finely pubescent" surface. Besides, the spores are considerably larger, "20—23 × 12—13.5 μm" *H. pithyophila* BOUD. as described and depicted by BOUDIER (1905—1910: 119, Pl. 227) has a hymenium with a "couleur ochacée pâle" with a concolorous outer surface and a stipe which is "d'une couleur cendrée olivâtre-pâle" Authentic, dried material of *H. pithyophila* was studied by DISSING (1966b), who considered the species to be conspecific with *H. crispa*.

Helvella elastica BULL. ex St.-AMANS.

Fig. 3a

Pileus 1—2.5 cm broad, convex, regularly saddle-shaped, with adnate lobes, hymenium pale brownish, outside naked, cream. Stipe terete, solid, in the largest specimen with indistinct grooves, 2.5—11 cm high, 2—8 mm broad, pruinose, concolorous with outside of pileus or pale brownish towards the base. Spores 21.1—22.4—23.8 × 11.6—13.5—14.0 μm.

Material: On soil under *Castanopsis* and *Lithocarpus*, Manki, W of Bulolo, Morobe district, 25. iv. 1973, E. H. (NG 126*).

This appears to be the first find of *H. elastica* in tropical areas. It is a large collection, 16 specimen, which in macroscopic characters are much like many other collections examined from Europe. However, the coloured slide shows that the hymenium and the base of the stipe has a pinkish tinge which I have never seen in a *Helvella* collection before. All essential microscopic characters are typical for the species. Three details have been noticed, which perhaps deserve further studies in material from the tropic areas. The uppermost cell in the paraphyses may be unusually long. In many cases it is more than 200 μm

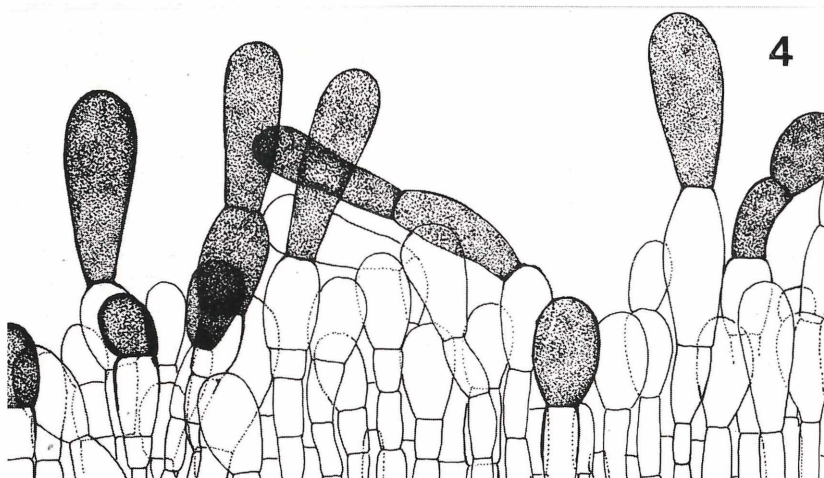
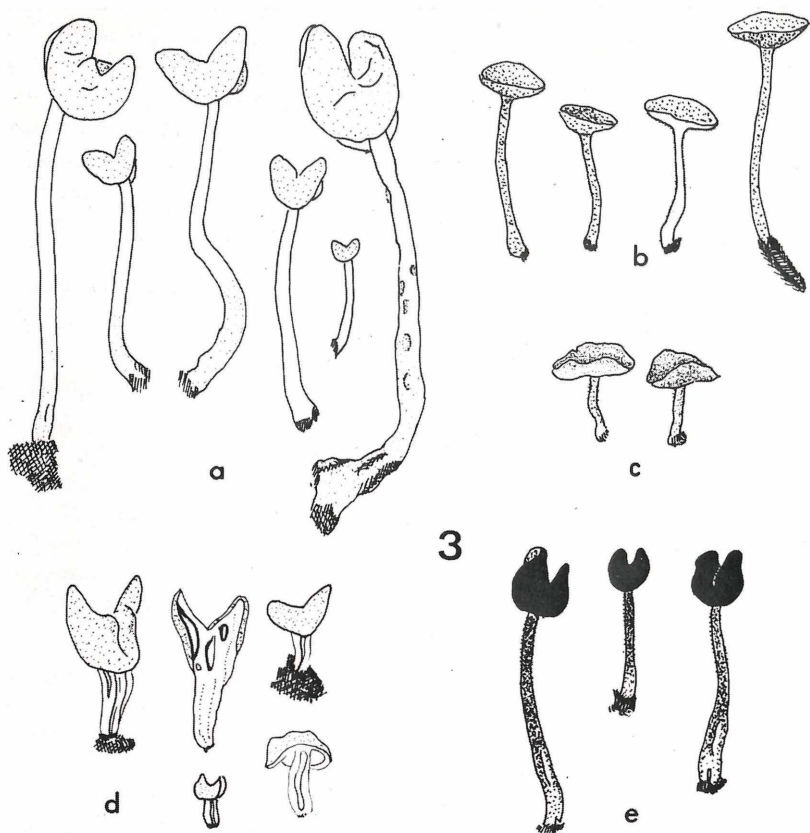


Fig. 3. Drawings of selected specimen from colour slides of fresh fruit bodies. a. *H. elastica*, NG 126, b. *H. cfr. villosa*, NG 69, c. *H. villosa*, NG 223, d. *H. cfr. lacunosa*, NG 47, e. *H. sp.* NG 121. a–e $\times \frac{1}{2}$
 Fig. 4. *H. sp.* Outer excipulum with elongated, projecting, dark brown cells. NG 121 $\times 620$

long. In empty, opened asci the wall usually stains weakly all over in Cotton Blue. In this collection the operculum, and the uppermost 5–6 μm of the ascus wall was not stained. Asci with less than eight spores were seen in several marginal sections. This is well known in the genus *Helvella*. But in some asci 16 spores, biseriate or irregularly arranged, were seen. This appears to be an unpublished observation in the genus. No asci with 16 mature spores were noticed.

Helvella lacunosa AFZ. ex FR.

Fig. 3d.

Material: Among litter under *Castanopsis* and *Lithocarpus*, Manki, W of Bulolo, Morobe District, 13. x. 1971, E. H. (NG 1). "Ascocarp black, smooth, margin partly connected with stipe. Stipe white, hollow, deeply furrowed" — On rotten wood, in *Castanopsis* and *Lithocarpus* forest, Watut, W of Bulolo, Morobe District, 11. xi. 1971, E. H. (NG 47*).

The field notes characterize the material of NG 1 fully. The collection consists of three small specimen, all immature, but in macroscopic characters typical for the species. As mentioned above *H. lacunosa* was also reported from the same area (and district) by KOBAYASI et al. (1973). NG 47 might also be merely a very pale collection of *H. lacunosa*, but since the spores are unusually small for that species, a short description is provided: Pileus 0.8–2.0 cm broad, saddle-shaped, first with inrolled margin, later convex, adnate, and at least attached to the stipe in one point, hymenium pale greyish brown, outside glabrous, even or delicately wrinkled, cream. Stipe 1.0–2.5 cm high, 0.3–0.4 cm broad below, gradually widening to 0.5–0.8 cm above, with few longitudinally, blunt ribs, which mostly continue on the outside of the pileus, concolorous with outside, glabrous; the inside of the stipe with chambers. Spores $10.6\text{--}14.0\text{--}15.2 \times 9.9\text{--}10.3\text{--}11.6 \mu\text{m}$. A rather high percentage of spores with guttules were seen.

NG 47 counts 4 specimen. Characters of the excipulum are similar to those of other members of the section Lacunosae with an outer excipulum of *textura angulata*, outermost a palisade of club-shaped cells, and a compact *textura intricata* in the medullary excipulum. The colour-slide shows the specimen with a pinkish tinge on the pileus. This together with the spore-size might very well indicate a separate taxon.

Helvella villosa (HEDW. ex O. KUNTZE) DISS. & NANNF.

Figs. 3b & 3c.

Pileus 1.5–2.0 cm broad, discoid to slightly compressed, hymenium pale greyish brown, outside greyish, villose, without ribs.

Stipe 1.5 cm high, 2 mm broad, solid, terete, villose, above greyish, towards the base greyish brown. Spores $17.5-19.8-21.5 \times 10.6-11.6-13.2 \mu\text{m}$. Some spores with pustules seen.

Material: On soil under *Nothofagus*, *Weinmannia*, *Ficus* etc., Daulo Pass, W of Goroka, Eastern Highlands, 6. i. 1972, E. H. (NG 69*); — On soil under *Castanopsis* and *Lithocarpus*, Manki, W of Bulolo, Morobo District, 6. v. 1973, E. H. (NG 223*).

The above description is based on the collection NG 223 which in all details but one, the spores are slightly broader, matches the interpretation of the species in Europe. Coll. NG 69 is much more slender, the stipe being 3–6 cm high, 1.5–2 mm broad, and according to the colour-slide it is dark brownish all over. The dried material is greyish brown. The spores are smaller than normal for the species, $14.9-16.8-18.2 \times 9.9-10.6-12.5 \mu\text{m}$. Some spores with pustules seen. *H. villosa*, apparently of the same slender type as coll. NG 69, was collected by KOBAYASI et al. (1973, fig. 3a) in Oksapmim, Papua New Guinea.

H. sp. (aff. *H. pezizoides*?).

Figs. 3e & 4.

Pileus 1.0–1.8 cm broad, regularly saddle-shaped, deflexed, hymenium even, greyish-brown to brown, outside tomentose, brownish. Stipe terete, solid, 3.5–8.5 cm high, at the base 0.4–0.6 cm broad, gradually tapering towards the pileus, above tomentose, concolorous with outside of pileus, towards the base becoming more yellowish, pruinose to nearly naked.

Outer excipulum of textura angulata, 50–66 μm thick, individual cells at right angles to the surface, $13-33 \times 6.5-16.5 \mu\text{m}$, outermost cells club-shaped, $26-36 (-43) \times 10-13 (-26) \mu\text{m}$, intermixed with scattered elongated, projecting cells, 45–65 μm long, which have a dark brownish wall especially in the cells towards the margin. Medullary excipulum of textura intricata, 150–165 μm thick. Subhymenium 30–45 μm thick. Hymenium 260–305 μm high, asci 12.5–13.9 μm broad, rounded above, pleurorhynchous below. Paraphyses 2.5–3.0 μm broad below, gradually widening to 6.0–6.5 μm above, septate, uppermost cell(s) with a pale brownish content. Spores $16.5-17.2-18.2 \times 9.2-9.9-11.2 \mu\text{m}$. A few spores with pustules seen.

Material: Among mosses and rotten wood in *Castanopsis* and *Lithocarpus* forest, Manki, W of Bulolo, Morobe District, 7. iv. 1972, E. H. (NG 112). "All over grey-brown to dark brown, cup and stipe hairy, base of stipe whitish to ochraceous" — On soil in *Castanopsis* forest, Manki, W. of Bulolo, Morobe District, 24. iv. 1972, E. H. (NG 121*). "Stipe felty-furfuraceous, indistinctly lacunose; hymenium grey-brown. Infected with *Stephanoma strigosum* WALLR."

The above description is based on material of NG 121, a collection counting eight specimen, three of which are not infected with *Stephanoma*. Fragments from one specimen were soaked in water. The hymenium was then pale yellowish brown to greyish brown in contrast to the dark brown colour of the outside, especially towards the margin. This colour is due to the projecting cells mentioned above. NG 121 belongs to section *Ephippium* (DISSING 1966a). In size and shape it recalls *H. pezizoides* ARZ. ex FR., but it seems well distinguished from this species in some of its characters, viz. the pale coloured hymenium and the projecting cells. *H. pezizoides* is tomentose with bundles of fascicled hyphae. NG 112 is unfortunately immature. It showed the same anatomic-microscopical characters. The collection consists of two specimen which are both discoid to slightly compressed.

Acknowledgements

I am much indebted to Dr. E. HORAK, Zürich, who placed this valuable material at my disposal. Dr. Tyge CHRISTENSEN prepared the Latin diagnoses. Miss Helle FELTRIN corrected the English manuscript and Mrs. Karin VESTBERG prepared the photographs. I highly appreciate their cooperation.

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Zeitschrift/Journal: [Sydowia Beihefte](#)

Jahr/Year: 1977

Band/Volume: [8](#)

Autor(en)/Author(s): Dissing Henry

Artikel/Article: [Helvetia papuensis, a New Species from Papua New Guinea 156-161](#)