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NOTES ON THE GENUS PSATHYRELLA-VIII

Description of and key to the European species of section Hydrophilae

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A description of and key to twelve species of *Psathyrella* section *Hydrophilea* (Romagn.) ex Sing. emend. Kits van Wav. is given. These species are: *P. hydrophila*, *P. hydrophiloides* (spec. nov., = *Drosophila pilulaeformis* ss. Kühn. & Romagn.), *P. laevissima*, *P. subpapillata* (comb. nov.), *P. fragrans* (an American species found in the Netherlands), *P. mucrocystis* (= *Drosophila chondrodermoides* Romagn.), *P. frustulenta*, *P. obtusata* with var. *utriformis* (var. nov.), *P. chondroderma*, *P. pseudocasca* (comb. nov.) *P. umbrina* (spec. nov.), and *P. rannochii* (spec. nov.). Most of these species are exceedingly rare and some have not yet been recorded from the Netherlands. Type material of *P. mucrocystis* and *Drosophila chondrodermoides* has been examined as well as material of *P. subpapillata* and *P. pseudocasca* from the Romagnesi herbarium. Of *P. frustulenta* and *P. obtusata* only brief descriptions are given as full descriptions have recently been published. The name *P. cortinarioides* P. D. Orton is considered a synonym of *P. frustulenta*.

The find of *Psathyrella chondroderma* (Berk. & Br.) A. H. Smith by Mr. and Mrs. Tjallingii on November 6th 1979 near Renkum (first record in the Netherlands) initiated this study of the group of species of *Psathyrella* that Romagnesi (*1944*: 52) named *Drosophila* section *Hydrophilae*.

On October 20th 1962 we had found near Denekamp a caespitose group of eight carpophores, which we had provisionally, be it with a question mark, identified as *P. chondroderma*. Restudying this find and comparing it with the Renkum find, we discovered that the two collections represented different species, our 1962 find being *Drosophila chondrodermoides*, recently described by Romagnesi (*1976*: 189), who very kindly sent us material for examination. Much later we discovered that Romagnesi's species had already been described by Smith (*1972*: 373) as *P. mucrocystis*.

Orton's (*1960*: 374) statement in his discussion of *P. jerdonii* that *P. chondroderma* - of which he had examined the type material - has no facial cystidia, necessitated a re-examination of this material, the result of his study seeming unlikely as all species of this group possess pleurocystidia. Moreover, the decisive difference between *P. chondroderma* and *P. mucrocystis* being the very differently shaped pleurocystidia, the type material might turn out to be either of the two species if pleurocystidia were found. Through the kindness of Dr. D. N. Pegler (K) we were enabled to study type material in which we found a sufficient number of pleurocystidia to produce a pleurocystidiogram (Fig. 5). Fortunately the cells turned out to tally with those of *P. chondroderma* as conceived by Favre (*1957*: 121) and Romagnesi.

Previously we had just finished a study of six collections very kindly sent us on loan from the Herbarium of the Royal Botanic Garden Edinburgh of a species that Orton (*1969*: 116) had described under the misapplied name *P. piluliformis* (Bull. ex Mérat) P. D. Orton. To these six collections we were able to add three more of our own, found over the years in the British Isles, where the species apparently is fairly common. All nine collections turned out to represent *P. laevissima* (Romagn.) Sing.

Our examinations eventually led to a reappraisal and redefinition of section *Hydrophilae*.

METHODS

For our methods of examining the carpophores, in particular their microscopical characters, the reader is referred to our previous papers (*1968*: 132; *1971*: 249; *1972*: 24). Again we wish to stress the importance and the profit of studying the pigmentation of the hymenophoral trama on 'washed' gills (for technique see Kits van Waveren *1971*: 249). In several species of the *Hydrophilae* this method reveals on close examination under the binocular lens against a well lit white background the pale brown colour of the minutely fimbriate edge of the gills, caused by the brown colour of cheilocystidia, characteristic of many species of this group. The method also reveals the presence of many, more or less strongly pigmented, yellow, anastomosing tissue strands, running from base to edge in the gills of most species of the group. Again we used the Munsell Soil Color Charts ed. *1971* (abbreviated to M.) and the code designating its colours for the description of the colours of the macroscopical structures of the carpophores and also the spores.

It serves no purpose to describe the colours of the spores of a very rare species in comparison to those of another equally rare species as is quite often done. Doing so presumes that the reader is acqainted with the equally rare species and this is rarely so. Unfortunately several species of section Hydrophilae are exceedingly rare, while the colour of their spores plays an important role in their identification. We have therefore tried, as in our previous papers, to assess the colours of the spores with the aid of 'Munsell'. The spores were studied in water, NH_4OH 10% and KOH 5%, using oil immersion and a rather strongly lit field of vision. M. Lange (*1952*: 79) used the same method.

Spore measurements are given both as a range and between brackets as a range of mean values. The small size of the spores being the chief characteristic of the species of section Hydrophilae, the mean value of length of the spores is very important. Fortunately in the genus Psathyrella the sizes of the spores on one gill usually vary little and often even are surprisingly equal provided only the darkest (= mature) spores are measured. Experience has taught us that measuring 20 spores lying on a gill suffices for the determination of the mean spore size of one sample. One of the chief characteristics of section *Hydrophilae* in our concept is that the length of the spores, averaged per collection, never exceeds 7.5 µm (but see *P. frustulenta* and *P. obtusata*).

From all collections studied we produced sporo-, basidio-, pleurocystidio-, cheilocystidio- and caulocystidiograms; those published in the present paper are carefully selected.

In dealing with the descriptions of the twelve taxa, the species are arranged in alphabetical order. In the lists of collections the author's name is abbreviated to E. K. v. W.

ACKNOWLEDGEMENTS

We wish to thank Prof. H. Romagnesi very much indeed for sending us from his herbarium material of *Psathyrella chondroderma*, *P. mucrocystis*, *P. pseudocasca* and *P. subpapillata*, for allowing us to publish a translation of his very detailed description of the latter species, for supplying us with so much valuable information and criticism and for taking so much interest in our work. We also wish to thank Dr. D. N. Pegler (K) for examining for us the type material of *P. chondroderma* as to possible remnants of its substratum. Our thanks are next due to Dr. R. Watling (E) for enabling us to study material of *P. laevissima* from the Royal Botanic Garden Edinburgh. Finally we are greatly indebted to Dr. C. Bas for critically reading the manuscript and to Dr. R. A. Maas Geesteranus for writing the latin descriptions.

Section HYDROPHILAE

Calling the genus *Drosophila*, Romagnesi (*1944*: 52) founded its section *Hydrophilae* — of subgenus *Hypholoma*, chiefly based on the presence of utriform pleurocystidia — defining it as follows: 'spores less than 11.5 μm long, sometimes very small, pale or dark; cystidia utriform but sometimes of an indistinct type; trama coloured from a yellow-brown membranal pigment, more or less encrusting the hyphae; caps often reddish.' He did not indicate a type species but distinguished two subsections: (i) subsection *Microsporae* (spores less than 6 μm long, very pale; veil often membranous, rarely rudimentary) with type species *D. hydrophila* (Fr. ex Bull.) Quél, and (ii) subsection *Frustulentae* (spores over 6 μm long, rarely pale; veil very scanty, fugacious, never membranous) with type species *D. frustulenta* (Fr.) Romagn. (sensu Romagnesi, which is not *Psathyrella frustulenta* (Fr.) A. H. Smith as described by us earlier *1977*: 289). No other species were mentioned as belonging to either of these two subsections. Subsection *Microsporae* does not cover the group '*Appendiculatae*', in which *P. hydropila* was placed by Kühner & Romagnesi (*1953*: 365), as the latter group includes *P. chondroderma* of which the length of the spores is given as 6–8.5 μm.

Singer (*1961*: 68), calling the genus *Psathyrella*, adopted Romagnesi's characterisation of section *Hydrophilae* (small spores, utriform cystidia, trama pigmented) and did not distinguish subsections. Earlier and later Singer (*1951*: 467; *1962*: 509 and *1975*: 502) gave a different definition of section *Hydrophilae* (in the subgenus—characterised by the pleurocystidia being utriform if present—in *1951* and *1962* called by him *Hypholoma*, in *1975 Drosophila*): spores up to 6.5 μm long and sub micr. 'not very deeply coloured', cystidia 'absent on the sides of the lamellae or more rarely present on both edges and the sides of the lamellae', hymenophoral trama coloured with membranal pigment and carpohores rather large; type species *Psathyrella hydrophila* (Bull. ex Fr.) Maire; no other species mentioned as belonging to this section. The absence of pleurocystidia in this definition is a mystery as these cells are present in all species now considered to belong to this section. With Singer (*1975*: 503) the species of section *Frustulentae* have spores 6–11.5 μm long (colour not mentioned), numerous pleurocystidia varying from utriform to ampullaceous and a very fugacious or—if initially abundant—entirely arachnoid veil; type species *P. frustulenta* (Fr.) A. H. Smith.

In Smith's (*1972*: 102) very dissentient infrageneric classification of *Psathyrella*, the species belonging to Romagnesi's section *Hydrophilae* find themselves distributed over two subgenera

and three sections. We expounded our reasons for denouncing Smith's classification in an earlier paper (*1976*: 350).

From the species described by us below and ranked with section *Hydrophilae* as emended by us, *P. fragrans*, *P. mucrocystis*, and *P. obtusata* are placed by Smith in subgenus *Psathyrella* section *Obtusatae*, *P. hydrophila* and *P. frustulenta* in subgenus *Pannucia*, the former in section *Appendiculatae* and the latter in section *Pannuciae*.

Smith states that 'the very small spores (5–7 μm long) are the central feature of this subsection *Hydrophilae* (Romagn.) A. H. Smith, as emended here', deleting therewith the pale colour of the spores, the brown colour of the cap and gills and the shape of the pleurocystidia.

In our own definition of section *Hydrophilae* the central features are not only the small size of the spores, on the average 7.5 μm long or less, but also their pale colour and the conspicuous brown colour of cap and gills. The shape of the pleurocystidia is deleted as it greatly varies from one species to another. This definition has the advantage of allowing us to bring into this section *P. obtusata*, *P. frustulenta* and *P. pseudocasca*, all of which seem to have wandered aimlessly in the classification of the genus.

PSATHYRELLA sect. HYDROPHILAE (Romagn.) Sing. ex Sing. emend. Kits van Wav.

Drosophila sect. *Hydrophilae* Romagn. *in* Bull. mens. Soc. linn. Lyon **13**: 51–54. *1944*. — *Psathyrella* sect. *Hydrophilae* (Romagn.) Sing. *in* Lilloa **22**: 467. *1951* (not val. publ.); ex Sing. *in* Sydowia **15**: 68. *1961*. Type: *Drosophila hydrophila* (Bull. ex Fr.) Quél.

Carpophores caespitose, subcaespitose or solitary, sometimes gregarious, often lignicolous. Pilei small to medium-sized, 10–40(–70) mm, usually striate, reddish brown or some other shade of brown, hygrophanous, never pink on drying; veil always present but varying from rudimentary to strongly developed. Lamellae usually crowded, narrowly (never very broadly) adnate or adnexed, brown, reddish brown or purplish brown, with white or whitish edge. Stipes up to 100 mm long (rarely longer), never rooting. Spore print some shade of brown. Spores small, their length averaging not more than 7.5 μm per collection, but almost always less, some shade of brown and sometimes distinctly pale, sometimes phaseoliform. Basidia less than 10 μm broad, 4-spored. Pleurocystidia present, thin- or at most very slightly thick-walled, with at their apex no crystals and no mucoid deposits which turn green in NH_4OH 10%. Pleurocystidioid cheilocystidia sometimes very few. Pleuro- and cheilocystidia and cells of pileipellis often pale brown in NH_4OH 10%. Hymenophoral trama strongly to moderately pigmented, chiefly from membranal pigment, sometimes also from encrustations.

The small size and brown colour of the spores in combination with the brownish colour of the lamellae and the usually striking reddish brown, warm brown or ochreous brown colour of the pileus are the essential characters of the species of section Hydrophilae. We have abstained from subdividing this section.

KEY TO THE SPECIES OF PSATHYRELLA SECTION HYDROPHILAE

1. Spores very small, average size 5.3–6.1 × 3.5–3.6 μm:
   2. Pleurocystidia mucronate (see Figs. 20, 45, 52):
      3. Gill edge whitish or concolorous . . . . . *P. laevissima*, p. 490
      3. Gill edge dark brown punctate . . . . . *P. subpapillata*, p. 503

2. Pleurocystidia not mucronate:
   4. Germ pore very distinct (1–1.5 μm); carpophores solitary, thick-set . *P. hydrophiloides*, p. 488
   4. Germ pore indistinct (callus) or very small (0.5 μm); carpophores caespitose, subcaespitose, rarely isolated, rather slender:
      5. Pleurocystidia non-capitate and mainly fusiform, ventricose or clavate, some utriform, with broad short pedicel (see Figs. 24–33); germ pore indistinct (callus) . *P. hydrophila*, p. 485
      5. Pleurocystidia broadly capitate to subcapitate and mainly narrowly to broadly ventricose, more rarely utriform or slenderly clavate, with fairly narrow and somewhat longer pedicel (see Fig. 16); germ pore very small (0.5 μm) . . . . . *P. fragrans*, p. 481
1. Spores larger, average size 6.9–7.5 × 3.9–4.6 μm:
   6. Pleurocystidia mucronate (see Figs. 20, 45, 52):
      7. Carpophores medium-sized to fairly large; caps 30–70(–90) mm . . . *P. mucrocystis*, p. 494
      7. Carpophores small; cap 12 mm . . . . . *P. umbrina*, p. 506
   6. Pleurocystidia not mucronate:
      8. Germ pore indistinct (callus) . . . . . *P. frustulenta*, p. 483
      8. Germ pore distinct:
         9. Pleurocystidioid cheilocystidia very to moderately numerous; veil abundant:
            10. Carpophores subcaespitose or solitary; many pleurocystidia with short to fairly long cylindrical to subcylindrical, often subcapitate apical elongation; spores phaseoliform *P. chondroderma*, p. 477
            10. Carpophores solitary; pleurocystidia without apical elongation; spores not phaseoliform:
               11. Pleurocystidia in their upper part covered with mucoid substance, staining dark red in neutral red . . . . . *P. pseudocasca*, p. 500
               11. Pleurocystidia not as above . . . . . *P. rannochii*, p. 501
         9. Pleurocystidioid cheilocystidia very scarce, spheropedunculate cells abundant; veil scanty: veil scanty:
            11. Pleurocystidia fusiform. . . . . *P. obtusata*, p. 499
            11. Pleurocystidia utriform. . . . . *P. obtusata* var. *utriformis*, p. 499

PSATHYRELLA CHONDRODERMA (Berk. & Br.) A. H. Smith—Figs. 1–6.

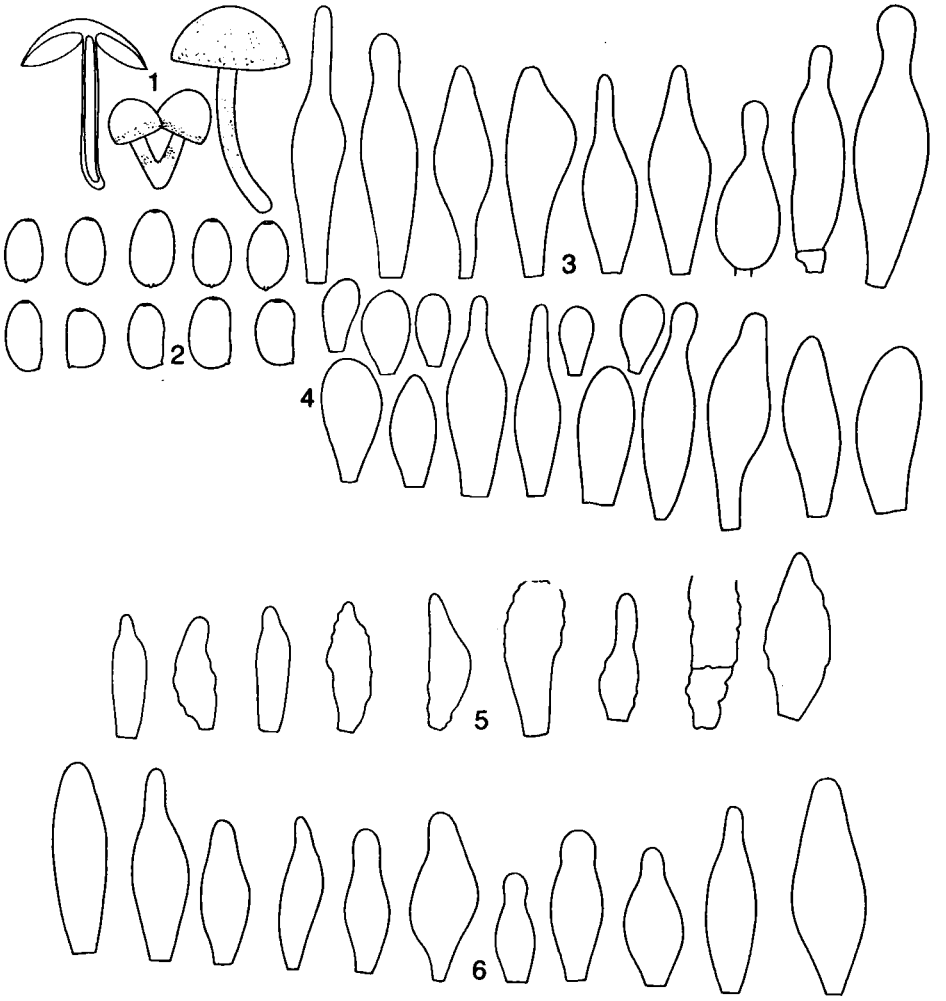
Agaricus chondrodermus Berk. & Br. *in* Ann. Mag. nat. Hist. IV, **7**: 132. *1876*. — *Psilocybe chondroderma* (Berk. & Br.) Sacc. *in* Syll. Fung. **5**: 1048. *1887*. — *Hypholoma chondroderma* (Berk. & Br.) P. Karst. *in* Bidr. Känn. Finl. Nat. Folk **48**: 241. *1889*. — *Psathyrella chondroderma* (Berk. & Br.) A. H. Smith *in* Contr. Univ. Mich. Herb. **5**: 43. *1941*. — *Drosophila chondroderma* (Berk. & Br.) Kühn. & Romagn., Fl. anal: 365. *1953*.

Hypoloma sublentum P. Karst. *in* Bidr. Känn. Finl. Nat. Folk **32**: 233. *1882*.

MISAPPLIED NAMES.—*Hypholoma pertinax* (Fr.) Ricken ss. Ricken, Blätterp.: 461. *1915* (non *Agaricus pertinax* Fr. *in* Vet. Ak. Förh. **18**: 50. *1851*). — *Agaricus instratus* Britz. ss. Cooke *in* Grevillea **18**: 53. *1887*. — *Hypholoma instratum* (Britz.) Mass. ss. Mass., Brit. Fung. Fl. **1**: 384. *1892*. (non *Agaricus instratus* Britz. *in* Ber. naturh. Ver. Augsburg **27**: 67. *1883*).

SELECTED DESCRIPTIONS & ILLUSTRATIONS.—Cooke, Ill. Brit. fungi **4**: pl. 599/606 A. *1884–1886* (as *Agaricus chondrodermus*), ditto **8** suppl. pl. 1181/1157. *1889–1891* (as *A. instratus*). — Ricken, Blätterp.: 461. *1915* (as *Hypholoma pertinax*). — J. E. Lange *in* Dansk bot. Ark. **4** (4): 43. *1923* (as *H. instratum*); Fl. agar. dan. **4**: 78, pl. 147 C. *1939* (as *H. chondrodermum*). — A. H. Smith *in* Contr. Univ. Mich. Herb. **5**: 43, pl. 17. *1941*. — Kühner & Romagnesi, Fl. anal. 365. *1953* (as *Drosophila chondroderma*). — Favre *in* Schweiz. Z. Pilzk. **35**: 121. *1957*.

CHIEF CHARACTERISTICS.—Carpophores medium-sized, subcaespitose or solitary; pileus up to 30–50 mm, paraboloid, rugulose, warm ochreous brown, at centre red-brown, hygrophanous, not or little striate; veil rather strongly developed; lamellae crowded, reddish brown with whitish edge; stipe up to 45 × 5 mm, whitish above and buff below; spores 6.3–8.1 × 3.6–4.5(–5) μm (mean values 7.2–7.4 × 3.9–4.4 μm) phaseoliform, brown, with fairly distinct germ pore;



Figs. 1-6. *Psathyrella chondroderma* — 1-4. 6 Nov. 1979. — 1. Habit sketch (× 0.5). — 2. Sporogram (× 1210). — 3. Pleurocystidiogram (× 575). — 4. Cheilocystidiogram (× 575). — 5. Type, pleurocystidiogram (× 575). — 6. *Romagnesi 1093* pleurocystidiogram (× 575).

pleurocystidia 40-62 × 12.5-17.5 μm, numerous, fusiform-ellipsoid, usually with short to fairly long, narrower (sub-)cylindrical apical elongation; pleurocystidioid cheilocystidia and sphero-pedunculate to clavate cheilocystidia numerous; hymenophoral trama strongly pigmented.

MACROSCOPICAL CHARACTERS (Renkum collection, description C. Bas).—Pileus up to 30 mm (according to Favre (*1957*: 121) up to 50 mm.), at first broadly paraboloid, later conico-convex, not fragile, warm red-brown at centre (slightly more reddish than M. 5 YR 3/4) to warm ochreous brown in marginal region (M. 5 YR 4/4, tending to 7.5 YR 4/4-5/6), probably not translucent, not or little striate when moist, glabrous, locally radially wrinkled at maturity.

Veil in young specimens on pileus white, locally rather thick, felted-subarachnoid, at maturity buff (M. 10 YR 7/4), forming patches in 3 mm broad marginal zone, on stipe a very vague subannular fibrillose zone at about 1/4 from apex with lower down sublanose-subsquamulose pale to distinctly brown remnants, later merely brown-fibrillose.

Lamellae fairly crowded (± 15 per 10 mm midway margin and centre of pileus), narrowly adnate to narrowly adnate-adnexed, up to 4 mm broad, slightly ventricose, moderately dark clayey brown (M. 7.5 YR 4/4) to slightly more reddish (M. 5 YR 4/4-3/4), with whitish, minutely flocculose edge particularly when young; l = 3-7.

Stipe up to 45 × 5 mm, slightly thickening towards base, sometimes almost subclavate, sometimes connate at base, not rooting, hollow (narrow cavity of ± 1.5 mm), from pale whitish at apex to pale buff at base (presence or absence of pruinosity of apex not recorded).

Context of pileus glossy brown, drying pale buff; smell weak, when crushed rather strong, herbaceous-subspermatic; taste indistinctive.

Trama of 'washed' lamella strong yellow-brown (strongest in basal 1/3) from many anastomosing brownish yellow (M 10 YR 5/6) strands running from base to edge through the in itself fairly pale brown (M 10 YR 6/3-6/4) tissue; edge minutely fimbriate and pale brown.

Spore print not recorded.

MICROSCOPICAL CHARACTERS (author's examination).—Spores 6.3-8.1 × 3.6-4.5(-5) μm (mean values 7.2-7.4 × 3.8-4.4 μm; 3 collections), in profile usually phaseoliform, sometimes subellipsoid, in face view ellipsoid, in water, NH_4OH 10% and KOH 5% brown (M. 7.5 YR 5/6) with a trace of red, with fairly distinct germ pore and distinct hilar appendix, not opaque.

Basidia 16-22.4 × 6.4-7.2 μm, subclavate, 4-spored.

Pleurocystidia 40-57.5(-62.5) × 12.5-17.5 μm, abundant, fusifrom-ellipsoid with a broad and fairly short pedicel, very slightly thick-walled, in NH_4OH 10% very pale brown, usually with narrower cylindrical to subcylindrical, often subcapitate thin-walled, colourless, sometimes rather long (7.5-20 × 4-5 μm) apical elongation more or less sharply delimited from the cellbody.

Marginal cells: Pleurocystidioid cheilocystidia 30-55 × (9-)10-15(-17.5) μm, numerous, locally sometimes even densely packed, versiform as to both size and shape; spheropedunculate and clavate cells, 17.5-30 × 7.5-12.5 (-15) μm, numerous, some of the larger cells often slightly thick-walled and pale brown in NH_4OH 10%.

Caulocystidia none seen; white fibrillosity on apex of stem consisting of dense wicker-work of thin (3-4 μm) colourless hyphae.

Pigmentation of hymenophoral trama in NH_4OH 10% sub micr.: hyphae distinctly brown from membranal pigment with many yellow hyphal septa and very few encrustations on narrow hyphae.

Pileipellis a cellular, 2-4 cells deep layer of subglobose, rather thick-walled cells, 15-40 μm, very distinctly brown from membranal pigment.

Clamps present on pleurocystidioid cheilocystidia and numerous on hyphae of fibrillosity on apex of stipe.

HABITAT.—Caespitose, in small fascicles, or solitary on coniferous stumps. Very rare.

COLLECTIONS EXAMINED.—NETHERLANDS, prov. Gelderland, Renkum, Oranje Nassau's oord, 6 Nov. 1979, Mr. and Mrs. *Tjallingii* (L). — BRITISH ISLES, Scotland, Glamis, date not recorded, *J. Stevenson* (type, K). — SWITZERLAND, Alps, precise locality not recorded, 31 Aug. 1970, *R. Kühner* (herb. Romagnesi Nr. 1093).

The above description is based on the Renkum collection. The species is exceedingly rare. It was described from the area Glamis in Scotland by Berkeley & Broome (*1876*: 132) and according to Stevenson (*1886*: 326) it was found in Glamis at different places in 1875 and 1877. Reid & Austwick (*1963*: 294) reported it also from Glamis. Ricken (as *Hypholoma pertinax*,

1915: 461) and Kühner & Romagnesi (*1953*: 365) called it rare, Lange (*1939*: 78) rather rare. From Romagnesi (in litt.) we learned that the specimens on which the description in the 'Flore analytique' is based and of which he only saw exsiccata, came from Kühner, who in 1970 sent him another collection, from which Romagnesi very kindly sent us a part. Favre (*1957*: 121) recorded four collections from Switzerland. Through Pegler and Watling we learned that there is no recent material of this species in the herbaria of the Royal Botanic Gardens of Kew and Edinburgh.

Fries' descriptions of *Agaricus pertinax* (*1851*: 50; *1857*: 429; *1874*: 297) agree with *P. chondroderma* except for the fact that *A. pertinax* has no veil and was accordingly ranked by Fries in the subgenus *Psilocybe* ('velum nullum'). Fries's plate 135[2] (*1877–1884*) shows large robust specimens of which the cap is conico-convex to almost plane, rugulose and devoid of any traces of a veil. The colours of cap, gills and stem, however, fully agree with those of *P. chondroderma*. As no veilless species is known resembling *A. pertinax*, Dennis, Orton & Hora (*1960*: 206) correctly regarded the name as a nomen dubium. *Hypholoma pertinax* ss. Ricken — rightly regarded by Kühner & Romagnesi (*1953*: 365) as identical with *P. chondroderma* but erroneously quoted by them as *Psilocybe pertinax* ss. Ricken — was decribed as having a strongly developed veil.

Britzelmayer's (*1883*: 67) description and plate 310 fig. 110 of *Agaricus (Hypholoma) instratus* Britz., correspond rather well with *P. bipellis* (although no veil is mentioned or depicted) and—because of the purple colour of cap and gills—not with *P. chondroderma*. *Agaricus (Hypholoma) instratus*, described (*1887*: 53, and depicted by Cooke plate 1181/1157), however, fully agrees with *P. chondroderma*, also in the opinion of J. Lange (*1923*: 43). Massee (*1892*: 384) extended Cooke's description a little and called the species *Hypoloma instratum* (Britz.) Mass.

Of *Hypholoma sublentum* P. Karst. that author himself later (*1889*: 241) stated that this species was the same as H. *chondroderma*.

On examination of the type material of *P. chondroderma* its spores turned out to be fully identical with those of our Renkum collection and the exsiccatum received from Romagnesi and, contrary to Orton's mention (*1960*: 374), pleurocystidia were distinctly present (Fig. 5) and sufficiently matched those of the same two collections and not those of *P. mucrocystis*.

A. H. Smith (*1941*: 241) gave a good description of what he then called *Psathyrella chondroderma*, agreeing with the current descriptions and—apart from the habitat—the one given above. In it he stated that the stem soon became avellaneous near the base, that the veil was whitish to pale cinnamon buff, that on the stem the fibrils of the veil also became discolored, that the spores measured 7–8 × 4–5 μm 'a little larger than those of European authors', and that the habitat was old logs of alder and cottonwood. He considered these differences with the European descriptions of *P. chondroderma* not great enough to be significant.

But recently (*1972*: 128) Smith considered his previous identification to having been an error, arguing that the American species, which he named *P. velibrunnescens*, is 'constant as to habitat' (rotting woord of frondose trees), characteristically vernal, quite accurately identified in the field by the discolorations on the veil hyphae either on the stipe or the margin of the pileus and its spores consistently 7–9 × 4–5 μm. He further pointed out that originally *P. chondroderma* was described as being associated with pines and terrestrial and that on Cooke's plate the veil is white. The (terrestrial) habitat, he believed was evident on Cooke's plate and on the type at Kew. But underneath this plate is clearly printed 'on pinewood', and Dr. N. Pegler very kindly checked for us the type at Kew and could not find proof that the specimens had been non-lignicolous.

Cooke's plate depicts rather young specimens and according to Smith the brown discoloration of the veil only appears at maturity. In later years *P. chondroderma* in Europe was always described as lignicolous on pinewood.

The brown discoloration of the veil in *P.* velibrunnescens, however, is by no means restricted to or specific for *P. velibrunnescens.* It is depicted on Lange's plate 147 C of *P. chondroderma* (in the description the veil is not called white but whitish), it was present in the Renkun find of that species and finally it was quite distinct in our Netherlands' collection of *P. mucrocystis* (the phenomenon probably escaped our attention when we described the Scottish collection of that species). It is in line with the brown discoloration of pleuro and cheilocystidia and the cells of the pileipellis in several closely related species (*P. mucrocystis, P. laevissima, P. subpapillata, P. hydrophila, P. fragrans*). It seems then that the vernal appearance, the habitat (frondose trees) and the spore size (7–9 × 4–5 μm — in 1941 still 7–8 × 4–5 μm — is very close to our figures, 6.3–8.1 × 4.1–4.5(–5) μm are the only differences between Smith's *P. velibrunnescens* and *P. chondroderma* and not brown discoloration of the veil from which Smith's species derives its name. Smith saw no less than 49 collections of his *P. velibrunnescens* and none of *P. chondroderma.* From all this it appears rather doubtful that *P. velibrunnescens* is specifically different from *P. chondroderma.*

PSATHYRELLA FRAGRANS A. H. Smith—Figs. 13–18

Psathyrella fragrans A. H. Smith *in* Mem. N. Y. bot. Gdn **24**: 372. 1972.

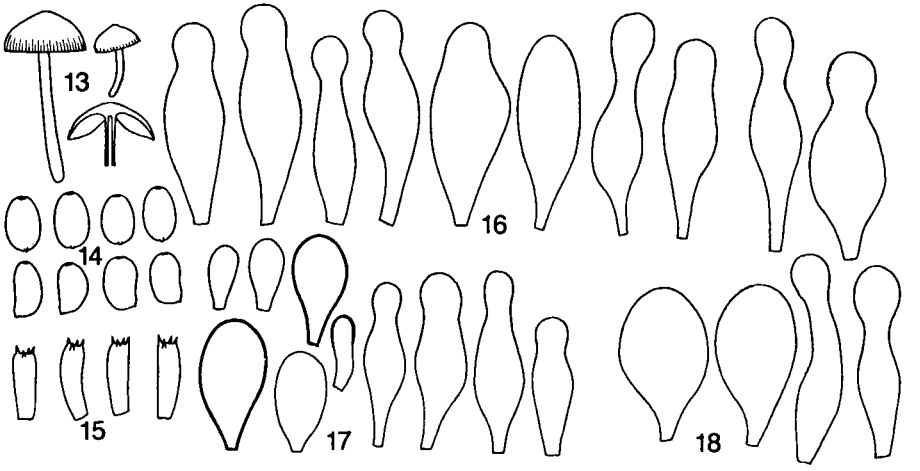
CHIEF CHARACTERISTICS.—Carpophores medium-sized and rather delicate as compared with P. hydrophila, subcaespitose on coniferous wood; pileus 22–45 mm, paraboloid, later convex, striate, reddish brown to brown, hygrophanous; veil rudimentary; lamellae fairly crowded, brown to reddish brown, with white edge; stipe 30–45 × 2.5–4 mm; hymenophoral trama strongly pigmented; with distinct sweet smell; spores 5.4–6.3 × (3.2–)3.6 (mean values 6 × 3.6) μm, phaseoliform, brown, with very small germ pore (0.5 μm); pleurocystidia 40–52 × 10–17.5 μm, abundant; capitate with rather narrow stalk; pleurocystidioid, spheropedunculate, and clavate cheilocystidia numerous.

MACROSCOPICAL CHARACTERS.—Pileus in early stages (10–15 mm) conico-paraboloid with deflexed marginal region, substriate at margin over 1 mm, very dark purple reddish brown (M. 5 YR 3/2) near edge dark reddish brown (M. 5 YR 3/3), at edge brown (M. 7.5 YR 4/4), with smooth surface, later (pileus 15–25 mm) paraboloid, striate over 3–4 mm, rugulose, very dark reddish brown with brown (M. 7.5 YR 4/4) 3 mm broad marginal zone; finally (pileus 30–45 mm) convex to almost plane and only marginal zone slightly deflexed, striate up to half-way centre, entirely or only at centre rugose, at centre still dark reddish brown (M. 5 YR 3/4), outside centre brown (M. 7.5 YR 4/4), hygrophanous, drying out to yellowish brown (M. 10 YR 6/4–5/4) with a trace of ochre, without pink, not micaceous, rather strongly rugose.

Veil scanty, in earliest stages only very delicate radial white fibrils on surface of pileus, on a ± 2 mm broad zone along margin sometimes forming small tufts, not appendiculate, in later stages few fugacious fibrils present on cap near margin, none in final stages.

Lamellae 3–5 mm broad, fairly crowded, slightly ventricose, fairly narrowly adnexed, in early stages pale brown, soon ochre brown (M. 7.5 YR 4/4) or yellowish brown (M. 10 YR 5/6) but more ochraceous, finally dark reddish brown (M. 5 YR 3/4); surface slightly veined; with somewhat paler or whitish edge.

Stipe 30–45 × 2.5–4 mm, relatively short, cylindrical, not rooting, hollow, white or sordid



Figs. 13–18. *Psathyrella fragrans*, 17 Oct. 1963. — 13. Habit sketch (× 0.5). — 14. Sporogram (× 1210) — 15. Basidiogram (× 575). — 16. Pleurocystidiogram (× 575). — 17. Cheilocystidiogram (× 575). — 18 Caulocystidiogram (× 575).

white from a very thin, silvery white, superficial, longitudinally fibrillose layer; pale brown above and darker towards brown base underneath this layer; with pruinose apex.

Context of pileus in centre 2–4 mm thick, dark purplish-reddish brown (M. 5 YR 3/2, 3/3), in stipe distinctly brown. Smell distinct and sweet.

Trama of 'washed' lamellae distinctly yellow-brown from many more or less parallel, wavy, anastomosing, yellowish brown (M. 10 YR 5/4) tissue strands running from base to edge through in itself pale brown (M. 10 YR 6/3) tissue.

Spore print not recorded, but very likely some shade of brown.

MICROSCOPICAL CHARACTERS.—Spores 5.4–6.3 × (3.2–)3.6 (mean values 6 × 3.6 μm; 1 collection), in profile phaseoliform, in face view ellipsoid to ovoid, in water, NH_4OH 10% and KOH 5% brown (M. 7.5 YR 5/4) with trace of reddish, with very small germ pore (0.5 μm) and small hilar appendix, opaque to subopaque.

Basidia 17.6–20.8(–24) × 5–6 μm, subcylindrical, 4-spored.

Pleurocystidia 40–52 × 10–17.5 μm, abundant, mainly narrowly to broadly ventricose and broadly capitate to subcapitate, only few utriform or clavate; walls very slightly thickened; contents pale greyish with a distinct trace of brown or only just very pale brown in NH_4OH 10%; no mucus or crystals.

Marginal cells: pleurocystidioid cheilocystidia 30–40 × 10–15 μm, numerous and rather densely packed; spheropedunculate and clavate cells, 15–20 × 5–11 μm, also numerous; a few larger ones, 20–30 × 12.5–15 μm; walls often slightly thickened and such cells pale brown; no mucus or crystals.

Caulocystidia: many spheropedunculate cells, 27.5–35 × 15–22.5 μm, some smaller, usually in clusters; few pleurocystidioid caulocystidia, 40–50 × 7.5–14 μm.

Pigmentation of hymenophoral trama in NH_4OH 10% sub micr.: narrow hyphae strongly and broad hyphae faintly pigmented from membranal pigment; many yellow hyphal septa: no encrustations.

Pileipellis a 2–3 cells deep layer of fairly thick-walled, subglobose cells, 25–50 μm., very pale brown in NH_4OH 10%.

Clamps on hyphae of stipe.

HABITAT.—Subcaespitose on coniferous tree stump. Very rare.

COLLECTION EXAMINED.—NETHERLANDS: prov. Overyssel, Denekamp, estate 'Singraven', area 'Beugelskamp', 17 Oct. 1963, *E. K. v. W.* (L).

We fully agree with Smith (1972: 372) that *P. fragrans* 'has the appearance of *P. hydrophila* but grows on a conifer substrate has a fragrant odor and differently shaped spores among other features'. Of the latter he could have added from his own description the 'nine-pin-shaped pleurocystidia with the apex capitate', furthermore the scantiness of the veil (its presence or absence on the cap is not mentioned by Smith) and the darker and distincly phaseoliform spores, which have a distinct, be it small germ pore. *Psathyrella fragrans* and *P. hydrophila* obviously are closely related. On account of its small and comparatively pale spores, the brown colour of its cap and gills and the capitate to utriform pleurocystidia, *P. fragrans* is to be regarded as a typical member of section *Hydrophilae*. Nevertheless with Smith the species finds itself in subgenus *Psathyrella* ('veil thin to rudimentary') whereas *P.* hydrophila finds itself in subgenus *Pannucia* ('veil more or less well developed'). This may go to show the impractibility of trying to use the velar development (very capricious in *Psathyrella*, even within one and the same species) as discriminating character at subgeneric level instead of at a much lower level.

PSATHYRELLA FRUSTULENTA (Fr.) A. H. Smith—Figs. 7-12.

Recently (Kits van Waveren, *1977*: 289) having given a full description of and observations on *P. frustulenta*, in this paper only an abbreviated description of this species is given and a new synonym and two corrections to the 1977 description.

(1) Abbreviated description:

Carpophores small to medium-sized, terrestrial against wood, solitary.

Pileus 10-30 mm, paraboloid, later convex without or with vague to fairly distinct umbo, dark reddish brown (M. 5 YR 3/2) with marginal area reddish brown (M. 5 YR 4/3, 4/4, 5/4), hygrophanous, drying out to pale brown without pink (M. 10 YR 7/4, 6/3, 6/4) and then rugulose.

Veil strongly developed, in early stages forming a dense coating of fibrils and even adpressed flocci on pileus, in places appendiculate; stipe covered with a thick velar coating; at maturity forming distinct velar fibrils and networks up to 3-5 mm from margin of pileus and fibrils and flocci on stipe.

Lamellae 3-5(-7) mm broad, at maturity strikingly brown (M. 5 YR 4/4; 7.5 YR 5/4), with white edge.

Stipe 15-50 × 2-3.5(-5) mm, white, cylindrical.

Context of cap dark reddish brown (± M. 7.5 YR 4/2) later dark brown (M. 10 YR 3/3).

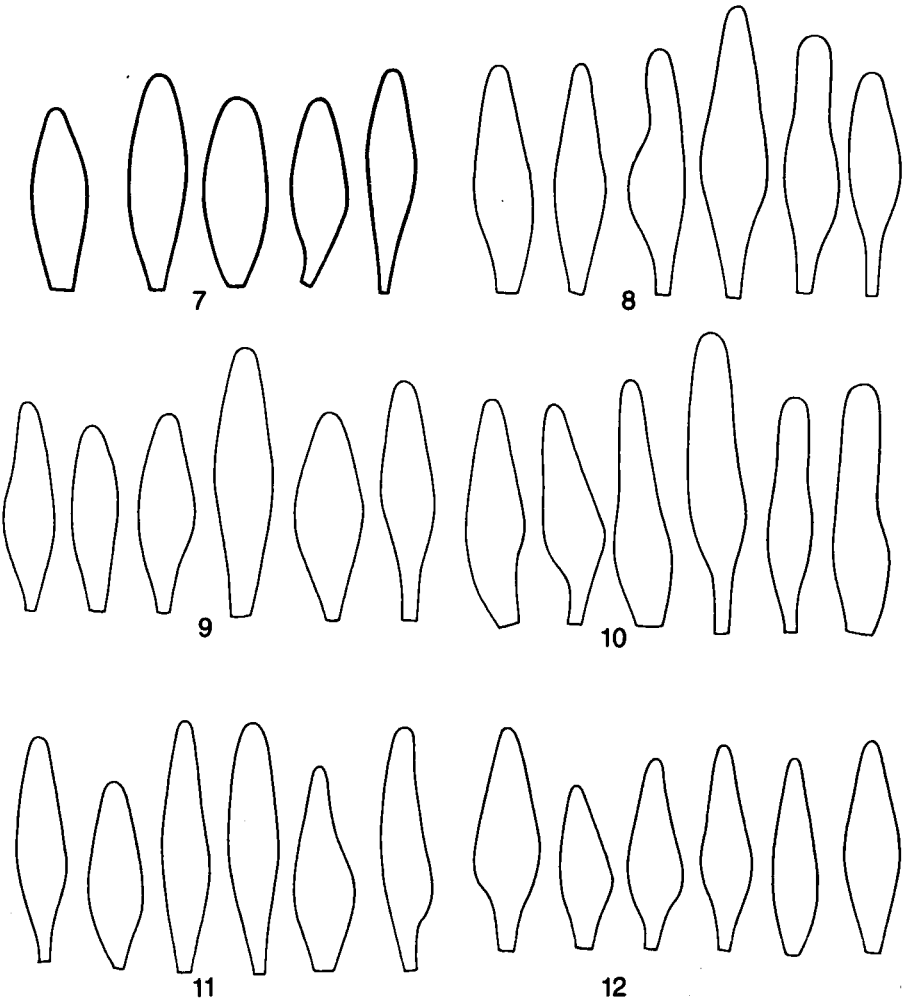
Trama of 'washed' lamellae conspicuously pigmented (yellowish brown).

Spore print pale reddish brown.

Spores 6.3-8.1 × 3.6-4.5 μm (mean values 6.9-7.6 × 3.9-4.5 μm: 11 collections [1]), in profile distinctly phaseoliform, in water and NH_4OH 10% pale brownish yellow with a reddish hue (M. 7.5 YR 6/6), with indistinct germ pore (callus).

Pleurocystidia 40-70 × 10-16 μm, very numerous, fusiform to subfusiform with distinct pedicel and subacute to obtuse apex, very pale brown in NH_4OH 10%.

[1] In only two out of our 11 collections the average length of the spores was 7.6 and in one collection it was 7.5, while in all the others (8) the average length varied between 6.9 and 7.3.



Figs. 7-12. *Psathyrella frustulenta*, Pleurocystidiograms (× 575). — 7. 11 Oct. 1976. — 8. 13 Oct. 1976. — 9. 16 Oct. 1976. — 10. 27 March 1977. — 11. 31 Aug. 1977. — 12. 9 Oct. 1978.

Pleurocystidioid cheilocystidia (15-)22-47(-55) × 7.5-17.5 μm, numerous, intermixed with large or locally smaller numbers of spheropedunculate and clavate cells, 12.5-30 × 7.5-17.5 μm. Pileipellis a 2-3 cells deep layer of globose to subglobose cells, 24-48 μm in diam., very pale brown, practically colourless, in NH_4OH 10%.

(2) As a result of our examination of the type specimen of *P. cortinarioides* P. D. Orton, we found this species in every way to be identical with *P. frustulenta*. Although not mentioned in the original description of *P.* cortinarioides, it turned out to have the same four characteristic features as *P. frustulenta*: pale spores (average sizes 7.5 × 4.4 μm), absence of germ pore,

abundance of pleurocystidia, and conspicuously pigmented hymenophoral trama. Consequently *P. cortinarioides* is a younger synonym of *P. frustulenta.*

(3) Corrections of errors in our earlier (*1977:* 289) description of *P. frustulenta*:

(i) In the heading 'chief characteristics' the spores were said to have a 'distinct germ pore (callus)'. This should read 'indistinct, practically absent germ pore (callus)' as was correctly written in the full description on page 291.

(ii) On page 295, fourth line from above, it was erroneously stated that our own measurements of the spores of *P. frustulenta* were 6.8-7.2 × 4.1-4.5 μm. In accordance with the corresponding figures mentioned in the full description these figures should read 6.3-8.1 × 3.6-4.5 μm.

Since our previous paper was published we were able to examine another seven collections of this apparently not uncommon species, making a total of 11 collections of *P. frustulenta.*

PSATHYRELLA HYDROPHILA (Bull. ex Fr.) Maire—Figs. 24-35

Agaricus hydrophilus Bull., Herb. France: pl. 511. *1791*; Hist. champ. France: 440. *1809.* — *Agaricus stipatus* var. ß *hydrophilus* (Bull.) ex Fr., Syst. myc. **1**: 296. *1821.* — *Agaricus hydrophilus* (Bull. ex Fr.) Mérat, Nouv. fl. env. Paris., Ed. 2, **1**: 83. *1821.* — *Hypholoma hydrophilum* (Bull. ex Fr.) Quél. *in* Mém. Soc. Emul. Montbél. (Champ. Jura Vosges) II **5**: 146. *1872.* — *Bolbitus hydrophilus* (Bull. ex Fr.) Fr., Hym. Eur.: 333. *1874.* — *Drosophila hydrophila* (Bull. ex Fr.) Quél , Enchir. Fung. 116. *1886.* — *Psathyra hydrophila* (Bull. ex Fr.) Bertrand *in* Bull. Soc. myc. Fr. **17**: 279. *1901.* — *Psathyrella hydrophila* (Bull. ex Fr.) Maire apud Maire & Werner *in* Mém. Soc. Sc. nat. Maroc. **45**: 113. *1937.*

Hypholoma californicum Earle *in* Bull. N.Y. bot. Gdn **2**: 344. *1902.* — *Drosophila californica* (Earle) Murrill *in* Mycologia **4**: 304. *1912.*

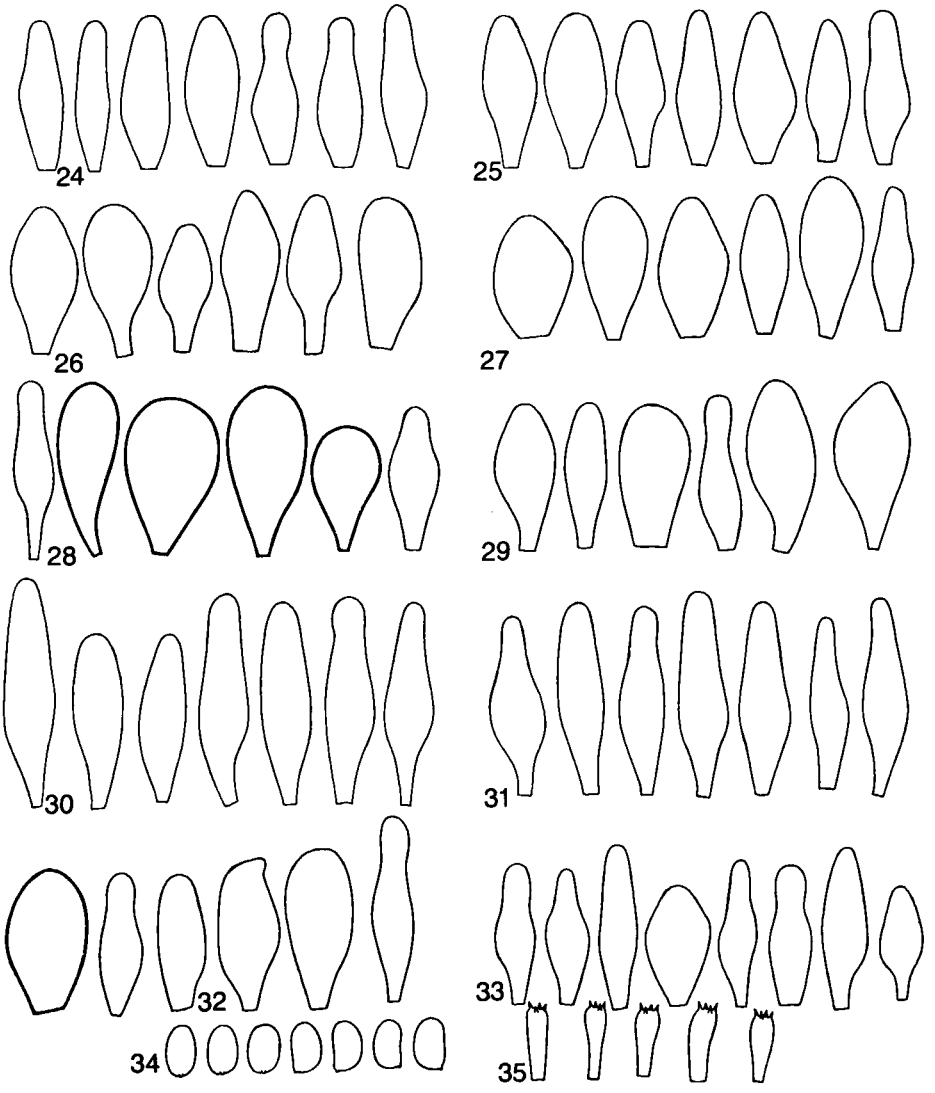
Agaricus piluliformis Bull. Herb. France: pl. 112. *1783.* — *Agaricus piluliformis* Bull. ex Mérat, Nouv. fl. env. Paris, Ed. 2, **1**: 84. *1821.* — *Hypholoma pilulaeforme* (Bull. ex Mérat) Gillet, Hymenomyc. France 571. *1878.* — *Drosophila pilulaeformis* (Bull. ex Mérat) Quél., Enchir. Fung. 116. *1886.*

MISSAPLIED NAME.—*Drosophila appendiculata* (Fr.) ss. Kühn. & Romagn., Fl. anal.: 365, 1953.

SELECTED DESCRIPTIONS & ILLUSTRATIONS.—Bulliard, Herb. France: pl. 511. *1790* and Hist. Champ. France: 440. *1809.* — M. C. Cooke, Ill. Brit. fungi 4: pl. 589/605 and pl. 606/610 (as Agaricus spadicea, no veil depicted). *1884-1886.* — Ricken, Blätterp.: 247, pl. 64 fig. 6. *1912.* — Konrad & Maublanc, Icon. select. Fung. **1** (fasc. II): pl. 42. *1926.* — Bresadola, Icon. mycol. **18**: pl. 854. *1931.* — J. E. Lange, Fl. agar. dan. **4**: pl. 146 A. *1939.* — Kühn. & Romagnesi, Fl. anal.: 365. *1953* (as *Drosophila appendiculata*) — Romagnesi, Nouv. Atl. Champ. **1**: pl. 51 B. *1956* (as *Drosophila hydrophila*). — A. H. Smith *in* Mem. N. Y. bot. Gdn **24**: 114. *1972.*

CHIEF CHARACTERISTICS.—Carpophores medium-sized, caespitose, lignicolous; pileus 15-50(-60) mm, from globose to paraboloid or convex, finally sometimes with revolute margin, substriate or not, at first dark reddish brown, later bright to dark orange-brown, yellow-brown or incarnate brown, hygrophanous, drying out to pale yellowish brown without pink; veil membranous, strongly developed, appendiculate, whitish to buff; lamellae brown to reddish brown with whitish edge; stipe 30-100(-150) × 2-9 mm, white, lower down brownish; spore print dark purplish brown; spores 5-6.3 × 3.2-3.6 (mean values 5.3-6.1 × 3.4-3.6) μm, slightly phaseoliform, pale yellowish brown, with inconspicuous germ pore (callus); pleurocystidia 30-52.5 × 8-17.5 μm, numerous, versiform-utriform; pleurocystidioid cheilocystidia and spheropedunculate cells numerous; hymenophoral trama strongly pigmented.

MACROSCOPICAL CHARACTERS.—Pileus in early stages 5-12 mm, globose to paraboloid, later 15-50(-60) mm, spreading to paraboloid, campanulate, finally usually convex, sometimes with



Figs. 24–35. *Psathyrella hydrophila* — 24–33. Pleurocystidiogram (× 575). — 24. 6 Oct. 1979. — 25. 8 Oct. 1979. — 26. 20 Oct. 1963. — 27. 12 Oct. 1968. — 28. 22 Apr. 1977. — 29. 11 Oct. 1965. — 30. 22 Oct. 1979. — 31. 29 Sept. 1979. — 32. 22 Oct. 1960. — 33. 2 Oct. 1979. — 34. Sporogram (× 1210). — 35. Basidiogram (× 575).

waxy, revolute margin, sometimes obtusely umbonate, normally not striate, rarely substriate at margin over 3–7 mm, in early stages dark reddish brown (M. 5 YR 3/3, 3/4, even 2.5 YR 3/4) all over, later dark (M. 5 YR 4/3, 4/4) or paler (M. 5 YR 5/4) incarnate brown, either all over or—if only at centre—then outside centre and usually all over bright orange-brown, ochre brown or yellowish brown (M. 5 YR 4/6, 5/6, 5/8; 7.5 YR 4/4, 5/4), near margin often yellowish (M. 10 YR

7/3, 7/4, 6/4), hygrophanous, young stages drying out from centre to warm ochre brown, at maturity to paler brown or yellowish brown (M. 7.5 YR 5/4, 5/6, 6/6) at centre, paler still towards margin (M. 10 YR 8/6, 7/6 or slightly more brown), without pink, not micaceous; surface often rugulose at and near centre when moist, more so when dry.

Veil in early stages white, covering stipe, forming a firm membrane connecting stipe with margin of pileus and sending up towards apex of pileus a dense coating of fibrils and tufts of fibrils in a marginal zone of 3–7 mm; in later stages sordid white to buff (but usually purplish from spore-deposits), leaving small to large membranous appendiculate patches or an appendiculate membrane along entire margin and on surface of pileus along margin a coating of radially arranged fibrils sometimes reaching up to one third of the radius of the pileus.

Lamellae 3–6 mm broad, crowded, moderately ventricose, narrowly adnate to adnexed, in earliest stages whitish, very soon pale brown (M. 10 YR 7/4, 7/3, 6/3; 7.5 YR 6/4), finally brown (M. 7.5 YR 5/4, 4/4), sordid reddish brown, chocolate brown, or incarnate brown (M. 5 YR 4/3, 4/4; 2.5 YR 4/4, 3/6), with white fimbriate edge.

Stipe at maturity generally tall and firm, 30–100(–150) × 2–9 mm, straight or flexuous, often somewhat attenuated upwards, minutely longitudinally fibrillose, hollow, at apex delicately sulcate, subpruinose, shiny and polished, white but in lower part isabelline to pale brown, at base connate and sometimes strongly set with whitish hairs.

Context of pileus 2–4 mm thick in centre, reddish brown (M. 5 YR 4/3) but very soon just brown (M. 10 YR 5/4, 4/4, 4/3, 3/3), of stipe in outer layer whitish, alongside cavity and near base pale brown. Taste and smell indistinctive.

Trama of 'washed' lamellae in young specimens fairly pale brown but at maturity dark yellowish brown from many, in early stages paler brown (M. 7.5 YR 6/4, 5 YR 6/4), but in later stages conspicuously brownish yellow (M. 10 YR 6/4, 6/6, 5/6), more or less parallel anastomosing strands running from base to edge through in itself pale brown (M. 10 YR 6/3, 7/2, 7/3; 7.5 YR 6/2; 5 YR 6/2) tissue, darkest near base; extreme edge at maturity minutely fimbriate and pale brown.

Spore print dark purplish brown to dark reddish brown.

MICROSCOPICAL CHARACTERS.—Spores 5–6.3 × 3.2–3.6 μm (mean values 5.3–6.1 × 3.4–3.6 μm; 10 collections), in profile often slightly phaseoliform, in face view ellipsoid to slightly ovate, in water and NH_4OH 10% pale yellowish brown (M. 10 YR 6/4; 7.5 YR 6/4; 5 YR 6/4), in KOH 5% darkening to sordid yellowish brown (M. 10 YR 5/4), not opaque, with inconspicuous germ pore (callus) and minute hilar appendix.

Basidia 14.4–20.8 × (5–)5.6–7.5(–8) μm, clavate or subcylindrical, 4-spored.

Pleurocystidia 30–52.5 × 8–17.5 μm, moderately numerous to abundant, versiform often even on one lamella (see Figs. 24–33), usually fusiform, ventricose or clavate, sometimes utriform always non-capitate, with (very) obtuse apex and short broad pedicel, very slightly thick-walled, rarely with walls somewhat thicker and then refringent, almost always and sometimes distinctly, brown in NH_4OH 10%, without mucus or crystals.

Marginal cells: pleurocystidioid cheilocystidia 20–45 × 7.5–15 μm, numerous, locally often either densely packed or more or less dispersed as the numerous spheropedunculate and clavate cells, 7.5–35 × 5–12.5(–15) μm; many cells of both kinds slightly thick-walled and pale brown in NH_4OH 10% some or quite a few of the latter cells with a somewhat thicker and refractive brown wall.

Caulocystidia (apex of stem): pleurocystidioid caulocystidia 30–60 × 10–15(–17.5) μm, versiform, rather few in number, isolated or in small clusters and then mixed with usually fairly numerous spheropedunculate cells, 10–40(–50) × 7.5–25 μm, either isolated or in clusters and either sessile on hyphae or (more often) equipped with a distinct pedicel, many slightly thick-walled.

Pigmentation of hymenophoral trama in NH_4OH 10% sub micr.: narrow hyphae of ± 15–20 μm broad subhymenial zone at edge very brown, broad hyphae of mediostratum pale brown, both from membranal pigment; yellow hyphal septa present; no encrustations.

Pileipellis a 2-4 cells deep layer of subglobose, fairly thick-walled cells, 25-50(-55) μm, practically colourless but some very pale brown in NH_4OH 10%.
Clamps fairly numerous on caulocystidia and hyphae at apex of stipe.

HABITAT.—Caespitose on and around stumps of deciduous trees, especially *Fagus*, but also *Quercus*, rarely solitary or terrestrial or on coniferous stumps. Very common.

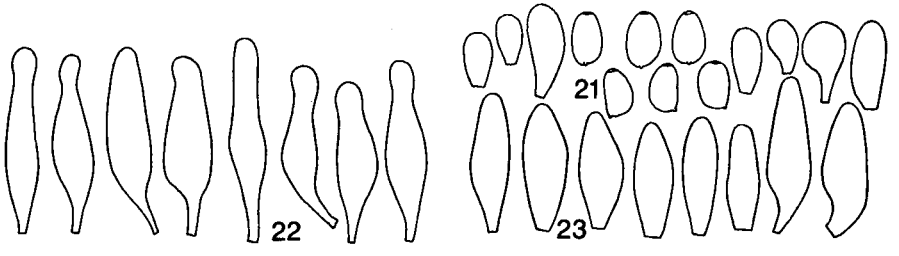
COLLECTIONS EXAMINED.—NETHERLANDS: prov. Overijssel: Delden, estate 'Twickel', 12 Oct. 1968, *E. K. v. W.*; 22 Oct. 1973, *E. K. v. W.*; 2 Oct. 1979, *E. K. v. W.*; 6 Oct. 1979, *E. K. v. W.*, 8 Oct. 1979 *E. K. v. W.*; Oldenzaal, estate 'Roderveld', 29 Sept. 1979, *E. K. v. W.*; estate 'Egheria', 22 Oct. 1960, *E. K. v. W.*; Denekamp, estate 'Singraven', 5 aug. 1961, *E. K. v. W.*; prov. Noord-Brabant, Drunen, 'Drunense duinen', 24 April 1977, *W. Hanegraaff*; prov. Limburg, Mook, 11 Oct. 1965, *E. K. v. W.*

As in all species of *Psathyrella* the macroscopical characters of *P. hydrophila* vary. Spores and badidia are very constant as to shape, size and colour, but the perceptibility of the germ pore and the degree by which the spores are phaseoliform (also the number of phaseoliform spores) varies to some extent. Size and above all shape of the pleurocystidia on the other hand greatly vary (see Figs.). With regard to this variability we have no faith in the specifity of the following three new species described by A. H. Smith (*1972*), each based on one collection: *P. alaskaensis* is said to differ from *P. hydrophila* only by the refractive walls of the cystidia as revived in KOH and the more versiform caulocystidia, *P. ogemawensis* only by a wedge-shaped form of the spores in face view, and *P. deceptiva* only by the scarcely larger spores and more copious veil.

In the past only few authors mentioned *Agaricus piluliformis* Bull. (or *A. pilulaeformis*), some doubting its genuiness, others connecting it with *P. hydrophila*, very few describing it either under *Agaricus*, *Hypholoma* or *Drosophila*. It is now universally recognised that *Agaricus piluliformis* Bull. represents very early stages of *P. hydrophila* (see discussion on page 000).

Psathyrella hydrophiloides Kits van Wav., *spec. nov.*—Figs. 21-23

Carpophoria statura media, crassiuscula, solitaria, terrestria. Pileus usque ad 45 mm latus, aetate convexus atque depressus, estriatus, margine undulatus et incisus, badius, hygrophanus. Velum tenue, album. Lamellae haud confertae, anguste adnatae badiae, acie subconcolores. Stipes 30 × 6 mm, eradicatus, teres, alutaceus, apice conspicue sulcatus. Sporae cumulatae obscure purpureofuscae, 5-6.3 × 3.2-3.6 μm, subtruncatae, nonnullae subphaseoliformes, gilvae, subopacae, poro germinativo 1-1.5 μm lato. Badidia 4-sporigera. Pleurocystidia 37.5-47.5 × 7.5-12.5 μm, haud numerosa, utriformia, nonnulla tantum fusiformi-ellipsoidea, stipite tenui manifeste munita.



Figs. 21-23. *Psathyrella hydrophiloides*, 22 May 1961. — 21. Sporogram (× 1210). — 22. Pleurocystidiogram (× 575). — 23. Cheilocystidiogram (× 575).

Cheilocystidia sat numerosa, 22.5-30(-35) × 7.5-11 μm, fusiformi-ellipsoidea, raro utriformia, pleurocystidiis dissimilia, stipite brevi latoque praedita, cellulis spheropedunculatis multis, 12.5-25 × 6-10 μm, intermixtis. Typus. — Netherlands, Overijssel, Denekamp, 'Singraven', 22 May 1961 (L.)

MISAPPLIED NAME.—*Drosophila appendiculata* var. *pilulaeformis* ss. Kühn. & Romagn. Fl anal.: 365. 1953.

CHIEF CHARACTERISTICS.—Carpophore medium-sized, solitary, terrestrial, thick-set; pileus up to 45 mm diam., at maturity convex and depressed, not striate, with wavy, indented margin, dark reddish brown, hygrophanous; veil scanty; lamellae not crowded, narrowly adnexed, dark reddish brown, edge concolorous; stipe 30 × 6 mm, conspicuously grooved at apex, very pale brown; spore print very dark purple brown. Spores 5-6.3 × 3.2-3.6 (mean values 5.9 × 3.5 μm), few slightly phaseoliform, with conspicuous germ pore (1.1.5 μm), brownish yellow, pleurocystidia not numerous, utriform and few ellipsoid; non-pleurocystidioid cheilocystidia fairly numerous and fusoid-elliptic; spheropedunculate cells numerous; hymenophoral trama pigmented.

MACROSCOPICAL CHARACTERS.—Pileus at maturity up to 45 mm, convex with distinctly depressed centre, firm and fleshy, not striate, with slightly wavy, indented margin, dark reddish brown (M. 2.5 YR 3/2), hygrophanous, drying out to fairly dark yellow (M. 10 YR 8/6, 7/6 but slightly more sordid greyish) darker at centre.

Veil scanty, forming white velar fibrils along margin of pileus and distinct garland-like remnants half-way stipe.

Lamellae 6 mm broad, not crowded, slightly ventricose, strongly ascending near stipe, narrowly adnexed, dark reddish brown (M. 5 YR 3/3), with ± concolorous edge.

Stipe 30 × 6 mm (at base 7 mm), cylindrical, not rooting, very pale brown, at base covered with dense, cottony, whitish mycelial layer but not strigose, hollow (cavity 3 mm wide); surface very delicately fibrillose.

Context in pileus firm, comparatively thick (2.5 mm in centre) dark greyish brown, in stipe very pale brown. Taste and smell indistinctive.

Trama of 'washed' lamellae yellowish brown from brownish yellow (M. 10 YR 6/4, 6/6, 5/6), anastomosing strands running from base to edge through the in itself pale brown (M. 10 YR 6/3, 7/2) tissue; extreme edge minutely fimbriate and pale brown,

Spore print very dark purplish brown.

MICROSCOPICAL CHARACTERS.—Spores 5-6.3 × 3.2-3.6 μm (mean values 5.9 × 3.5 μm; 1 collection), in profile adaxially flattened ellipsoid to ovoid, rarely slightly phaseoliform, in face view ellipsoid to slightly ovoid, in water and NH_4OH 10% brownish yellow (M. 10 YR 6/6), in KOH 5% sordid yellowish brown (M. 10 YR 5/6), subopaque, with conspicuous, subtruncate, hyaline germ pore (1-1.5 μm) and small hilar appendix.

Basidia 14.4-17.6 × 4.8-5.6 μm, subcylindrical, 4-spored.

Pleurocystidia 37.5-47.5 × 7.5-12.5 μm, not numerous, utrifrom, only few fusoid-ellipsoid, with narrow and distinct pedicel, thin-walled, very pale brown in NH_4OH 10%.

Marginal cells: fusoid-ellipsoid and rarely utriform cheilocystidia, 22.5-30(-35) × 7.5-11 μm, fairly numerous, with short and broad pedicel, many very pale brown in NH_4OH 10% (a few distinctly brown), intermixed with numerous small spheropedunculate cells, 12.5-25 × 6-10 μm (rarely larger, up to 27.5 × 15 μm), several of which pale brown in NH_4OH 10%.

Caulocystidia (apex of stipe): pleurocystidioid caulocystidia 22.5-47.5 × 7.5-9) μm, scattered and very few, versiform, utriform, thin-walled; spheropedunculate cells 17.5-30 × 10-17.5 μm, isolated or in small clusters.

Pigmentation of hymenophoral trama in NH_4OH 10% sub micr.: narrow hyphae of subhymenium (15 μm broad zone at edge) very brown, broad hyphae very pale brown, both from membranal pigment; yellow hyphal septa present; no encrustations.

Pileipellis a 2-3 cells deep layer of subglobose, thick-walled cells, 25-55 μm diam., in NH_4OH 10% distinctly pale brown.
Clamps on caulocystidia and hyphae of stipe.

HABITAT.—Terrestrial under Fagus, solitary. Very rare.

COLLECTION EXAMINED.—NETHERLANDS, prov. Overijssel, Denekamp, estate 'Singraven', 22 May 1961, *E. K. v. W.* (type, L).

Kühner & Romagnesi (*1953*: 365) depicted and briefly described a taxon, which they named *Drosophila appendiculata* var. *pilulaeformis* ss. Ricken. Their description fully agrees with the species described above. The name given by them to this taxon is based on Ricken's suggestion (*1912*: 247) that a 'kurzgestielte fast kugelige Form' of *P. hydrophila* is perhaps *A. pilulaeformis* Bull. Ricken neither described nor named this taxon. Our species obviously belongs to the genus *Psathyrella*, but cannot bear the epithet 'pilulaeformis' as *Agaricus piluliformis* Bull. represents early stages of *P. hydrophila* (see observations on *P. laevissima*).

Psathyrella hydrophiloides differs from *P. hydrophila* by quite a number of characters: the carpophores are robust, thick-set, the cap is darker, the veil scanty, the gills are not crowded, the apex of the stem is conspicuously sulcate, the spores are slightly darker and above all have a very distinct germ pore.

The above description is based on the only specimen we ever saw and which is the only one recorded from the Netherlands. According to Kühner & Romagnesi (*1953*: 365) the species is fairly common in France.

PSATHYRELLA LAEVISSIMA (Romagn.) Sing.—Figs. 36-48

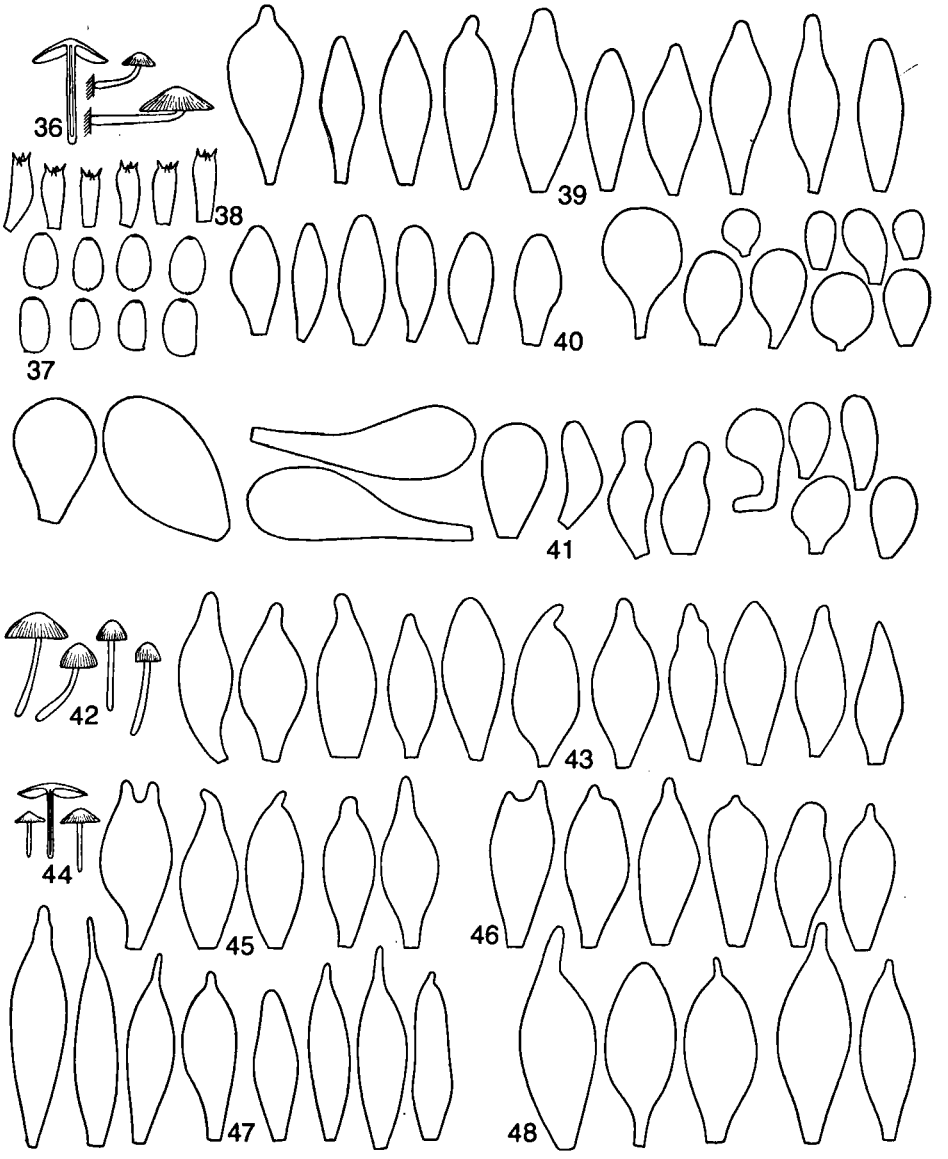
Drosophila leavissima Romagnesi *in* Bull. Soc. linn. Lyon **21**: 155. *1952*. — *Psathyrella laevissima* (Romagn.) Sing. *in* Beih. Nova Hedwigia **29**: 197. *1969*.

MISAPPLIED NAME.—*Psathyrella piluliformis* ss. P. D. Orton *in* Notes R. bot. Gdn Edinb. **29**: 116. 1969.

SELECTED DESCRIPTIONS & ILLUSTRATIONS.—Favre *in* Schweiz. Z. Pilzk. **33**: 70. *1958* (as *Drosophila laevissima*); P. D. Orton. *in* Notes R. bot. Gdn Edinb. **29**: 116. *1969* (as *Psathyrella piluliformis*).

CHIEF CHARACTERISTICS.—Carpophores small to medium-sized, gregarious (not caespitose!) on and around stumps of deciduous trees; pileus 15-35 mm, convex to subumbonate, dark brown, hygrophanous; veil evident only in youngest stages; lamellae very crowded, adnexed, dark reddish brown, edge minutely fimbriate, scarcely whitish; stipe 15-40 × 1.5-3 mm, sordid white to yellowish brown; spore print brownish black; spores 5.4-5.9 × 3.2-3.6 (mean values 5.5-5.6 × 3.4-3.5) μm, with small, distinct germ pore, bright brown; pleurocystidia moderately numerous, fusoid-ventricose, many with short subcylindrical extension at apex or distinctly mucronate; spheropedunculate cheilocystidia in very large numbers, 10-30 × 10-20 μm, the majority slightly thick-walled and very pale to distinctly brown in NH_4OH 10%, intermixed with very few fusoid-ventricose, rarely mucronate cheilocystidia 27.5-32.5 × 10-12 μm; hymenophoral trama strongly pigmented.

MACROSCOPICAL CHARACTERS.—Pileus 15-35(-45, rarely -50) mm, rather fleshy, broadly conico-convex to convex or convex-subumbonate, delicately striate up to half-way from margin, smooth, in later stages rugulose, dark brown, date brown or reddish brown (M. 5 YR 3/4; 7.5 YR 4/4, 4/2), hygrophanous, drying from centre to pale brown or alutaceous with a trace of ochre at centre, without pink, micaceous.



Figs. 36–48. *Psathyrella laevissima* — 36–41. 30 Aug. 1962. 36. Habit sketch (× 0.5). — 37. Sporogram (× 1210). — 38. Basidiogram (× 575). — 39. Pleurocystidiogram (× 575). — 40. Cheilocystidiogram (× 575). — 41. Caulocystidiogram. — 42, 43. 15 Sept. 1960. — 42. Habit sketch (× 0.5). — 43. Pleurocystidiogram (× 575). — 44, 45. 2 Sept. 1967. — 44. Habit sketch (× 0.5). — 45. Pleurocystidiogram (× 575). — 46–48. Pleurocystidiogram (× 575). — 46. 31 Aug. 1967. — 47. 28 Aug. 1967. — 48. 12 Nov. 1967.

Veil fugacious, white, only distinct in very young stages and then only at margin of pileus, sometimes still connecting margin with stipe.

Lamellae 2.5–3 mm broad, very crowded, moderately ventricose, fairly broadly adnexed, not uncinate, at margin of pileus sharp and very narrow, at first pale brown later conspicuously dark purplish red-brown (M. 5 YR 4/2, 4/3); edge minutely fimbriate, concolorous or whitish.

Stipe 15–40 × 1.5–3 mm, hollow, not rooting, cylindrical or slightly thickened at base, minutely longitudinally fibrillose-striate, at apex and upper ± 1/3 whitish, at lower 2/3 pale yellowish brown; apex slightly pruinose.

Context of pileus 1.5–2 mm thick in centre, dark greyish brown, of stipe pale yellowish brown. Smell and taste indistinctive.

Spore print brownish black.

Trama of 'washed' lamellae almost equably strong yellow-brown, with slightly stronger pigmented anastomosing strands running from base to edge; edge minutely dark brown punctate.

MICROSCOPICAL CHARACTERS.—Spores 5.4–5.9 × 3.2–3.6 μm (mean values 5.5–5.6 × 3.4–3.5 μm: 9 collections), in profile adaxially flattened ellipsoid, rarely slightly phaseoliform, in face view ellipsoid to ovoid, with small (± 1 μm) but distinct germ pore and small hilar appendix, in water and NH_4OH 10% bright brown (M. 7.5 YR 5/6), in KOH 5% sordid brown (M. 7.5 YR 5/4), not opaque.

Basidia 15–17.5 × 5–6 μm, subcylindrical to subclavate, 4-spored.

Pleurocystidia 32.5–45(–60) × 10–15(–20) μm (including rostra), moderately numerous, fusoid-ventricose with acute to subacute, infrequently obtuse apex, slightly thick-walled and pale brown in NH_4OH 10%; apex very often drawn out into a short (2.5–6 μm), subcylindrical, thin-walled and colourless extension or rostrum (mucronate); no mucus or crystals.

Marginal cells: spheropedunculate cells in very large numbers and densely packed, 10–20 × 7.5–17.5 μm, a small number larger, 20–30 × 15–20 μm, the latter, but also some of the smaller ones, with slightly thickened walls and very pale to distinctly brown (coloured cells usually in clusters), intermixed with very few scattered pleurocystidioid cheilocystidia, (15–)20–35(–40) × 7.5–15 μm, with short and rather broad pedicel and subobtuse to subacute, rarely mucronate apex. No mucus or crystals.

Caulocystidia (apex of stipe): spheropedunculate, clavate, and versiform cells, 20–55 × 10–22.5 μm, some with long pedicels slightly thick-walled and pale brown in NH_4OH 10%, rather few in number and usually in clusters of two or three up to ten cells, without mucus or crystals. Examination of several stipes yielded only two sublageniform caulocystidia.

Pigmentation of hymenophoral trama in NH_4OH 10% sub micr.: mediostratum consisting of broad hyphae (10–40 μm), the thin subhymenium of narrow (4.5–9 μm) hyphae, both mostly distinctly brown in NH_4OH 10% from membranal pigment; no encrustations, few yellow hyphal septa.

Pileipellis a 2–3 cells deep layer of subglobose cells, 15–50 μm diam., distinctly brown in NH_4OH 10%.

Clamps numerous on hyphae of stipe.

HABITAT.—On and around stumps of deciduous trees, sometimes densely gregarious. August–November. Not reported from the Netherlands. Common in France and British Isles.

COLLECTIONS EXAMINED.— GREAT BRITAIN: Devonshire, Quantock Hills, 15 Sept. 1960 (foray Brit. Mycol. Soc.), *E. K. v. W.* (L); Montgomeryshire (Wales), Lake Vyrnwy, 30 Aug. 1962, *E. K. v. W.* (L); Hampshire, Slindon Park, 2 Sept. 1967 (foray Brit. Mycol. Soc.), *E. K. v. W.* (L); Surrey Gomshall, 27 Aug. 1967, *P. D. Orton 3076* (E); Somerset, Selworthy, 31 Aug. 1967, *P. D. Orton 3077* (E); Surrey, East Horsley, Mountain Wood, 28 Oct. 1967, *P. D. Orton 3078* (E); Scotland, Perthshire, Dall, 9 Nov. 1967, *P. D. Orton 3079* (E) and 12 Nov. 1967, *P. D. Orton 3080* (E); Scotland, Aros Wood, 11 Sept. 1968, *P. James* (herb. Watling 6046, E).

The above description of the macroscopical characters is largely based on our very copious Lake Vyrnwy find. The six collections we received for examination from the Royal Botanic Garden Edinburgh were not accompanied by descriptions, but Orton's (*1969*: 116) description of the species is based on this material and fully adequate to go by. Of the altogether nine collections examined the macroscopical features of the dry basidiocarps and the microscopical characters were strikingly similar. In *Orton 3079* and *3080* the pleurocystidia were somewhat larger than in all our other collections, resp. 35–57 × 10–15 μm and 40–60 × 15–20 μm. The pleurocystidioid cheilocystidia were rarely mucronate and always fusoid-ventricose except in *Orton 3079* in which most of these cells were narrow (× 7.5–10 μm) and subcylindrical (a few of such cells sometimes occurred in other collections). The number of pleurocystidia having at their apex a short subcylindrical extension or a rostrum, varied. In some collections their number was small, while in *Orton 3077* and the Aros Wood collection several pleurosystidia had two rostra.

In the literature very little if anything at all is said about the rather conspicuous pigmentation of various tissue elements of *P. laevissima*. In all our nine collections the hymenophoral trama of the 'washed' gills turned out to be strong yellow-brown in NH_4OH 10% under the binocular lens, the colour becoming stronger towards the base. Microscopically the hyphae of the trama are distinctly brown in *P. laevissima*, but no encrustations were seen (neither by Romagnesi). As in *P. hydrophila*, the pleurocystidia are pale brown in NH_4OH 10% and so are a number of spheropedunculate cells on the gill edge. A number of the latter cells are even distinctly brown and they often find themselves in clusters, accounting for the edges of the gills being minutely dark brown punctate when observed on the 'washed' gills under the binocular lens. It also results in the edges macroscopically not really being white in spite of the presence of very large numbers of spheropedunculate cells, but ± concolorous.

The cells of the pileipellis in *P. leavissima* are distinctly brown in NH_4OH 10%, more so than in *P.*hydrophila.

In summing up: *P. laevissima* resembles *P. hydrophila* because of the colour of its pileus and lamellae (both variable in both species and therefore in our opinion of little value as a means of distinguishing between the two species) and because of the small size and pale coulour of its spores. It is sharply distinguished from *P. hydrophila* because of its quite different habit (smaller pilei and much smaller stipes), its pilei in the early stages not being globose but convex almost right from the start, its gregariuos, non-caespitose growth, its rudimentary veil, its fusoid-ellipsoid-venticose pleurocystidia having an acute or subacute (infrequently subobtuse and rarely obtuse) apex, which often is mucronate, its spores having a distinct germ pore (indistinct, callus, in *P. hydrophila*), and the edge of its lamellae lined with large numbers of spheropedunculate cells and only few pleurocystidioid cells (in *P. hydrophila* a much smaller number of spheropedunculate cells, intermixed with quite a number of pleurocystidioid cheilocystidia).

In the 'Flore analytique' Kühn. & Romagn. (*1953*: 366) called *P. laevissima* rare, but later (*1975*: 184) Romagnesi regarded the species as 'assez commun'. Favre (*1958*: 70) reported three collections from Switzerland; Moser (*1978*: 277) ranks it under the rare and still little known species; in the Netherlands it has not yet been recorded; Bona (*1978*: 70) reported it from Spain.

Orton (*1960*: 374) stated that his experience lead him to believe that 'there is a small "*hydrophilus*" corresponding to *A. piluliformis* Bull. and perhaps to appendiculata s. Kühn. & Romagn. as well as a more robust and more common "*hydrophilus*" (perhaps corresponding to var. *pilulaeformis* s. Kühn. & Romagn.)' but that he was not prepared to state whether these are

in fact two species. He suspected this to be so and that the smaller one grows gregariously in large numbers, whereas the larger one is densely caespitose. Later Orton (*1969*: 116) worked this out, stating that the smaller species was to be called *P. piluliformis* (Bull. ex Mérat) P. D. Orton, while giving a number of differences between that species and *P. hydrophila* but not all. In trying to unravel the species complex concerned, we soon discovered that the species, which Orton named *P. piluliformis* had already been described by Romagnesi (*1952*: 155) as a new species, *P. laevissima*. We also found that Orton's *P. piluliformis* is quite different from Bulliard's *Agaricus piluliformis* (= early stages of *P. hydrophila*, see below) and from the taxon mentioned by Kühn. & Romagn. (*1953*: 365) as *Drosophila appendiculata* var. *pilulaeformis* (= a species in its own right, quite different from both *P. laevissima* and *P. hydrophila* and in the present study named *P. hydrophiloides*).

As for *P. piluliformis*, Bulliard himself (*1809*: 440) clearly stated that he had made an error in describing *Agaricus piluliformis* as a species, having discovered that the specimens on which he based this species merely represented very early stages of *A. hydrophilus*. Bulliard's plate 112 shows a large caespitose (and not gregarious group) of some 30 carpophores, all of which with globose caps and habit quite different from *P. laevissima*. Orton rightly stated that the species, described by him as *P. piluliformis* is not caespitose but gregarious. Also, long before the carpophores of *P. laevissima* have reached the size as shown on Bulliard's plate 112, their caps are well expanded, their shape being as rightly described by Orton 'conico-convex, then expanded'. From all this it is quite clear that *P. piluliformis* (Bull. ex Mérat) P. D. Orton ss. Orton is a misaplication.

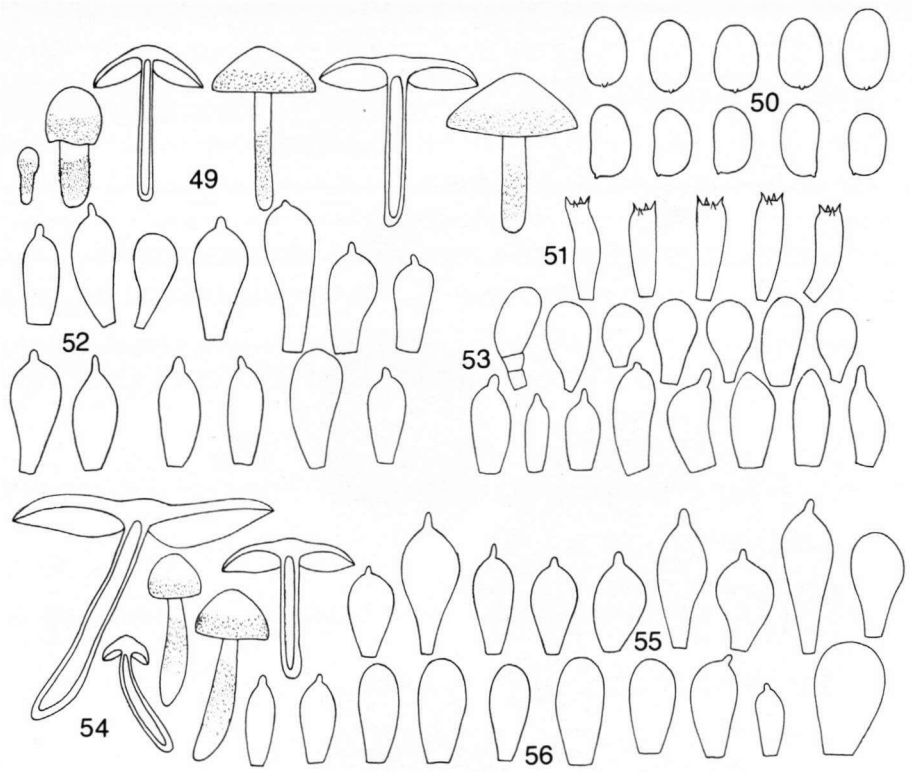
Singer (*1969*: 197) described (without giving pictures) a var. *nothofagi* of *P. laevissima* from Chili, neither making clear nor stating, however, by which characters it differs from *P. laevissima* (the spores are described as slightly larger, 6–7 × 4–4.5 μm).

Smith (*1972*: 363) suggested—without giving a description of *P. laevissima*—that *P. fuscofolia* (Peck) A. H. Smith may be conspecific with *P. laevissima* as he regards the former species as a segregate of *P. hydrophila*, from which it differs by the almost complete absence of a veil and the pale trama in KOH. But the photographs of *P. fuscofolia* on Smith's plates 34 and 35 show densely caespitose carpophores of which the habit is totally different from that of *P. laevissima;* the apices of the pleurocystidia of *P. fuscofolia* are very obtuse and not mucronate, while the hymenophoral trama of *P. laevissima* is not paler than that of *P. hydrophila*.

PSATHYRELLA MUCROCYSTIS A. H. Smith—Plate 1, Figs. 49–56.

Psathyrella mucrocystis A. H. Smith *in* Mem. N.Y. bot. Gdn **24**: 373. 1972.
Drosophila chondrodermoides Romagn. *in* Bull. Soc. mycol. Fr. **92**: 189. 1976.

CHIEF CHARACTERISTICS.—Carpophores medium-sized to fairly large, caespitose or solitary on wood; pileus 30–70 mm diam., paraboloid, finally plane and subumbonate, not striate, dark reddish brown, hygrophanous; veil rather little to very strongly developed on both pileus and stipe, sometimes forming an annular zone on stipe; tips of velar flocci on pileus at maturity sometimes pale brown; lamellae fairly crowded, dark reddish brown to brown, with white edge; stipe 30–70 × 4–6 mm, pale brown, darker towards base; spore print brown; hymenophoral trama strongly pigmented; spores 7.2–8.1 × 4.1–4.5 μm, (mean values 7.1–7.5 × 4.5 μm), brownish yellow, without germ pore or callus: pleurocystidia 20–45 × 7.5–12.5 μm, clavate and mucronate; pleurocystidioid cheilocystidia very scarce to rather few in number; spheropedunculate marginal cells numerous.



Figs. 49-56. *Psathyrella mucrocystis.* — 49-53. 20 Oct. 1962. — 49. Habit sketch (× 0.5). — 50. Sporogram (× 1210). — 51. Basidiogram (× 575). — 52. Pleurocystidiogram (× 575). — 53. Cheilocystidiogram (× 575). — 54-56. 22 Aug. 1965. — 54. Habit sketch (× 0.5). — 55. Pleurocystidiogram (× 575). — 56. Cheilocystidiogram (× 575).

MACROSCOPICAL CHARACTERS.—Pileus in earliest stages (10-15 mm) subglobose-subparaboloid, at maturity 30-70(-90) mm and spreading via conico-paraboloid with truncate umbo to finally plane with vague and obtuse umbo and marginal area still deflexed (with Romagnesi: tending to become revolute), sometimes even depressed, firm and fleshy, not striate or sometimes substriate at margin, conspicuously dark reddish brown (M. 2.5 YR 3/4; 5 YR 3/4), at margin itself very pale brown, sometimes rugulose around centre when moist; hygrophanous, soon drying via (reddish) brown (M. 5 YR 3/3, 3/4, 4/4) and dark brown (M. 7.5 YR 4/4) to warm ochre brown (M. 5 YR 4/6, 4/8, 5/6, 5/8) or almost orange-brown (M. 5 YR 5/8), without pink, not micaceous, rugulose (with Romagnesi: at centre when moist slightly granular sub lente).

Veil strongly (going by our own two collections) to rather little (with Romagnesi) developed (see observations). Numerous white fibrils and small tufts of fibrils reaching up to 3/4 from margin, increasing in number towards margin, forming wicker-works of floccose, stellate squamules with, at maturity, distinctly pale ochre brown tips, appendiculate, on lower 2/3-1/2 of stipe forming a dense floccose lanose-fibrillose, sometimes squamulose coating with sometimes an annuliform zone. Veil in primordia and subprimordial stages covering entire stipe beneath margin of pileus with a thick, dense, lanose-squamose layer, inserting at margin of pileus, covering pileus right up to the top (with Romagnesi: veil distinct in subprimordial stage but slight and fugacious, white, only leaving traces on pileus, not on stipe).

Plate 1. *Psathyrella mucrocystis*

Lamellae 4–6 mm broad, fairly crowded, slightly ventricose, broadly adnate, in earliest stages pale brown (M. 10 YR 6/4), then brown (M. 7.5 YR 5/4, 4/4) and at maturity reddish brown (M. 5 YR 5/4, 4/4), contrasting with the dark pileus and pale brown stipe, with white, later whitish fimbriate edge.

Stipe 30–60 × 4–8 mm (Romagnesi: 40–90 × 6–13 mm), its length about equalling diameter of pileus, relatively thick, firm, cylindrical, sometimes attenuated near apex or at base or at both, upper 1/3 whitish, lower 2/3 pale sordid brown, darker at sometimes swollen base, very hollow, not rooting, distinctly pruinose at striate apex.

Context of pileus in centre 3–4 mm thick, at first reddish brown (M. 5 YR 3/3, 3/4), later dark greyish brown (M. 7.5 YR 4/2), in stipe whitish to pale yellowish brown, lower down darker and brownish grey, along cavity pale brown. Striking sweet smell of anise (Smith: almond).

Trama of 'washed' lamellae strong yellowish brown (M. 10 YR 5/6) from many anastomosing, brownish yellow (M. 10 YR 6/6) strands running from base to edge, darker and merging in basal 1/3 of lamella, through the in itself pale brown (M. 10 YR 6/3) tissue; extreme edge minutely fimbriate and pale brown.

Spore print dark brown with purplish hue.

MICROSCOPICAL CHARACTERS.—Spores (6.3–)7.2–8.1 × 4.1–4.5 μm (mean values 7.1–7.5 × 4.5; 4 collections), in profile adaxially flattened ellipsoid to subphaseoliform[2], in face view ellipsoid to slightly ovoid, in water, NH_4OH‰, and KOH 5% brownish yellow (± M. 10 YR 6/6, 7.5 YR 6/6), not opaque, without germ pore or callus, with small hilar appendix.

Basidia 22.5–27.5 × 6–7.5 μm, subcylindrical, 4-spored.

Pleurocystidia: 20–32.5 × 7.5–15 μm (Romagnesi: 25–50 × 9–13.5 μm; Smith 28–37 × 8–14 μm), very scarce to moderately numerous, clavate with at apex a narrow (1–2 μm), cylindrical, 1–4 μm long, thin-walled, colourless protuberance (mucronate); cell body usually distinctly but very pale brown in NH_4OH 10% (particularly larger cells.

Marginal cells: spheropedunculate and clavate cells 15–25(–27.5) × 7.5–15(–17.5) μm, very numerous, some with slightly thickened wall and some larger ones distinctly pale brown in NH_4OH 10%; intermixed with very few to a fair number of scattered, colourless, mucronate, pleurocystidioid cheilocystidia, 20–30 × 7.5–11 μm.

Caulocystidia: versiform, spheropedunculate, and clavate cells fairly numerous, 15–35 × 7.5–20 μm, some distinctly pedicellate; very few ellipsoid, rather large (27.5–40 × 10–15 μm), mucronate pleurocystidioid cells with up to 7.5 μm long mucro.

Pigmentation of hymenophoral trama in NH_4 OH 10% sub micr.: distinctly brownish yellow from membranal pigment; scattered yellow hyphal septa; no encrustations.

Pileipellis: a 2–4 cells deep layer of subglobose, thick-walled, pale brown cells, 15–35 μm diam.

Clamps present on hyphae of stem.

HABITAT.—Caespitose or solitary on stumps of coniferous or deciduous trees. June–Oct. Very rare.

COLLECTIONS EXAMINED.—NETHERLANDS, prov. Overijssel, Denekamp, estate 'Singraven', 20 Oct. 1962, *E. K. v. W.* (L). — GREAT BRITAIN, Scotland, county Angus, Glenisla, estate 'Brewlands', 22 Aug. 1965, *E. K. v. W.* (L). — FRANCE, dept. Oise, Chapelle-en-Serval, 2 June 1973, *H. Romagnesi* (herb. Romagn. 1130). — U. S. A., Idaho, McCall-Valley Co., Cascade Lake, 14 July 1962, *A. H. Smith 65384* (type).

The mucronate cystidia are far and away the outstanding feature of this extremely rare species, in combination with the habit, the medium to large size of the firm carpophores, the striking red-

[2] Spores of Romagnesi's specimen more rarely and less subphaseoliform than those of our two collections.

brown colour of cap and gills, the brown spore print and the fairly (not very) pale spores which have no germ pore.

The species is only known from Smith's description (*1972*: 373), based on one collection and Romagnesi's description (*1976*: 189) based on four collections of this species, which he named *Drosophila chondrodermoides* because of its great resemblance to the almost equally rare *P. chondroderma*. Romagnesi pointed out that his *D. chondrodermoides* differed from *P. chondroderma*, which has the same habit, by its vernal appearance (one of his collections, however, was found on 2 August), its growth on old stumps of deciduous trees and its paler spores. Curiously enough he did not mention the mucronate cystidia and the absence of a germ pore.

We first studied our October 1962 collection. The spores and the shape of the mucronate cystidia are fully identical with those of *D. chondrodermoides*, but the find is not vernal, it grew on a coniferous stump, the veil is very strongly developed (with Romagnesi slight and fugacious) and the pleurocystidia are very scarce, very small (20–26.5 × 7.5–12.5 μm) and therewith extremely difficult to find. We then found in our herbarium our Scottish collection of August 1965 (at that time still unidentified) and in the literature Smith's description of *P. mucrocystis* (*1972*: 373). These two turned out to be in several respects intermediate between our Netherlands' collection and the four collections described by Romagnesi. The Scottish collection was found in summer it grew on deciduous wood, its pleurocystidia are moderately numerous and slightly larger than in our Netherlands' collection, and its veil was also strongly developed. Smith's collection was also found in summer (July), it grew 'on outwash of a stream' (wood not mentioned), its pleurocystidia were scattered to abundant (apparently great variation) and were slightly larger still. Although Smith put the species in subgenus *Psathyrella* (Smith's definition: 'veil thin to rudimentary or absent'), he described the margin of its pileus as 'fringed with fibrils until near maturity, veil fibrillose pallid buff', the stem as 'lower down fibrillose to squamulose with buff colored veil fibrils, veil leaving a zone of fibrils when it breaks but the zone soon evanescent', this description clearly being intermediate between Romagnesi's description and the one given above for our two collections.

The features of Smith's, Romagnesi's and our own specimens obviously cover one and the same species. Smith's name for this species being the oldest, it has priority.

In the beginning of our correspondence with Romagnesi about *P. mucrocystis*, the facts that Smith only saw immature carpophores of his species and erroneously depicted in his fig. 783 three spores without but also three spores with a distinct germ pore (whereas he clearly stated in his description that the germ pore is 'very inconspicuous to lacking') threatened to stand in the way of convincing Romagnesi that his *P. chondrodermoides* (*1976*) was conspecific with *P.* mucrocystis (*1972*). But later and above all when we had received and compared the holotype of *P. mucrocystis* with an exsiccatum of *P. chondrodermoides*, received from Romagnesi, and could report to Romagnesi that spores, cystidia and the pigmentation of the subcutis of both species were fully identical, he regarded (in litt.) the synonymy as 'evidement assez probable'. A slight difference in colour between the gills of Smith's holotype and young specimens of our own material could be explained away by the presence of very large numbers of pale and still immature spores in Smith's material. The pigmentation of the hymenophoral trama of the 'washed' gills of the type and our own material was exactly the same.

PSATHYRELLA OBTUSATA (Fr.) A. H. Smith

Psathyrella obtusata (Fr.) A. H. Smith *in* Contr. Univ. Mich. Herb. **5**: 55. *1941.*

Recently (Kits van Waveren, *1977*: 299) having published a full description of and observations on *P. obtusata*, in the present study only an abbreviated description of this species is given, also additional information, a correction of our 1977 description and a description of a new variety.

ABBREVIATED DESCRIPTION.–Carpophores small to medium-sized, terrestrial, solitary; pileus 20-25 mm, conico-convex, striate, strikingly brown (M. 7.5 YR 4/4-5/4), towards margin paler (M. 10 YR 6/4), hygrophanous, drying to very pale brown (M. 10 YR 8/4) without pink and then rugulose; veil distinct but scanty; velar fibrills only along margin of cap and a few on stipe; lamellae 3–4 mm broad, strikingly pinkish brown, with white edge; stipe 60–75 × 2–3 mm, white; hymenophoral trama brown only at base; spore print brown with purplish hue; spores 7.2–8.1 × 4.5–5 μm (mean values 7.4–7.5 × 4.6–4.8 μm: 2 collections), subphaseoliform, yellowish brown with a reddish hue, with small germ pore; pleurocystidia 35–50 × 9–15 μm, abundant, fusiform with fairly broad pedicel and acute to subacute apex; spheropedunculate and clavate cheilocystidia 20–30 × 12.5–20 μm, abundant, intermixed with very few pleurocystidioid or spheropedunculate cells with a very short subcylindrical neck, 30–45 × 12.5–15 μm. Pleuro- and cheilocystidia and cells of pileipellis very pale brown in NH_4OH 10%.

ADDITIONAL NOTES.—All authors describing the spores, called them pale brown; as for their size, only Petch (*1924*: 125) for his *P. rufescens* (which in our 1977 paper we listed as a synonym of *P. obtusata*) gave small figures (6–9 × 4–5 μm) and so did Smith (*1941*: 55), whose figures were 6–7 × 3.5–4 μm, and Lange (*1939:* 98), whose figures were 7.25–7.75 × 4.75 μm. Smith's recent figures (*1972*: 385) are 7–9 × 4–4.5 μm and those of Romagnesi (*1975*: 197) 7.7–10 × 4.7–5.7 μm. In our original 2 collections of *P. obtusata* and in the type of its var. utriformis the average length of the spores is 7.5 μm or less. Since 1977, however, we found 3 more collections in which the average length is 7.8, 7.9 and 7.8 μm afparen thy *P. obtusata* is a border-line case between sections Hydrophilae and Fatuae to be keyed out in both.

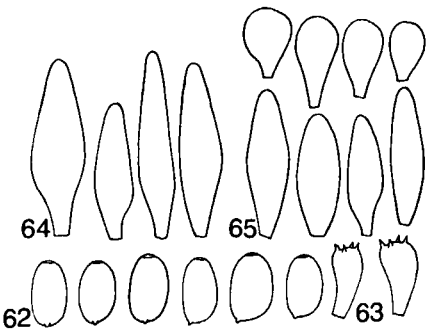
CORRECTION.—The paragraph in our former description of *P. obtusata* (*1977*: 299) listing the synonyms of the species should have included '*Psathyrella obtusata* (Fr.) A. H. Smith *in* Contr. Univ. Mich. Herb. **5**: 55. *1941*'. In fig. 33 of our 1977 paper a small germ pore should have been depicted in the spores.

Psathyrella obtusata var. **utriformis** Kits van Wav., *var. nov.*

A varietate typica differt pleurocystidia utriformibus.
Typus: Netherlands, prov. Zuid-Holland, Oegstgeest, 11 October 1979 (L).

This variety differs from typical *P. obtusata* by its pleurocystidia and pleurocystidioid cheilocystidia being utriform, the former (as in the type) abundant, the latter very scarce. Both pleuro- and cheilocystidia are distinctly pale brown in NH_4OH 10%.

COLLECTION EXAMINED.—NETHERLANDS, prov. Zuid-Holland, Oegstgeest, 11 Oct. 1979, *P. B. Jansen* (type, L).



Figs. 62-65. *Psathyrella pseudocasca*, 23 Apr. 1948. — 62. Sporogram (× 1210). — 63. Basidiogram (× 575). — 64. Pleurocystidiogram (× 574). — 65. Cheilocystidiogram (× 575).

Psathyrella pseudocasca (Romagn.) Kits van Wav., *comb. nov.*—Figs. 62-65

Drosophila pseudocasca Romagn. *in* Bull. mens. Soc. linn. Lyon **21**: 154. 1952 (basionym). — *Psathyrella pseudocasca* (Romagn.) Moser *in* Gams, Kl. KryptogFl. **2b**/2 (2. Aufl.): 239. 1955 (not val. publ.).

CHIEF CHARACTERISTICS.—Carpophores small to medium-sized, solitary around stumps of deciduous trees; pileus 22-33 mm, subglobose, then convex, only in the end slightly striate, reddish brown, hygrophanous; veil copious on surface of pileus and stipe; lamellae crowded, pale greyish-brownish; stipe 40-50 × 3-5 mm, white; hymenophoral trama moderately pigmented; spores 6.8-7.2 × 3.6-4.5 μm (mean values 7.1 × 4.4 μm), not phaseoliform, fairly pale brown, with germ pore; pleurocystidia 32.5-47.5 × 9-12 μm, abundant, fusiform with acute to subobtuse apex, with upper 1/4-1/2 covered with mucoid substance staining red in neutral red and not greenish blue in NH_4OH 10%; spheropedunculate and clavate cells on sterile gill edge numerous and intermixed with a moderate number of pleurocystidioid cheilocystidia.

MACROSCOPICAL CHARACTERS.—Pileus 22-33 mm, fairly fleshy, at first globose or campanulate, then convex, finally spreading with a distinct umbo gradually developing at centre, with margin regular or a little wavy, magnificently very intense reddish ochre brown, towards margin becoming more and more brown, slightly and only in the end striate, when moist glossy and smooth, hygrophanous, young pilei drying out to warm ochreous with centre for a while remaining reddish.

Veil: pileus clothed with a remarkably abundant white veil, consisting of numerous dispersed flocci, reaching almost apex of pileus, disappearing in the end, forming an appendiculate soft felty membrane along margin of pileus; very plumose on stipe.

Lamellae ±3.5 mm broad, fairly crowded, thin, l = 3, subventricose, adnate, not or scarcely uncinate, at first pale yellowish grey, then pale greyish brown and remaining so, with white, strongly pruinose edge. Stipe 40-50 × 3-5 mm, subcylindrical, rigid, fleshy, hollow, white, scarcely sordid yellow in final stages, strigose at base, vaguely grooved at apex. Context of pileus in centre 3-4 mm, when moist reddish, paler when dry.

Hymenophoral trama of 'washed' lamellae pale yellowish brown (M. 10 YR 6/4) at base, getting paler towards edge.

Spore print dark brown (sepia) with a trace of purple.

MICROSCOPICAL CHARACTERS.—Spores 6.8-7.2 × 3.6-4.5 μm (mean values 7.1 × 4 μm: 1 collection), in face view ellipsoid, in profile adaxially flattened ellipsoid, not phaseoliform, in water and NH_4OH 10% fairly pale yellowish brown to brown (M. 10 YR 5/4, slightly paler than

M. 7.5 YR 5/4), in KOH 5% yellowish brown (M. 10 YR 5/6), not opaque, with distinct germ pore (1-1.5 μm) and small hilar appendix.

Basidia 17.5-20 × 7.5-9 μm, clavate, 4-spored.

Pleurocystidia 32.5-47.5 × 9-12.5 μm, abundant, fusiform, subelliptic, sublageniform with acute to subobtuse apex and short, fairly broad pedicel, thin-walled, colourless, upper 1/4-1/2 (rarely more) of cells usually covered with conspicuous slightly refractive in NH_4OH 10% very pale greyish green, structureless mucoid substance, staining very dark red and becoming minutely granular in neutral red, but not staining blue-green in NH_4OH 10% (this substance locally 'dripping' along sides of cells) causing the cells seemingly to have one or more inclusions. No crystals.

Marginal cells: spheropedunculate and clavate cells small, 15-22.5 × 8-12.5 μm, abundant, intermixed with a moderate number of pleurocystidioid cheilocystidia 27.5-40 × 8-12.5 μm; all cells colourless; no crystals.

Caulocystidia not found.

Pigmentation of hymenophoral trama in NH_4OH 10% sub micr.: hyphae very pale yellowish brown; few yellow hyphal septa: no encrustations.

Pileipellis a 2-3 cells deep layer of vesiculose cells, practically colourless.

Clamps present on hyphae of stipe.

HABITAT & DISTRIBUTION.—Around stumps of frondose trees; not reported from the Netherlands and the British Isles, according to Kühn. & Romagn. (*1953*: 363) not common in France.

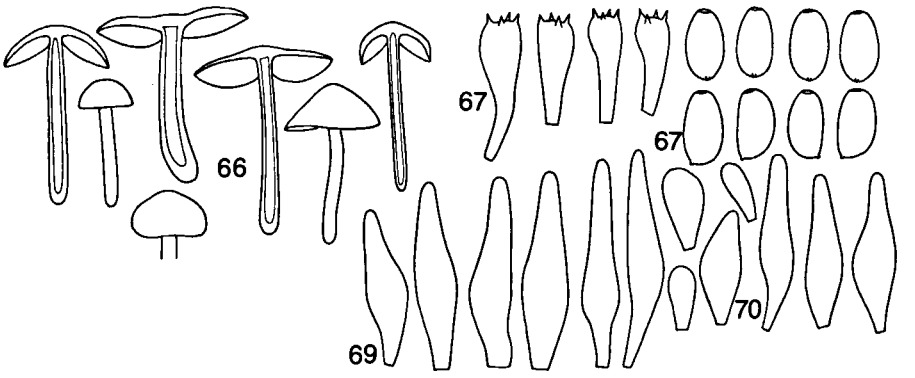
COLLECTION EXAMINED.—FRANCE: dept. Yv. Achères, 23 April 1948, *H. Romagnesi* (herb. Romagnesi no. *581*, holotype).

The above description of the macroscopical characters is a translation of a full description received from Romagnesi; the description of the microscopical characters is based on the author's examination of the holotype. Romagnesi's statement (*1952*: 154) that his *Drosophila pseudocasca* is probably the same as *Hypholoma cascum* ss. Lange (*1939*: 77) is neither repeated in the 'Flore analytique' nor in the description we received from Romagnesi. In the 'Flore analytique' these taxa are described as separate species. The main and most reliable difference between the two species is that in *P. casca* the pleurocystidia are utriform and not covered by a mucoid substance staining red in neutral red; moreover its spores are larger and darker. Macroscopically the two species are very much alike so that Lange's plate 147 A of *P. casca* agrees with *P. pseudocasca* as stated already in the 'Flore analytique'.

Psathyrella rannochii[3] Kits van Wav., *spec. nov.*—Figs. 66-70.

Pileus primo badius, margine luteobrunneus, usque ad 45 mm latus, maturitate expansus paraboloideus vel demum convexus, interdum planus, raro subumbonatus, e badio spadiceus, estriatus vel margine vix striatus, distincte rugulosus, hygrophanus, in sicco ochraceous colore roseo destitutus. Velum primo crassum albidum vel isabellinum, pileus 1/3-1/2 obtegens, pilei marginem cum stipite conjungens, demum pileum reticulo fibrilloso atque floccis obducens, marginem versus saepe denticulis appendiculatis, stipite nonnumquam annulo munito. Lamellae 4-7 mm latus, subconfertae, ascendentes, sublate adnatae, purpureofuscae. Stipes 40-50 × 4-6 mm teres, floccoso-fibrillosus et albidus vel isabellinus infra velum, albus striatus pruinosusque supra velum. Caro pilei centro 2-3 mm crassa, badia vel spadicea. Sporae 6.3-8.1 × 4.1-4.5 μm, spadiceae, purpureotinctae in cumulo, ellipsoideo-amygdaliformes, apiculo germinativo

[3] This species is named after its type locality.



Figs. 66-70. *Psathyrella rannochii*, 30 Aug. 1965. — 66. Habit sketch (× 0.5). — 67. Basidiogram (× 575). — 68. Sporogram (× 1210). — 69. Pleurocystidiogram (× 575). — 70. Cheilocystidiogram (× 575).

parvo. Basidia 25-35 × 7.5-9 μm, clavata, 4-sporigera. Pleurocystidia (32.5-)35-55(-60) × 8-12.5 μm, numerosa, anguste fusiformia, apice acuta vel subacuta. Cheilocystidia pleurocystidioidea (25-)27.5-45 (-50) × 7.5-10(-12) μm, abundantia, cellulis spheropedunculatis immixtis 15-20 × 7.5-8 μm. Pileipellis a cellulis formata. Solitaria vel gregaria in ericetis acerosis terrestris. Typus: Great Britain, Scotland, Perthshire, Kinloch Rannoch, 30 Aug. 1965, E. K. v. W. (L).

CHIEF CHARACTERISTICS.—Carpophores medium-sized, solitary or subgregarious, terrestrial; pileus up to 45 mm, paraboloid, finally convex, rarely vaguely umbonate, dark red-brown, not or scarcely striate, rugulose, hygrophanous; veil strongly developed, often forming appendiculate denticles, sometimes an annular zone on stem; lamellae rather crowded, dark brown with purplish hue, with whitish edge; stipe up to 50 × 6 mm, coarsely fibrillose-shaggy, whitish above, buff below; spores 6.3-8.1 × 4.1-4.5 μm (mean values 6.8-7.2 × 4.2-4.4 μm), ellipsoid, dark brown, with small germ pore; pleurocystidia 35-60 × 8-12.5 μm, numerous, narrowly fusiform; pleurocystidioid cheilocystidia 27.5-45 × 7.5-10 μm, abundant, intermixed with few spheropedunculate cells; hymenophoral trama pigmented.

MACROSCOPICAL CHARACTERS.—Pileus in primordia and early stages (4-13 mm) semiglobose-paraboloid with incurved margin, very dark reddish brown (M. 10 R 2.5/2; 2.5 YR 2.5/2, 2.5/4), but at margin (under velar coating) yellowish brown (M. 7.5 YR 5/6, 5/8), at maturity up to 45 mm, spreading to paraboloid, finally convex, sometimes (oldest stages) even plane with slightly deflexed marginal area and depressed centre, rarely vaguely umbonate, very dark red-brown (M. 5 YR 3/4), at margin yellowish brown (M. 7.5 YR 5/6, 5/8), red colour gradually fading from margin inward, making way for dark warm brown (M. 7.5 YR 3/2, 4/2, 4/4) be it usually still and particularly near and at centre with distinct reddish hue, not or (in oldest stages) scarcely striate at margin, but distinctly finely radially rugulose, hygrophanous, drying out to ochre brown, ochre yellowish (M. 10 YR 7/6, 6/6) or pale brown, with darker centre and then without pink, rugulose and not micaceous.

Veil in primordia and early stages forming a thick whitish to buff coating enveloping lower 1/3-1/2 of pileus, sending up many fibrils almost to apex and forming a dense layer connecting margin with stipe and there downwards passing into a fibrillose-shaggy layer; at maturity forming on pileus a rather dense network, denser towards margin, of radially arranged fibrils, bundles of fibrils and often minute flocci, in addition often forming appendiculate denticles or even an uninterrupted fringe at margin; fibrillose and sometimes minutely floccose remnants of veil on upper part of stipe sometimes forming an erect annular zone.

Lamellae 4-7 mm broad, rather crowded, ascending, fairly straight but sometimes distinctly

ventricose, rather broadly but sometimes rounded adnate, at first pale brown (M. 10 YR 6/3), browner towards base (towards M. 10 YR 5/4), greyer towards edge, later darker brown (M. 10 YR 3/3) with a purplish hue; edge whitish or concolorous.

Stipe 40–50 × 4–6 mm, cylindrical, sometimes thickening towards base, hollow, below insertion of veil conspicuously coarsely fibrillose-shaggy and whitish to buff, above insertion white, striate and pruinose.

Context of pileus 2–3 mm thick in centre, dark reddish brown (M. 5 YR 4/2) or dark brown (M. 7.5 YR 3/2, 4/2; 10 YR 3/3), of stipe pale brown; smell and taste indistinctive.

Trama of 'washed' lamellae yellowish brown from base to edge, at base M. 10 YR 5/4, for the rest only slightly paler, M. 10 YR 6/4, scarcely paler at edge.

Spore print dark brown with purplish hue.

MICROSCOPICAL CHARACTERS.—Spores 6.3–8.1 × 4.1–4.5 μm (mean values 6.8–7.2 × 4.2–4.4 μm: 2 collections), in profile more or less adaxially flattened ellipsoid to subovoid, in face view ellipsoid to ovoid, in water warm brown (M. 5 YR 4/6), in NH_4OH 10% dark brown (M. 5 YR 4/3), in KOH 5% sordid brown (M. 10 YR 4/3), not opaque, with small germ pore (± 1 μm) and small hilar appendix. Basidia 25–35 × 7.5–9 μm, clavate, 4-spored. Pleurocystidia (32.5–)35–55(–60) × 8–12.5 μm, numerous, rather narrowly fusiform, pedicellate, with acute to subacute apex, thin-walled, very pale brown in NH_4OH 10%; no mucus or crystals. Marginal cells: pleurocystidioid cheilocystidia (25–)27.5–45(–50) × 7.5–10(–12) μm, abundant, intermixed with very few spheropedunculate cells, 15–20 × 7.5–8 μm and some basidia; all cells thin-walled; no mucus or crystals. Trama of lamellae in NH_4OH 10% sub. micr. brown-yellow from membranal pigment; no yellow hyphal septa or encrustations. Pileipellis a 2–3 cells deep, layer of colourless cells, 25–50 μm diam.

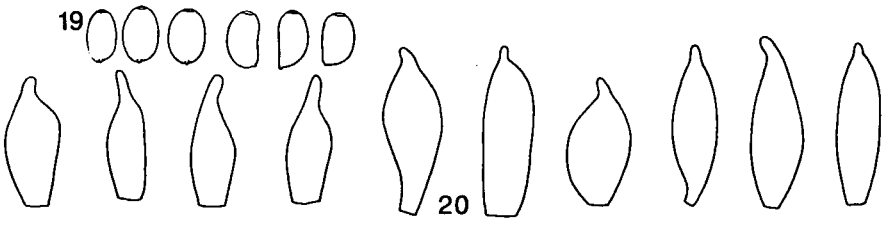
HABITAT & DISTRIBUTION.—Solitary or subgregarious, terrestrial, found along footpath close to very large saw dust area in an area of heather and some small coniferous trees. Known for certain only from type locality in Scotland (see observations).

COLLECTIONS EXAMINED.—GREAT BRITAIN, Scotland, Perthshire, Kinloch Rannoch, very close to Rannoch School, 30 Aug. 1965 (type) and 31 Aug. 1970, *E. K. v. W.* (L).

Macroscopically the Rannoch specimens looked exactly like the specimens depicted on Lange's plate 143 A and B (as *Stropharia spintrigera*) except for the ring on the stem, which in *P. spintrigera* is a cuff, in *P. rannochii* at most an annular zone. Microscopcally *P. rannochii*, however, differs from *P. spintrigera* by the presence of numerous pleurocystidia. Kew Herbarium possesses four British collections of carpophores (all labelled *P. spintrigera*), which on examination turned out to have pleurocystidia and spores fully corresponding with those of *P. rannochii*, while the macroscopical aspect of the exsiccata was compatible with that species. Field notes, however, being virtually absent, it is impossible to identify with certainty these collections as *P. rannochii*, which they, however, probably are: (1) Perthshire, Rannoch, 4 Sept. 1963 (no notes; found at the very same site as our 1965 and 1970 collections); (2) Invernessshire, Aviemore, 31 Aug. 1953 (sole notes: 'pileus dark brown, appendiculate with veil'); (3) Sutherland, Borgie Bridge, 13 Sept. 1954 (no notes); (4) Northumberland, Dipton (no date, sole note: 'on saw dust').

Psathyrella subpapillata (P. Karst.) Kits van Wav., *comb. nov.*—Figs 19, 20

Hypholoma subpapillatum P. Karst. *in* Meddn Soc. Fauna Flora fenn. **5**: 31. *1879* (basionym). — *Drosophila subpapillata* (P. Karst.) Kühn. & Romagn., Fl. anal.: 366. *1953*. — *Psathyrella subpapillata* (P Karst.) Schulm. *in* Karstenia **3**: 72. *1955* (not val. publ.).



Figs. 19, 20. *Psathyrella subpapillata, Romagnesi 152.* — 19. Sporogram (× 1210). — 20. Pleurocystidiogram (× 575).

SELECTED DESCRIPTIONS & ILLUSTRATIONS.—P. Karst. *in* Acta Soc. Sci. fenn. 1: tab. 6 fig. 27 1883 (as *Hypholoma subpapillata*). — Kühn. & Romagn., Fl. anal. 366. *1953.*

CHIEF CHARACTERISTICS.—Carpophores medium-sized, solitary, on deciduous wood; pileus 30-32 mm, at first campanulate, later spreading and wavy, striate, reddish brown with yellow hue, rugulose, towards centre punctate sub lente, hygrophanous; veil rudimentary; lamellae 2-3 mm broad, crowded, with dark brown punctate edge; stipe 20-30 × 2-4 mm, at first white, then brownish; hymenophoral trama strongly pigmented; spore print purple brown; spores 5.4-6.3 × 3.2-3.6 μm (mean values 5.9 × 3.5 μm) frequently phaseoliform, pale yellowish brown, with distinct germ pore (± 1.5 μm); pleurocystidia 30-40 × 10-15 μm, moderately numerous, subfusoid, subclavate, rostrate; marginal cells spheropedunculate, subcylindrical, clavate, and subutriform, very distinctly brown in NH_4OH 10%, intermixed with very few pleurocystidioid cells; cells of pileipellis brown.

MACROSCOPICAL CHARACTERS.—Pileus in early stages (12-15 mm) campanulate, very slightly conical, ochre; later (30-32 mm) spreading and wavy, very delicately translucently striate, reddish brown with yellow hue (very vivid colour), with paler margin, smooth but more or less rugulose, minutely micaceous and towards centre punctate by (sub lente) small brighter granules, hygrophanous, becoming extremely pale dry and then very rugose.

Veil forming in early stages some very fugacious arachnoid filaments on pileus.

Lamellae 2-3 mm broad, crowded, inequal, adnexed, fairly pointed in front, subventricose, at first pale brownish yellow, then brown-yellow, finally brown with slightly pruinose and - particularly in front - dark brown punctate edge.

Stipe 20-30 mm, rather firm though fistulose (particularly at base), more or less flexuous, springing from a remarkable tuft of rigid white hairs, at first white and shiny-silky, then pale brownish under covering of delicate longitudinal silky fibrils producing a silvery aspect, later gradually darkening, at base sometimes taking colour of pileus, with flocculose apex.

Context in centre of pileus fairly thick (3 mm), hygrophanous, when moist dark reddish brown with a yellow hue; in cortex of stipe brown yellowish, paler when dry, fragile, with strong, sweet (fungoid) smell when fresh and slightly raphanoid taste.

Trama of 'washed' lamellae strong yellow brown from numerous brownish yellow (M. 10 YR 5/6), wavy, anastomosing strands running from base to edge through the in itself pale brown (M. 10 YR 6/3, 6/4) tissue.

Spore print purplish brown.

MICROSCOPICAL CHARACTERS.—Spores 5.4-6.3 × 3.2-3.6 (mean values 5.9 × 3.5 μm; 1 collection), in profile many slightly but distinctly phaseoliform, in face view ellipsoid to subovoid, in water pale yellowish brown (M. 10 YR 6/4-7/6), darker in NH_4OH 10% (M. 7.5 YR 6/6), in KOH 5% sordid pale yellowish brown (M. 2.5 Y 6/4), with distinct germ pore (± 1.5 μm) and small hilar appendix.

Basidia 12-15 × 5 μm, subclavate, 4-spored (Romagnesi).

Pleurocystidia 30–40 × 10–15 μm (Romagnesi: 45–55 × 10–15(–17 μm), moderately numerous, subfusoid, subclavate, very slightly thick-walled, sometimes very pale brown in NH_4OH 10%, equipped with an apical, short (2–6 × 1.5–2.5 μm), thin-walled, colourless, and usually curved protuberance (mucronate) according to Romagnesi sometimes enveloped by a refractive exsudate.

Marginal cells: spheropedunculate, clavate, subcylindrical, and subutriform cells, 20–30 × 8–15 μm, almost all of them with slightly thickened walls and many, especially the larger cells, conspicuously brown in NH_4OH 10%; pleurocystidioid (mucronate) cheilocystidia, 25 × 12.5 μm, very sparse; no mucus or crystals.

Caulocystidia none found.

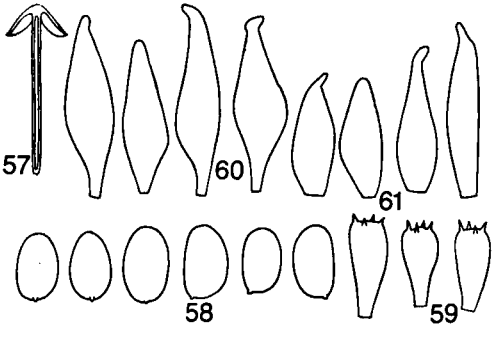
Pigmentation of hymenophoral trama in NH_4OH 10% sub micr.: narrow hyphae strong brownish yellow from membranal pigment, with a great many yellow hyphal septa; broad hyphae pale brown; no encrustations.

Pileipellis; a (2–3) cells deep layer of subglobose cells, 30–50 μm diam., brown in NH_4OH 10%.

HABITAT.—According to Romagnesi (in litt.) solitary or in groups of 2 specimens on old decaying stump of (probably deciduous) tree.

COLLECTION EXAMINED.—France, 2 Febr. 1938. *H. Romagnesi* (herb. Romagn. Nr. 152).

The description of the macroscopical characters of this species is a translation of a full description which we received from Romagnesi; the description of the microscopical characters is based on our own examination of an exsiccatum received from Romagnesi. As it turned out to be Romagnesi (in litt.) had regarded the sub lente minutely granular surface of the centre of the cap as the prime diagnostic feature of this species. But in the 'Flore analytique' it is the brown punctate gill edge which is printed in bold face as the most striking character of the species. It has been the granular surface of the cap (and not the brown punctate gill edge) which made Romagnesi (in litt.) separate *P. subpapillata* from the very closely related *P. laevissima*, which has a smooth surface (hence the name). Both species have mucronate cystidia. In *P. laevissima* also a number of spheropedunculate cells (often in clusters) are distinctly brown in NH_4OH 10%, be it not to the extent we found them to be in *P. subpapillata* (see observations on *P. laevissima*). Karsten (*1879*: 31) described the surface of his *Hypholoma subpapillatum* as 'papillis minutissimus subscaber', his plate 6 fig. 27 merely showing a mat surface. A minutely granular



Figs. 57–61. *Psathyrella umbrina*, 5 Sept. 1968. — 57. Habit sketch (× 0.5). — 58. Sporogram (× 1210). — 59. Badidiogram (× 575). — 60. Pleurocystidiogram (× 575). — 61. Cheilocystidiogram (× 575).

surface of the cap, no doubt due to its cellular structure, is also occasionally seen in species of *Pluteus*, *Panaeolus* and some species of *Psathyrella*. In fact, Romagnesi himself described the surface of his *Drosophila chondrodermoides* (= *P. mucrocystis*) as 'un peu grénelée-chagrinée au milieu s.l.'. The phenomenon of the granular surface therefore, not being specific, the brown punctate gill edge not being mentioned in Karsten's description and type material being non-existent (as we learned from the Helsinki herbarium), we at first were inclined to regard Karsten's name as a nomen dubium and to describe Romagnesi's species under a new name. In the end, however, we decided to follow Romagnesi in preserving Karsten's epithet for it.

On close comparison (on one slide) of the spores of *P. subpapillata* and *P. laevissima*, we found those of the former species to be slightly paler and to have a more distinct and larger (1.5 μm) germ pore. The shape of the pleurocystidia was for both species the same.

Psathyrella umbrina Kits van Wav., *spec. nov.*—Figs. 57-61

Carpophoria parva, separatim crescentia terrestria. Pileus 12 mm latus, campanulatus, margine subrevolutus, striatus, badius, hygrophanus, exarescens haud roseus neque rugulosus. Velum validum, fibrillosum, pilei marginem versus densum, haud appendiculatum. Lamellae 3 mm latae, anguste adnatae, brunneae, acie albae. Stipes 45 × 1.5 μm, eradicatus, albus. Caro badia in pileo, alba in stipite sed brunnea ad basin. Sporae (6.8-)7.2-8.1 × 4.5-5 μm, haud phaseoliformes, ochraceae, poro germinativo destitutae. Basidia 4-sporigera. Pleurocystidia 35-42.5 × 10-12.5 μm, modice numerous, fusoidea, stipitata, complures mucronatae, nonnulae apicibus mucoso-obtectae. Cheilocystidia dissipata, pleurocystidiis similia. Pileipellis e cellulis formata. Typus: 'Great Britain, Scotland Invernessshire, Tomich, 5 Sept. 1968, E. K. v. W.' (L).

CHIEF CHARACTERISTICS.—Carpophore small, isolated, terrestrial (in moss); pileus 12 mm, campanulate with extreme margin revolute, striate, reddish brown, hygrophanous; veil rather strongly developed, not appendiculate; lamellae 2 mm broad, narrowly adnexed, distinctly brown, with white edge; stipe 45 × 1.5 mm, white; hymenophoral trama little pigmented. Spores (6.8-)7.2-8.1 × 4.5-5 (mean values 7.3 × 4.6 μm: 1 collection) not phaseoliform, without germ pore, ochreous yellow; pleurocystidia 35-42.5 × 10-12.5 μm, moderately numerous, fusoid pedicellate and many mucronate; gill edge with only pleurocystidioid cheilocystidia and basidia.

MACROSCOPICAL CHARACTERS.—Pileus 12 mm diam., campanulate, at extreme margin slightly revolute, striate up to 2/3 from margin, reddish brown (M. 5 YR 4/3), hygrophanous, soon drying from margin via brown (M. 7.5 YR 5/4) to pale yellowish brown (M. 10 YR 6/4, 6/3) without pink, neither micaceous nor rugulose.

Veil rather strongly developed on pileus, forming a fairly dense wicker-work of radially arranged white fibrils, reaching up to 1/3 from margin, densest at margin where the fibrils form a united rather dense velar zone, not appendiculate.

Lamellae 3 mm broad, moderately ventricose, narrowly adnexed, rounded near stipe, pale cocoa colour when viewed from below but distinctly brown (M. 7.5 YR 5/4) in face view, with white edge.

Stipe 45 × 1.5 mm, straight, cylindrical, hollow, not rooting, shiny from a very thin white, minutely longitudinally striate fibrillose layer through which at base brown colour of context visible over a distance of 10 mm.

Context in centre of pileus 1 mm thick, reddish brown (M. 5 YR 4/3), in stipe white, in lower half pale brown, at base brown.

Hymenophoral trama of 'washed' lamellae pale brown (M. 10 YR 7/2-7/3), at extreme base yellowish brown (M. 10 YR 6/4).

Spore print not recorded.

MICROSCOPICAL CHARACTERS.—Spores (6.8-)7.2-8.1 × 4.5-5 (mean value 7.3 × 4.6 μm; 1 collection), in profile more or less adaxially flattend ellipsoid (not phaseoliform), in face view ellipsoid to ovoid, in water, NH_4OH 10% and KOH 5% ochreous yellow (M. 7.5 YR 6/6), without germ pore, with small but distinct hilar appendix, not opaque.

Basidia 17.5-22.5 × 7.5-8.5 μm, clavate, 4-spored.

Pleurocystidia 35-42.5 × 10-12.5 μm, moderately numerous, fusoid, pedicellate, many distinctly mucronate (short, curved, apical appendix) and if not then with subacute apex, thin-walled, colourless, without crystals: top part (± 1/4-1/3) of a number of cells covered with a very thin greyish mucoid film.

Marginal cells: Pleurocystidioid cheilocystidia 25-37.5(-40) × 7.5-12.5 μm; rather few in number and scattered among many basidia, spheropedunculate cells absent.

Caulocystidia: pleurocystidioid caulocystidia versiform, 35-50 × 7.5-15 μm (1 mucronate cell seen) and scattered, spheropedunculate cells 30-35 × 15-17.5 μm, few in number.

Pigmentation of hymenophoral trama in NH_4OH 10% sub micr.: at base narrow hyphae distinctly brown, broad hyphae very pale brown with a small number of yellowish hyphae septa and a fair number of very small encrustations, for the rest hyphae pale brown, without yellow septa and encrustations.

Pileipellis a 2-3 cell deep layer of subglobose, cells, 25-50 μm, very pale brown in NH_4OH 10%

Clamps on caulocystidia and numerous on hyphae of stipe.

HABITAT.—One specimen found in moss (not on wood!) under birch. Known only from type locality.

COLLECTION EXAMINED.—GREAT BRITAIN, Scotland, Invernessshire, Tomich, 5 September 1968, *E. K. v. W.* (Type L).

On the strength of its small and pale spores and its brown cap and gills this species deserves a place in section *Hydrophilae*. Together with *P. laevissima* and *P. subpapillata* it forms the small group of species which are characterized by their small size and mucronate pleurocystidia.

Although we are basing this species on only one specimen, its features are so characteristic (small size, campanulate brown cap, brown gills, well-developed veil, ochreous yellow spores without germ pore, mucronate pleurocystidia, heteromorphous gill edge, solitary growth in moss) that we have not hesitated in describing it as a new species.

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