

ADDITIONS TO OUR MONOGRAPH ON PSATHYRELLA

Thirteen new species, some revised keys, comments on other recently described species, and corrections and additions to our monograph

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Thirteen new species and a new variety of *Psathyrella* are described: *P. badia*, *P. bernhardii*, *P. borgensis*, *P. capitatocystis*, *P. dennyensis*, *P. minutissima*, *P. mookensis*, *P. multicystidiata*, *P. perpusilla*, *P. ploddensis*, *P. romseyensis*, *P. twickelensis*, *P. vyrnwyensis*, and *P. obtusata* var. *aberrans*. Some rectifications in the keys published in our monograph (Kits van Waveren, 1985) and some reconstructed keys necessitated by the insertion of new species are given. Recently described new species from outside the area covered by our monograph are briefly described and discussed. Corrections in and supplementary information to some of our descriptions in the monograph and a redescription of *P. obtusata* are presented.

Having brought about the manuscript of our monograph on the Dutch, French, and British species of *Psathyrella* (Kits van Waveren, 1985), we found ourselves still facing some 65 unidentified but fully described collections (dated from 1959 up till 1984) of which we started the identification in 1984. Almost all of these had been collected by ourselves.

Since 1982 we regularly received excellently documented material from Scandinavian countries, especially from Mr. O. Weholt (Norway) who supplied us with a wealth of exsiccata, accompanied with excellent drawings and descriptions, which widened our knowledge about the awesome variability in species of *Psathyrella*, which so often leads to erroneous interpretations.

Among our 65 unidentified collections we came across a few species in which we acquired a better insight in the variability of their characters, necessitating (usually slight) alterations in or additional information to descriptions of species in our monograph. These cases the reader will find enumerated in the last part of this paper, viz. that with supplementary notes and corrections to our monograph, in the same sequence as in that work.

As expected we came across a number (in fact 13) of hitherto unknown species, which we felt had to be described as new. Their descriptions and accompanying drawings are to be found in the first part of this paper, arranged per section or subsection. In the keys to sections *Hydrophilae* and *Pennatae* and subsection *Lutenses* several new species had to be inserted which resulted in considerable alteration and reshuffling. In these cases newly constructed keys are provided.

In our monograph *P. obtusata* is dealt with in section *Hydrophilae* (and only very unobtrusively in the key to the species of section *Pennatae*), as the mean length of the spores can be 7.5  $\mu\text{m}$  or less while all other macroscopical and microscopical characters are in keeping with those of the other species of that section. It is now given full value in the key to section *Pennatae* as more often the mean length of the spores is 7.6–7.9  $\mu\text{m}$ . Moreover a new, distinctive and in our opinion taxonomically important microscopical feature was discovered and added to the key characters. Improved knowledge of this species made a complete redescription desirable.

The illustrations of both the macroscopical and microscopical characters for each taxon again have been taken and selected from all collections available of the taxon involved in order to demonstrate the variability of all characters. All our pictures of fruit-bodies were drawn at natural size. Spores were drawn with a magnification of  $\times 2420$  and reduced to  $\times 1210$ . Basidia and cystidia were drawn at  $\times 1150$  and reduced to  $\times 575$ . These magnifications are not indicated in our illustrations or legends.

## DESCRIPTIONS OF NEW SPECIES

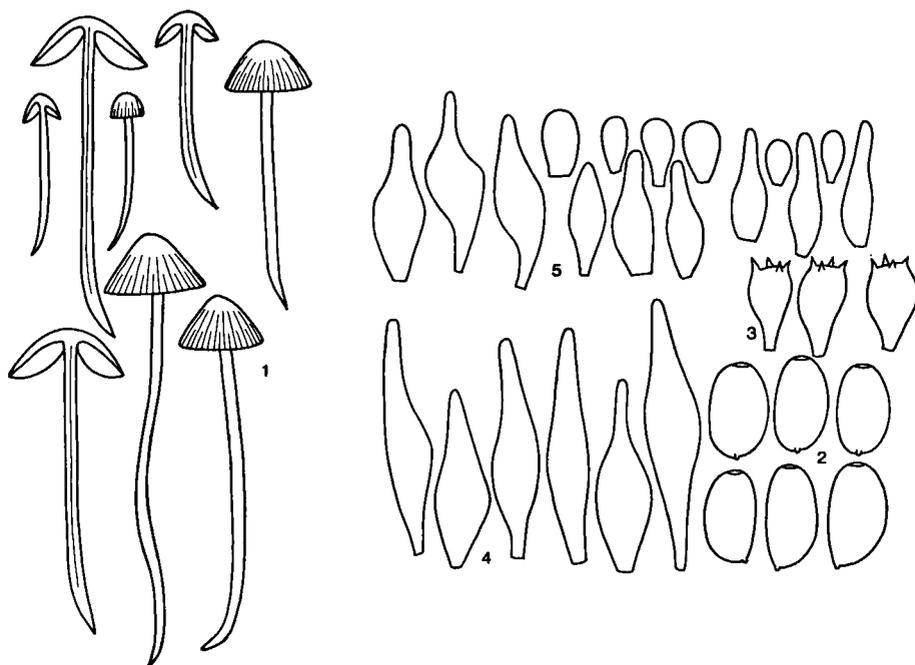
### SECTION PSATHYRELLA

#### *Psathyrella bernhardii* Kits van Wav., *spec. nov.*—Figs. 1–5

Pileus primo 4–5 mm latus, parabolicus, badius, maturitate 10–16 mm, parabolicus vel conico-parabolicus, brunneus, pallidior marginem versus, dein obscure sordideque brunneus, striatus, hygrophanus, in sicco alutaceus fere albus, vel pallide cinereus, colore roseo destitutus, rugulosus, atomatus. Velum album e fibrillis et fasciculis formatum, haud appendiculatum. Lamellae 2–3 mm latae, ventricosae, anguste adnatae, primo dilute brunneae, maturitate obscure sordideque cinereopurpureo-brunneae, acie albae. Stipes 25–40  $\times$  1–1.5 mm, cylindraceus cavus, radicans, albidus deorsum isabellinus, apice pruinosis. Caro pilei centro 1 mm crassa, obscure brunnea, stipitis albida, deorsum dilute brunnea, basi brunnea. Sporae in cumulo purpureoatrae, (9–)10–11(–11.5)  $\times$  5.5–6.5  $\mu\text{m}$ , ellipsoideae haud phaseoliformes, in aqua observatae obscure rubrae, poro germinativo magno (1.8–2  $\mu\text{m}$ ) munitae, non opacae. Basidia 20–25(–27.5)  $\times$  10–12.5  $\mu\text{m}$ , spheropedunculata, 4-sporigera. Pleurocystidia 45–65  $\times$  12.5–15  $\mu\text{m}$ , sat numerosa, fusoidea pedicellata, collo cylindraceo vel subcylindraceo angusto praedita, tenuitunicata, subincolorata. Cellulae marginales: cheilocystidia lageniformia vel sublageniformia, collo cylindraceo praedita, 25–47.5  $\times$  8–11  $\mu\text{m}$ , numerosa, cellulis spheropedunculatis et clavatis 10–17.5  $\times$  8–11  $\mu\text{m}$  et basidiis intermixtis. Pileipellis e cellulis formata. Trama lamellarum colorata. Terrestis, in sabulo arido atro, sub Fago. Autumno. Gregaria. Typus: The Netherlands, prov. Overijssel, Delden, 17 Sept. 1972, *E. Kits van Waveren* (L).

Etymology: Named in honour of H. R. H. Prince Bernhard of the Netherlands, Founder President of the World Wild Life Fund International.

Cap in early stages 4–5 mm broad, paraboloid and reddish brown (Mu. 5 YR 4/3, 3/4), very soon centre and ridges between the striae without reddish hue and merely dark brown (Mu. 7.5 YR 4/4), striae themselves slightly paler (Mu. 7.5 YR 5/4), overall colour, dark brown (Mu. 5 YR 4/4), paler near margin, striate up to half-way from margin; at maturity 10–16 mm, paraboloid or conico-paraboloid, dark sordid, fuliginous brown (Mu. 7.5 YR 3/2; 10 YR 3/2, 3/3), striate up to 1/2–2/3 from margin, only slightly paler (Mu. 10 YR 4/3) near margin, hygrophanous, rapidly drying out to alutaceous, almost white or very pale greyish (Mu. 10 YR 7/2, 8/2), without pink but rugu-



Figs. 1–5. *Psathyrella bernhardii*. — 1. Carpophores ( $\times 1$ ). — 2. Spores. — 3. Basidia. — 4 Pleurocystidium. — 5. Cheilocystidium.

lose and micaceous. Veil white, in early stages forming rather coarse fibrils and wickerworks of fibrils, reaching up to half-way from margin, in places rather dense at margin, not appendiculate, fugacious, at full maturity few fibrils both near margin of cap and on stem. Gills 2–3 mm broad, ventricose, narrowly adnate, at first pale brown (Mu. 10 YR 6/3), at maturity sordid greyish brown (Mu. 10 YR 5/3), finally dark sordid greyish-purplish brown (Mu. 7.5 YR 4/2), with white edge, not underlined with red. Stem 25–40  $\times$  1–1.5 mm, cylindrical, distinctly rooting (pseudorrhiza up to 12 mm), hollow, whitish in upper part, isabelline lower down, at base brown (Mu. 10 YR 5/3), at extreme apex little pruinose. Trama of ‘washed’ gills pigmented, be it not strongly, in basal 1/4 of gill pale yellowish brown (Mu. 10 YR 6/4), towards edge via pale greyish brown (Mu. 10 YR 7/3) to very pale greyish brown, almost greyish (Mu. 10 YR 7/2) at edge. Spore print purplish black.

Spores (9–)10–11 (–11.5)  $\times$  5.5–6.5  $\mu\text{m}$  (mean values 10.4–5.8  $\mu\text{m}$ : 1 collection), ellipsoid, adaxially flattened, dark, in water dark red (Mu. 2.5 YR 3/6), in  $\text{NH}_4\text{OH}$  10% dark brown (Mu. 5 YR 4/4, 3/4), in  $\text{KOH}$  5% very dark fuliginous brown (Mu. 7.5 YR 4/2; 10 YR 3/3), not opaque, with large germ pore (1.8–2  $\mu\text{m}$ ) and distinct hilar appendix. Basidia 20–25 (–27.5)  $\times$  10–12.5  $\mu\text{m}$ , spheropedunculate, 4-spored. Pleurocystidia 45–65  $\times$  12.5–15  $\mu\text{m}$ , moderately numerous, fusoid-pedicellate with narrow (3–4  $\mu\text{m}$ ) cylindrical to subcylindrical neck, gradually passing into ventricose cell body, thin-walled, practically colourless in  $\text{NH}_4\text{OH}$  10%. Marginal cells: lageniform to sublageniform cheilo-

cystidia with cylindrical neck more sharply delimited from cell body than with pleurocystidia,  $25-47.5 \times 8-11 \mu\text{m}$ , numerous (but not densely packed as in *P. microrrhiza*), intermixed with many unobtrusive small spheropedunculate and clavate cells,  $10-17.5 \times 7.5-10 \mu\text{m}$  and both immature and mature basidia; all cells thin-walled and colourless. Hymenophoral trama in basal part of gills distinctly brown from membranal pigment with few yellow hyphal septa and a fair number of minute encrustations; pigmentation decreasing towards edge and very faint in peripheral half of gill. Pileipellis a 2-3 cells deep layer of globose and subglobose colourless cells,  $15-40 \mu\text{m}$  diam.

Habitat.—Terrestrial in sandy soil of a roadside of a main road under *Fagus*, some specimens attached to beech-nuts. September. Gregarious. Known only from type locality.

Collection examined.—THE NETHERLANDS, prov. Overijssel, Delden, main road Delden-Borne near ice-rink (some 40 specimens), 17 Sept. 1972. E. K. v. W. (type, L).

The species is close to *P. trepida* (as interpreted and described in our monograph, 1985: 74), with which it has in common the fuliginous colour of cap and gills and the relatively small spores. It is distinguished from *P. trepida* by its much smaller size (cap only up to 16 mm, stem only up to 40 mm long), its cap being paraboloid and not becoming convex, its narrowly adnate gills, its fusoid and not sublageniform pleurocystidia, its distinctly pigmented hymenophoral trama and its habitat (not in marshy area).

In our monograph *P. bernhardii* keys out in section *Psathyrella* near *P. trepida*. The following additions to the key to the species of that section (p. 41) are necessary:

21. Spores small (mean values  $10.4-10.8 \times 5.8-6 \mu\text{m}$ ), caps fuliginous brown:
  - 21\* Caps 12-30 mm broad, at maturity becoming convex; stem 45-80 mm long; pleurocystidia sublageniform; in marshes . . . . . *P. trepida*
  - 21\* Caps 10-16 mm broad, at maturity remaining paraboloid or conico-paraboloid; stem 20-40 mm long; pleurocystidia fusoid-pedicellate with narrow, fairly long neck, terrestrial *P. bernhardii*
21. Spores large (mean values  $12-13.7 \times 6.5-7.6 \mu\text{m}$ ), caps not fuliginous:

## SECTION HYDROPHILAE

### REVISED KEY TO THE SPECIES OF SECTION HYDROPHILAE<sup>1</sup>

1. Spores very small, average size  $5.3-6.1 \times 3.4-3.6 \mu\text{m}$ :
  2. Pleurocystidia mucronate:
    3. Pleurocystidia  $32.5-45 \mu\text{m}$  long, with  $\pm$  plumpy rostra of  $2.5-6 \times 2.5-5 \mu\text{m}$ , not sharply delimited from cell body (rarely narrower or longer, up to  $10 \mu\text{m}$ ); pleurocystidioid cheilocystidia very scarce; cap smooth . . . . . *P. laevissima*
    3. Pleurocystidia  $40-70 \mu\text{m}$  long, with narrow rostra of  $2-10 \times 1.5-2.5(-3) \mu\text{m}$ , sharply delimited from cell body; pleurocystidioid cheilocystidia numerous; cap at centre minutely granular . . . . . *P. subpapillata*
  2. Pleurocystidia not mucronate:
    4. Germ pore distinct; carpophores solitary, thick-set . . . . . *P. hydrophiloides*
    4. Germ pore indistinct (callus) or very small; carpophores caespitose, subcaespitose, rarely solitary, rather slender:

<sup>1</sup> For three extralimital species see elsewhere in this paper: *P. berolinensis* from Germany (p. 361), *P. ivoeensis* from Sweden (p. 365), *P. stigmatospora* from Switzerland and Sweden (p. 363).

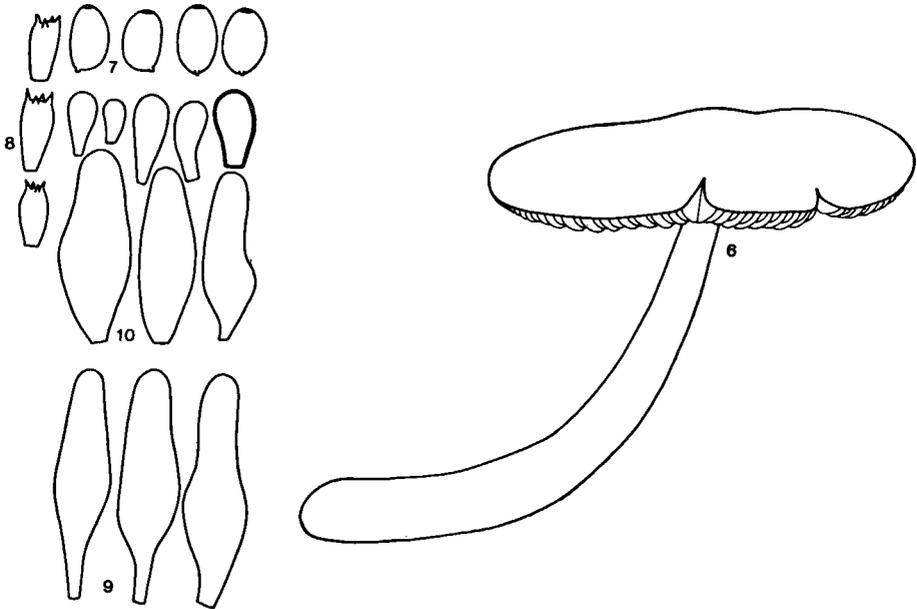
5. Pleurocystidia non-capitate, mainly fusiform, ventricose or clavate, some utriform, with broad, short pedicel; germ pore indistinct (callus); smell indistinctive  
*P. piluliformis* (see also p. 367)
5. Pleurocystidia broadly capitate to subcapitate, mainly narrowly to broadly ventricose, more rarely utriform, slenderly clavate, with fairly narrow and somewhat longer pedicel; germ pore very small (0.5  $\mu\text{m}$ ); smell distinct and sweet . . . . . *P. fragrans*
1. Spores larger, average size 6.8–7.5  $\times$  3.9–5  $\mu\text{m}$  (but rather frequently 7.6–7.9  $\mu\text{m}$  long in *P. obtusata*):
  6. Pleurocystidia (most, many to only a few) mucronate:
    7. Carpophores medium-sized to fairly large; caps 30–70 mm *P. mucrocystis* (see also p. 367)
    7. Carpophores small; caps 12–15 mm  
*P. umbrina* var. *umbrina* (see also *P. subumbrina* from Sweden, p. 362)
  6. Pleurocystidia never mucronate:
    8. Pleurocystidia in their upper part covered by mucoid substance, staining red in neutral red  
*P. pseudocasca*
  8. Not as above:
    9. Pleurocystidioid cheilocystidia very to moderately numerous:
      10. Pleurocystidia fusoid, ellipsoid or sublageniform:
        11. Many pleurocystidia with short to fairly long (sub-)cylindrical, often subcapitate apical elongation; spores distinctly phaseoliform  
*P. chondroderma* (see also p. 367)
        11. Not as above:
          12. Spores distinctly phaseoliform, in water pale brownish (Mu. 10 YR 5/6, 7.5 YR 6/6); pleurocystidia fusiform to sublageniform with subacute to obtuse apex, 40–70  $\times$  10–16  $\mu\text{m}$ ; gills reddish rust-brown  
*P. frustulenta* (see also p. 367)
          12. Spores not phaseoliform, in water dark brown (Mu. 5 YR 4/6); pleurocystidia rather narrowly fusoid to sublageniform, 32.5–55 (–60)  $\times$  8–12.5  $\mu\text{m}$ , with acute to subacute apex; gills dark brown with purplish hue . . . . . *P. rannochii*
      10. Pleurocystidia utriform:
        13. Large species (cap 60 mm, stem 85  $\times$  7–10 mm) . . . . . *P. borgensis*, p. 332
        13. Small species (cap 12–19 mm, stem 30–65  $\times$  1.5–3 mm):
          14. Spores with distinct germ pore, fairly dark, in water orange-brown (Mu. 5 YR 5/6, 4/6); veil poorly developed, rudimentary  
*P. mookensis*, p. 333
          14. Spores with indistinct (callus) or absent germ pore, conspicuously pale or distinctly dark; veil strongly developed.
            15. Germ pore absent; spores conspicuously pale, in water yellow (Mu. 7.5 YR 6/6, 7/8); spore print distinctly brown  
*P. umbrina* var. *utriformis*
            15. Germ pore indistinct (callus); spores dark, in water reddish (Mu. 2.5 YR 4/8); spore print very dusky red . . . *P. dennyensis*, p. 335
  9. Pleurocystidioid cheilocystidia (very) scarce, spheropedunculate and clavate cells abundant:
    16. Pleurocystidia ventricose-fusiform (or sublageniform); few to many spheropedunculate or clavate cells at their apex equipped with a short thick protuberance or somewhat longer subcylindrical or cylindrical short neck  
*P. obtusata* var. *obtusata*, p. 337
    16. Pleurocystidia utriform; no spheropedunculate or clavate cells equipped with a protuberance . . . . . *P. obtusata* var. *aberrans*, p. 340

*Psathyrella borgensis* Kits van Wav., *spec. nov.*—Figs. 6–10

Pileus maturitate 60 mm latus, subplanus, subumbonatus, badius, marginem versus pallidior, magis brunneus et leviter purpureo-tinctus, striatus, hygrophanus, in sicco pallide cinereo-ochraceus, centro ochraceo brunneus, margine distincte roseus. Velum tenue. Lamellae 4 mm latae, subconferatae, ventricosae, late adnatae, obscure brunneae et purpureo-tinctae, acie albae. Stipes 85 × 7 (apex)–10 mm (basis), cylindraceus, eradicatus, apice albus, pruinosis et striatus, albus, deorsum sordide albus, ad basim isabellinus. Caro pilei 2–3 mm crassa, concolor, stipitis alba, infra isabellina. Sporae in cumulo obscurissime purpureobrunneae, 6.5–7.0(–8.0) × (4.0–)4.5(–5)  $\mu\text{m}$ , ellipsoideae, saepe ellipsoideo-ovoideae, raro subphaseoliformes, in aqua observatae brunneae, poro germinativo c. 1.5  $\mu\text{m}$  lato munitae. Basidia 15–17.5 × 7.5–8  $\mu\text{m}$ , clavata, 4-sporigera. Pleurocystidia 50–57.5 × 12.5–15  $\mu\text{m}$ , numerosa, utriformia, tenuitunicata. Cellulae marginales: cheilocystidia pleurocystidioidea similia 30–45 × 12.5–17.5  $\mu\text{m}$ , numerosa; cellulae spheropedunculatae et clavatae 10–20 × 5–10  $\mu\text{m}$  numerosae intermixtae, interdum subcrasse tunicata et pallide brunneae. Pileipellis e cellulis formata. Trama lamellarum colorata. Ad terram, solitaria, in silvis frondosis. Aestate. Typus: The Netherlands, prov. Overijssel, Denekamp, Borgbosch, 11 July 1964, *E. Kits van Waveren* (L).

Etymology: Named after the type locality.

Cap at maturity 60 mm, convex to almost plane, with vague umbo (20–25 mm broad), at centre fairly dark reddish brown (Mu. 5 YR 4/3, 4/4), elsewhere less reddish and paler brown (Mu. 5 YR 5/3, 5/4) with a trace of purple, particularly in marginal area, striate up to half-way, hygrophanous, drying out to ochreous brown (Mu. 7.5 YR 5/6) at centre, elsewhere pale greyish brown (Mu. 10 YR 6/3), in c. 20 mm broad marginal



Figs. 6–10. *Psathyrella borgensis*. — 6. Carpophore (×1). — 7. Spores. — 8. Basidia. — 9. Pleurocystidiogram. — 10. Cheilocystidiogram.

area slightly but distinctly pink, in peripheral half distinctly rugulose and slightly micaceous. Veil rudimentary, at maturity forming scattered minute fibrils along margin of cap and loose fibrils on stem. Gills 4 mm broad, fairly crowded, ventricose, ending sharply at margin of cap, broadly adnate without tooth, conspicuously dark brown (Mu. 7.5 YR 4/2) with purplish hue, paler and more greyish brown near edge; edge white but in some places pale brown, not red underlined. Stem 85 × 7 mm at apex, 10 mm at base, very gradually thickening towards base, fragile, not rooting, at apex white, slightly pruinose and striate over a distance of 20 mm, elsewhere sordid white and at base isabelline, very finely fibrillose striate below apex, hollow; cavity wide and penetrating into flesh of cap. Flesh of cap in centre 3 mm thick but above cavity of stem 2 mm thick, at surface of cap concolorous, elsewhere greyish brown; of stem white but near base pale brown and at base brown; smell indistinctive. Trama of 'washed' gill equally strongly pigmented from base to edge, pale brown (Mu. 10 YR 6/3). Spore print very dark purplish brown.

Spores 6.5–7.0(–8.0) × (4.0–)4.5(–5) μm (mean values 6.9 × 4.5 μm: 1 collection), ellipsoid or ellipsoid-ovoid, not phaseoliform, adaxially flattened, rarely subphaseoliform, in water dark warm brown (Mu. 5 YR 4/6), in NH<sub>4</sub>OH 10% darker (Mu. 5 YR 4/4), in KOH 5% sordid brown (Mu. 10 YR 4/3), not opaque, with distinct germ pore (1.5 μm) and small hilar appendix. Basidia 15–17.5 × 7.5–8 μm, clavate, 4-spored. Pleurocystidia 50–57.5 × 12.5–15 μm, numerous, utriform with fairly short pedicel, the majority with subapical constriction, thin-walled, colourless or faintly brown in NH<sub>4</sub>OH 10%. Marginal cells: pleurocystidioid cheilocystidia 30–45 × 12.5–17.5 μm, many rather thick-set as compared with pleurocystidia, numerous, quite a few pale to distinctly brown in NH<sub>4</sub>OH 10%, at their base intermixed with numerous, unobtrusive spheropedunculate and clavate cells, 10–20 × 5–10 μm; the (many) larger cells slightly to distinctly brown in NH<sub>4</sub>OH 10%, somewhat thick-walled and sometimes irregularly shaped. Hymenophoral trama in NH<sub>4</sub>OH 10% sub micr.: narrow hyphae distinctly, broad hyphae scarcely brown from membranal pigment with few yellow hyphal septa in basal part of gill, without encrustations. Pileipellis a 2–3 cells deep layer of colourless subglobose cells, 15–40(–50) μm diam.

Habitat & distribution.—Terrestrial, solitary, found growing from the almost vertical side of a small, shallow dry ditch (hence the curved stem). Known only from type locality.

Collection examined.—THE NETHERLANDS, prov. Overijssel, Denekamp, Borgbosch, 11 July 1964, E. K. v. W. (type, L).

We rank this species with those of section *Hydrophilae* on account of the small size of the spores, although in some respects it seems close to *P. fusca* (pink colour in the marginal area of the drying cap, rudimentary veil, gills dark brown with a purplish hue). But in *P. fusca* (mean length of the spores 7.5–8.4 μm) the cap is always conical or conico-paraboloid, never plane or vaguely umbonate, while the pleurocystidia differ in shape from those of *P. borgensis*.

#### *Psathyrella mookensis* Kits van Wav., *spec. nov.*—Figs. 11–15

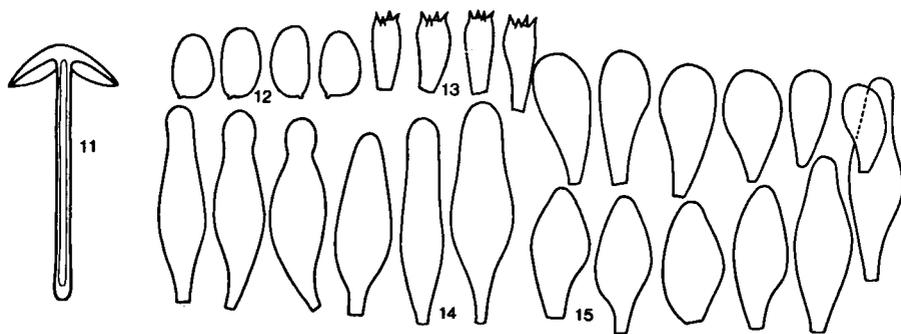
Pileus 16 mm latus, conico-convexus, striatus, griseobrunneus, centro vero flavospadiceus, hygrophanus, in sicco pallide brunneus, colore roseo destitutus. Velum tenue. Lamellae 2 mm latae, adscendentes, late adnatae, obscure purpureobrunneae, acie albae. Stipes 30 × 2 mm, cylindraceus, eradicatus, albus, infra pallide flavobrunneus apice pruinosis. Caro pilei 1.5 mm crassa, concolor, stipi-

*tis alba*, infra isabellina. Sporae in cumulo non observatae,  $6.5-7.0 \times 4.5 \mu\text{m}$ , ellipsoideae, saepe ovoideae, haud phaseoliformes, in aqua observatae aurantiacobrunneae, poro germinativo  $1-1.5 \mu\text{m}$  lato munitae. Basidia  $17.5-22.5 \times 7.5-8 \mu\text{m}$ , clavata, 4-sporigera. Pleurocystidia  $42.5-57.5 \times 12.5-17.5 \mu\text{m}$  numerosa, utriformia, tenuitunicata. Cellulae marginales: cheilocystidia pleurocystidioidea similia,  $30-40(-50) \times 12.5-15 \mu\text{m}$ , cheilocystidia spheropedunculata et clavata,  $20-30(-40) \times 10-15 \mu\text{m}$ , et cellulis forma intermedia numerosis intermixtis. Trama lamellarum colorata. Pileipellis e cellulis formata. Ad terram, solitaria, in silvis frondosis. Typus: The Netherlands, prov. Limburg, Mook, 30 July 1965, *E. Kits van Waveren* (L).

**Etymology:** Named after the village Mook, in the area of which the species was found.

Cap 16 mm, conico-convex, striate up to half-way, greyish brown, with ochreous (Mu. 10 YR 7/6-6/6) centre, hygrophanous, drying out to very pale brown (Mu. 10 YR 8/3), without pink, not micaceous but distinctly rugulose. Veil only seen on lower third of stem as white fibrils. Gills 2 mm broad, rounded near margin of cap, then ascending, straight, broadly adnate with tooth, dark purplish brown (Mu. 2.5 YR 3/2; 5 YR 3/2), with white edge. Stem  $30 \times 2$  mm, cylindrical, neither rooting nor bulbillate, white but in lower half pale yellowish brown, hollow, with distinctly pruinose apex. Flesh of cap in centre 1.5 mm thick, concolorous, of stem white but in lower half pale isabelline. Trama of 'washed' gills pale brownish yellow (Mu. 10 YR 7/4) from base to edge. Spore print colour not recorded.

Spores  $6.5-7.0 \times 4.5 \mu\text{m}$  (mean values  $6.9 \times 4.5 \mu\text{m}$ ; 1 collection), in face view ellipsoid, but many distinctly ovoid, in profile adaxially flattened, in water not pale, (orange-) brown (Mu. 5 YR 5/6, 4/6), in  $\text{NH}_4\text{OH}$  10% dark brown (Mu. 5 YR 4/3), in KOH 5% sordid brown (Mu. 10 YR 5/4, 4/4), not opaque, with fairly distinct germ pore ( $1-1.5 \mu\text{m}$ ) and small hilar appendix. Basidia  $17.5-22.5 \times 7.5-8 \mu\text{m}$ , clavate, 4-spored. Pleurocystidia  $42.5-57.5 \times 12.5-17.5 \mu\text{m}$ , numerous, utriform almost always with a subapical constriction, with relatively short, fairly broad pedicel, thin-walled, colourless. Marginal cells a motley of numerous utriform cells,  $30-40(-50) \times 12.5-15 \mu\text{m}$  and spheropedunculate and clavate cells,  $20-30(-40) \times 10-15 \mu\text{m}$ , with numerous intermediate stages. Hymenophoral trama in  $\text{NH}_4\text{OH}$  10% pale yellowish brown from membranal pigment, paler towards edge, without yellow hyphal septa, with very few minute encrustations. Pileipellis a 2-3 cells deep layer of globose, subglobose ( $15-30 \mu\text{m}$ ) and also ellipsoid ( $30-50 \times 15-20 \mu\text{m}$ ), colourless cells.



Figs. 11-15. *Psathyrella mookensis*. — 11. Carpophore ( $\times 1$ ). — 12. Spores. — 13. Basidia. — 14. Pleurocystidiogram. — 15. Cheilocystidiogram.

**Habitat & distribution.**—Solitary in humus, found along footpath in deciduous wood. Known only from type locality.

**Collection examined.**—THE NETHERLANDS, prov. Limburg, Groesbeek near hotel Wolfsberg, 30 July 1965, *E. K. v. W.* (type, L).

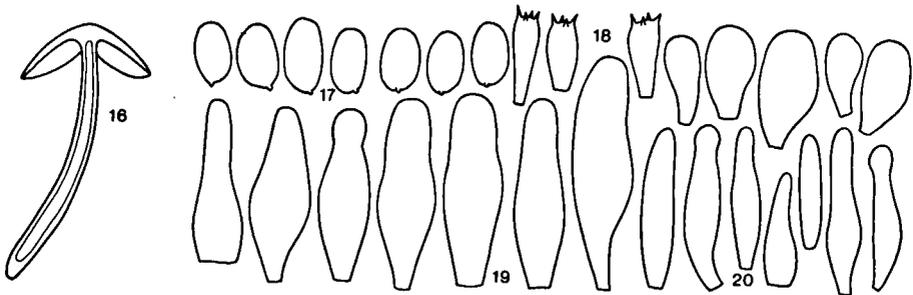
Although the colour of cap, gills, and hymenophoral trama is not conspicuously brown, this species belongs to section *Hydrophilae* because of its small spores.

***Psathyrella dennyensis* Kits van Wav., spec. nov.**—Figs. 16–20

Pileus 19 mm, conico-parabolicus, obscure sordideque brunneus recens an perobscure badius, valde striatus, hygrophanus, in sicco pallide brunneus, colore roseo destitutus, haud rugulosus nec atomatus. Velum album, insigne e flocculis in zona pilei marginale sat angusta etiam appendiculatum, stipitem infra apicem pruinose omnino fibrillis lanosis obtegens. Lamellae 2.5 mm latae, adscendentes, rectae, late adnatae, obscure tabacinae, acie albae. Stipes 40 × 3 mm, cylindraceus, albus, cavus, eradicatus, apice pruinose. Caro pilei centro 2 mm crassa, concolor, stipitis albus. Sporae in cumulo obscure badiae, 7–8 × 4–4.5 μm, ellipsoideae, haud phaseoliformes, in aqua observata rubro-brunneae, poro germinativo indistincto instructae. Basidia 17.5–22.5 × 7.5–9 μm, clavata, 4-sporigera. Pleurocystidia 30–50 (–55) × (10–)12.5–17.5 μm, utriformia, plerumque fusioideus praeditus cum apex valde obtusus, interdum sat numerosa, tenui-tunicata. Cellulae marginales: cheilocystidia pleurocystidioidia 27.5–45 × 7.5–15 μm, numerosa, cheilocystidia spheropedunculatis et clavatis 15–22.5 × 7.5–12.5 μm numerosis. Trama lamellarum paulo colorata. Pileipellis e cellulis formata. Terrestis, in ericetis, sub *Betula*, autumnno. Typus: Great Britain, Hampshire, New Forest, Denny Bog, 21 Sept. 1971, *E. Kits van Waveren* (L).

**Etymology:** Named after the area, called Denny Bog, in the New Forest.

Cap 19 mm, conico-paraboloid, dark sordid brown (Mu. 10 YR 3/3, 4/3, 4/4) and probably very dark reddish brown when quite fresh, strongly striate, hygrophanous, drying out to very pale brown (Mu. 10 YR 8/4), scarcely darker at centre, without pink, neither rugulose nor micaceous. Veil white, forming rather strongly developed flocculi on surface of cap, but exclusively in a fairly narrow marginal zone, also appendiculate along entire margin, furthermore forming a lanose-fibrillose coating down the entire



Figs. 16–20. *Psathyrella dennyensis*. — 16. Carpophore (×1). — 17. Spores. — 18. Basidia — 19. Pleurocystidiogram. — 20. Cheilocystidiogram.

stem below its pruinose apex. Gills 2.5 mm broad, ascending, straight, fairly broadly adnate, dark tobacco-coloured (Mu. 7.5 YR 4/2), with white edge. Stem  $40 \times 3$  mm, cylindrical, white, hollow, not rooting, pruinose at apex. Flesh of cap in centre 2 mm thick, concolorous, of stem white; smell indistinctive. Trama of 'washed' gill in basal 1/3 pale brown (Mu. 10 YR 7/4), paler (Mu. 10 YR 7/3) towards margin and very pale (Mu. 10 YR 7/2) near edge. Spore print very dusky red.

Spores  $7-8 \times 4-4.5 \mu\text{m}$  (mean values  $7.3 \times 4.5 \mu\text{m}$ ; 1 collection), ellipsoid, not phaseoliform, in water reddish (Mu. 2.5 YR 4/8), in  $\text{NH}_4\text{OH}$  10% dark brown (Mu. 5 YR 4/4), in  $\text{KOH}$  5% sordid brown (Mu. 10 YR 4/3), germ pore indistinct (callus), hilar appendix distinct, not opaque. Basidia  $17.5-22.5 \times 7.5-9 \mu\text{m}$ , clavate, 4-spored. Pleurocystidia  $30-50(-55) \times 12.5-15(-17.5) \mu\text{m}$ , utriform, several cells with subcapital constriction, most cells however fusoid with very obtuse apex, rather numerous, thin-walled, very pale brown in  $\text{NH}_4\text{OH}$  10%. Marginal cells: pleurocystidioid cheilocystidia  $27.5-45 \times 7.5-15 \mu\text{m}$ , numerous, intermixed with numerous spheropedunculate and clavate cells,  $15-22.5 \times 7.5-12.5 \mu\text{m}$ ; all cells thin-walled and colourless. Hymenophoral trama very pale brown from membranal pigment, without yellow hyphal septa and encrustations. Pileipellis a 2-3 cells deep layer of in  $\text{NH}_4\text{OH}$  10% very pale brown globose and subglobose cells (a few broadly ellipsoid cells),  $25-40 \mu\text{m}$  diam.

Habitat & distribution.—Terrestrial in heath, solitary. September. Only known from type locality in southern England.

Collection examined.—GREAT BRITAIN, Hampshire, New Forest, Denny Bog, 21 Sept. 1971, E. K. v. W. (type, L).

*Psathyrella dennyensis* in several respects rather resembles *P. romseyii* in subsection *Lutenses*. The pleurocystidia and the pattern of cellular lining of the gill edge is for both species basically the same and the spores of both species have an indistinct germ-pore (callus). The difference between the two species hardly finds expression in the actual description of the spores but immediately leaps to the eye when spores of both species are compared in two mounts on one slide. In *P. romseyensis* the mean values for the spore size are  $7.7 \times 4.2 \mu\text{m}$ , the spores are orange-brown (Mu. 5 YR 4/6, 4/8) when mounted in water and often slightly phaseoliform, whereas in *P. dennyensis* they are slightly smaller, the mean values for their sizes being  $7.3 \times 4.5 \mu\text{m}$  (which places the species in section *Hydrophilae*), while when mounted in water they also are darker, reddish (Mu. 2.5 YR 4/8) and not phaseoliform. Also in *P. dennyensis* the pleurocystidia are more ventricose, measuring  $\times (10-)$   $12.5-17.5 \mu\text{m}$ .

Because of the scarcity of material for comparison and considering the great variability of macroscopical characters the following differences between *P. romseyensis* and *P. dennyensis* are less reliable but provisionally may be taken into account. Contrary to *P. romseyensis* the cap in *P. dennyensis* is conico-paraboloid and not convex, neither umbonate, the veil is rather strongly developed, and the gills are neither ventricose nor conspicuously broadly adnate. But here again more observations on more collections are needed.

### *Psathyrella obtusata* (Pers.: Fr.) A. H. Smith

Synonymy.—See Kits van Waveren, 1985: 197.

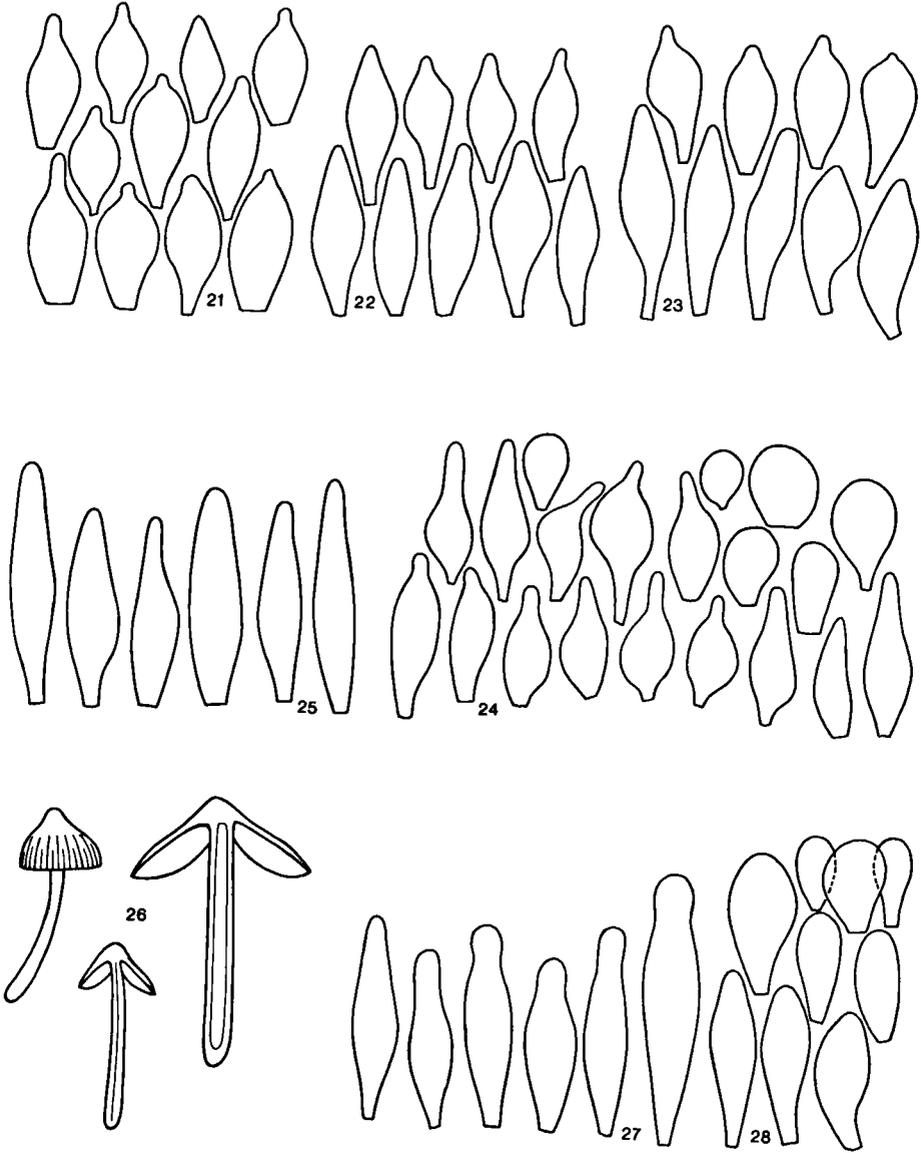
var. *obtusata*—Figs. 21–25

Descriptions & illustrations.—See enumeration by Kits van Waveren, 1985: 197.

Cap 20–25 mm, conical, conico-convex, but sometimes conspicuously paraboloid, without (rarely with) umbo, striate up to 2/3 from margin, at central half strikingly brown (between Mu. 7.5 YR 4/4 and 5/4), in peripheral half much paler (Mu. 10 YR 6/4) but with darker striation (Mu. 7.5 YR 5/4), hygrophanous, drying out to very pale brown (Mu. 10 YR 8/4), without pink, rugulose and distinctly micaceous. Veil white, distinct but variable, usually scanty; velar fibrils and minute fibrillose networks of fibrils on surface of cap in a 1–2 mm broad zone along margin, but sometimes more strongly developed, fibrils and networks reaching up to 2/3 from margin, rarely even up to apex; surface of lower 2/3 of stem covered with quite a few fibrils. Gills 3–4 mm broad, strikingly pinkish brown, colour of weak chocolate (Mu. 5 YR 5/3–6/3), moderately ventricose, rather broadly adnate, with white edge. Stem 60–75 × 2–3 mm, slightly thickening towards base, somewhat flexuous, not rooting, hollow, with white smooth surface and pruinose apex. Flesh of cap 2 mm thick in centre, concolorous (c. Mu. 10 YR 4/3) with a trace of reddish. Trama of ‘washed’ gill pale brown (Mu. 10 YR 7/3) in peripheral half, slightly browner (Mu. 10 YR 7/4) towards base, sometimes still browner in narrow strip at base, sometimes with brownish yellow (Mu. 10 YR 5/6) anastomosing tissue strands running from base towards edge through the in itself pale brown (Mu. 10 YR 6/4) gill tissue. Spore print brown with purplish hue.

Spores 7–8 × 4.5–5.5  $\mu\text{m}$  (mean values: sometimes 7.4–7.5 × 4.5–4.8  $\mu\text{m}$ , bringing the species in section *Hydrophilae*; more often 7.6–7.9 × 4.5–4.9  $\mu\text{m}$ , bringing the species in section *Pennatae*), in face view ellipsoid or ellipsoid-ovoid, in profile adaxially flattened, often subphaseoliform, sometimes even distinctly phaseoliform, pale, in water pale yellowish brown (Mu. 7.5 YR 6/8, 5/8) with reddish hue, in  $\text{NH}_4\text{OH}$  10% brown (Mu. 5 YR 4/6, 5/6; 7.5 YR 5/6) without reddish hue, in KOH 5% sordid brown (Mu. 10 YR 5/3, 5/4), not opaque, with small and sometimes rather indistinct germ pore and small hilar appendix. Basidia 17.5–22 × (9–)10  $\mu\text{m}$ , spheropedunculate to clavate, 4-spored. Pleurocystidia 25–75 × 9–15  $\mu\text{m}$ , abundant, ventricose-fusoid or sublageniform, with short rather broad pedicel and subacute to subobtuse, rarely obtuse apex, thin-walled, practically colourless or very pale brown in  $\text{NH}_4\text{OH}$  10%. Marginal cells: three different kinds of cells, viz. (i) spheropedunculate and clavate cells, normally large, 35 × 10–20  $\mu\text{m}$ , abundant, very densely packed (see our monograph: 198, fig. 283, bottom row of cells); (ii) the same cells but at apex equipped with a short, relatively thick protuberance (bulge), 2.5–5 × 3–5  $\mu\text{m}$ , passing gradually into cell body, or with a somewhat longer subcylindrical or cylindrical short neck, 5–6 × 2.5–4  $\mu\text{m}$ , either passing gradually into cell body or more or less sharply delimited from it (see our monograph: 198, fig. 283, top row of cells); (iii) pleurocystidioid cheilocystidia, 30–45 × 12.5–17  $\mu\text{m}$ , very few to few in number (rarely locally or along entire edge slightly more). (The cells mentioned sub ii are distinctive for *P. obtusata* (Figs. 21–24), normally few in number, rarely numerous and then very striking. Needless to say that intermediate forms between sub i, ii and iii occur.) Hymenophoral trama in  $\text{NH}_4\text{OH}$  10% sub micr. in basal half distinctly brown from membranal pigment with a fair number of yellowish hyphal septa and few to many minute encrustations, in peripheral half very pale brown. Pileipellis a 2–4 cells deep layer of globose and subglobose cells, 25–50  $\mu\text{m}$  diam., in  $\text{NH}_4\text{OH}$  10% very pale brown.

Habitat & distribution.—Terrestrial, solitary but sometimes gregarious, in deciduous woods, Sept.–Oct. Rather rare in the Netherlands. Reported from France and the British Isles; several collections seen from Norway.



Figs. 21–25. *Psathyrella obtusata*. — 21. Cheilocystidiogram, from 21 Oct. 1976. — 22. Id., from 17 Oct. 1968. — 23. Id., from 25 Sept. 1975. — 24. Id., from 30 June 1985 (Norway, *Weholt 8/85*). — 25. Pleurocystidiogram, 30 June 1985 (Norway, *Weholt 8/85*).

Figs. 26–28. *Psathyrella obtusata* var. *aberrans*. — 26. Carpophores (× 1). — 27. Pleurocystidiogram. — 28. Cheilocystidiogram.

Collections examined.—THE NETHERLANDS: prov. Overijssel: Denekamp, estate 'Singraven', 17 & 20 Oct. 1962, 15 Oct. 1967 (L); Delden, bank of 'Oelerbeek', 17 Oct. 1968 (L); prov. Noord-Holland, estate 'Elswout', 25 Sept. 1975, 21 Oct. 1976 (L); prov. Limburg, Wittem, 2 Oct. 1964 (2 collections, L).—BRITISH ISLES: Oxford, estate 'Wychwood Forest', 13 Sept. 1969 (L); Scotland, Invernesshire, Tomich, 17 Sept. 1968 (L).—NORWAY: 2 Sept. 1982 (herbarium O. Weholt Nr. 188/82), 31 Oct. 1982 (Nr. 226/82), 21 May 1983 (Nr. 24/83) and 30 June 1985 (Nr. 8/85) (O) at (L).

This is our second redescription and reevaluation of an in our experience in the Netherlands rather rare species.

Our observations on this species in our monograph (1985: 199) and earlier (1977: 299) on the reasons why we adopted the interpretation by Lange (1939: 98, pl. 152 A), A. H. Smith (1972: 385) and Romagnesi (1975: 197) of Fries's *Agaricus obtusatus* for the species described above, are still valid. In our 1977 description of *P. obtusata* we had only one collection of this rare species at our disposal. Its characters, above all the microscopical ones, fully agreed with those reported by Lange: (i) Gill edge lined with abundant large spheropedunculate and clavate cells, intermixed with only few of these cells, equipped with a very short apical protuberance or neck. (In 1977 we called the latter cells wrongly merely 'cheilocystidia' and in 1982 did not sharply distinguish between these latter cells and the pleurocystidioid cheilocystidia.) (ii) Small spores (with Lange  $7\frac{1}{4}$ – $7\frac{3}{4} \times 4\frac{3}{4} \mu\text{m}$ ), mean values for our then sole collection  $7.4 \times 4.6 \mu\text{m}$ . For our 1985 description we had seven collections at our disposal for which we (1985: 198) incorrectly (printer's error) gave  $7$ – $7.9 \times 4.5$ – $5 \mu\text{m}$  for the mean values of the spore sizes. (iii) The overall brown colour of cap and gills.

The fourteen collections now at our disposal can be split into two groups, one (a) comprising three collections in which the spores are small ( $7.4$ – $7.5 \mu\text{m}$  long) and therefore fitting very well in section *Hydrophilae* and one (b) comprising eleven collections in which the spores are larger ( $7.6$ – $7.9 \mu\text{m}$  long) and therefore fitting less well in this section and keying out in section *Pennatae*.

Going by the size of the spores *P. obtusata* is intermediate between the two sections mentioned. Because of its overall resemblance to the other typical members of section *Hydrophilae* (particularly the dominantly brown colours of the fruit-bodies) we maintain the species in that section, but also are dealing with it in the key to the section *Pennatae*.

In retrospect it turned out to be that all our cheilocystidiograms made in previous years of our collections of this species showed a few to several spheropedunculate and clavate cells equipped with an apical protuberance or short neck, although while making these cheilocystidiograms we had never been aware of the presence of these rather peculiar and striking cells. These cells are easily overlooked but not at all difficult to notice. They seem to be distinctive for *P. obtusata* and therefore of taxonomical value. They did not occur on the three cheilocystidiograms we made in 1979 of *P. vyrnwyii*, a species close to *P. obtusata* and were not seen in *P. obtusata* var. *aberrans*.

***Psathyrella obtusata* var. *aberrans* Kits van Wav., var. nov.—Figs. 26–28**

Misapplied name.—*Psathyrella obtusata* var. *utriformis* sensu Kits van Wav. in *Persoonia* (Suppl.) 2: 200. 1985.

A forma typica differt pleurocystidia et cheilocystidia pleurocystidioidea utriformis. Cheilocystidia spheropedunculatae et clavatae sine protuberantiae. Typus: The Netherlands, prov. Overijssel, Denekamp, 'Singraven', 15 Oct. 1967 (L).

On Oct. 15th 1967 we found two lots, each comprising two specimens of seemingly the same species of *Psathyrella* on a mossy coniferous tree stump, growing close to each other. The specimens of one lot turned out to be typical specimens of *P. obtusata* var. *obtusata* with conical caps, mean values of spore sizes  $7.6 \times 4.6 \mu\text{m}$ , slender fusoid pleurocystidia and scanty pleurocystidioid cheilocystidia, large quantities of spheropedunculate and clavate cells (some equipped with an apical protuberance). The specimens of the other lot had (like sometimes also in *P. obtusata*) umbonate caps, mean values of spore sizes  $7.9 \times 4.6 \mu\text{m}$ , but the pleurocystidia and scanty pleurocystidioid cheilocystidia were distinctly utriform (Figs. 27, 28), many even with subcapital constriction; none of the numerous spheropedunculate and clavate, cheilocystidia were equipped with an apical protuberance. We described (1982: 499) this aberrant variety as *P. obtusata* var. *utriformis*.

A recent revision of our material of *P. obtusata*, however, revealed that we had erroneously designated (Kits van Waveren, 1982: 499) the wrong collection for the type of this variety, viz. one that turned out to represent *P. spadiceogrisea* f. *exalbicans* (spores with distinct germ pore and dark gills and spores). Nevertheless a variant of the true *P. obtusata*, characterised by the pleurocystidia and pleurocystidioid cheilocystidia being utriform as the sole difference with *P. obtusata* var. *obtusata* does exist. It is described here as *P. obtusata* var. *aberrans*. The pleurocystidia depicted in our monograph (1985: 200, fig. 284) are those of *P. obtusata* var. *aberrans* and not of *P. obtusata* var. *utriformis*. The latter name has now to be placed in the synonymy of *P. spadiceogrisea* f. *exalbicans*.

Collections of *P. obtusata* var. *aberrans* with a mean value of the length of the spores above  $7.5 \mu\text{m}$  key out in subsection *Spadiceogriseae* side by side with *P. clivensis* (Kits van Waveren, 1985: 221).

It turned out to be quite difficult to distinguish between *P. obtusata* var. *aberrans* and *P. clivensis*. Size, shape, and colours of the carpophores of both species are about the same, both have utriform pleurocystidia and the same pattern of cellular-lining of the gill edge (large quantities of spheropedunculate and clavate cells, intermixed with only few utriform cheilocystidia). But *P. obtusata* var. *aberrans* has smaller (mean values  $7.9 \times 4.6 \mu\text{m}$ ) and darker (although still fairly pale spores (in water Mu. 7.5 YR 6/8, 5/8), which have a very small, sometimes indistinct germ pore, whereas the spores of *P. clivensis* are distinctly larger (mean values  $8.4\text{--}9.7 \times 5.5\text{--}5.7 \mu\text{m}$ ) and paler (in water Mu. 7.5 YR 6/6), and do not have a germ pore (at most a callus). Besides *P. obtusata* var. *aberrans* is a woodland and *P. clivensis* typically a grassland species.

## SUBSECTION LUTENSES

## REVISED KEY TO THE SPECIES OF SUBSECTION LUTENSES

1. Mucoïd deposits staining bluish green in NH<sub>4</sub>OH 10% on pleurocystidia and pleurocystidioid cheilocystidia (deposits very gradually disappearing in exsiccata) . . . . . *P. lutenses*
1. Not as above:
  2. Annulus present on stem (very rarely exclusively as very distinct appendiculate denticles at margin of cap . . . . . *P. sphagnicola*
  2. No annulus on stem:
    3. Veil strongly developed, covering entire cap:
      4. Carpophores densely caespitose; veil forming dense arachnoid fleece of silky adpressed radial fibrils on cap . . . . . *P. pannucioides*
      4. Carpophores not caespitose; veil on cap floccose scaly:
        5. Cap small (8–12 mm), predominantly snow-white, only at centre very pale yellowish brown (see also *P. kitsiana* from Sweden, p. 364) . . . . . *P. vestita*
        5. Cap medium-sized (25–35 mm), at first at central half pale ochre, pale brown, later predominantly pale mouse grey practically all over (see also *P. suavissima* from Switzerland, p. 362) . . . . . *P. pervelata*
    3. Veil thin, rudimentary, fugacious:
      6. Germ pore present:
        7. Few, many or most pleurocystidioid cheilocystidia distinctly capitate, the non-capitate ones being utriform (Fig. 33) . . . . . *P. capitocystis*, p. 342
        7. Not as above:
          8. Rather large and tall species; stems 50–110 mm long; caps (15–)25–60 mm.
            9. Stem gradually and conspicuously thickening towards base; gills dark grey to black (rarely brownish if spores failed to ripen); spores large (mean values 9.6–10.9 × 5.3–6 μm), in water dark red (Mu. 2.5 YR 3/6, 3/4)
 

*P. tephrophylla*
            9. Stem cylindrical (sometimes only very slightly thickening towards base); gills greyish brown-purple; spores smaller (mean values 7.5–8.4 × 4.5–4.7 μm) in water orange-brown (Mu. 5 YR 4/4, 4/6, 4/8) . . . . . *P. fusca*
          8. Smaller species; stems not tall, 20–35 (–55) mm long; caps 7–40 mm (but see also in subsection *Spadiceogriseae*: *P. almerensis* and *P. spadiceogrisea* f. *exalbicans* of which the gill edge sometimes, be it rarely, is lined with many instead of few utriform cells):
            10. Most, many, or only a few spores in face view distinctly subtriangular
 

*P. panaeoloides* (see also p. 368)
            10. Not as above:
              11. Habitat: in marshy areas, muddy borders of ponds with thick bed of decaying leaves, boggy beds of ditches, often gregarious; cap rarely umbonate; stems relatively short (15–55 × 1.5–4 mm) as compared with diameter of cap (10–40 mm); many cystidia with subapical constriction . . . . . *P. noli-tangere*
              11. Habitat not as above; terrestrial:
                12. Surface of fresh cap strongly wrinkled, cap 5–15 mm
 

*P. reticulata*
                12. Not as above; cap 34 mm and distinctly umbonate
 

*P. twickelensis*, p. 344
    6. Germ pore indistinct (callus) or absent:

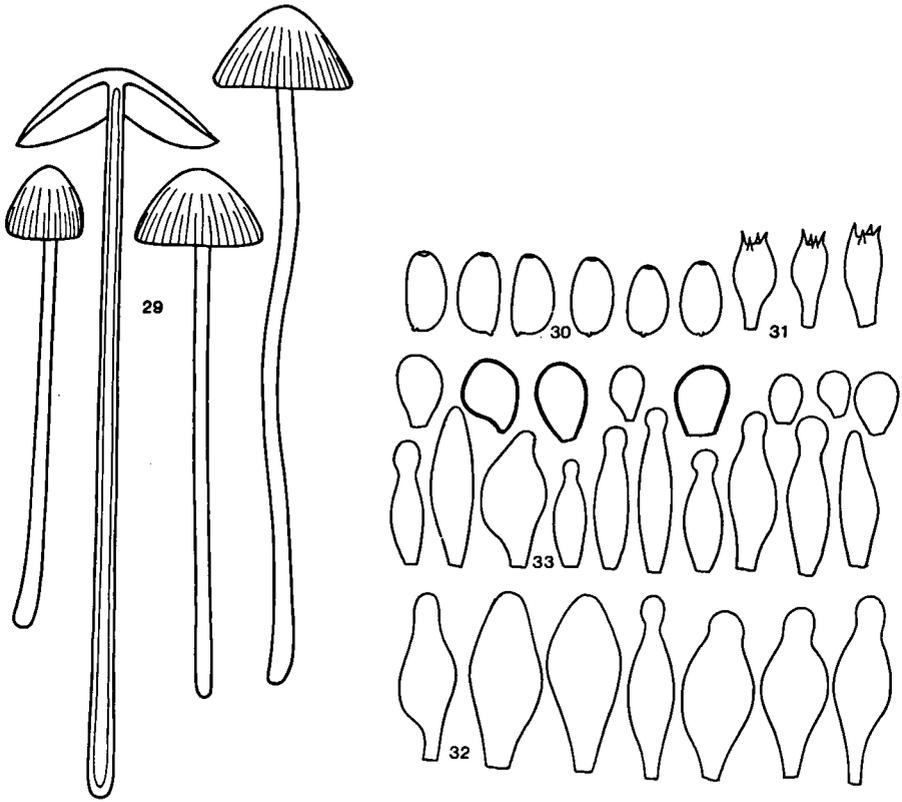
13. Pleurocystidia exceedingly abundant, versiform . . . . . *P. multicystidiata*, p. 346
13. Not as above:
14. Pleurocystidia utriform, thick-set, very ventricose,  $32.5-40(-42.5) \times 10-17.5(-20) \mu\text{m}$ , many with subapical constriction, others fusoid with very obtuse apex; spores in water dark red (Mu. 2.5 YR 3/6, 4/6); small species; cap 14 mm, without umbo; stem  $20 \times 1 \text{ mm}$  . . . . . *P. badia*, p. 348
14. Pleurocystidia utriform, rather slender,  $(30-35)-45(-50) \times (7.5-9)-15 \mu\text{m}$ , most pleurocystidia fusoid with (very) obtuse to subobtuse apex, very few with subapical constriction; spores in water orange-brown (Mu. 5 YR 5/8, 4/8); robust species; cap  $17-32 \text{ mm}$ , with umbo; stem  $20-30 \times 2-4 \text{ mm}$  *P. romseyensis*, p. 349

***Psathyrella capitatocystis* Kits van Wav., spec. nov.—Figs. 29–33**

Pileus 10–25 mm latus, exumbonatus, conicus, maturitate cinereus, brunescens apicem versus, perstriatus, hygrophanus, in sicco margine admodum pallide cinereus, apicem versus pallide brunneus, apice dilute ochraceus. Velum album, primo e fibrillis fasciculisque fibrillosis numerosis zonam pilei marginalem 1–1.5 mm latam formans, nec appendiculatum, et fibrillae in stipite paucae. Lamellae 3–5 mm latae ad pilei marginem ventricosae, alibi rectae, adscendentes, late adnatae, acie albae. Stipes 50–90  $\times$  2 mm, deorsum leviter incrassatus, eradicatus, cavus, apice eximie pruinosis. Caro pilei centro 1 mm crassa, brunnea, stipitis alba. Sporae in cumulo purpureo-atrae, 8–10  $\times$  4.5–5  $\mu\text{m}$ , ellipsoideae, nec phaseoliformes, obscurae, in aqua observatae obscure badiae, nec opacae, poro germinativo distincto munitae. Basidia 20–22.5  $\times$  8–10  $\mu\text{m}$  clavata, 4-sporigera. Pleurocystidia (35–) 40–50  $\times$  12.5–17.5 (–20)  $\mu\text{m}$ , sat numerosa, utriformia, plurimum subutriformia vel ventricosofusiformia, nonnulla capitata, collo lato brevique praedita, interdum collis tenuitunicatis. Cellulae marginales: cheilocystidia pleurocystidioidea 30–40  $\times$  10–12.5 (–15)  $\mu\text{m}$ , numerosa, vulgo capitata, cheilocystidiis spheropedunculatis et clavatis 10–20 (–22.5)  $\times$  7.5–17.5  $\mu\text{m}$  intermixta. Pileipellis e cellulis formata. Trama lamellarum colorata. Terrestis, solitaria, in graminis sub *Betula*. Autumno. Typus: The Netherlands, prov. Overijssel, Oldenzaal, 'Roderveld', 21 Oct. 1975, *E. Kits van Waveren* (L).

Cap 10–25 mm, conical, without umbo, at maturity conspicuously grey (Mu. 10 YR 6/2), in peripheral half, towards centre slightly browner (Mu. 10 YR 6/3) and at 4 mm broad apex brown (Mu. 10 YR 6/4, 5/4), strongly striate up to 3/4 from margin, hygrophanous, rapidly drying out to very pale grey at margin, pale brown (Mu. 10 YR 8/3, 8/4) elsewhere, slightly ochraceous at apex, without pink, distinctly micaceous and finely rugulose; cap of young specimens drying out to pale brown everywhere, but slightly ochraceous at apex. Veil white, in young specimens forming on a 1–1.5 mm broad marginal zone many isolated fibrils and rather dense fibrillose wicker-works, the latter in many places interwoven to small strands, lying horizontally along extreme margin of cap, not appendiculate; a few scattered fibrils on stem. Gills 3–5 mm broad, ventricose near margin of cap, then ascending, straight, broadly adnate with tooth, brownish grey (Mu. 5 YR 5/2) to greyish brown (Mu. 7.5 YR 5/2), with white, minutely fimbriate edge. Stem 50–90  $\times$  2 mm (growing in tall grass, hence the long stem), gradually very slightly thickening (3 mm) towards non rooting base, hollow, white, densely pruinose at apex. Flesh of cap in centre 1.5 mm thick, brown (Mu. 10 YR 4/3, 3/3), of stem white, in bottom part pale brown and in base brown. Smell indistinctive. Trama of 'washed' gill pale brownish grey (Mu. 2.5 YR 6/2), from base to edge. Spore print purplish black.

Spores 8–10  $\times$  4.5–5  $\mu\text{m}$  (mean values 8.7  $\times$  4.6  $\mu\text{m}$ : 1 collection), ellipsoid, adaxially flattened, neither ovoid nor phaseoliform, dark, in water dark red (Mu. 2.5 YR 3/6), in  $\text{NH}_4\text{OH}$  10% dark brown (Mu. 5 YR 4/4), in  $\text{KOH}$  15% dark sordid brown (Mu. 7.5 YR 4/2), not opaque, with distinct germ pore (1.5–1.8  $\mu\text{m}$ ) and small apiculus. Basidia 20–



Figs. 29–33. *Psathyrella capitatocystis*. — 29. Carpophores ( $\times 1$ ). — 30. Spores. — 31. Basidia. — 32. Pleurocystidiogram. — 33. Cheilocystidiogram.

$22.5 \times 8$ – $10 \mu\text{m}$ , clavate, 4-spored, many with sterigmata up to  $5 \mu\text{m}$  long. Pleurocystidia ( $35$ –) $40$ – $50$ (– $55$ )  $\times$   $12.5$ – $17.5$ (– $20$ )  $\mu\text{m}$ , fairly numerous, most cells subutriform or (very) ventricose-fusoid, some utriform, most cells with broad, usually very short neck, passing either gradually or abruptly into cell body, very few capitate, thin-walled, colourless, infrequently neck longer and very thin-walled and more or less sharply delimited from cell body; pedicel either short and broad or longer and narrower. Marginal cells: pleurocystidioid cheilocystidia  $30$ – $40 \times 10$ – $12.5$ (– $15$ )  $\mu\text{m}$ , abundant, in most places densely packed, few or many or even most cells distinctly capitate, intermixed with many unobtrusive small spheropedunculate and clavate cells,  $10$ – $12.5 \times 7.5$ – $10 \mu\text{m}$ , and a small number of larger cells,  $12.5$ – $20$ (– $22.5$ )  $\times$   $10$ – $17.5 \mu\text{m}$ , some of which with slightly thickened wall and very pale brown in  $\text{NH}_4\text{OH}$  10%. Hymenophoral trama very pale brown from membranous pigment with very few yellow hyphal septa in basal part of gill, without encrustations. Pileipellis a 2–4 cells deep layer of colourless globose and subglobose cells,  $25$ – $40 \mu\text{m}$  diam.

**Habitat & distribution.**—Terrestrial, solitary, found in tall grass in deciduous wood under *Betula*. Known only from type locality.

Collection examined.—THE NETHERLANDS, prov. Overijssel, estate 'Roderveld' (nature reserve), 21 Oct. 1975 (7 specimens), *E. K. v. W.* (type, L).

In this species capitate cystidia are always present but their number varies from one specimen and even one gill to another. Capitate pleurocystidia are few to even very few in number (easily overlooked, a thorough search needed), but capitate cheilocystidia occur more frequently and sometimes numerous to even abundant.

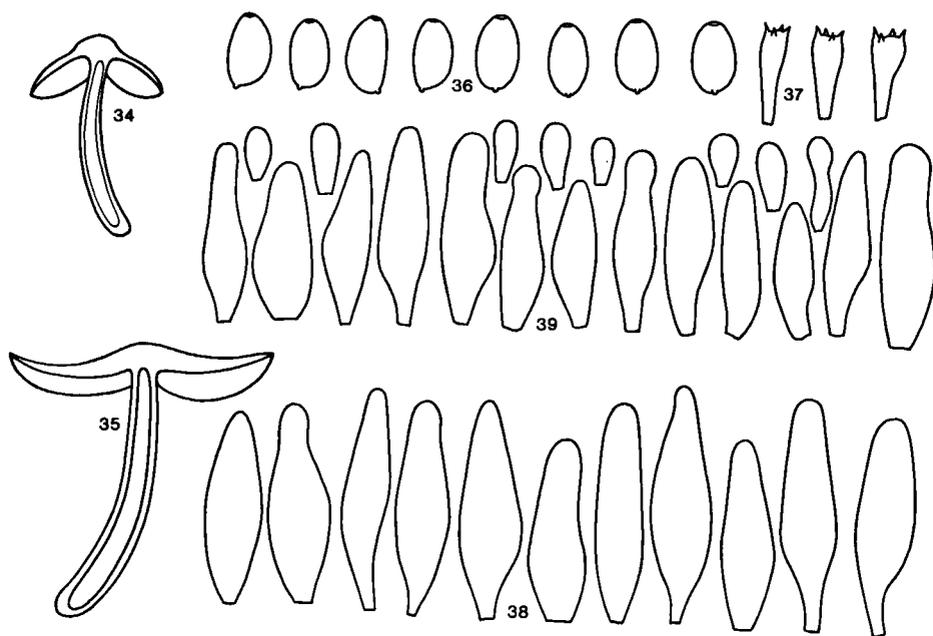
*Psathyrella twickelensis* Kits van Wav., *spec. nov.*—Figs. 34–39

Pileus primo 10 mm latus, parabolicus, dein convexus vel denique revolutus, robuste umbonatus, obscure badius dein brunneus, margine substriato, subsulcatus, hygrophanus, in sicco pallide brunneus, centro ochraceus, colore roseo destitutus, paulum rugulosus, nec atomatus. Velum album, e fibrillis et fasciculis parvis, zonam pilei marginalem 2 mm latam formans, etiam fibrillae in stipite. Lamellae 3–5 mm latae, subventricosae, adscendentes, late adnatae, purpureo-cinereobrunneae, brunneae ad basim, acie albae. Stipes 20–35 × 1.5–3 mm, cylindraceus, eradicatus, albus, minute fibrilloso-striatus. Caro pilei centro 3 mm crassa, obscure badia. Sporae in cumulo purpureo-atrae, (6.5–)7–8(–9) × 4–5 μm, ellipsoideae, nec phaseoliformes, in aqua observatae obscure rubellae, poro germinativo distincto (1.5–1.8 μm) munitae. Basidia 19–24 × 8–9 μm, clavata, 4-sporigera. Pleurocystidia 35–55(–60) × 10–15 μm, numerosa, utriformia, fusoideo-pedicellata, apice perobtusata, raro constrictione subapicale instructa, tenui-tunicata, colore carentia. Cellulae marginales: cheilocystidia pleurocystidioida 30–50 × 9–12.5(–15) μm, numerosa, cellulis spheropedunculatis et clavatis (10–)12.5–17.5(–20) × 5–10 μm intermixta, tenui-tunicata et colore destituta. Trama lamellarum valde distincte colorata. Pileipellis e cellulis formata. Terrestriis sub Fago vel Querquo. Aestate–Autumno. Typus: The Netherlands, prov. Overijssel, Delden, 20 Oct. 1973, *E. Kits van Waveren* (L).

Etymology: Named after the estate 'Twickel', where it was first found.

Cap at first c. 10 mm, paraboloid, later spreading to 35 mm and then convex with deflexed marginal zone and finally plane with even revolute marginal area, with large umbo, at first very dark red-brown (Mu. 2.5 YR 2.5/4, 3/4; 5 YR 3/2) later dark reddish brown (Mu. 2.5 YR 3/6, 4/6), red soon disappearing from margin towards centre and colour gradually becoming warm brown (Mu. 7.5 YR 4/4) then yellowish brown (Mu. 5 YR 5/8, 5/6; 7.5 YR 6/8, 7/8), faintly striate-sulcate only at margin, hygrophanous, rapidly drying out, finally all over pale brown (Mu. 10 YR 7/3) with centre more ochreous, without pink, slightly rugulose, not micaceous. Veil white, forming fine, radially arranged fibrils and small wicker-works of fibrils on a 2 mm broad zone along entire margin of cap; scattered fibrils on stem. Gills 3.5 mm broad, near margin slightly concave, half-way edge becoming slightly ventricose and ascending, broadly adnate, in basal 1/3 brown (Mu. 10 YR 5/4), elsewhere purplish brown (± Mu. 2.5 YR 4/4 with greyish hue), with minutely fimbriate white edge. Stem 20–35 × 1.5–3 mm, cylindrical, not rooting, very pale brown under a rather dense and homogeneous layer of white fibrils, rendering surface white and minutely longitudinally striate, with pruinose apex. Flesh of cap in centre 3 mm thick (umbo!), very dark red-brown (Mu. 5 YR 3/2), rapidly becoming browner (Mu. 5 YR 3/3, 4/3), of stem pale brown (Mu. 10 YR 6/3). Trama of 'washed' gill conspicuously pigmented, in basal 1/3 pale (reddish) brown (Mu. 5 YR 6/4; 7.5 YR 6/4), towards edge rather suddenly much paler, in peripheral 1/3 very pale brown (Mu. 10 YR 7/2), practically colourless. Spore print purplish black.

Spores (6.5–)7–8(–9) × 4–5 μm (mean values 7.7–8 × 4.5 μm: 2 collections), ellipsoid, adaxially flattened, neither ovoid nor phaseoliform, dark, in water dark red (Mu. 2.5 YR 3/6), in NH<sub>4</sub>OH 10% dark brown (Mu. 5 YR 3/4, 4/4), in KOH 5% dark sordid brown (Mu. 10 YR 3/3), not opaque, with distinct germ pore (1.5–1.8 μm) and distinct



Figs. 34–39. *Psathyrella twickelensis*. — 34. Carpophores ( $\times 1$ ), Delden, 20 Oct. 1973. — 35. Beilen, 13 June 1974. — 36. Spores. — 37. Basidia. — 38. Pleurocystidiogram. — 39. Cheilocystidiogram.

hilar appendix. Basidia 19–24  $\times$  8–9  $\mu\text{m}$ , clavate, 4-spored. Pleurocystidia 35–55 (–60)  $\times$  10–15  $\mu\text{m}$ , numerous, utriform, fusoid-pedicellate with very obtuse to subobtuse apex, hardly ever with subapical constriction, thin-walled, colourless. Marginal cells: pleurocystidioid cheilocystidia 30–50  $\times$  9–12.5  $\mu\text{m}$ , numerous, intermixed with numerous small, (10–)12.5–17.5 (–20)  $\times$  5–10  $\mu\text{m}$ , spheropedunculate and clavate cells. All cells thin-walled, colourless. Hymenophoral trama strikingly brown from membranar pigment with a number of yellow hyphal septa and numerous minute encrustations.

Habitat & distribution.—Terrestrial under *Fagus* and *Quercus*.

Collections examined.—THE NETHERLANDS: prov. Overijssel, verge of main road Delden-Borne, near ice rink, 20 Oct. 1973, *E. K. v. W.* (type, L); prov. Drenthe, Beilen, garden of Schapendrift 29, 13 June 1974, *H. S. C. Huijsman* (L).

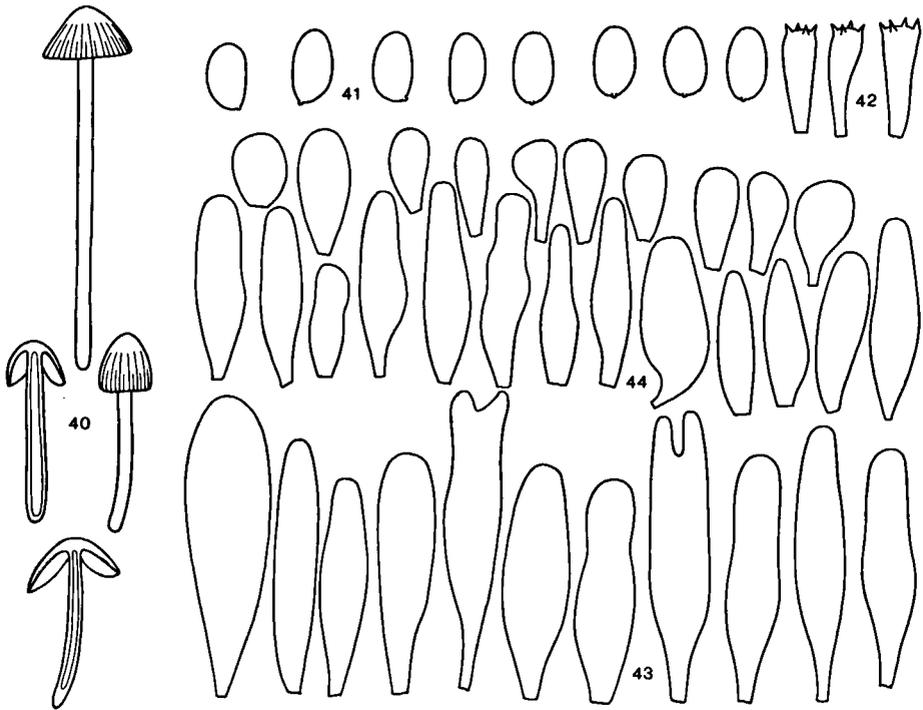
Although a majority of both pleurocystidia and pleurocystidioid cheilocystidia of the specimen of the June 1974 collection were fusoid with (very) obtuse apex, we identified this specimen, which was also growing solitarily, as *P. twickelensis* on account of the presence of a number of utriform cells while its macroscopical characters agreed with those of the type specimen.

*Psathyrella multicystidiata* Kits van Wav., *spec. nov.*—Figs. 40–44

Pileus 8–17 mm latus, parabolicus vel conico-parabolicus, primo margine incurvatus, obscure badius, dein (centro excepto) umbrinus vel ochraceus, striatus, hygrophanus, in sicco brunneus, colore rosea destitutus. Velum album primo e fibrillis et fasciculis fere ad apicem, nec appendiculatum, evanescens, fibrillae in stipite paucae. Lamellae 2 mm latae, parum ventricosae, anguste adnatae, primo brunneae, dein obscure sordideque marginem versus purpureo-cinereae, acie albae. Stipes 20–45 × 1–2 mm, cylindraceus, parte superiore albus, parte inferiore isabellinus, eradicatus, apice pruinosis. Caro pilei concolor, stipitis alba, deorsum dilute brunnea. Sporae in cumulo obscure umbrinae, 7.5–8.5 × 4.5  $\mu\text{m}$ , ellipsoideae, nec phaseoliformes, in aqua observatae sat pallide flavobrunneae, sine poro germinativo vel callo. Basidia 22.5–27.5 × 7.5–9  $\mu\text{m}$ , clavata, 4-sporigera. Pleurocystidia 50–70 × 10–17.5(–20)  $\mu\text{m}$ , perabundantia, versiformia, utriformia, vulgo fusioidea vel subcylindracea, pedicellata, apicibus valde obtusa et interdum constrictione subapicali instructa, etiam interdum late clavata, raro sublageniformia vel apicibus furcatis, tenui-tunicata, colore destituta vel admodum dilute brunnea in  $\text{NH}_4\text{OH}$  10%. Cellulae marginales eximie versiformes: cheilocystidia pleurocystidioidea 35–47.5(–50) × 10–12.5  $\mu\text{m}$ , sat numerosa, cellulis anguste clavatis vel sublageniformibus intermixta, 35–40 × 7.5–10  $\mu\text{m}$ , etiam cellulis spheropedunculatis clavatisque 12.5–30 × 7.5–15  $\mu\text{m}$ . Trama lamellarum admodum pigmento praedita. Pileipellis e cellulis formata. Terrestri. Autumno. Typus: The Netherlands, prov. Overijssel, Denekamp, 'Singraven' (arboretum), 23 Oct. 1971, *E. Kits van Waveren* (L).

Cap 8–17 mm, paraboloid or conico-paraboloid, at first with incurved marginal area, dark reddish brown (Mu. 5 YR 3/3, 3/4), later only at centre dark reddish brown or brown (Mu. 7.5 YR 5/4), outside centre warm brown (Mu. 7.5 YR 4/4) to ochreous (Mu. 7.5 YR 6/6), striate up to half-way from margin, hygrophanous, drying out to pale brown, slightly darker than in most species of *Psathyrella* (acorn-colour, Mu. 10 YR 7/4), darker at centre, without pink, not rugulose or micaceous. Veil white, in the beginning many scattered fibrils and fascicles of fibrils almost reaching apex of cap, increasing in number towards margin, but not appendiculate, fugacious, later decreasing in number; scattered fibrils on stem. Gills 2 mm broad, slightly ventricose, strongly ascending, narrowly adnate, conspicuously yellowish brown (slightly paler than Mu. 10 YR 5/6) at base, gradually paler and slightly greyish towards edge (Mu. 10 YR 7/2, 8/2), later dark sordid brown (Mu. 10 YR 4/3) with trace of purple at base, towards edge via greyish brown (Mu. 10 YR 5/2) to purplish grey (Mu. 5 YR 6/1), with white edge. Stem 20–45 × 1.5–2 mm, cylindrical, white from a minutely fibrillose superficial layer, glossy, isabelline in lower 1/3, not rooting, hollow, with pruinose apex. Flesh of cap colorless, of stem white but in lower half pale brown. Trama of 'washed' gill very distinctly pigmented, in a very narrow zone along base strong brown (Mu. 7.5 YR 5/6), basal 1/3 brownish yellow (Mu. 10 YR 6/6), peripheral 2/3 pale greyish brown (Mu. 10 YR 7/2). Spore print dark brown.

Spores 7.5–8.5 × 4.5  $\mu\text{m}$  (mean values 8.1 × 4.5  $\mu\text{m}$ : 1 collection), ellipsoid adaxially flattened, neither ovoid, nor phaseoliform, relatively pale, in water yellowish brown (Mu. 7.5 YR 5/6, 6/6) with reddish hue, in  $\text{NH}_4\text{OH}$  10% brown (Mu. 5 YR 5/6), KOH 5% sordid brown (Mu. 10 YR 5/3), neither with pore nor even with callus, not opaque, with minute, scarcely visible hilar appendix. Basidia 22.5–27.5 × 7.5–9  $\mu\text{m}$ , clavate, 4-spored. Pleurocystidia 50–70 × 10–17.5(–20)  $\mu\text{m}$ , exceedingly abundant, very versiform but in the main to be called utriform, far and away most cells fusoid to subcylindric, pedicellate and with very obtuse apex, rarely with subapical constriction or forked apex (2 or even 4 apical protrusions), some cells (broadly) clavate, rarely sublageniform, all cells thin-walled and very pale brown in  $\text{NH}_4\text{OH}$  10% or practically colourless. Marginal cells: gill edge sterile from a motley of cells: utriform pleurocystidia 35–47.5(–50) × 10–12.5  $\mu\text{m}$ , fairly numerous, in some parts predominating and intermixed with narrow



Figs. 40–44. *Psathyrella multicystidiata*. — 40. Carpophores ( $\times 1$ ). — 41. Spores. — 42. Basidia. — 43. Pleurocystidiogram. — 44. Cheilocystidiogram.

clavate and/or sublageniform cells,  $35\text{--}40 \times 7.5\text{--}10 \mu\text{m}$ , in other parts either narrow clavate or sublageniform cells predominating, intermixed with only few to fairly numerous utriform cells, often transitional forms, in some parts spheropedunculate and clavate cells,  $12.5\text{--}30 \times 7.5\text{--}15 \mu\text{m}$ , predominating. Hymenophoral trama in basal part of gills strongly pigmented from yellowish brown membranous pigment, numerous yellow hyphal septa, and numerous very small encrustations; pigmentation gradually decreasing towards edge. Pileipellis a 3–4 cells deep layer of globose, subglobose, obpyriform and a few very broadly ellipsoid colourless cells,  $30\text{--}60 \mu\text{m}$  diam.

**Habitat & distribution.**—Terrestrial against small dead branch in humose ground of path in very mixed deciduous wood (arboretum). Known only from type locality.

**Collection examined.**—THE NETHERLANDS, prov. Overijssel, Denekamp, 'Singraven' (arboretum), 23 Oct. 1971, E. K. v. W. (type, L).

The exceedingly abundant, large and in the main utriform pleurocystidia with very obtuse apex are distinctive.

*Psathyrella multicystidiata* resembles both *P. frustulenta* and *P. obtusata* because of the brown colour of its cap and gills, its abundance of pleurocystidia (most of which

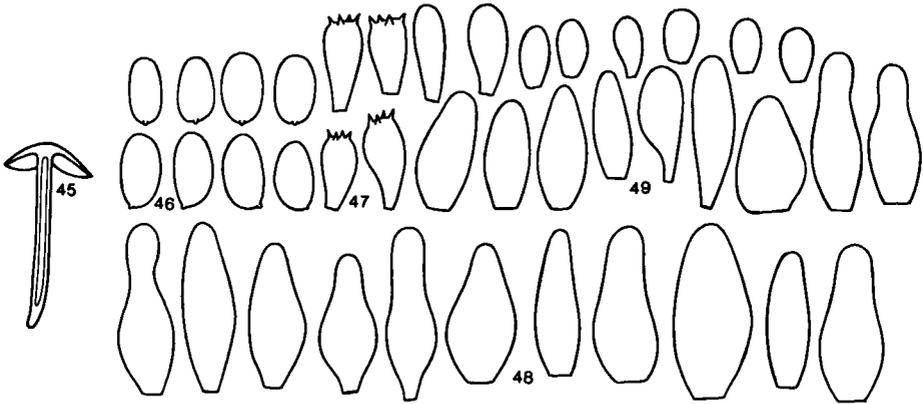
pale brown in  $\text{NH}_4\text{OH}$  10%), its strongly pigmented hymenophoral trama and its pale spores. It differs from *P. frustulenta* by its less strongly developed veil, its larger spores (mean values  $8.1 \times 4.5$ ) which are not phaseoliform and its in the main utriform pleurocystidia. It differs from *P. obtusata* (in which not infrequently the spores are almost of the same size as in *P. multicystidiata*) by its non-phaseoliform spores, which do not have a germ pore (very small in *P. obtusata*), its much longer and differently shaped pleurocystidia and above all by its pattern of the cellular lining of the gill edge, which is not of the spadiceogrisea type as in *P. obtusata*.

*Psathyrella badia* Kits van Wav., *spec. nov.*—Figs. 45–49

Pileus 14 mm latus, conico-parabolicus, obscure badius, striatus, hygrophanus, in sicco sat pallide brunneus, parum subsulcatus, haud roseus. Velum album e fibrillis et fasciculis parvis, zonam pilei marginalem 1 mm latam formans, haud appendiculatum, et fibrillae in stipitis parte inferiori paucae. Lamellae 2.5 mm latae, ventricosae, late adnatae, cinereobrunneae, acie albae. Stipes  $20 \times 1$  mm, cylindraceus, cavus, sordide albus, basi paulum radicans, apice pruinosis. Caro pilei centro 5 mm crassa, badia, stipitis alba. Sporae in cumulo non observatae,  $7-8 \times (4-)4.5-5 \mu\text{m}$ , ellipsoideae, vel ellipsoideo-ovoideae, nec phaseoliformes, obscure rubellae, poro germinativo distincto munitae. Basidia  $17.5-22.5 \times 8-9.5 \mu\text{m}$ , clavata, 4-sporigera. Pleurocystidia  $32.5-42.5 \times 10-15(-17.5) \mu\text{m}$ , sat numerosa, utriformia, tunica tenui praedita, colore carentia. Cellulae marginales: cheilocystidia pleurocystioidea  $27.5-37.5 \times 10-17.5 \mu\text{m}$ , sat numerosa, cheilocystidia sphaeropedunculatis et clavatis  $7.5-17.5(-22.5) \times 6-10 \mu\text{m}$  intermixta. Trama lamellarum distincte colorata. Pileipellis e cellulis haud coloratis formata. Terrestris in locis muscosis. Autumnno. Typus: The Netherlands, prov. Noord Holland, Castricum, 5 Oct. 1968, *E. Kits van Waveren* (L).

Cap 14 mm, conico-paraboloid, without umbo dark red-brown (Mu. 5 YR 3/4), striate up to 2/3 from margin, hygrophanous, drying out to fairly pale brown (Mu. 7.5 YR 6/4), without pink, not micaceous, slightly radially sulcate. Veil white, forming numerous fibrils and small fascicles on surface of cap in a 1 mm broad zone along entire margin of cap, not appendiculate; on lower half of stem scattered fibrils and a few fascicles. Gills 2.5 mm broad, ventricose near margin of cap, then ascending, straight, conspicuously broadly adnate, at edge pale grey (Mu. 10 YR 6/1), towards base soon greyish brown (Mu. 10 YR 5/2), at base browner (Mu. 10 YR 4/3), with minutely fimbriate white edge. Stem  $20 \times 1$  mm, cylindrical, hollow, sordid white, minutely longitudinally fibrillose striate, with very slightly rooting base (pseudorrhiza 3 mm) and pruinose apex. Flesh of cap in centre 0.5 mm thick, reddish brown (c. Mu. 5 YR 4/3), of stem whitish, smell indistinctive. Trama of 'washed' gill distinctly pigmented, in basal 2/3 of gill pale brown (Mu. 10 YR 7/4), in periphery paler (Mu. 10 YR 7/3). Spore print not recorded.

Spores  $7-8 \times (4-)4.5-5 \mu\text{m}$  (mean values  $7.8 \times 4.5 \mu\text{m}$ : 1 collection), ellipsoid to ellipsoid-ovoid, not phaseoliform, dark, in water dark red (Mu. 2.5 YR 3/6, 4/6), in  $\text{NH}_4\text{OH}$  10% dark brown (Mu. 5 YR 3/3) in KOH 5% dark sordid brown (Mu. 10 YR 3/3); germ pore indistinct (callus), at most minute; hilar appendix small. Basidia  $17.5-22.5 \times 8-9.5 \mu\text{m}$ , clavate, 4-spored. Pleurocystidia small,  $32.5-40(-42.5) \times 10-17.5(-20) \mu\text{m}$ , moderately numerous, utriform, mostly with subapical constriction, sometimes fusoid, very ventricose and with very obtuse apex, thin-walled, colourless. Marginal cells: pleurocystidioid (utriform) cheilocystidia  $27.5-37.5 \times 10-17.5 \mu\text{m}$ , rather numerous but—except in a few places—not densely packed, intermixed with many small and unobtrusive sphaeropedunculate and clavate cells,  $7.5-17.5(-22.5) \times 6-10 \mu\text{m}$ ; all cells thin-walled and colourless. Hymenophoral trama very distinctly yellowish brown from



Figs. 45–49. *Psathyrella badia*. — 45. Carphophore ( $\times 1$ ). — 46. Spores. — 47. Basidia. — 48. Pleurocystidiogram. — 49. Cheilocystidiogram.

membranal pigment with a fair number of yellow hyphal septa and many minute encrustations. Pileipellis a 2–3 cells deep layer of globose to subglobose, rarely broadly ellipsoid colourless cells, 25–40  $\mu\text{m}$  diam.

Habitat & distribution.—In moss of dip in coastal dunes. October. Known only from type locality.

Collection examined.—THE NETHERLANDS, prov. Noord-Holland, Castricum, coastal dunes of Amsterdam Water Supply, 5 Oct. 1968, E. K. v. W. (type, L).

Because of the utriform shape of the cystidia, which on the gill edge are numerous and intermixed with very small spheropedunculate and clavate cells, this species belongs to subsection *Lutenses*, in which the species is outstanding because of its small size and dark spores.

***Psathyrella romseyensis* Kits van Wav., *spec. nov.*—Figs. 50–55**

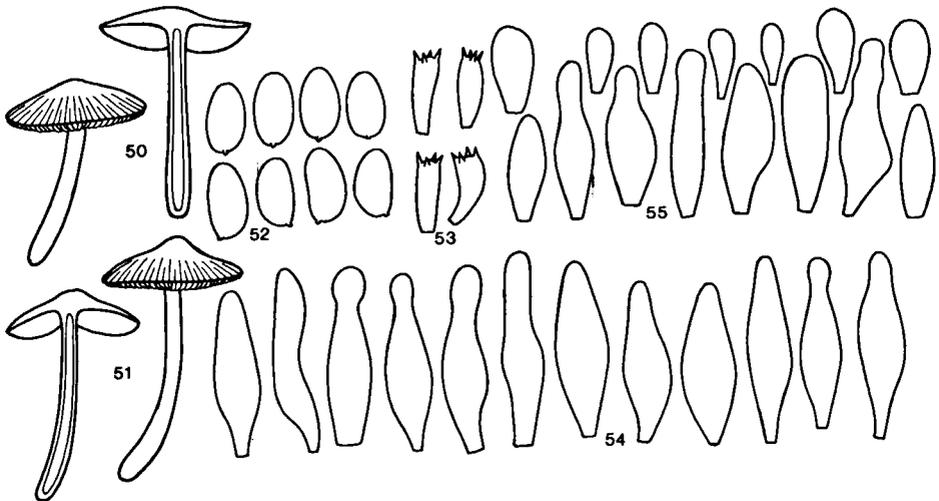
Pileus 17–32 mm latus, conico-convexus, convexus vel plano-convexus, umbonatus, obscure brunneus, rubello-tinctus (an primo centro badius) marginem versus pallescens, striatus, hygrophanus, in sicco pallide brunneus, colore roseo destitutus, nec rugulosus, nec atomatus. Velum album tenue, evanescens, margine pilei, e fibrillis et fasciculis parvis formatum, nec appendiculatum, fibrillae in stipite paucae. Lamellae 3–5 mm latae, ventricosae, late vel admodum late adnatae, obscure tabacinae vel cinereobrunneae, acie albae. Stipes 20–30  $\times$  2–4 mm, cylindraceus, cavus, sordide albus, deorsum brunnescens, eradicatus, apice pruinosis. Caro pilei centro 1.5–2 mm crassa, obscure brunnea, stipitis sordide alba vel pallide brunnea et brunnescens deorsum. Sporae in cumulo admodum obscure badiae, 7–8.5  $\times$  4–4.5  $\mu\text{m}$ , ellipsoideae, nonnullae phaseoliformes, in aqua observatae aurantiobrunneae, poro germinativo indistincto munitae. Basidia 16–20  $\times$  7–7.5  $\mu\text{m}$ , clavata, 4-sporigera. Pleurocystidia (30–)35–45(–50)  $\times$  (7.5–)9–13  $\mu\text{m}$ , utriformia, raro apice constricta, vulgo fusioidea apice (admodum) obtusa vel subobtusa, parum numerosa, tenuitunicata, sine colore vel admodum dilute brunnea in  $\text{NH}_4\text{OH}$  10%. Cellulae marginales: cheilocystidia pleurocystidioidea

25–45 × 7.5–12.5  $\mu\text{m}$ , abundantia, cellulis spheropedunculatis et clavatis 12.5–22.5 × 7.5–12.5  $\mu\text{m}$  intermixta, tenuitunicata et sine colore, numerosa. Trama lamellarum colorata. Pileipellis e cellulis formata. Terrestris, subcaespitosa vel solitaria. Typus: Britannia, Hampshire, New Forest, Romsey, 11 Sept. 1971, *E. Kits van Waveren* (L).

**Etymology:** Named after the village of Romsey.

Cap 17–32 mm, conico-convex to convex or plano-convex, with umbo, very dark brown (Mu. 7.5 YR 3/2; 10 YR 3/2) with reddish hue (in early stages probably dark reddish brown) or dark brown (Mu. 7.5 YR 4/4) at centre, elsewhere paler, greyish brown (Mu. 10 YR 5/2) or acorn-coloured, striate up to 2/3 from margin, hygrophanous, drying out to pale brown (Mu. 10 YR 7/4), slightly darker at centre, without pink, neither rugulose nor micaceous. Veil white, rudimentary, forming many or only a few fibrils and small wicker-works of fibrils in a 1 mm broad zone along margin of cap, not appendiculate, fugacious; few scattered fibrils on stem. Gills 3–5 mm broad, ventricose, broadly to very broadly adnate without tooth, more or less tobacco-coloured or greyish brown (Mu. 7.5 YR 4/4; 10 YR 5/2, 5/3, 5/4), with white edge. Stem 20–30 × 2–4 mm, cylindrical or slightly thicker towards base, hollow, whitish (but see observations), minutely longitudinally fibrillose striate from a thin whitish layer, pruinose at apex; base not rooting, covered by down. Flesh of cap in centre 1.5–2 mm thick, dark brown (Mu. 10 YR 3/3) of stem whitish (but see observations); smell indistinctive. Trama of 'washed' gill pigmented (but see observations). Spore print very dark reddish brown.

Spores 7–8.5 × 4–4.5  $\mu\text{m}$  (mean values 7.7–7.8 × 4.2–4.4  $\mu\text{m}$ : 2 collections), ellipsoid, adaxially flattened but a number of spores slightly but distinctly phaseoliform, in water orange-brown (Mu. 5 YR 5/8, 4/8), in  $\text{NH}_4\text{OH}$  10% dark brown (Mu. 5 YR 4/4, 4/6), in  $\text{KOH}$  5% sordid brown (Mu. 10 YR 5/3, 4/3), with indistinct germ pore (callus)



Figs. 50–55. *Psathyrella romseyensis*. — 50. Carpophores (× 1), Romsey, 11 Sept. 1971. — 51. Id., Delden, 23 Sept. 1969. — 52. Spores. — 53. Basidia. — 54. Pleurocystidiogram. — 55. Cheilocystidiogram.

and distinct hilar appendix, not opaque. Basidia  $16-20 \times 7-7.5 \mu\text{m}$ , clavate, 4-spored. Pleurocystidia  $(30-)35-45(-50) \times (7.5-)9-13 \mu\text{m}$ , utriform but very few with subapical constriction, most cells being fusoid with (very) obtuse to subobtuse apex, with broad pedicel, little numerous, thin-walled, colourless or very pale brown in  $\text{NH}_4\text{OH}$  10%. Marginal cells: pleurocystidioid cheilocystidia  $25-45 \times 7.5-12.5 \mu\text{m}$ , abundant or merely numerous and then in some areas crowded, intermixed with fairly numerous spheropedunculate and clavate cells,  $12.5-22.5 \times 7.5-12.5 \mu\text{m}$ ; all cells thin-walled and colourless. Hymenophoral trama pigmented (but see observations). Pileipellis a 2-3 cells deep layer of globose and subglobose cells,  $15-40 \mu\text{m}$  diam., very pale brown in  $\text{NH}_4\text{OH}$  10%, practically colourless.

**Habitat & distribution.**—Terrestrial (found in dry soil of a heath, also in moss), solitary or subcaespitose. September.

**Collections examined.**—GREAT BRITAIN, Hampshire, New Forest, Ampfield Wood near Romsey, 11 Sept. 1971, *E. K. v. W.* (type, L). — THE NETHERLANDS, prov. Overijssel, Delden, Bornse straatweg near ice rink, 23 Sept. 1969, *E. K. v. W.* (L).

This species in some respects resembles *P. noli-tangere* but differs from that species by its habitat (not in marshy areas), its slightly robuster habit, the presence of an umbo, its very broadly adnate gills, its smaller, narrower and little numerous pleurocystidia, which moreover are very infrequently provided with a subapical constriction, and its spores not having a distinct germ pore.

At first we were reluctant in concluding the specimens of the British collection (4 subcaespitose specimens on a heath) and the Dutch collection (1 solitary specimen in wet moss) to represent one and the same species. In the end we decided that they may be regarded as such, chiefly because sizes, shape, colour, and germ pore (callus) of the spores and sizes and shapes of pleurocystidia and pleurocystidioid cheilocystidia in both collections were precisely the same, while most macroscopical characters (size, umbo, rudimentary veil, broadly adnate gills) also were fully identical. There were three differences between the two collections: (i) In the Dutch specimen the flesh of the stem was clearly pigmented, the result being that while the thin superficial layer of the stem rendered the upper half of the stem whitish, the lower half was increasingly brownish towards the base, the fibrils of the thin layer increasingly disjoining towards the base and therewith increasingly exposing the brown colour of the stem, which in its upper half was yellowish brown (Mu. 10 YR 5/4), lower down gradually darker towards the base (Mu. 10 YR 3/3). In the British collection the flesh of the stem was very pale brown. (ii) In the Dutch specimen the hymenophoral trama was little pigmented ('washed' gill pale brown, Mu. 10 YR 7/4, paler towards the edge, sub micr. very pale brown, without yellow hyphal septa and encrustations) whereas in the British material this trama was distinctly pigmented ('washed' gill with very vague yellowish brown anastomosing tissue strands running from base almost to edge through the in itself pale brownish grey, paler than Mu. 10 YR 6/2, gill tissue and sub micr. distinctly brown with few yellow hyphal septa and here and there minute encrustations). (iii) The Dutch specimen grew in wet moss, the British specimens in the dry soil of a sandy heath.

Considering the great variability of pigmentations in *Psathyrella* and the doubtful importance here to be attached to the difference in habitat as only two collections were

available, we let the striking similarity of the macro- and microscopical features between the specimens of our two collections overrule these three differences. Obviously more collections are needed for further observation.

For a comparison of *P. romseyensis* with *P. denniensis* (in sect. *Hydrophilae*) see the discussion under that species.

S E C T I O N P E N N A T A E

REVISED KEY TO THE SPECIES OF SECTION PENNATAE

1. Veil very strongly to strongly developed; no red underlining of gill edge; cystidia without oily inclusions:
  2. In coastal dunes, behind fore dunes, amongst *Ammophila*, *Carex* and *Festuca*; spores 9–10 (–11) × 4.5–5 μm (but see first 9; also in dunes but gill edge red underlined and spores 7–9 × 4.5–5 μm) . . . . . *P. flexispora*
  2. Not as above:
    3. Pleurocystidia ventricose-fusoid, tapering to a subacute, acute or very acute apex, slightly thick-walled, distinctly (pale) brown in NH<sub>4</sub>OH 10%, with refractive wall:
      4. On burnt ground; pleurocystidia 22.5–40 × 7.5–12.5 μm, with very acute, sharply pointed apex; spores 6.5–8 × 4–4.5 μm, without germ pore . . . . . *P. pennata*
      4. Not on burnt ground, terrestrial; pleurocystidia 40–80 × 8–17.5 μm, with subacute to acute apex; spores with germ pore:
        5. Spores 8–10 × 4.5–5 μm . . . . . *P. artemisiae* var. *artemisiae*
        5. Spores 6.5–7 (–8) × 4–4.5 μm . . . . . *P. artemisiae* var. *microspora*
    3. Pleurocystidia ventricose-fusoid with subobtuse to subacute apex, with wall neither thickened, nor refractive, not distinctly (pale) brown in NH<sub>4</sub>OH 10%:
      6. Distinctly pink in drying cap . . . . . *P. impexa* (see also p. 368)
      6. No pink in drying cap (see also *P. rostellata*, p. 365) . . . . . *P. friesii*
1. Veil rudimentary or thin, only rarely at most moderately developed, fugacious:
  7. Pleurocystidia and pleurocystidioid cheilocystidia with one large oily inclusion and/or a few smaller ones . . . . . *P. gossypina*
  7. Cystidia without oily inclusions:
    8. Carpophores on culms of *Phragmites*, *Scirpus* just above water level (see also *P. almerensis*)  
*P. basii*
    8. Not as above:
      9. Gill edge red underlined; spheropedunculate and clavate cheilocystidia large (12.5–35 × 7.5–25 μm) and abundant; spores 7–9 × 4.5–5.5 μm (If spores 9–11 × 5.5–6.5, see *P. murcida*.):
        10. Pink in drying cap; spores (mean values 8.1 × 4.6 μm), ellipsoid, dark, with small (c. 1 μm wide) germ pore; pleurocystidioid cheilocystidia moderately numerous  
*P. dunensis*
        10. No pink in drying cap; spores (mean values 8.7 × 5.4 μm) ellipsoid but many distinctly ovoid, with distinct (c. 1.8 μm wide) germ pore; pleurocystidioid cheilocystidia few in number . . . . . *P. dunarum*
      9. Gill edge not red underlined (except rarely in *P. murcida*):
        11. Carpophores minute; cap 3–9 (–11) mm; stem 15–25 mm long:
          12. Basidia 2-spored; pleurocystidia not mucronate . . . . . *P. perpusilla*, p. 354
          12. Basidia 4-spored; pleurocystidia mucronate, subcapitate or forked  
*P. minutissima*, p. 356
  11. Carpophores larger:

13. Rather large central area of cap becoming conspicuously warm ochre-brown during process of drying:
14. Spores  $10-11.5 \times 5.5-6.5 \mu\text{m}$ , very dark, opaque; basidia subspheropedunculate; pleurocystidia  $47-72.5(-75) \times 10-17.5 \mu\text{m}$ , lageniform with long, narrow neck . . . . . *P. dicrani*
14. Spores smaller,  $7-10 \times 4-4.5 \mu\text{m}$ , dark, subopaque or not opaque; basidia clavate:
15. Pleurocystidia  $55-75(-88) \times (8-)10-12(-15) \mu\text{m}$ , narrowly fusoid or lageniform . . . . . *P. fulvescens*
15. Pleurocystidia  $35-55(-60) \times (8-)10-15(-17.5) \mu\text{m}$ , fusoid or sublageniform . . . . . *P. fulvescens* var. *brevicystis*
13. Central area of cap not conspicuously browning during process of drying (but if spores very dark and opaque and basidia subspheropedunculate, see *P. dicrani*):
16. Carpophores densely caespitose, with long stems and relatively small caps  
*P. multipedata*
16. Not as above:
17. Spores large (mean values  $9.6-10.5 \times 5.5-5.7 \mu\text{m}$ ); large species from *Fagus* woods; cap 15-35 mm; stem  $50-110 \times 3.5-6$  mm  
*P. murcida*
17. Spores smaller (mean values  $7-9.5 \times 3.9-5.5 \mu\text{m}$ ) and smaller species:
18. Carpophores on dead wood from deciduous trees . . . *P. senex*
18. Carpophores terrestrial, in grass, moss, or clayey soil, often attached to sprigs or wooden debris hidden in the ground (compare also *P. twickelensis* in subsect. *Lutenses* with pleurocystidia doubtfully utriform):
19. Medium-sized species, robust; cap 30 mm; stem  $64 \times 4$  mm  
*P. ploddensis*, p. 357
19. Smaller, usually more slender species; cap 8-25 mm; stem  $17-60(-75) \times 1.5-3$  mm:
20. Spores pale, in water pale yellowish brown to orange (Mu. 7.5 YR 6/8, 5/8, 5 YR 5/6, 6/6); spheropedunculate and clavate cheilocystidia large,  $17.5-35 \times 10-20 \mu\text{m}$ , abundant; pleurocystidioid cheilocystidia few; pleurocystidia ventricose-fusoid,  $35-75 \times 9-15 \mu\text{m}$ ; spore print some shade of brown:
21. Spores small (mean values  $7.4-7.9 \times 4.5-4.9 \mu\text{m}$ ); pleurocystidioid cheilocystidia scarce, rarely locally or along entire edge somewhat more; pleurocystidia ventricose-fusoid, sublageniform,  $35-75 \times 9-15 \mu\text{m}$  . . . . . *P. obtusata*, p. 336
21. Spores larger (mean values  $8.7 \times 5.2 \mu\text{m}$ ); pleurocystidioid cheilocystidia as under first 21 but in very small stretch adjoining stem suddenly numerous; while spheropedunculate and clavate cells less numerous and smaller; pleurocystidia narrowly fusoid to subcylindrical,  $50-65 \times 10-12 \mu\text{m}$   
*P. vrynwyensis*, p. 359
20. Spores dark, in water dark red (Mu. 2.5 YR 3/6), spore print purplish black.

22. Spheropedunculate and clavate cheilocystidia large, 12.5–27.5 × 7.5–17.5  $\mu\text{m}$ , numerous, pleurocystidioid cheilocystidia scanty, spores not elongate (mean values 7.8–8.2 × 4.7–4.9  $\mu\text{m}$ )

*P. seymourensis*

22. Spheropedunculate and clavate cheilocystidia small, 10–20 × 5–10  $\mu\text{m}$ , unobtrusive, pleurocystidioid cheilocystidia numerous, spores elongate (mean values 7.7–9.5 × 3.9–4.7  $\mu\text{m}$ )

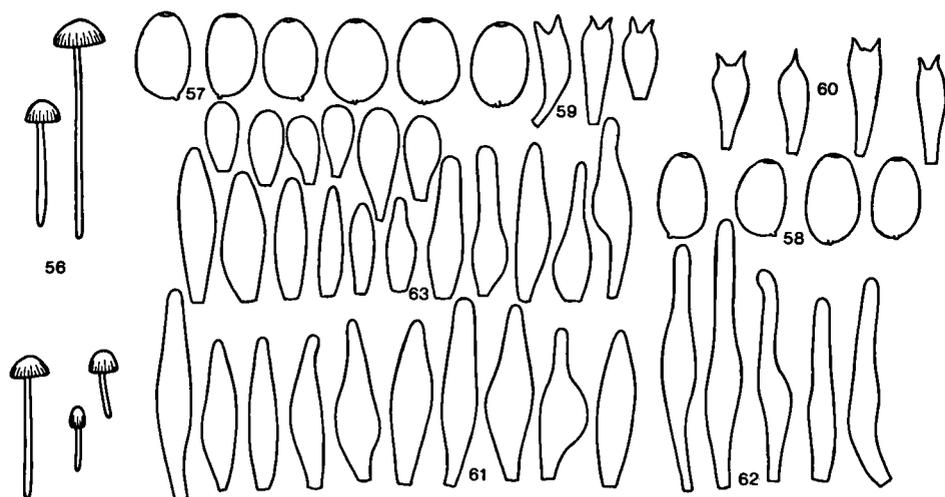
*P. ocellata*

***Psathyrella perpusilla* Kits van Wav., spec. nov.—Figs. 56–63**

Pileus 3–5(–8) mm, parabolicus, striatus, obscure badio-cinereo-brunneus, hygrophanus, in sicco centro pallide ochraceus, marginem versus pallescens, colore roseo destitutus, eximie micaceus, leviter rugulosus. Velum album, primo dense membranaceum, pileum et stipite conjugens, fibrillas numerosus pilei marginem formans. Lamellae 1.5 mm latae, ventricosae, late adnatae, obscure badiae, acie albae. Stipes 20–25 × 0.75–1 mm, cylindraceus, albus, eradicatus, apice pruinosis. Caro pilei eximie tenuis, concolor, stipitis alba. Sporae in cumulo obscure purpureo, 8.0–9(–10) × (5–)5.5–6.5  $\mu\text{m}$ , late ellipsoideae, haud phasecoliformes, in aqua observatae obscure badiae, poro germinativo 1.5  $\mu\text{m}$  munitae. Basidia 15–25 × 6.5–9  $\mu\text{m}$ , clavata, 2-sporigera. Pleurocystidia 32.5–42.5(–50) × 7.5–12.5  $\mu\text{m}$ , moderatim numerosa, lageniformia vel sublageniformia, collo subcylindraceo praedita, tenui-tunicata. Cellulae marginales: cheilocystidia pleurocystidioida 20–35(–37.5–40) × 7.5–10(–12.5)  $\mu\text{m}$  numerosa, cellulis sphaeropedunculatis et clavatis, 15–20(–22.5) × 7.5–12.5  $\mu\text{m}$  intermixta. Trama lamellarum colorata. Pileipellis e cellulis formata, nec colorata. Terrestris, in terram argillosam inter graminis in silva frondosa (*Alnus*, *Populus*), solitaria. Typus: The Netherlands, prov. Noord-Holland, Amsterdam Wood, 24 July 1962, *E. Kits van Waveren* (L).

Cap 3–5(–8–11) mm, paraboloid or conico-paraboloid, when moist striate up to 1/2–2/3 from margin, dark reddish-greyish brown (Mu. 5 YR 4/2; 7.5 YR 4/2) with purplish hue, soon browner (Mu. 7.5 YR 4/4), hygrophanous, rapidly drying out to pale greyish ochre (Mu. 10 YR 7/4) at centre, paler (Mu. 10 YR 8/4) towards margin or alutaceous (Mu. 10 YR 6/2, 7/3), without pink, strongly micaceous, not or only slightly rugulose. Veil distinct, in very young specimens forming a dense fleece, connecting stem with margin of cap, at maturity leaving many white minute fibrils and wicker-works of fibrils in a 1 mm broad zone along margin of cap and scattered isolated fibrils further up, even at apex, also at base of stem. Gills 1.5 mm broad, ventricose, broadly adnate, first pale, later dark chocolate (Mu. 2.5 YR 5/2; 5 YR 4/2), with white, minutely fimbriate edge. Stem 20–25 × 0.75–1 mm, cylindrical with distinct very small bulb at base, sometimes springing from a minute, disc-like structure, white, in lower part isabelline, hollow, not rooting; apex distinctly pruinose. Flesh of cap in centre very thin, concolorous, of stem white. Trama of 'washed' gill in basal 2/3 of gill pale yellowish brown (Mu. 7.5 YR 7/6) in periphery paler (Mu. 10 YR 7/3), without red underlining of gill edge. Spore print not recorded.

Spores 8.0–9(–10) × (5–)5.5–6.5  $\mu\text{m}$  (mean values 8.5–9.2 × 5.2–5.9  $\mu\text{m}$ : 4 collections), broad-ellipsoid to ovoid, adaxially flattened, in water dark orange-red (Mu. 2.5 YR 4/6, 3/6), in NH<sub>4</sub>OH 10% dark brown (Mu. 5 YR 4/3, 4/4, 3/4), in KOH 5% dark sordid brown (Mu. 7.5 YR 4/2), not opaque to subopaque, with distinct germ pore (c. 1.5  $\mu\text{m}$ ) and distinct hilar appendix. Basidia 15–25 × 6.5–9  $\mu\text{m}$ , clavate, 2-spored (very few 1-spored basidia seen, accounting for the presence of very few, very large spores, e.g. 11 × 7.0  $\mu\text{m}$ ). Pleurocystidia 32.5–50(–60) × 7.5–12.5  $\mu\text{m}$ , fairly numer-



Figs. 56–63. *Psathyrella perpusilla*. — 56. Carpophores ( $\times 1$ ), Amsterdam Wood, 13 June 1961 and 24 July 1962. — 57. Spores, Amsterdam Wood, 24 July 1962. — 58. Id., Oost Flevoland, 12 March 1977. — 59. Basidia, Amsterdam Wood, 24 July 1962. — 60. Id., Oost Flevoland, 12 March 1977. — 61. Pleurocystidiogram, 24 July 1962. — 62. Id., 12 March 1977. — 63. Cheilocystidiogram, 24 July 1962.

ous lageniform to sublageniform or fusoid, with cylindrical to subcylindrical and sometimes long neck ( $4\text{--}5\ \mu\text{m}$  thick) and subacute to acute apex, passing gradually into ventricose cell-body, with relatively broad and distinct pedicel, thin-walled, colourless. Marginal cells: pleurocystidioid cheilocystidia,  $20\text{--}35\text{--}(45) \times 7.5\text{--}10\text{--}(12.5)\ \mu\text{m}$ , numerous, often even densely packed, intermixed with moderately numerous spheropedunculate and clavate cells,  $15\text{--}20\text{--}(22.5) \times 7.5\text{--}12.5\ \mu\text{m}$ ; all cells thin-walled and colourless. Hymenophoral trama in  $\text{NH}_4\text{OH}$  10% sub micr. pale but distinctly (particularly at base) yellowish brown from membranous pigment, with near base a few and at base a fair number of yellow hyphal septa, without encrustations. Pileipellis a 2–3 cells deep layer of globose, colourless cells,  $25\text{--}40\text{--}(50)\ \mu\text{m}$  diam.

**Habitat & distribution.**—Terrestrial in clayey soil, against small dead sprigs in deciduous woods (*Alnus*, *Populus*) between thin grass. Very rare.

**Collections examined.**—THE NETHERLANDS: prov. Noord-Holland, Amsterdam, Amsterdam Wood, 13 June 1961, 30 Sept. 1961 & 24 July 1962 (type), *E. K. v. W.* (L); prov. Flevoland, Oost-Flevoland, Wisentbos (lot K 85), 12 March 1977, *D. Tjallingii-Beukers*; Lelystad, Zuigerplas (lot A 62), 15 June 1983, *P. B. Jansen*. Not recorded from France and British Isles.

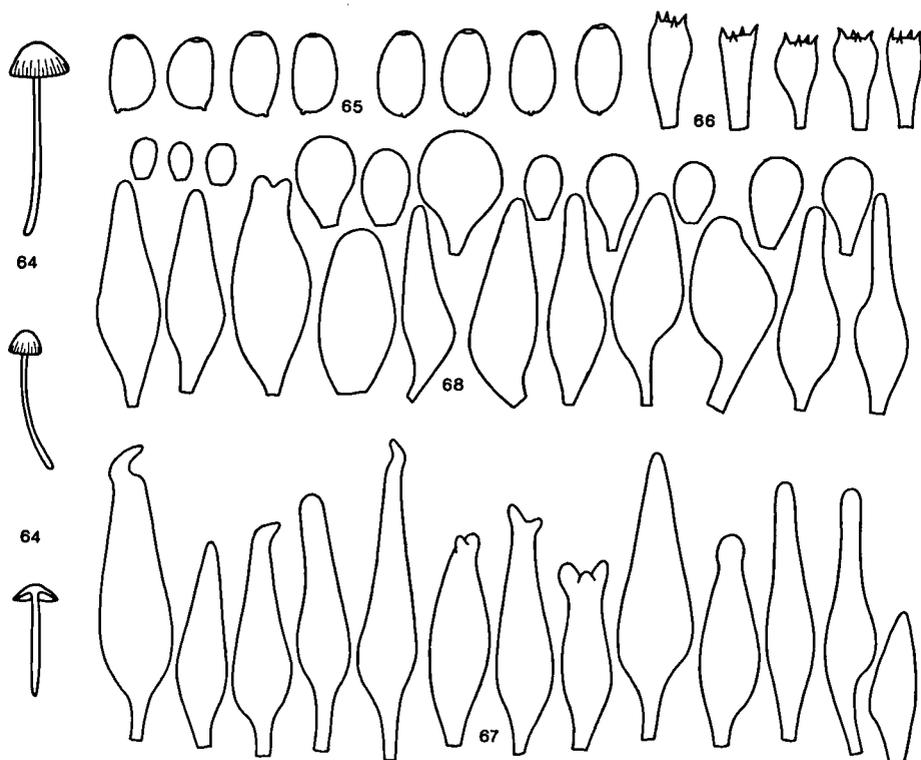
This species is characterised macroscopically by its exceedingly small size of the carpophores and its bulbillate stem, microscopically by its 2-spored basidia, and broad spores.

*Psathyrella minutissima* Kits van Wav., *spec. nov.*—Figs. 64–68

Pileus 4–9 mm latus, conicus vel parabolicus, pallide flavo-brunneus sed marginem versus cinereo-brunneus, perstriato-sulcatus, hygrophanus, in sicco pallide brunneus, colore roseo destitutus, nec atomatus, parum rugulosus. Velum album, initio pileum obvolvens, fugacissimum demum a pileo abscedens, stipitis ad basim parum. Lamellae 1 mm latae, subventricosae, late adnatae, cinereo-purpureae, acie albae. Stipes 15–25 × 0.75–1 mm, cylindraceus, basi parum incrassatus, eradicatus, pallide brunneus, apice pruinosis. Caro centro pilei 1 mm crassa, brunnea, stipitis alba. Sporae in cumulo obscure brunneae, 8–10 × 4.5–5.5  $\mu\text{m}$ , ellipsoideae vel ellipsoideo-ovoideae, nec phaseoliformes, nec opacus, nec obscurae, in aqua observata rubelo-aurantiacae, poro germinativo distincto (1.5–1.8  $\mu\text{m}$ ) munitae. Basidia 22.5–27.5 × 8–10  $\mu\text{m}$ , clavata, 4-sporigera. Pleurocystidia 45–70 × 12.5–17.5 (–20)  $\mu\text{m}$ , sat numerosa, sublageniformia vel fusiformia, apice subacuta vel obtusa, saepe mucronata vel subcapitata furcata, tenui-tunicata, colore destituta. Cellulae marginales: e basidiis numerosis constantes et cellulis spheropedunculatis parvis (7.5–)10–15 × 5–10  $\mu\text{m}$  etiam cellulis sphaeropedunculatis majoribus, 20–25 (–30) × 12.5–15 (–20)  $\mu\text{m}$ , cheilocystidiis sparsis versiformibus plerumque tenui-tunicatis, decoloratisque intermixtis. Trama lamellarum colorata. Pileipellis e cellulis formata. Terrestis solitaria, inter ramentis silvarum (*Quercus*, *Fagus*). Autumno. Typus: The Netherlands, prov. Noord-Holland, Overveen, 'Elswout', 25 Oct. 1980, *E. Kits van Waveren* (L).

Cap 4–9 mm, conical or paraboloid, central half or two third pale yellowish brown (Mu. 10 YR 6/4–5/4), peripheral half or one third greyish brown (Mu. 10 YR 5/2), striate-sulcate up to half-way from margin, hygrophanous, drying out to very pale brown (Mu. 10 YR 8/3), at centre ochreous yellow, without pink, not micaceous, slightly rugulose. Veil white in primordium (total length of stem + height of cap 2 mm) covering entire cap with a whitish, silvery coating, inserting on stem, very fugacious, at maturity absent from cap but on basal half of stem as scattered minute fibrils. Gills 1 mm broad, slightly ventricose, rather broadly adnate distant, greyish purple (Mu. 5 YR 5/2), with white edge. Stem 15–25 × 0.75–1 mm, cylindrical, slightly thicker at base, not rooting, very pale brown, minutely longitudinally fibrillose striate, at apex rather coarsely pruinose. Flesh of cap in centre 1 mm thick, brown (Mu. 10 YR 5/4), in stem white, lower down very pale brown. Trama of 'washed' gill pale yellowish brown (Mu. 10 YR 7/4), gradually paler towards edge. Spore print very dark brown.

Spores 8–10 × 4.5–5.5  $\mu\text{m}$  (mean values 8.6 × 5.1  $\mu\text{m}$ : 1 collection), ellipsoid or ellipsoid-ovoid, not phaseoliform, not dark, in water reddish yellow, orange (Mu. 5 YR 5/6) in NH<sub>4</sub>OH 10% brown (Mu. 7.5 YR 5/4) with reddish hue, in KOH 5% sordid brown (Mu. 10 YR 5/3), not opaque, with distinct germ pore (1.5–1.8  $\mu\text{m}$ ) and small hilar appendix. Basidia 22.5–27.5 × 8–10  $\mu\text{m}$ , clavate, 4-spored. Pleurocystidia 45–70 × 12.5–17.5 (–20)  $\mu\text{m}$ , rather numerous, sublageniform to fusoid with fairly short and broad or longer and narrower (10–15 × 2.5–4  $\mu\text{m}$ ) pedicel and subacute, subobtuse or obtuse and often mucronate or subcapitate or lobed (forked) apex, thin-walled, colourless. Edge of gill heteromorphic: numerous immature and rather few mature basidia intermixed with (i) many small spheropedunculate cells, (7.5–)10–15 × 5–10  $\mu\text{m}$  and only few and scattered larger spheropedunculate cells, 20–25 (–30) × 12.5–15 (–20)  $\mu\text{m}$ , some of the latter cells slightly thick-walled and very pale brown in NH<sub>4</sub>OH 10%, (ii) relatively few and scattered (in a few places somewhat more) versiform sublageniform or fusoid cheilocystidia, 35–50 (–55) × 10–15  $\mu\text{m}$  with subobtuse or obtuse, rarely forked apex and short, broad pedicel, and (iii) some broadly ellipsoid to utriform cheilocystidia, 35–50 × 20  $\mu\text{m}$ ; far and away most cells thin-walled and colourless in NH<sub>4</sub>OH 10%. Hymenophoral trama pale brown from membranal pigment, paler towards edge, no yellow hyphal septa or encrustations. Pileipellis a two cells deep layer of colourless globose and subglobose cells, 15–25  $\mu\text{m}$  diam.



Figs. 64–68. *Psathyrella minutissima*. — 64. Carpophores ( $\times 1$ ). — 65. Spores. — 66. Basidia — 67. Pleurocystidiogram. — 68. Cheilocystidiogram.

**Habitat & distribution.**—Solitary, against dead branch on the ground in deciduous woods (*Quercus* and *Fagus*). Known only from type locality.

**Collection examined.**—THE NETHERLANDS, prov. Noord-Holland, Overveen, estate 'Elswout', 25 Oct. 1980 (5 specimens), *E. K. v. W.* (type, L).

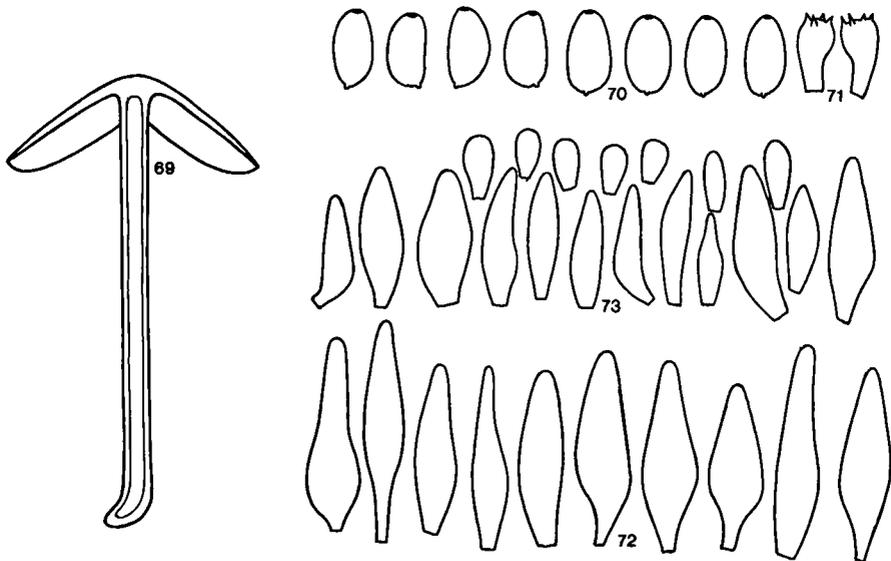
***Psathyrella ploddensis* Kits van Wav., *spec. nov.*—Figs. 69–73**

Pileus 30 mm latus, conico-convexus, recens obscure badius, perstriatus, hygrophanus, in sicco pallide brunneus, haud roseus. Velum album, e fibrillis vel fasciculis numerosis in zonam pilei marginalem 8 mm latam formans, haud appendiculatum, et fibrillae in stipite paucae. Lamellae 4 mm latae, ad pilei marginem ventricosae, alibi rectae adscendentes, late adnatae, basi brunneae, aciem versus cinerascens, acie albae. Stipes 65  $\times$  4 mm, cylindraceus, eradicatus apice pruinosis, cavus, albus. Caro pilei centro 2 mm crassa, obscure brunneus, stipitis apice brunneus, alibi pallide brunnea. Sporae in cumulo purpureo-atrae, 7–8  $\times$  4.5–5  $\mu\text{m}$ , ellipsoideae, haud phaseoliformes, in aqua observata obscure badiae, poro germinativo parvo instructae. Basidia 17.5–20  $\times$  7.5–9  $\mu\text{m}$ , clavata, 4-sporigera.

*Pleurocystidia* (35–)40–50 × 10–15 (–17.5)  $\mu\text{m}$ , sat numerosa, ventricoso-fusoidea, apice subacuta vel subobtusata, tenui-tunicata. Cellulae marginales: cheilocystidia pleurocystidioidia et sublageniformia 25–35 × 7.5–12.5 (–15)  $\mu\text{m}$ , abundantia, interdum confertissima, cellulis spheropedunculatis et clavatis 12.5–15 × 5–7.5  $\mu\text{m}$  immixta. Trama lamellarum distincte colorata. Pileipellis e cellulis formata. In muscos udos sub *Betula*. Typus: Scotia, Invernessshire, Tomich, Plodda Falls, 10 Sept. 1968, *E. Kits van Waveren* (L).

**Etymology:** Named after the type locality.

Cap 30 mm, conico-convex, when fresh dark reddish brown (Mu. 5 YR 3/4), red very soon disappearing, then becoming dark warm brown (Mu. 7.5 YR 4/4), with extreme margin slightly extending beyond gills and whitish, strongly striate up to 2/3 from margin, hygrophanous, drying out to pale brown without pink, neither micaceous nor rugulose. Veil white, leaving numerous fibrils, isolated and fasciculated in a 8 mm broad marginal zone of cap, not appendiculate, and loose scattered fibrils on stem. Gills 4 mm broad, ventricose near margin of cap, then straight and ascending, broadly adnate, brownish (Mu. 10 YR 5/4) at base, becoming greyer towards edge, in periphery pale brownish grey, with white edge. Stem 65 × 4 (apex) × 5 (base) mm, cylindrical, not rooting, hollow, white, glossy, flamed, with minute longitudinal fibrillose striation, pruinose at apex. Flesh of cap in centre 2 mm thick, dark brown (Mu. 10 YR 4/4), of stem alongside gills brownish (Mu. 10 YR 4/4), lower down very pale brown (Mu. 10 YR 7/3) but near and in base darker, entire stem covered by a thin white superficial layer. Trama of 'washed' gills brownish yellow in a very narrow strip at base, in basal 1/3 pale brown (Mu. 10 YR 7/4), elsewhere very pale brown (Mu. 10 YR 7/3). Spore print purplish black.



Figs. 69–73. *Psathyrella ploddensis*. — 69. Carpophore (×1). — 70. Spores. — 71. Basidia. — 72. Pleurocystidiogram. — 73. Cheilocystidiogram.

Spores  $7-8 \times 4.5-5 \mu\text{m}$  (mean values  $7.8 \times 4.6 \mu\text{m}$ : 1 collection), ellipsoid, adaxially flattened, dark, in water dark red (Mu. 2.5 YR 3/6) in  $\text{NH}_4\text{OH}$  10% dark brown (Mu. 5 YR 4/4, 3/4), in KOH 5% dark sordid brown (Mu. 10 YR 4/3, 3/3), with distinct but small germ pore (c.  $1 \mu\text{m}$ ) and small but distinct hilar appendix. Basidia  $17.5-20 \times 7.5-9 \mu\text{m}$ , clavate, 4-spored. Pleurocystidia  $(35-40-50) \times 10-15(-17.5) \mu\text{m}$ , fairly numerous, ventricose fusoid to sublageniform, with short and fairly broad pedicel and subacute to subobtuse apex, thin-walled, colourless. Marginal cells: pleurocystidioid cheilocystidia  $25-35 \times 7.5-12.5(-15) \mu\text{m}$ , densely packed, intermixed with many unobtrusive small spheropedunculate and clavate cells,  $12.5-15 \times 5-7.5 \mu\text{m}$ ; all cells thin-walled and colourless. Hymenophoral trama distinctly brown from membranous pigment, particularly in basal 1/3 and there with many yellow hyphal septa and minute encrustations. Pileipellis a 2-3 cells deep layer of globose and subglobose in  $\text{NH}_4\text{OH}$  10% colourless or very pale brown cells,  $15-50 \mu\text{m}$  diam.

Habitat & distribution.—In very wet moss under *Betula*. September. Known only from type locality.

Collection examined.—SCOTLAND, Invernessshire, Tomich, Plodda Falls, 10 Sept. 1968, E. K. v. W. (type, L).

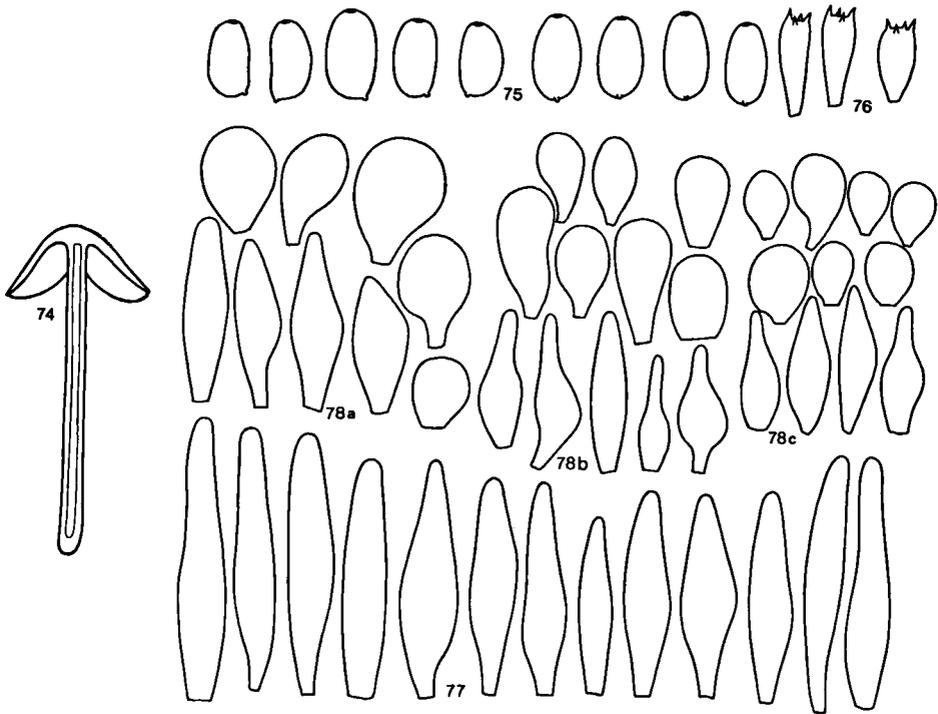
*Psathyrella ploddensis* is a rather robust but otherwise uncharacteristic species, which because of the size of its dark spores and fusoid to sublageniform pleurocystidia belongs to section *Pennatae*.

#### *Psathyrella vyrnwyensis* Kits van Wav., *spec. nov.*—Figs. 74-78

Pileus 17 mm latus, 10 mm altus, obtuse conicus ex umbonate, centro brunneus marginem versus sordide brunneus, striatus, hygrophanus, in sicco admodum pallide brunneus, apice flavidus, colore roseo destitutus, subatomatus et subrugosus. Velum album, e fibrillis et fasciculis fibrillosis minutis disseminatis marginem pilei formatum. Lamellae 4 mm latae, ad pilei marginem ventricosae, alibi rectae, adscendentes, late adnatae, acie albae. Stipes  $40 \times 2-3$  mm, apice albus, deorsum pallide brunneus, cavus, apice pruinosis. Caro pilei centro 2 mm crassa, concolor, caro stipitis apice alba, deorsum pallide brunnea. Sporae in cumulo obscure brunneae,  $8-9 \times 4.5-5.5 \mu\text{m}$ , ellipsoideae nonnullae vix phaseoliformes, nec obscurae, in aqua observata aurantiacae, haud opacae, poro germinativo admodum parvo. Basidia  $17.5-22.5 \times 7-10 \mu\text{m}$ , clavata, 4-sporigera. Pleurocystidia  $(45-50-65) \times 10-12.5 \mu\text{m}$ , abundantia, anguste fusiformia, apice obtusa, subobtusa vel subacuta, brevi pedicellata, tenui-tunicata, colore destituta cellulae. Cellulae marginales: cellulae spheropedunculatae et clavatae perabundantes,  $17.5-30 \times 12.5-27.5 \mu\text{m}$ , creberrimae, cheilocystidiis lageniformibus, sublageniformibus vel fusiformibus  $30-40(-45) \times 7.5-12.5 \mu\text{m}$  parvulus sed juxta stipes confertis intermixtae. Trama lamellarum colorata. Pileipellis e cellulis formata. Terrestris, sub *Fagus*. Typus: Britannica, Wales, prov. Powys, Lake Vyrnwy, 29 Aug. 1979, E. Kits van Waveren (L).

Etyymology: Named after the type locality.

Cap 17 mm broad, 10 mm high, obtuse conical without umbo, central half warm brown (Mu. 7.5 YR 5/4) with reddish, peripheral half sordid brown (Mu. 10 YR 5/4), striate up to 2/3 from margin, hygrophanous, drying out to yellowish (Mu. 10 YR 8/6) at apex, very pale brown (Mu. 10 YR 8/4) towards margin, palest (Mu. 10 YR 8/4) at margin, without pink, slightly micaceous, not rugulose but distinctly, be it slightly, sulcate. Veil white, forming here and there minute fibrils and small wicker works of fibrils close to margin of cap, not appendiculate, not seen on stem. Gills 4 mm broad, ventricose near margin of cap, then straight, ascending, broadly adnate, with white, fimbriate edge. Stem  $40 \times 2$  (apex)  $\times 3$  (base) mm, gradually thickening towards base, white at apex over a distance of 8 mm, lower down pale brown, hollow, at apex pruinose, at base



Figs. 74–78. *Psathyrella vyrynwyensis*. — 74. Carpophore ( $\times 1$ ). — 75. Spores. — 76. Basidia. — 77. Pleurocystidiogram. — 78. Cheilocystidiogram, a. near margin of cap, b. half way stem, c. adjoining stem.

strigose from white hairs. Flesh of cap in centre 2 mm thick, brown (Mu. 7.5 YR 5/4) with reddish hue, of stem in apex white to very pale brown, browner towards base, yellowish brown in the middle, pale bronze brown in base. Trama of 'washed' gill very pale yellowish brown (Mu. 10 YR 7/3) from base to edge. Spore print dark brown.

Spores  $8-9 \times 4.5-5.5 \mu\text{m}$  (mean values  $8.7 \times 5.2 \mu\text{m}$ : 1 specimen), ellipsoid, adaxially flattened, few slightly phaseoliform, not dark, in water orange (Mu. 5 YR 5/6, 6/6), in  $\text{NH}_4\text{OH}$  10% yellowish brown (Mu. 7.5 YR 5/8), in  $\text{KOH}$  5% sordid olivaceous brown (Mu. 10 YR 6/4) with reddish hue, not opaque, with very small germ pore and small hilar appendix. Basidia  $17.5-22.5 \times 7-10 \mu\text{m}$ , clavate, 4-spored. Pleurocystidia (45–)  $50-65 \times 10-12.5 \mu\text{m}$ , abundant, narrowly fusiform with obtuse, subobtuse or acute apex and short pedicel, thin-walled, colourless. Marginal cells: gill edge sterile from very large quantities of spheropedunculate cells,  $17.5-30 \times 12.5-27.5 \mu\text{m}$ , near margin of cap densely packed and intermixed with only very few lageniform, sublageniform or fusoid cheilocystidia,  $30-40(-45) \times 7.5-12.5 \mu\text{m}$ , half-way towards stem slightly increasing in number, but suddenly in very small stretch adjoining stem, numerous, simultaneously the spheropedunculate cells, although remaining distinctly in evidence, becoming less numerous, smaller and more clavate; most spheropedunculate cells, partic-

ularly those in the area of the margin of the cap slightly thick-walled and pale brown in  $\text{NH}_4\text{OH}$  10%. Hymenophoral trama very pale brown from membranous pigment, hardly any yellow hyphal septa, few minute encrustations. Pileipellis a 2–3 cells deep layer of colourless globose and subglobose cells, 30–50  $\mu\text{m}$  diam. and a few broadly ellipsoid cells 50  $\times$  25  $\mu\text{m}$ .

**Habitat & distribution.**—On humus in rich soil under *Fagus*. Known only from type locality in Wales.

**Collection examined.**—BRITISH ISLES, Wales, county Powys, Lake Vyrnwy, 29 Aug. 1979, E. K. v. W. (type, L).

In an attempt to identify this species with Smith's (1972) keys, we arrived at *P. agrariella*, of which Smith states, unfortunately without giving pictures of carpophores and cells, that the pleurocystidia are abundant, fusoid ventricose, 48–60  $\times$  10–14  $\mu\text{m}$ , that the spores have a small germ pore. Allowing for the great variability of macroscopical characters within all species of *Psathyrella*—Smith's description of these characters in *P. agrariella* seems sufficiently to fit in with *P. vyrnwyensis*. But of the cellular lining of the gill edge of *P. agrariella* Smith states 'cheilocystidia abundant, broadly ventricose, mucronate or saccate, 22–30  $\times$  10–16  $\mu\text{m}$ , slightly yellowish revived in KOH in some.' This description unfortunately does not elucidate to which kind of cells it pertains as no distinction is made between on the one hand the lageniform, sublageniform and fusoid cheilocystidia and on the other hand the spheropedunculate and clavate cells while the ratio between these two types of cells (very important in *P. vyrnwyensis*) is not mentioned. Moreover none of the marginal cells of *P. vyrnwyensis* were mucronate and in *P. agrariella* the pleurocystidia were more ventricose (up to 14  $\mu\text{m}$ ) than in *P. vyrnwyensis* (12.5  $\mu\text{m}$ ; among the abundance of pleurocystidia we found only one cell of which the breadth was 14  $\mu\text{m}$  and one in which it was 15  $\mu\text{m}$ ). As both size and shape of the pleurocystidia in *P. vyrnwyensis* and the dark brown colour of the spore print (not mentioned by Smith for *P. agrariella*) are striking, it was decided to regard *P. vyrnwyensis* as a species in its own right.

#### RECENTLY DESCRIBED NEW SPECIES FROM OUTSIDE THE AREA COVERED BY OUR MONOGRAPH

(The data on macroscopical characters mentioned are taken from the original descriptions. The microscopical data mentioned are from our own examination of the type material, except in the case of *P. berolinense*.)

*Psathyrella berolinense* Gerhardt, Höh. Pilze Langen Luch: 137, fig. 120, pl. 15. 1978.

**Descriptions & illustrations.**—Engel in Pilzfl. N.W. oberfranken 6: 95, pl. on cover. 1982; Gerhardt, Pilze 1: 205. 1984, Kriegelsteiner in Z. Mykol. 49: 89. 1983; Kubicka in Z. Mykol. 48: 41. 1982.

This small (cap 3–20 mm, stem 20–40 × 1–2 mm) coprophilous (boar-droppings) *Psathyrella* was discovered in Germany (Berlin-Grünwald, August 1977, Gerhardt). Because of its small spores (5.8–7.4 × 3–3.7  $\mu\text{m}$ ) it would belong in section *Hydrophila*, but because of the presence of pileocystidia and other striking characters (coprophilous growth, small size, entirely pruinose stem, dark spores) it should perhaps be placed in a new section or be removed from *Psathyrella*, e.g. to *Coprinus* subsect. *Setulosi*. It is furthermore characterised by the presence of lageniform pleurocystidia (20–30 × 4–9.5  $\mu\text{m}$ ), cheilocystidia (size not given, no distinction given between pleurocystidioid cheilocystidia and spheropedunculate and clavate cells) and even pileocystidia (50 × 11  $\mu\text{m}$ ), their numbers not given. We have not examined type material.

*Psathyrella subumbrina* Kits van Wav. & Örstadius in *Persoonia* 31: 129. 1986.

This species, found in Sweden by Örstadius (Kjugekull, 22 Oct. 1983), differs from *P. umbrina* by its thick-set habit (stem 15–30 × 2–3 mm, cap 9–13 mm), its stem having a bulbous base, its strongly developed and in early stages conspicuously appendiculate veil and its slightly smaller spores (6.5–7 × 4.5–5  $\mu\text{m}$ , mean values 6.7 × 4.5  $\mu\text{m}$ ) which are provided with a rather striking oily drop in the centre. Because of the small size of the spores and the overall brown colours this species belongs to section *Hydrophila*.

*Psathyrella suavissima* Ayer in *Mycol. helv.* 1: 145–153. 1984. — *Psathyrella sacchariolens* Enderle in *Beitr. Kenntn. Pilze Mitteleur.* 1: 35–60. 1984.

This remarkable species was first found by Ayer in 1971, later again by him and others in several Swiss localities. Like *P. pervelata*, to which it is very close, it has a very strongly developed veil but it differs from that species by its cap being in all stages strikingly paraboloid (in the end with flattened centre) and never, like in *P. pervelata*, conical or conico-paraboloid, while its colour is strong ochreous orange to brown-orange (Mu. 5 YR 6/8, 5/8; 7.5 YR 6/8, 5/8); in *P. pervelata* the cap colour is predominantly mouse grey, only in the beginning at centre pale ochre to pale brown. Furthermore *P. suavissima* is characterised by a very strong smell (of *Hebeloma sacchariolens*), while its utriform pleurocystidia are smaller (37.5–45 × 12.5–16  $\mu\text{m}$ ) and do not have a subapical constriction. We examined the type (Switzerland, Fribourg, Chatonnye, 20 May 1980 (LAU)), in fact produced the line-drawings of the cystidia, depicted by the author.

Much later (between May and October 1983) Enderle found in Germany (Grimmelfingen, forest 'Hörnle') the very same species and published it—provisionally as a new species producing two kinds of spores (obviously mature and larger, paler, immature ones) under the name *Psathyrella sacchariolens* Enderle, nom. prov. (1984, loc. cit.).

The pleurocystidia being utriform and the utriform pleurocystidioid cheilocystidia being numerous this species belongs to subsection *Lutenses*.

*Psathyrella stigmatospora* Cléménçon in Mycol. helv. 1: 402. 1985.

A combination of three striking microscopical features characterises this species of which we examined type material: (i) Spores small,  $7-8 \times 4-4.5 \mu\text{m}$  (mean values  $7.3 \times 4.6 \mu\text{m}$ ) rather pale, in water reddish brown (Mu. 5 YR 4/8), in  $\text{NH}_4\text{OH}$  10% warm brown (Mu. 5 YR 4/6), in KOH 5% sordid brown (Mu. 10 YR 4/4) with distinct germ pore and hilar appendix. (ii) Surface of most spores minutely but distinctly rough to punctate (oil immersion). (iii) Gill edge lined with abundant and densely packed spheropedunculate (majority) and clavate (minority) rather small cells,  $(12.5-15-20(-25) \times 10-12.5(-15) \mu\text{m})$ , intermixed with very few, easily overlooked, pleurocystidioid cheilocystidia,  $22.5-27.5 \times 10-12.5 \mu\text{m}$ , some of which scarcely distinguishable from clavate marginal cells. Pleurocystidia  $(20-25-40(-42.5) \times 9-15 \mu\text{m})$ , numerous, in the main ventricose-fusoid with short pedicel and obtuse to very obtuse apex, some utriform but without subapical constriction. Cap 11–26 mm, paraboloid, brown, hygrophanous, drying out to very pale brown without pink; veil very distinct, white; flocculi at maturity reaching up to half-way centre and appendiculate; gills 3 mm broad, not crowded, brownish, broadly adnate, with white edge; stem 30–35  $\times$  3–4 mm, cylindrical, not rooting, white; flesh of cap fairly thick, in centre 2–3 mm thick, sordid brown, of stem white but wall of cavity pale yellowish. Trama of 'washed' gill in  $\text{NH}_4\text{OH}$  10% almost colourless, in peripheral 1/3 very pale brown (Mu. 10 YR 7/3) towards base slightly darker (Mu. 10 YR 7/4) and at base Mu. 10 YR 6/4. Spore print (Cléménçon) dark brown.

The average length of the spores ( $7.3 \mu\text{m}$ )— $7.1 \mu\text{m}$  in the Swedish collection, see below—brings this species in section *Hydrophilae*. Many spores in the Swiss collection were abnormally shaped, elongate or constricted, or/and provided with a protruding, drawn out apex. Cléménçon—aware of this great variability of the spores, obviously due to abnormal development—very wisely deleted these spores in measuring their proper sizes, which he nevertheless still recorded as rather diverging ( $5.9-9 \times 3.6-4.8 \mu\text{m}$ ); he did not give mean values. We did and were careful in selecting only the darkest (= mature) spores of which the shape moreover could be regarded to be normal. In this way we arrived at the figure  $7.3 \mu\text{m}$  for the average length of the spores. The spores submic. being fairly pale, the spore print accordingly dark brown and the prevailing colour of cap and gills also having been described as brown, the species seemed to fit in well with those of section *Hydrophilae*.

The minutely but distinctly rough surface of most spores is a phenomenon hitherto not yet described for European species of *Psathyrella*. A.H. Smith (1972: 35–42) described four species (*P. echiniceps*, *P. rugocephala*, *P. rigidipes*, *P. subcinomomea*) all of them having a distinctly, be it faintly, rough surface, only just perceptible with the light microscope and comparable with the ornamentation in *P. stigmatospora*. In *Lacrymaria velutina* and allied species this ornamentation is very much coarser.

The characteristic pattern of the cellular lining of the gill edge would bring *P. stigmatospora* in our subsection *Spadiceogriseae*, in which this species would be very close to

(and in our key to that subsection would adjoin) *P. casca*. Having examined *P. stigmatospora* we immediately reexamined the two collections of *P. casca* mentioned in our monograph (1985: 228). Our Dutch collection (1 Aug. 1974, the only one used for calculating the mean values for the spore sizes as given in our monograph; the Swedish collection having been added much later, while the manuscript was already with the printer) had larger and perfectly smooth spores (mean values  $7.7 \times 4.5 \mu\text{m}$ ), larger pleurocystidia,  $35-45(-55) \times 10-12 \mu\text{m}$ , which, moreover, in the main were distinctly utriform with subapical constriction, while the marginal spheropedunculate and clavate cells also were distinctly larger,  $15-40 \times 15-17.5(-20) \mu\text{m}$  and intermixed with very few ventribose-fusoid and also larger ( $25-40 \times 10-15 \mu\text{m}$ ) pleurocystidioid cheilocystidia.

To our very great surprise we next discovered on reexamination of the microscopical characters of the Swedish collection, mentioned in our monograph (1985: 230), that they were fully identical with those of *P. stigmatospora* and that, while examining that collection earlier, we had overlooked the ornamentation of the spores (of which the mean values for the sizes had been found to be  $7.1 \times 3.9 \mu\text{m}$ ). Pleurocystidia and the pattern of the cellular lining of the gill edge were exactly the same as those of Cléménçon's *P. stigmatospora*. This Swedish collection therefore was wrongly mentioned as a collection of *P. casca* and is to be deleted from the paragraph 'collections examined' under that species. The last sentence of our exposition on *P. casca* is also to be deleted as it pertains to the Swedish collection of *P. stigmatospora*.

The sizes given by Örstadius for the carpophores of his collection of *P. stigmatospora* are: cap 30–70 mm; stem up to  $80 \times 7$  mm, sometimes thickening towards its base (10 mm); veil well developed, appendiculate, sometimes even forming a fugacious annular zone; gills light brown, 6–7 mm broad; spore print dark brown.

Collections examined.—Switzerland, Epalinges near Lausanne, 'Les Liaises', 3 June 1979 (type LAU, isotype L). — Sweden, Skåne, Kjugekull, c. 15 km East of Kristianstad, 1 June 1983 (herb. L. Örstadius 53-83, L).

#### *Psathyrella kitsiana* Örstadius in Windahlia 16: 154. 1986.

The author found four specimens of this small species in Sweden, Skåne, Näsrum, Västana, on 4 Oct. 1985, growing near an old trunk of *Quercus* (Örstadius 217-85). Cap 10–18 mm, conical to convex, strong brown, striate. Veil very strongly developed, both on cap and stem. Stem 20–30 mm, pale brown. Gills subdistant, slightly ventricose, very pale brown when young, then brownish. Spore print dark brown. The species is characterised by the curious and conspicuous shape of the spores, immediately leaping to the eye sub micr. They measure  $7-8(-9) \times 3.5-4.5 \mu\text{m}$  (mean values  $7.9 \times 4.3 \mu\text{m}$ ) are in face view ellipsoid to sometimes subobovoid, conspicuously narrowing near base, in profile adaxially flattened but in lower half usually strikingly depressed and terminating in a conspicuously protruding hyaline hilar appendix, without germ pore (at most a callus). Basidia  $15-22 \times 7.5-9 \mu\text{m}$ , 4-spored. Pleurocystidia  $35-50 \times 12.5-17.5 \mu\text{m}$ , numerous, utriform without subapical constriction, subutriform or fusoid with very obtuse to

subobtuse apex. Pleurocystidia cheilocystidia  $30-40 \times 7.5-15 \mu\text{m}$ , numerous, spheropedunculate and clavate cheilocystidia  $20-35 \times 10-20 \mu\text{m}$  numerous. Hymenophoral trama practically colourless.

Because of the size of its spores, its in the main utriform pleurocystidia and its pleurocystidioid cheilocystidia being numerous this species belongs to subsection *Lutenses*.

***Psathyrella rostellata* Örstadius in Windahlia 16: 156. 1986.**

Of this species the author found four collections in Sweden of which he sent us two: *Örstadius* 240-85, Skåne, Opmana, Bökenäs, (*Fagus* forest) 12 Oct. 1985 and *Örstadius* 246-85, Skåne, Benestad (on decayed mossy wood, probably *Ulmus*) 17 Oct. 1985. Cap 23-30 mm, conico-convex, dark brown, striate. Veil moderately to strongly developed on both cap (up to 2/3 from margin) and stem. Gills crowded, ventricose, adnate, light brown, with white fimbriate edge. Stem 35-60  $\times$  3-5 mm, whitish, sometimes thickening towards base. Spore print very dark brown, almost black. Spores 7-8  $\times$  (4-)4.5-5  $\mu\text{m}$  (mean values 7.9-8.1  $\times$  4.5-4.6  $\mu\text{m}$ ), ellipsoid, adaxially flattened, not dark (in water yellowish brown), with distinct but small germ pore. Basidia 20-25  $\times$  7.5-9(-10)  $\mu\text{m}$ , 4-spored. Pleurocystidia 50-65  $\times$  10-17.5  $\mu\text{m}$ , abundant, fusoid-pedicellate with subobtuse to subacute and often either mucronate or forked apex, practically colourless, thin-walled. Pleurocystidioid cheilocystidia 40-50  $\times$  12.5-17.5  $\mu\text{m}$ , fairly abundant; numerous spheropedunculate and few clavate cheilocystidia 12.5-27.5  $\times$  10-17.5  $\mu\text{m}$ . Hymenophoral trama pigmented.

Because of the size of its spores and the shape of its pleurocystidia this species belongs to section *Pennatae*. Because of its strongly developed veil it finds its place in the first half of our key to that section close to *P. friesii*. It differs from *P. friesii* by the presence of both mucronate and forked pleurocystidia and its distinctly paler spores.

***Psathyrella ivoensis* Örstadius in Windahlia 16: 155. 1986.**

Of this species the author found three specimens in Sweden: *Örstadius* 234-85, Skåne, Ivö, growing at the base of an old *Fagus* tree on 7 Oct. 1985. Cap 12-30 mm, convex while young, only slightly spreading at maturity, brown, striate. Veil absent on cap, sparse fibrils on stem. Gills crowded, rather broadly adnate, 3 mm broad, blackish brown, with edge coarsely fimbriate. Spore print dark brown, blackish brown. Spores 7-7.5 (-8)  $\times$  3.5-4.5  $\mu\text{m}$  (mean values 7.3  $\times$  4  $\mu\text{m}$ ), ellipsoid, adaxially flattened, some slightly phaseoliform, dark, in water orange, germ pore absent but callus. Basidia 20-27.5  $\times$  6-7.5  $\mu\text{m}$ , 4-spored. Pleurocystidia 35-45  $\times$  8-12  $\mu\text{m}$ , moderately numerous, narrowly fusoid, sublageniform or subcylindric with obtuse to subobtuse apex and with short and fairly broad pedicel, sometimes with minute droplets or granules at the apex, staining pale blue in  $\text{NH}_4\text{OH}$  10%. Gill edge lined with a motley of very versiform abundant and densely packed clavate, utriform, subutriform, subcylindrical, sublageniform cheilocystidia, 30-45  $\times$  10-15  $\mu\text{m}$  (in the absence of spheropedunculate and small clavate cheilo-

cystidia) many of which (particularly those near the margin of the cap) at their apex covered by a crown of refractive crystalloid mucoid material staining pale blue in  $\text{NH}_4\text{OH}$  10% but for the greater part dissolving in  $\text{KOH}$  5%. Hymenophoral trama: mediostrium very pale brown in  $\text{NH}_4\text{OH}$  10% from membranal pigment but subhymenium (particularly at gill edge) very strongly pigmented from yellowish brown membranal pigment with numerous yellow hyphal septa. Because of the small spores (mean length  $7.3 \mu\text{m}$ ) this species is to be ranked with those of section *Hydrophilae* (the overall brown colours, the strongly pigmented hymenophoral trama and the absence of a germ pore also fitting well in this section) in which it is outstanding because of the nature of the cellular lining of the gill edge and the mucoid material on the apices of many cheilocystidia, staining blue in  $\text{NH}_4\text{OH}$  10%.

Having asked us to examine and identify his three new species discussed in the present paper, Mr. Örstadius accepted our offer to use our complete microscopical descriptions and line drawings for publication, but gave his own figures for the sizes of cystidia, basidia, and spores. In *P. ivoensis* this resulted in a fundamental difference between his and our findings with regard to the size of the spores, which we found to be  $7-7.5(-8) \times 3.5-4.5 \mu\text{m}$  (mean values  $7.3 \times 4 \mu\text{m}$ ) on account of which the species belongs to section *Hydrophilae* (upper limit of length of spores  $7.5 \mu\text{m}$ ) whereas Örstadius found  $7.2-8 \times 3.8-4.2 \mu\text{m}$  (mean values  $7.6 \times 4 \mu\text{m}$ ). Our figure of  $7.3 \mu\text{m}$  is fully in keeping with the macroscopical characters of *P. ivoensis*: brown cap and gills, spore-print blackish-brown, spores brown sub micr., strongly pigmented hymenophoral trama even with browner anastomosing strands running from base to edge when studied under the binocular lens on a 'washed' gill. In spite of having found the mean length of the spores  $76 \mu\text{m}$ , i.e. just above the upper limit of  $7.5 \mu\text{m}$  for the species of section *Hydrophilae*. Örstadius correctly ranked this species with that section.

#### SUPPLEMENTARY NOTES ON THE SPECIES DEALT WITH IN OUR MONOGRAPH AND CORRECTIONS

(The page numbers between brackets refer to those of our monograph.)

(p. 98) *P. stercoraria*.—In the synonymy: Arnolds in *Bibl. myc.* 90: 439. 1983 should read 1982.

(p. 123) *P. populina*.—Collections examined: We received exsiccata of this extremely rare species from Mr. O. Weholt (Norway), who had found it in a valley on the North coast of the Isle of Samos (Greece) on 5 June 1985, and from Mr. P. Blank (Switzerland), who had found it in a wood along the river 'Whitach', municipality Schleithem (Switzerland), date not mentioned.

(p. 159) *P. cernua*.—Addition to the observations on *P. cernua*: *Agaricus areolatus* Klotzsch apud Berk. in *J. E. Smith, Engl. Fl.* 5(2): 112. 1836 or in *Hooker Brit. Fl.* 2(2): 112. 1836, of which many authors later gave descriptions, has been associated with *P. cernua*, e.g. Bres., *Iconogr. mycol.* 18: pl. 861, 1931, as *Psilocybe cernua* Vahl var. *areolata*

(Klotzsch) Bres. Dennis, Orton & Hora (1960: 172) already indicated that *Agaricus areolata* was a doubtful species. Reid & Austwick (1963: 296) examined the type (K) and discovered that this species in fact is *Lacrymaria velutina* (Pers. ex Fr.) Konr. & Maubl. We were enabled to examine a fragment of the type and confirmed their conclusion.

(p. 163) *P. spadicea*.—Reevaluation of the colour of the spores of *P. spadicea*: in water as well as in  $\text{NH}_4\text{OH}$  10% and in KOH 5% very pale greyish-pinkish to yellowish pink (Mu. 5 YR 7/4; 7.5 YR 7/4, 7/6, 8/6) with scarcely different hues in these three media.

(p. 165) *P. sarcocephala*.—Reevaluation of the colour of the spores of *P. sarcocephala*: in water as well as in  $\text{NH}_4\text{OH}$  10% and in KOH 5% pale reddish brown (Mu. 7.5 YR 6/4) with slightly different hues in the three media.

(p. 180) *P. piluliformis*.—In footnote: 1971 should read 1791.

(p. 186) *P. mucrocystis*.—The pleurocystidia of specimens (exsiccata sent to us) found, growing in a group, by U. Söderholm on 29 August 1985 in Finland, Tampere, were identical with those described and depicted by us, but the abundant spheropedunculate and clavate cheilocystidia were intermixed with scattered but rather numerous pleurocystidioid cheilocystidia provided not with a small and short but with a strikingly large apical elongation (see Fig. 80).

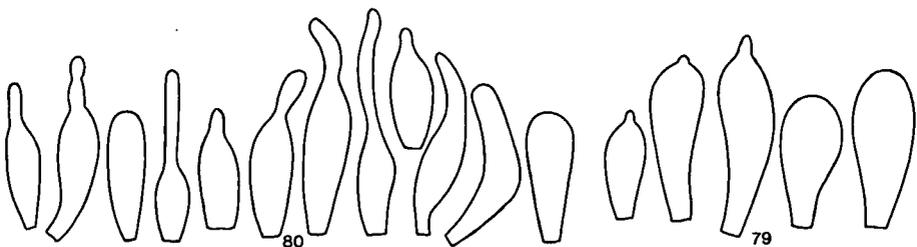
(p. 189) *P. frustulenta*.—In first line of the description: for 'up to 30 mm' read 'up to 40 mm'.

(p. 190) 'Stem 25–50 × 2–3.5(–5)' should read 'Stem 25–60 × 2–4(–5) mm'.

(p. 190) Pleurocystidia . . . 'colourless' should read 'colourless or very pale brown in  $\text{NH}_4\text{OH}$  10%'.

(p. 192) *P. chondroderma*.—Top line of 2nd paragraph '(mean values 7.2–7.4 3.9–4.4  $\mu\text{m}$ : 3 collections)' should read '(mean values 7.2–7.4 × 3.9–4.4  $\mu\text{m}$ : 3 collections).'

(p. 196) *P. rannochii*.—Addition to description of pigmentation of 'washed' gill: or distinctly yellowish brown, particularly in basal half, from brownish yellow (Mu. 10 YR 6/4–6/6) anastomosing tissue-strands running through the in itself pale greyish brown (Mu. 10 YR 6/2) tissue from base (where they merge) almost to edge.



Figs. 79–80. *Psathyrella mucrocystis* (Finland, Tampere, 29 Aug. 1985 (herb. Orstadius, L)). — 79. Pleurocystidiogram. — 80. Cheilocystidiogram.

(p. 196) Addition to description of colour of spores in KOH 5%: 5/4, 4/4.

(p. 196) Collections examined: we received exsiccata with full descriptions of two collections (both from coniferous sawdust) from Mr. O. Weholt (Norway): Norway, Lindedalen, 12 Sept. 1983 (herb. Weholt Nr. 129/83) and Frederikstad, Østfold, 30 May 1984 (herb. Weholt Nr. 5/84).

(p. 197) *P. obtusata*.—See redescription of this species and its var. *aberrans* on p. 336 of the present publication.

(p. 213) *P. panaeoloides*.—Description of size and shape of the spores to be deleted and substituted by: Spores 7–10(–11) × 4.5–7 × 4.5–6.5 μm (mean values 7.5–9.7 × 4.9–6.7 × 4.5–6.1 μm: 10 collections), usually all, sometimes only many, rarely only a few spores in face view very broadly ovate or subtriangular (some even subglobose), in profile lenticular (spores not having this shape are ellipsoid, adaxially flattened).

(p. 214) Additional information: In specimens in which only a limited number of spores is lenticular (the others ellipsoid, adaxially flattened) it is impossible to decide whether a given spore, seen in profile would turn out to be subtriangular if seen en face. In such cases it may be impossible to give the spore size in three dimensions.

(p. 229) *P. casca*.—Swedish collection cited belongs to *P. stigmatospora*.

(p. 230) Delete last paragraph above '*Psathyrella niveobadia*'.

(p. 239) *P. spadiceogrisea* f. *exalbicans*.—To be added to the synonymy: *Psathyrella obtusata* var. *utriformis* Kits van Wav. in *Persoonia* 11: 499. 1982.

(p. 249) *P. impexa*.—Pleurocystidia 'tapering towards obtuse to subacute apex' to be substituted by 'tapering towards subobtuse to subacute apex'.

(p. 272) *A. areolatus* Klotzsch = *Lacrymaria velutina*. See note above under '(p. 159) *P. cernua*'.

(p. 284) 'Arnolds, E. (198)' should read 'Arnolds, E. (1982)'.

(p. 285) Omitted from the list of references: Hirsch, G. (1984) 'Pilzflora der D.D.R.' — Zur Nomenklatur einiger Taxa. In *Wiss. Z. Friedrich-Schiller-Univ., Jena, Naturwiss. R.*, 33: 813–820.

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