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NOTES ON THE GENUS PSATHYRELLA—IV

Description of and key to the European species of section Psathyrella

E. KITS VAN WAVEREN
Rijksherbarium, Leiden

(With 66 Text-figures and Plates 60—63)

The species of the genus *Psathyrella*, listed by Kühner & Romagnesi (1953: 357) in the groups *Graciles* and *Microrrhizae*, but excluding *P. ammophila*, are described and brought into one section, *Psathyrella* section *Psathyrella* emend. Kits van Wav. Four new species, belonging to this section are described, *P. connata*, *P. melanophylloides*, *P. ridicula*, and *P. melanophylla* [=*Drosophila caudata* sensu Kühn. & Romagn.]. *Drosophila stellata* var. *orbicularis* Romagn. is raised to specific level. Type material of *D. ochracea* Romagn., *D. opaca* Romagn., *D. stellata* Romagn., *D. stellata* var. *orbicularis* Romagn., and *Psathyrella longicauda* P. Karst. has been examined. It is argued that when it comes to a choice between spore size and shape of basidia on the one hand, and the degree of development of the veil on the other hand as leading characters in subdividing the genus *Psathyrella* into subgenera, spore size and shape of basidia are to be preferred because this directly leads to establishing the subgenus *Psathyrella* as a very natural group. The degree of development of the veil as key character leads to an undesirable spreading of closely related species over several subdivisions.

Apart from *P. gracilis* and *P. microrrhiza*, and to some extent *P. polycystis* and *P. pseudogracilis*, all other species of the section *Psathyrella* are very rare; three of our four new species are known only from the type locality. We fully realize that describing new species of *Psathyrella* is a hazardous undertaking as lack of material of these rare species has made it impossible to study and describe thoroughly the variability of their characters. In a previous paper (Kits van Waveren, 1971b) we listed seven considerations which in our opinion should guide us when it has to be decided whether a new species should be described or not. In the present paper we have endeavoured to let ourselves be guided by these considerations.

A. H. Smith, in his recently published (1972) monumental book on the North American species of *Psathyrella*, lists 412 species (398+another 16 in the appendix, making a total of 414, but in the text Nrs. 195 and 218 are missing). Out of these 412 species no less than 265 are described as new species, and 166 of these are based on only one collection; 24 on two. Further, Smith gives 53 new combinations of names and describes 17 new varieties of which many pertain to species also based on only one collection. Over the years he must, just as we, have found that apart from the well known and often common species almost every collection gathered in

the field differs in one or even more minor but also often major respects from any of the species previously collected. Our own herbarium now comprises over 60 still unidentified collections of *Psathyrella*, all of them with full descriptions of the macroscopic and microscopic characters. It would be tempting but scarcely rewarding to publish at random many of them as new species merely by giving the descriptions and finding a name. This is indeed what Smith did in several previous papers, and it is the great merit of his recent book that in it he has now attempted to classify all species, varieties, and forms known to him.

For our methods of examining the pleuro- and cheilocystidia, the shape, size and colour of the spores, the basidia and the pigmentation of the hymenophoral trama, the latter under both the binocular lens and the microscope, the reader is referred to our previous papers (Kits van Waveren, 1968: 132; 1971a: 249, and 1972: 24). Spore measurements are given both as a range and as a mean value added between brackets. For the description of the colours of the macroscopic structures and the spores (mounted in water, NH_4OH 10% or KOH 5% and studied with oil immersion with a rather strongly lit field of view) we used 'Munsell Soil Color Charts' edition 1954 (abbreviated in the text to M.) and the code designating its colours (a few of the colours in the 1971 edition differ very slightly from the corresponding ones in the 1954 edition, and the numbering of the code in the 1971 edition also is very slightly different from that used in the 1954 edition).

It is assumed that Romagnesi wrote the chapter on the genus *Drosophila* in the 'Flore analytique' (Kühner & Romagnesi, 1953), which explains why only his name is quoted when our text refers to this chapter.

In the descriptions of the species we have mentioned neither the cellular structures nor the pigmentation of the various layers of the flesh of the cap, since in our experience neither play any part in the delimitation of the species of section *Psathyrella*. The pigmentation of the trama of the cap is too variable, depending, as it does, largely on the age of the carpophores and on weather conditions (rain). This also goes for the pigmentation of the hymenophoral trama, but to a much lesser extent, so that this pigmentation is of some importance in characterizing species of *Psathyrella*, provided specimens are examined which are neither very young nor too old.

The caps of almost all species of section *Psathyrella* are dark reddish brown in their very early, and early stages. In many species the caps retain this colour for some length of time in the mature stages till the onset of the process of drying. At that stage the caps still look fresh but in fact they have already started drying out, the disappearance of the reddish hue being the first sign. The process sets in quickly so that some colour changes may have already taken place either in the field and/or before study of the specimens in the laboratory. The flesh of the caps is concolorous with the surface of the caps but by the time specimens have been bisected in order to produce habit sketches in the laboratory, the flesh usually has already lost its dark reddish colour. In descriptions therefore the colour of the flesh is often described as merely dark brown or dark greyish brown, whereas in fact it must have been dark reddish brown at onset. The same goes for quite a number of descriptions of the colour of the cap of species described in the literature.

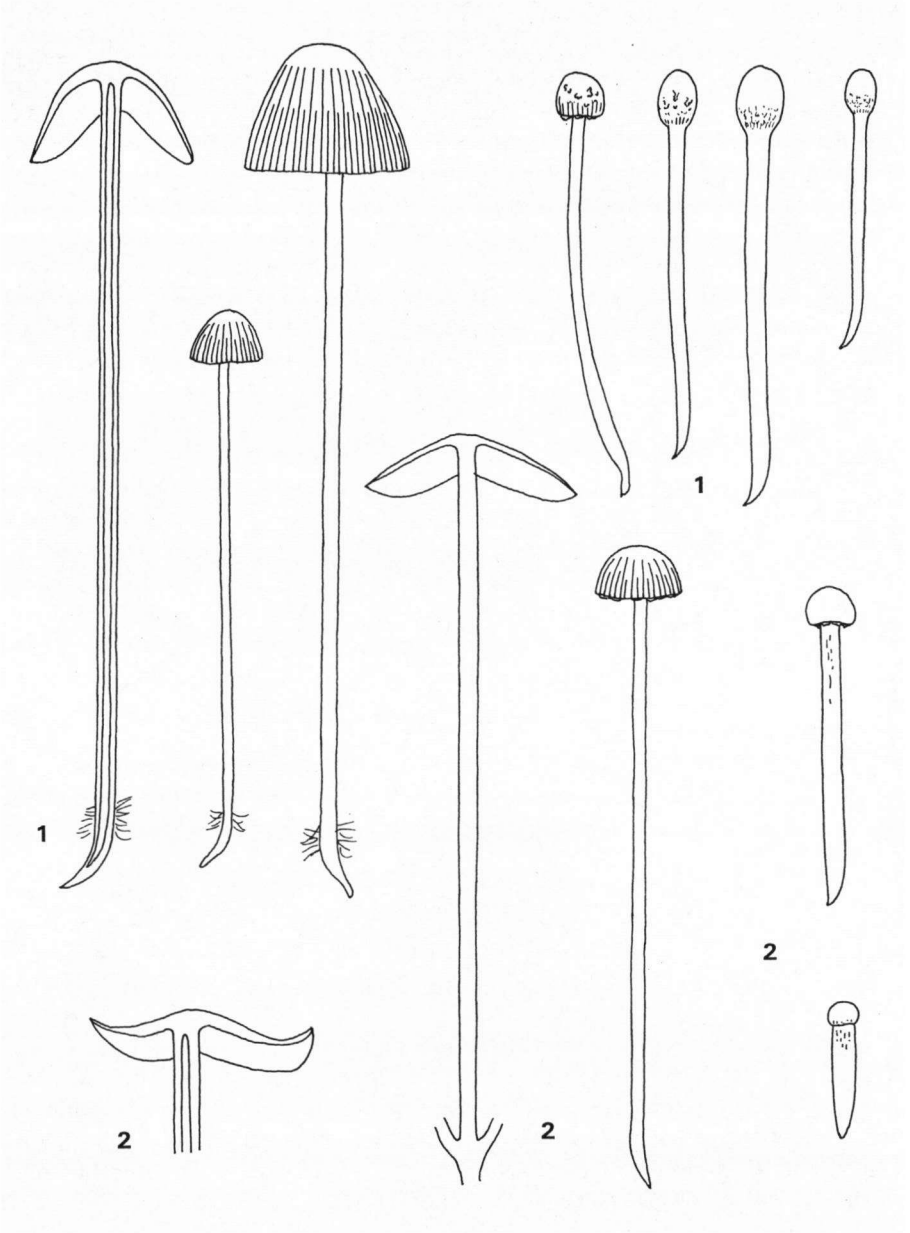


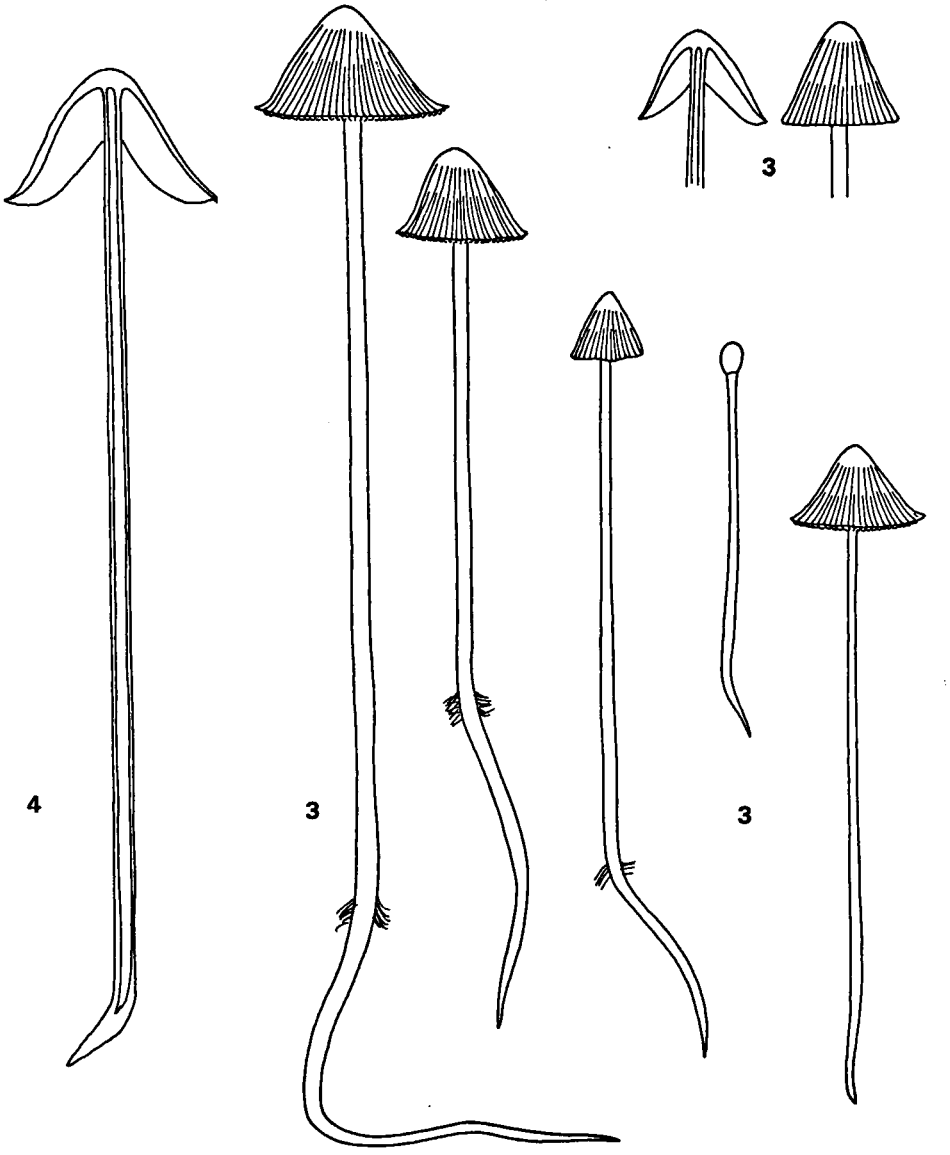
Fig. 1. *Psathyrella bifrons*, 7 Nov. 1961. — Habit sketch (× 1).
Fig. 2. *Psathyrella connata*, 13 Nov. 1962. — Habit sketch (× 1).

Since spore prints were often not available we always used spores from gills of mature carpophores, mounted in NH_4OH 10% for measuring spores sizes and producing sporograms. We were careful to use only the darkest coloured (=ripest) spores, also for assessing the colour of the spores in water, NH_4OH 10% and KOH 5% and the opacity in water.

In the literature descriptions of species of *Psathyrella* rarely give a detailed account of the pattern of the cellular lining of the sterile gill edge. This edge is almost always lined with two types of cells, pleurocystidium-like cells and spheropedunculate cells. In the terminology of the cystidia on the gill edge we follow Romagnesi in describing the pleurocystidioid cells as 'cheilocystidia', and describing the other type of sterile cells as spheropedunculate cells, although we are fully aware of the fact that the latter also are poper cheilocystidia. The proportion between the numbers of these two types of cells and/or the size of the spheropedunculate cells (sometimes also their shape) is characteristic for some species, e.g. *P. gracilis*, *P. microrrhiza*, and *P. prona* (see Kits van Waveren, 1971a, 1972). In our descriptions we have therefore made a point of describing the cheilocystidia and the spheropedunculate cells separately, and estimating the proportion between these two types of cells as accurately as possible. It is advisable to use the mid portion of the gills for this purpose as the spheropedunculate cells often increase in number and also in size towards the margin of the cap. For some species the proportion between the two types of cells varies from one collection to another or even from one specimen of the same collection to another, but for other species this proportion may be quite specific. In rare instances the cheilocystidia may even be absent near the margin of the cap, the spheropedunculate cells dominating the picture.

We therefore introduced the pattern of the cellular lining of the gill edge in the delimitation of species. The gill edge of *P. microrrhiza* (33 collections of different dates), *P. bifrons* (5 collections of different dates), and *P. orbicularis* (3 collections of different dates) are characterized by the very numerous and densely packed cheilocystidia, the spheropedunculate cells, although present, being barely noticeable. Our sole collection of *P. connata* also has densely packed cheilocystidia, and we can only hope that in the future more collections will teach us that this character is constant in this species too. In some of our collections of *P. polycystis* and *P. pseudogracilis* the cheilocystidia are rather densely packed, but in others they are not. Fortunately both species are characterized by the features of their pleurocystidia.

The sizes of the spores in the species of section *Psathyrella* scarcely differ from one species to the other so that no real significance can be attributed to slight differences in spore size. Exceptions are *P.ochracea* and *P.bifrons*. Romagnesi (1953: 357) describes the spores of *P. pseudogracilis* as rather large ($11.5–16.5 \times 5.7–7.5$ µm) but in our material, consisting of nine fairly typical collections, we were unable to confirm this finding (but see observations on *P. pseudogracilis* on p. 396). Like Romagnesi, on examination of the type material we found the spores of *P. ochracea* slightly larger than in any other species of this section. The spores of *P. bifrons* are slightly but distinctly larger than those of *P. microrrhiza*, as already observed by Romagnesi.



Figs. 3, 4. *Psathyrella melanophylla.* — Habit sketches (× 1). — 3. 16 Oct. 1963. — 4. 18 Oct. 1974.

It is interesting that the caps of the species of the *P. melanophylla* group, although they are (cf. Romagnesi, 1953: 358) dark reddish brown in the fresh stage, show no pink shades on drying; but *P. melanophylloides* is an exception to this rule.

As the spores of all species of section *Psathyrella* have the same shape (ellipsoid-amygdaliform), owing to lack of space we have depicted spores of only a few species.

Most species of section *Psathyrella* are very closely related, and in some cases seemingly intermediate forms occur, as pointed out earlier for *P. gracilis* and *P. microrrhiza* (Kits van Waveren, 1971a: 279). *Psathyrella melanophylloides*, in the present paper described as a new species, is intermediate between *P. gracilis* and *P. melanophylla* (see observations on *P. melanophylloides*, p. 370); we also refer to our observations on *P. polycystis* (p. 393) with regard to P. *connata*.

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

ACKNOWLEDGEMENTS

We are very greatly indebted to Prof. Romagnesi for his very stimulating encouragement in the undertaking of our study of the genus *Psathyrella* and for taking so much interest in our work. We also wish to thank him very much indeed for sending us from his own herbarium material of the species he described in 1952, *P. ochracea*, *P. opaca*, *P. stellata*, and *P. orbicularis*. Furthermore we wish to thank the director of the Museum Botanicum at Helsinki for lending us the type material of *P. longicauda*.

By giving Persoonia a substantial donation, 'Winterthur Insurances Amsterdam' enabled us to give colour pictures of some of our species, for which we are very grateful.

THE SUBDIVISION OF THE GENUS PSATHYRELLA INTO SUBGENERA AND OF THE SUBGENUS PSATHYRELLA INTO SECTIONS

There is a fundamental difference between Romagnesi's (1953) and Smith's (1972) subdivision of the genus *Psathyrella* into subgenera; 4 with Romagnesi (who names the genus *Drosophila*), 11 with Smith. Romagnesi first separates the species of subgenera *Lacrymaria* and *Pluteopsis* from the remaining species of the genus and then uses spore size and shape of basidia as a basic character for separating the species of subgenus *Psathyrella* from those of subgenus *Psathyra*. This concept we fully endorse. Smith on the other hand does not use spore size at all in his key to the 11 subgenera he distinguishes. Having got rid of the species of 9 subgenera whose species are characterized by very special features (ornamented spores, granulose veil, absence of pleurocystidia in combination with the presence of an appendiculate veil, inocyboid thick-walled pleurocystidia, presence of an annulus etc.) he splits the remaining species of the genus into two subgenera, *Psathyrella* and *Pannucia*. This is done on the basis of the development of the veil, the veil being either 'thin to rudimentary or absent (check button stages)' in *Psathyrella*, or 'outer veil and/or partial veil more or

less well-developed, pileus margin appendiculate with remains of partial veil or a combination of both' in *Pannucia*. But what is 'more or less developed'? The limit is bound to be vague.

The result is that with Smith *P. gracilis* and *P. microrrhiza* (=*P. squamifera* with Smith), obviously two very closely related species with even intermediate forms (Kits van Waveren, 1971a: 279), find themselves in two different subgenera: *P. gracilis* in *Psathyrella* and *P. microrrhiza*, because of its veil, in *Pannucia*. Other species of Romagnesi's subgenus *Psathyrella* too are widely spread across Smith's classification: *P. prona* (non-rooting) is placed in section *Atomatae* (of subgenus *Psathyrella*) whose species are said to be 'either coprophilous or growing on very well fertilized soil', whereas the equally non-rooting species *P. atomata* (regarded by us as a form, f. *cana*, of *P. prona*, see Kits van Waveren, 1972: 37) finds itself in the series *Psathyrellae* of subsection *Psathyrellae* of section *Psathyrella* together with the rooting species *P. gracilis* and P. *trepida*. One finds the large-spored *P. bifrons* (spore size according to Smith 8–11 × 4.5–5.5 μm) in the same stirp (*Frustulenta*) as the small-spored *P. nolitangere* and *P. squamosa*, the latter two species, moreover, grossly differing from each other and each from *P. bifrons*.

Because of the variability of the development of the veil in the many species belonging to the genus *Psathyrella*, even within a single species, further because of the fugacity of the veil (manifestation strongly influenced by environmental conditions, such as rain, and age of the carpophores), and finally because of the frequent absence of primordia or young fresh stages in collections, we strongly feel that when classifying the species of the genus *Psathyrella*, the development of the veil should be brought in at the latest possible moment. Priority over the veil should be given—as it is by Romagnesi (1953: 353) and Singer (1975: 504)—to spore size and shape of basidia. This brings together into one, we believe natural, group a number of species as now find themselves spread throughout Smith's classification.

Singer (1975: 500) has subdivided the genus *Psathyrella* into seven subgenera (*Lacrymaria*, *Homophron*, *Drosophila*, *Heterocystis*, *Cystopsathyra*, *Psathyra*, and *Psathyrella*). We wholeheartedly endorse Singer's adoption of Romagnesi's concept of *Psathyrella* as distinguishable from *Psathyra* mainly by the large spores, which are mostly practically black in print or at least fuliginous-fuscous, and the characteristically ventricose to subvesiculose basidia with usually very narrow pedicel. Singer has not attempted a further subdivision of the subgenus *Psathyrella* into sections. In this paper we propose a subdivision into five sections.

In an earlier paper (Kits van Waveren, 1972: 23–54) we discussed at full length the European species of one section, viz. section *Atomatae*, which are characterized among other features by a non-rooting stem. Here we will deal with a second section, viz. section *Psathyrella* emend. Kits van Wav. It comprises all rooting species of the subgenus, therefore all species of Romagnesi's (1953: 357) groups *Graciles* and *Microrrhizae* of subgenus *Psathyrella* except *P. ammophila*. We feel that in several respects the latter species differs so much from the homogenous lot of species of our section *Psathyrella*, that a separate section should be introduced for it (habit and

habitat quite different, cap neither conical nor campanulate in any stage and very fleshy and accordingly not striate, stem firm and not really rooting, pleurocystidia very scarce, and cheilocystidia very sparsely and scattered.

Psathyrella conopilea (*subatrata*) and allied species of which the caps bear long thick-walled setae are again very different from the species of sections *Atomatae* and *Psathyrella*, and therefore demand a section of their own. For the purple-coloured *P. bipellis*, Malençon & Romagnesi (1953: 117) already founded section *Bipelles*. We intend dealing in full with these three sections and their species in a future paper. We have united the species of Romagnesi's groups *Graciles* and *Microrrhizae* into one section because our examinations taught that *P. gracilis* and *P. pseudogracilis* both have traces of a veil, whereas in some species of the *Microrrhizae* the development of the veil is similar; that in some species of the *Microrrhizae* the hymenophoral trama is just as colourless as in those of the *Graciles*; and that the red gill edge is a very unreliable character, occurring, moreover, in species of both groups. Finally seemingly intermediate forms occur between species of both groups (Kits van Waveren, 1971a: 279).

Our section *Psathyrella* does not correspond at all with section *Psathyrella* sensu Smith, which comprises the species of his subsection *Mesosporae*, none of them rooting (including the European species *P. orbitarum*=*P. prona*, see Kits van Waveren, 1972: 23–54, and also *P. clivensis*), nor does it correspond with the species of his subsection *Psathyrellae*, of which only a few are rooting and which includes *P. ammophila*. Moreover, the distinctly rooting *P. microrrhiza* is not included in Smith's section *Psathyrella*.

PSATHYRELLA (Fr.) Quél. section PSATHYRELLA *emend.* Kits van Wav.

Carpophores terrestrial, sometimes cespitose or subcespitose, often gregarious. Caps small to medium size, 15–40 mm in diam., coloured some shade of reddish brown, brown or greyish brown, striate when moist, hygrophanous and often showing pink on drying; veil varying from absent to rather strongly developed; gills broad and almost always broadly adnate, often with red edge; stems up to 150(–180) mm long, rooting; hymenophoral trama varying from practically colourless to usually distinctly brown from membranal pigment; spore print purple black or black; spores large, 10–14 × 6–7 μm, in water dark reddish brown; basidia 4-spored and ventricose (10–12 μm broad); pleurocystidia present; gill edge sterile with varying numbers of cheilocystidia and spheropedunculate cells. Type species: *P. gracilis* (Fr.) Quél.

For three reasons draughting a key to the species of section *Psathyrella*, in fact to the species of any section of the genus *Psathyrella*, is bound to be a hazardous undertaking: (i) Within a single species the variability of the majority of characters is great. Sizes of carpophores (diameter of cap, length of stem and root, the latter often very short and therefore both in the field and in the laboratory easily overlooked) for instance vary greatly, depending, as they no doubt do, on substrate, climatologic conditions, etc. Colour variations of the cap and to a lesser degree of the gills are considerable, and the development of the veil varies a good deal. Sizes and shape of pleurocystidia also vary considerably within a single species (see our pleuro-

cystidiograms of *P. polycystis* in the present paper, and of *P. microrrhiza* in our previous paper, 1971a: 249–280). (ii) This variability naturally also exists in those species which are rare, and of which as a result only a few collections (often even only one) are available, and in these cases the variability is inevitably almost unknown. (iii) Seemingly intermediate forms between species exist. For the species of the section *Psathyrella* we describe and discuss them in the observations on the species involved as we did for *P. gracilis* and *P. microrrhiza* in a previous paper (1971a: 274–279).

Like Romagnesi we believe the colour (pigmentation) of the hymenophoral trama to be important in the delimitation of many species. It is to be studied both macroscopically (binocular lens) and microscopically on 'washed' gills of neither too young nor too old but just mature specimens. But this pigmentation is also subject to some variation.

The key to the species is based on what are regarded as the essential and standard characters of the species. It does not comprise variations of species which are regarded as accidental, atypical, and therefore not warranting the introduction of new forms or varieties. An exception is made for the occasional collections of *P. gracilis* and *P. microrrhiza* with a white gill edge as the sole deviation from the standard characters.

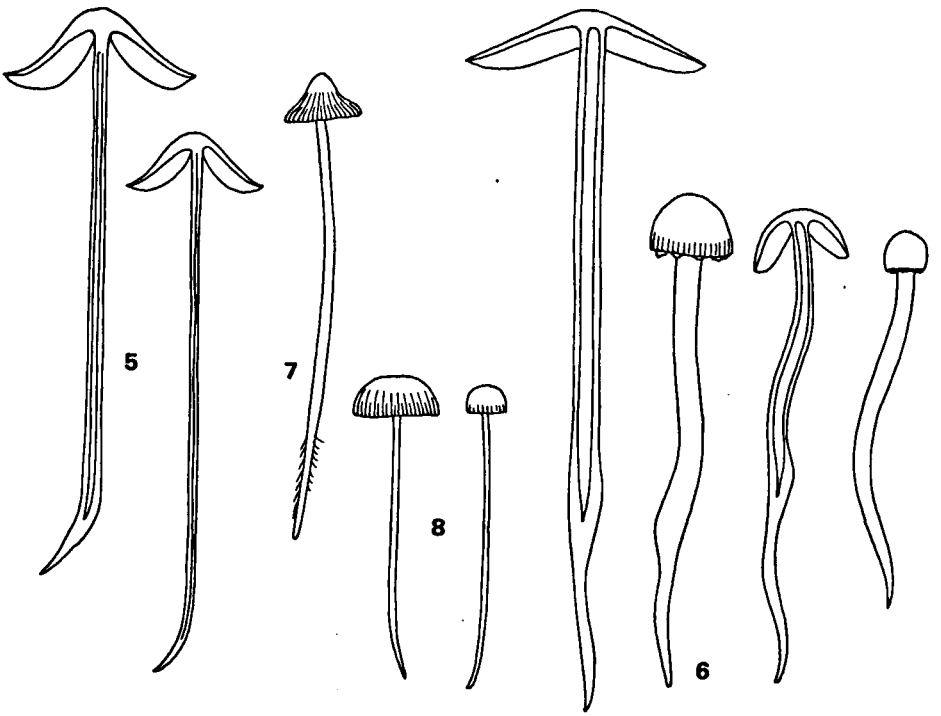


Fig. 5. *Psathyrella melanophylloides*, 21 Oct. 1973. — Habit sketch (× 1).
Fig. 6. *Psathyrella longicauda*, 11 Nov. 1969. — Habit sketch (× 1).
Figs. 7, 8. *Psathyrella orbicularis*. — Habit sketches (× 1). — 7. 23 Oct. 1959. — 8. 1 Oct. 1966.

KEY TO THE SPECIES OF *Psathyrella* SECTION *Psathyrella*

1. Hymenophoral trama colourless or almost so on both macroscopical (binocular lens) and microscopical examination.
   2. Gill edge red.
      3. Pleurocystidia obclavate, lageniform or fusiform, slender, often wavy, with subobtuse to acute apex, 8—15 µm wide.
         4. Caps 6–30 mm in diam., rugulose; stem 20–110 mm long.
            5. Caps dark brown, then brown, soon greying; gills dark grey to purple black *P. gracilis* f. *gracilis*, p. 366
            5. Caps pale yellowish brown or yellowish to white; gills white and carrying few spores . . . . . *P. gracilis* f. *substerilis*, p. 366
         4. Caps 15–50 mm in diam., predominantly grey, moderately to strongly rugose; stem 60–150 mm long. . . . . *P. gracilis* f. *corrugis*, p. 366
      3. Pleurocystidia at least partly clavate, cylindrical, subutriform, utriform or ventricose.
         6. Pleurocystidia partly clavate, cylindrical, subcylindrical (sometimes constricted or subutriform and partly obclavate, lageniform or fusiform, 9–15 µm wide *P. gracilis* f. *clavigera*, p. 366
         6. Pleurocystidia ventricose, subutriform or utriform, 10–20 µm wide *P. pseudogracilis*, p. 396
   2. Gill edge white.
      7. Germ pore distinct, ±2 µm wide; fruitbody solitary.
         8. Pleurocystidia obclavate, lageniform to fusiform, slender, often wavy, with subobtuse to acute apex, 50–70 × 8–15 µm *P. gracilis* f. *gracilis* with white gill edge, p. 366
         8. Pleurocystidia versiform, partly as in *P. gracilis* but many cylindrical, subcylindrical (sometimes constricted), mucronate, usually rather small, 30–50 × 8–12.5 µm, sometimes width up to 12.5–17.5 µm . . . . . *P. gracilis* f. *albolimbata*, p. 366
      7. Germ pore indistinct, ±1.5—1.8 µm wide; fruitbodies cespitose or subcespitose (rarely solitary); gills dark grey to black.
         9. Cap conical, with marginal area revolute; fruitbodies usually cespitose or subcespitose.
            10. Pink on dry cap; gills ventricose and narrowly adnate; stem 35–70 mm long; pleurocystidia rather numerous, slender, 50–70 × 7.5—10 µm *P. melanophylloides*, p. 378
            10. No pink on dry cap; gills straight and broadly adnate; stem 70–150 mm long; pleurocystidia scarce, 35–60 × 9–15 µm. . . . . *P. melanophylla*, p. 370
         9. Cap campanulate, with marginal area not revolute; fruitbodies solitary *P. pellucidipes*, p. 390
1. Hymenophoral trama coloured on both macroscopical (binocular lens) and microscopical examination.
   11. Gill edge red.
      12. Pleurocystidia exceedingly numerous, very slender; swollen apex 'spatula'-like *P. polycystis*, p. 393
      12. Not as above.
         13. Cheilocystidia exceedingly numerous, densely packed.
            14. Veil strongly developed (fibres, bundles of fibres, flocci, in young specimens appendiculate); carpophores large (cap 17–50 mm in diam., stem 25–190 × 1–4 mm) . . . . . *P. microrrhiza*, p. 381
            14. Veil forming finer network, not appendiculate; carpophores small (cap 10–17 mm in diam., stem 35–70 × 1 mm) . . . . *P. orbicularis*, p. 388
         13. Cheilocystidia scattered to moderately numerous.

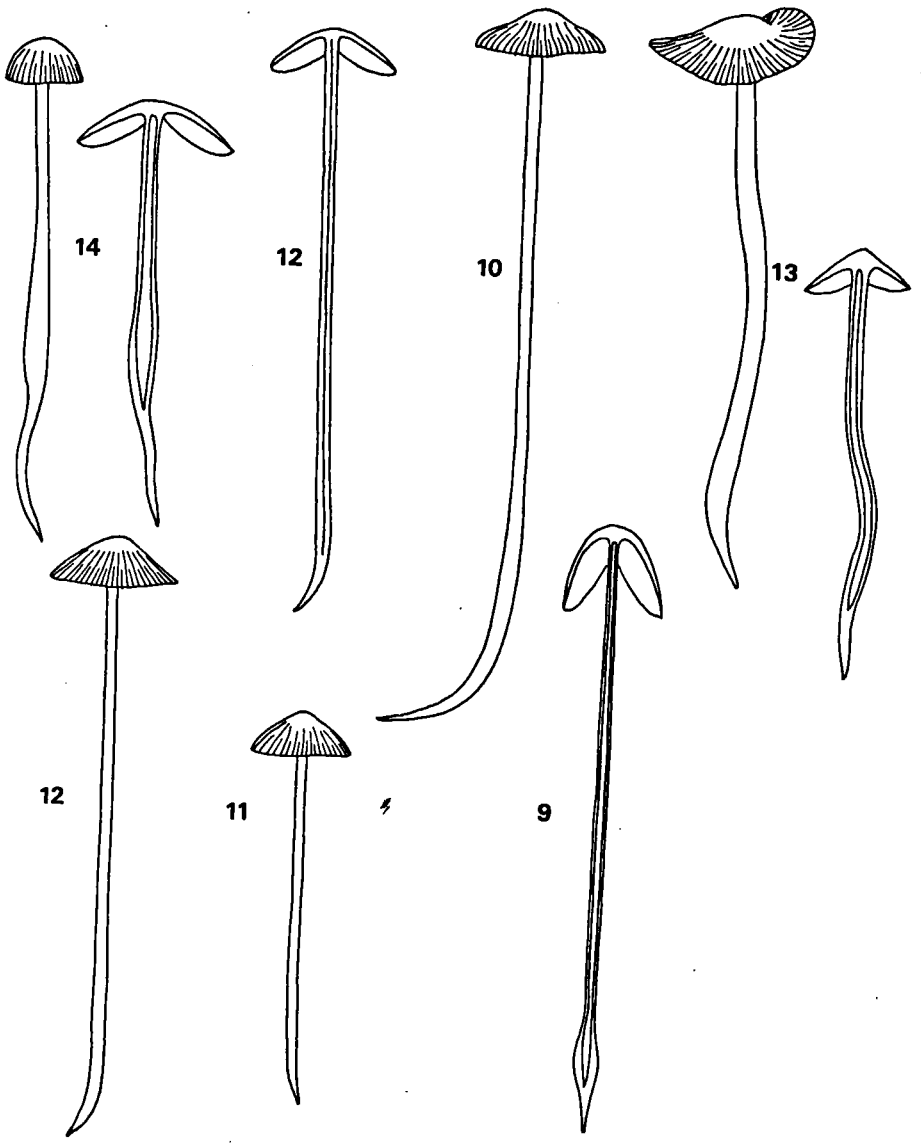


Fig. 9. *Psathyrella pellucidipes*, 19 Sept. 1967. — Habit sketch (× 1).
Figs. 10–14. *Psathyrella polycystis*. — Habit sketches (× 1). — 10. 22 Sept. 1962. — 11. 28 Sept. 1962. — 12. 13 Nov. 1962. — 13. 11 Nov. 1967. — 14. 28 Sept. 1968.

15. Cap 8—18 mm in diam., pale ochraceous with faint reddish hue; dry cap strongly rugose (cerebriform) . . . . . *P. ochracea*, p. 384
15. Cap 22–23 mm in diam., chestnut brown, brown, undulating, lobed and sulcate . . . . . *P. stellata*, p. 401

11. Gill edge white.
16. Cheilocystidia exceedingly numerous, densely packed.
17. Fruitbodies solitary but usually gregarious; veil strongly developed; stem up to 190 mm long; pleurocystidia 40–70 × 8–15 µm.
18. Cap very broadly obtuse campanulate, 15–45 mm in diam., ochre brown; gills tobacco brown (but sometimes bicoloured and then basidia 4–, 2– and 1–spored, vast majority sterile) . . . . . *P. bifrons*, p. 356
18. Cap conical, conico-campanulate, 17–50 mm in diam., dark brown, dull brown or greyish brown; gills dark purple grey to purple black; basidia always 4-spored . . . . . *P. microrrhiza* with white gill edge, p. 381
17. Fruitbodies cespitose; veil distinct; stem up to 80 mm long; pleurocystidia very long and slender, 65–80(–100) × 10–12 µm . . . . . *P. connata*, p. 363
16. Cheilocystidia neither numerous nor densely packed.
19. In marshes; cap fuligineous brown . . . . . *P. trepida*, p. 402
19. Not as above.
20. Cap pale brown or ochraceous, drying very rapidly; pleurocystidia 35–40 × 7.5–10 µm. . . . . *P. opaca*, p. 386
20. Cap dark brown or chestnut brown, drying slowly; pleurocystidia 40–80 × 7.5–14 µm.
21. Fruitbodies gregarious in humus or manured grass; veil fairly strongly developed (appendiculate in young specimens); stem 3–3.5 mm in diam., pseudorrhiza 10–30 mm long; germ pore indistinct; pleurocystidia slender, 50–80 × 9–12.5 µm. . . . . *P. longicauda*, p. 366
21. Fruitbodies subcespitose round tree trunk; veil rudimentary; stem 1–2 mm in diam., pseudorrhiza 5–15 mm long; germ pore distinct; pleurocystidia 40–60 × 7.5–14 µm . . . . . *P. ridicula*, p. 398

PSATHYRELLA BIFRONS (Berk.) A. H. Smith—Pls. 60, 61; Figs. 1, 19–22 (*sensu* W. G. Smith, Ricken, Kühner & Romagnesi; *non* Rea, A. H. Smith).

Agaricus bifrons Berk. *in* Hooker, English Flora J. E. Smith 5(2): 114. 1836. — *Pannucia bifrons* (Berk.) P. Karst. *in* Bidr. Känn. Finl. Nat. Folk **32**: 514. 1879. — *Psathyra bifrons* (Berk.) Quél. *in* Bull. Soc. bot. Fr. **26**: 52. '1879' [1880] (misappl.). — *Drosophila bifrons* (Berk.) Quél., Ench. Fung.: 117. 1886 (misappl.). — *Psilocybe bifrons* (Berk.) P. Hennings *in* Engler & Prantl, Natürl. PflFam. **1** (1**): 235. 1898. — *Hypholoma bifrons* (Berk.) Bigeard & Guillemin, Fl. Champ. sup. Fr.: 281. 1913 (misappl.). — *Psathyrella bifrons* (Berk.) A. H. Smith *in* Contr. Univ. Mich. Herb. **5**: 40. 1941 (misappl.); *sensu* Berk., W. G. Smith (Syn. Brit. Bas.: 192. 1908), Ricken (Blätterp.: 257, 1913), Kühn. & Romagn. (Fl. anal.: 358. 1953).

MISAPPLIED.—*Agaricus bifrons* sensu Fries, Hym. europ.: 307. 1874 (=*A. conopilea*?); Monogr. Hym. Suec. **2**: 347. 1857 (=*A. conopilea*?); Ic. sel. Hym. **2**: 38, pl. 138 fig. 2. 1879 (=*A. conopilea*?). — *Agaricus bifrons* sensu Cooke, Ill. Brit. Fungi **4**: pl. 616/594. 1884–1886 (=*A. conopilea*?); *Psathyra bifrons* sensu Rea, Brit. Basidiomyc.: 416. 1922 (=.....?).

SELECTED DESCRIPTIONS AND ILLUSTRATIONS. — Ricken, Blätterp.: 257. 1913. — Kühn. & Romagn., Fl. anal.: 358. 1953.

CHIEF CHARACTERISTICS.—Solitary to gregarious; cap 15–45 mm, strikingly broadly obtuse campanulate, ochraceous brown tinged with red, not showing pink on drying; veil strongly developed; gills 'brun tabac' according to Kühn. & Romagn. (1953:

358) but in our collections bicoloured because of abnormal sporogenesis, with edge white; stem rooting (pseudorrhiza 5–10 mm); spores 11.7–14.4 × 6.3–7.2 μm; pleurocystidia 45–70 × 10–15 μm, lageniform; cheilocystidia very densely packed; basidia 4-spored but in our collections also some 2- and 1-spored, giving rise to larger spores of 14.9–17 × 6.8–8.1 μm; hymenophoral trama coloured.

MACROSCOPIC CHARACTERS.—Cap at first (primordia: diam. of cap 3–5 mm, height 5–8 mm, margin appressed to stem) ellipsoid, not striate, dark reddish brown (M. 5 YR 3/4–4/4) or dark yellowish brown (M. 5 YR 4/6); when slightly older (diam. 8–10 mm, height 6–7 mm) hemispherical-campanulate, slightly striate at margin and reddish brown (M. 5 YR 4/4, 4/6) only at top, the remainder having lost the reddish hue, being dark brown (M. 7.5 YR 4/4), towards the edge paler, just brown (M. 7.5 YR 5/6), at margin ochraceous (M. 7.5 YR 7/8). Mature cap 15–45(–50) mm in diam., 11–30 mm high, conspicuously broadly obtuse, campanulate, sometimes even subhemispherical, in the final stages sometimes vaguely lobed, the surface sometimes grooved, the very thin, whitish extreme margin barely turning up; dark ochre brown with a faint reddish hue (M. 5 YR 5/6, 5/8, 6/6), paler towards margin (M. 7.5 YR 7/6, 8/6) and in later stages pale sordid ochre brown, oaknut colour (M. 10 YR 5/4, 6/4), again paler towards margin, only in final stages and sometimes only in local areas with a trace of grey or purplish because of the presence of spores (M. 10 YR 5/3, 4/2), finely striate almost to centre, hygrophanous, drying out to pale alutaceous, very pale yellowish brown or sordid white (M. 10 YR 8/4, 8/3), slightly darker at centre (M. 10 YR 7/3, 7/4), without pink shades, sometimes slightly micaceous, rugulose.

Veil rather strongly developed; in young stages white fibres and bundles of fibres or even flocci arranged at random on cap, reaching up to 1/2–2/3 from margin upwards and sometimes even at top, their number increasing towards margin, sometimes forming appendiculate flocci and denticles; easily detersible, in mature specimens usually absent.

Gills 4–6 mm broad, faintly ventricose near margin of cap, then straight, ascending, broadly adnate with a tooth. Colour when viewing the gills from underneath cap in very young specimens very pale brown (M. 10 YR 7/1, 7/2), later on (but still immature) slightly darker (M. 10 YR 7/3), next with a trace of grey (M. 10 YR 6/2, 5/2) and finally still greyer (M. 10 YR 5/1), particularly so towards the stem. Gills on viewing their face in very young specimens pale brown (M. 10 YR 7/2, 7/3) at base, whitish towards and white near edge; in mature specimens to a certain extent bicoloured: in basal part very pale brown (M. 10 YR 7/1, 7/2, 7/3), towards edge and particularly towards stem greyer (M. 10 YR 6/1). Gills throughout their entire surface fairly densely and minutely speckled by spore accumulations, almost always more densely towards and near edge, and particularly near stem. Spore accumulations in some areas often denser than in others, leaving brown colour of gill clearly visible between them. Edge of gills white and minutely fimbriate.

Stem 70–180 × 2–4 mm, straight, rather firm, cylindric or very slightly thickening towards base, whitish in upper part, isabelline to pale brown in lower ±2/3, sordid brown at base, hollow, at apex pruinose, rooting but with pseudorrhiza very short (4–10 mm) and easily overlooked, at base strongly strigose with white and often long hairs often reaching some 20–40 mm up, at extreme base sometimes thickened.

Flesh of cap very thin, 1.5 mm in centre, sordid ochre brown; flesh of stem pale brown, darker at base, white in upper part.

Spore print purplish black.

Trama of 'washed' gill under binocular lens hyaline, distinctly brown in a fairly narrow zone along base (M. 10 YR 6/3, 6/4, 5/6), the remainder up to edge pale brown (M. 10 YR 7/3, 7/4).

MICROSCOPIC CHARACTERS.—Spores 11.7–14.4 × 6.3–7.2 μm (averages 12.5–12.9 × 6.5–6.8 μm); excluded, however, all spores (37 out of a total of 250 spores measured, 50 out of each of our 5 collections) measuring 14.9 μm long or longer,[1] as these were taken to have come from 2- or even 1-spored basidia (size of these 37 spores: 14.9–17 × 6.8–8.1 μm); ellipsoid-amygdaliform, in water dark reddish brown (M. 2.5 YR 3/6, 3/4), in NH_4OH 10% scarcely darker (M. 2.5 YR 3/4, 3/6), in KOH 5% dark greyish brown (M. 10 YR 3/3, 3/2, 4/2), opaque, hilar appendix distinct, apical germ pore ±2 μm wide and distinct. Mature basidia with well developed sterigmata usually rather scarce, sometimes even scarcely present, 17.6–33.6 × (10.4–)11.2–12.8 μm, 4-spored but in all specimens also some 2-spored and rarely even 1-spored basidia (sterigmata 4.8–8 μm long) present.

Pleurocystidia 45–70 × 10–15(–17.5) μm, fairly numerous, lageniform, sometimes with slightly swollen apex, colourless, thin-walled, without mucus or crystals.

Cheilocystidia 20–45(–50) × (5–)7.5–12.5 μm, exceedingly numerous, very densely packed, lageniform, colourless, thin-walled, without mucus or crystals. Clavate cells 10–20 × 2.5–7.5 μm, hardly noticeable, as in number and size very small. Gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%): trama distinctly coloured from base to edge from pale brownish membranal pigment, strongest at and near the base, yellow hyphal septa and some encrustations in basal half of the gill.

Cuticle of cap cellular; cells 16–48 μm in diam., colourless.

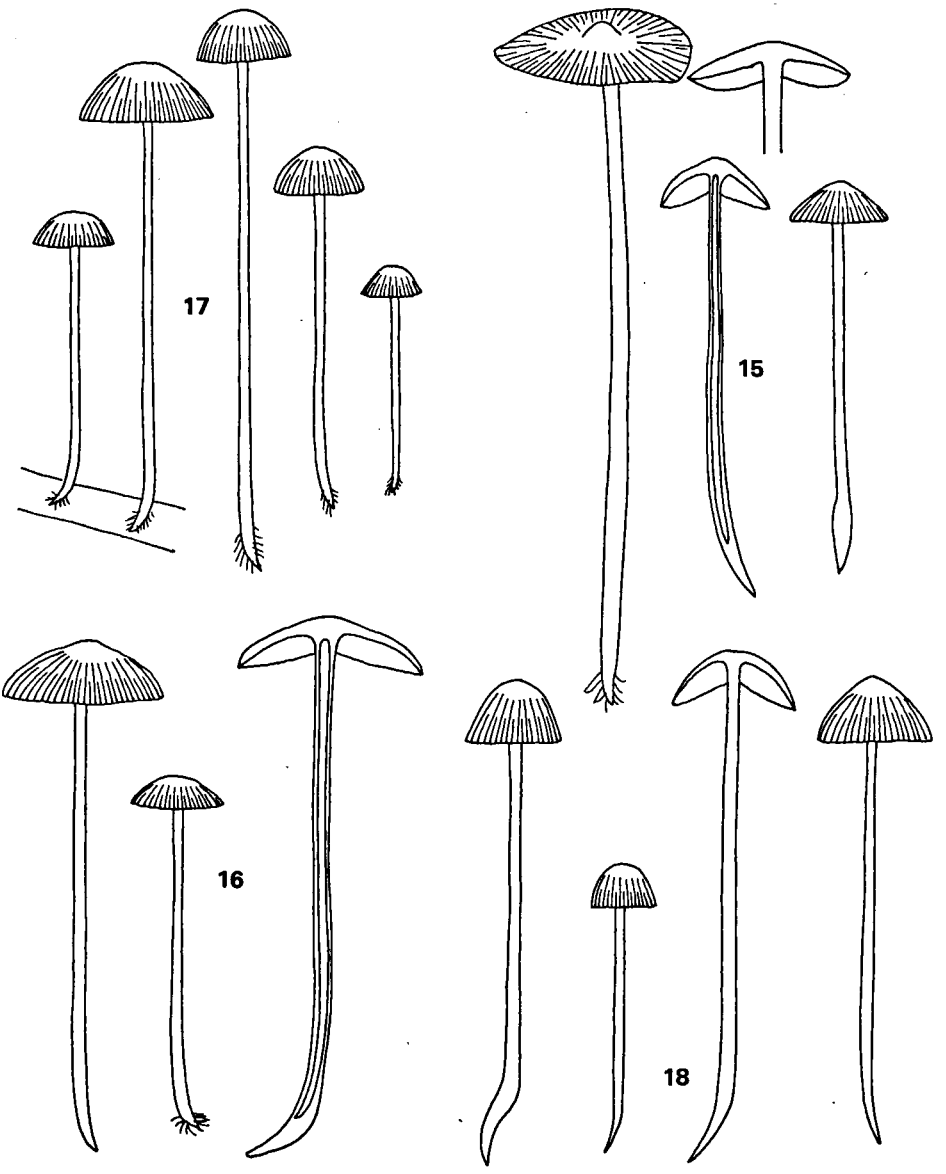
Clamps present on hyphae of stem.

HABITAT.—Gregarious in clayey soil, terrestrial against small pieces of wood, branches. October–November. Very rare.

COLLECTIONS EXAMINED.—THE NETHERLANDS, prov. Noord-Holland, Amsterdam, Amsterdamse Bos, 20 Nov. 1958, 6 Nov. 1959, 9 Oct. and 10 Nov. 1960, 7 Nov. 1961, *E. K. v. W.* (L).

Psathyrella bifrons we found in the years 1958–1961 always in the same area on the clayey soil of the Amsterdamse Bos, growing gregariously and producing tall and very striking carpophores. It has since disappeared from this area. Its characteristic features over the years were both very marked and very consistent: (i) the very broadly obtuse-campanulate and never conical, membranaceous, large cap; (ii) the rather striking ochraceous brown, oaknut brown colour of the cap, which in the early stages was reddish brown; (iii) the total absence of pink in the colour of the drying and dry cap; (iv) the rather strongly developed veil (bundles of fibres, even flocci; young specimens even appendiculate); (v) the white gill edge, and (vi) the irregular, incomplete and obviously abnormal sporogenesis, causing the gills to be somewhat bicoloured. Of these 6 items the first five are in full agreement with Berkeley's (1836: 114) original description in which he calls the cap 'campanulate obtuse' (the word 'conical' is not used), its colour when fresh 'ochraceous-brown tinged with red', and when dry 'pale tan' (no pink mentioned), the colour of the gill edge white. Of the veil Berkeley states that the cap is 'furnished at first with a minute fibrillose very evanescent veil', which might suggest a less strong development of the

[1] Two spores 14.9 μm long; 17 spores 15.3 μm; 4 spores 15.8 μm; 10 spores 16.2 μm; 4 spores 17 μm.



Figs. 15–17. *Psa hyrella pseudogracilis.* — Habit sketches (× 1). — 15. 27 July 1961. — 16. 24 July 1962. — 17. 16 Aug. 1963.
Fig. 18. *Psathyrella ridicula,* 11 Aug. 1962. — Habit sketch (× 1).

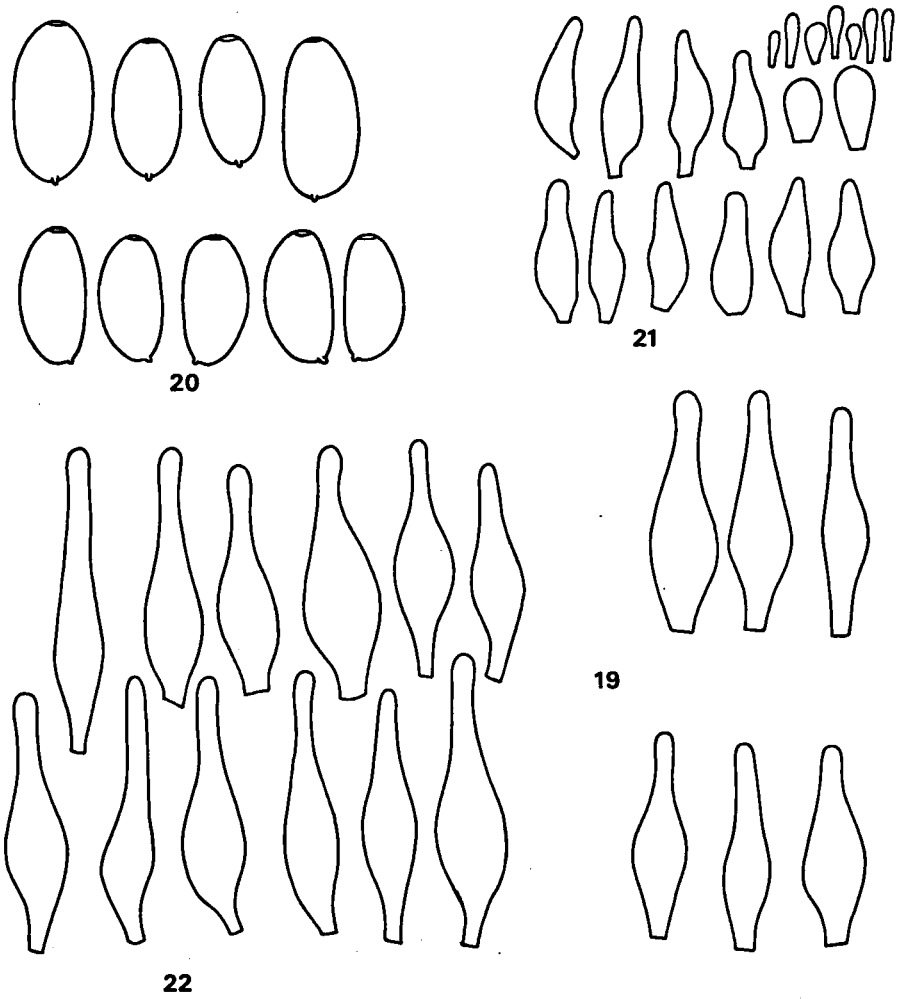
veil than observed in the species described by us above (but see W. G. Smith, 1908: 192). No bicolouration of the gills is mentioned. Microscopical data of course are missing, so that the interpretation of his species has to go entirely by the macroscopical characters.

In Berkeley's description no indication or explanation at all is given why he chose the epithet '*bifrons*'. Ricken (1913: 257) probably interpreted this epithet as pertaining to the gills. Of the species he named *Psathyra bifrons* he described the gills (in italics) as 'öfter sogar zweifarbig, nach dem Hutrande hin sammetschwarz, um den Stiel herum weiss', and 'in seiner besten Entwicklung mit halbweissen und halbschwarzen Lamellen'. Buch (1952: 270), who adopted Ricken's interpretation of *P. bifrons*, also described the gills as bicoloured, be it that he found the gills 'grau, teilweise nach dem Hutrand zu weissgelblich und gleichzeitig nach dem Stiele zu schwarz'. Our collections on the whole showed the pattern of sporogenesis found by Buch; the spores had accumulated chiefly near the stem and in the area near the edges. Besides the whole surface of the gills of our mature specimens was minutely speckled with spore accumulations between which the true brownish colour of the gills clearly showed. The spreading of these areas was irregular; they were mostly located near the base of the gills and towards the margin of the cap.

Other authors, on the other hand, indicate that the epithet '*bifrons*' pertains to the change of colour taking place while the cap is drying. Cooke (1871: 151) for instance added 'Changing *Psathyra*' to the epithet, and later (1887: 215) '*Bi-frons*=with two foreheads or faces, like Janus, from the changing colour'. W. G. Smith (1908: 192) wrote behind the epithet *bifrons* '(from the two-coloured pileus; *bifrons* with two faces)', and to him we owe a most valuable contribution to the interpretation of *P. bifrons* Berk. He gave a short but very adequate description of what he called *P. bifrons* Sacc. (but Saccardo, 1887: 1071, writes '*P. bifrons* Berk.') in which he stated: Cap obtuse, ochraceous brown tinged with red, whitish when dry, evanescent white-fibrillose, stem subrooting, gills pink-cinereous, edge white. He illustrated this description by depicting two specimens, which strikingly correspond with the specimens of our own collections: very broadly obtuse campanulate caps (diam. 30 mm, stem 100 mm long), slightly but distinctly rooting stems and moreover a rather strongly developed veil. All this fully agrees with Ricken's and Kühner & Romagnesi's interpretation of *P. bifrons* and the species described by us above. The large size of the carpophores of our collections (larger than described by Berkeley, but corresponding with W. G. Smith's description) is easily explained by the fact that the clayey soil of the Amsterdamse Bos not only produces many species of *Psathyrella* but also notably large carpophores of such species as *P. gracilis* and *P. microrrhiza*, both closely related to *P. bifrons*.

We learned from the mycologists of the Herbarium at Kew, London, and Edinburgh that they did not know nor had ever seen specimens named *P. bifrons*, and that these herbaria did not possess material labelled *P. bifrons*, let alone type material of this 'British' species. According to the New Check List (Dennis & al., 1960: 143, 175) two interpretations of the species exist: the one by Rea (1922: 416) and A. H. Smith

(1941: 40), and the one by Ricken (1913: 257) and Kühner & Romagnesi (1953: 358). Rea merely copied Berkeley's description and added figures for the spore size (9–10×4–5 μm), and Ricken's description of the cheilocystidia ('36–40×6–8 μm, blunt'). He claims that he has seen the species ('v.v.') and states that the species is 'not uncommon'. Rea quotes Cooke's plate 616/594 fig. A (1884–1886) which shows 6 specimens, all, however, with conical caps, the largest having a diameter of only



Figs. 19–22. *Psathyrella bifrons*. — 19–21. 7 Nov. 1961. — 19. Pleurocystidiogram (×575). — 20. Spores (×1212). — 21. Cheilocystidiogram (×575). — 22. 20 Nov. 1958. — Pleurocystidiogram (×575).

12 mm; the stems being non-rooting, measuring up to 50 mm long, and some of them wavy. One therefore wonders whether Rea's description pertains to another species.

A. H. Smith (1941: 40), while giving a more elaborate description, states that he based the determination of the single collection he found on Rea's description. His description says of the cap that it is 10–30 mm broad, obtusely conic and only sometimes campanulate, of its colour that it is pale buff, changing to sordid cinnamon brown, fading to sordid tan (no pink mentioned), of the veil that it is strongly developed, of the stem that it measures 60–100 × 3–5 mm (no pseudorrhiza mentioned). The spores are said to measure only 8–10 × 4–5 μm, and pleurocystidia are said to be absent. His description of 1972 (: 219) is practically the same, the diameter of the cap is given as 10–20 mm and the spores are said to be slightly larger, 8–11 × 4.5–5.5 μm. In our opinion therefore Smith's description deviates too much from Berkeley's original description and the supplementary description furnished by W. G. Smith.

Contrary to authors of the New Check List we therefore believe that W. G. Smith's, Ricken's, and Kühner & Romagnesi's interpretation of *P. bifrons* Berk. is to be preferred.

Neither Berkeley's original description of *P. bifrons* nor any of the later descriptions —except those of Ricken and Buch—mention the bicolouration of the gills. Kühner & Romagnesi (1953: 358), while merely mentioning the phenomenon, state not having noticed it in their collections. In all specimens of our collections this bicolouration was clearly present, be it not to the extent as described by Ricken and Buch, and as depicted by Ricken. In our specimens the bicolouration was obviously caused by some kind of disturbance in the sporogenesis, causing many basidia to be sterile, others to be 4-spored (their number varying between a great many and very few), 2-spored and (rarely) even 1-spored. Apparently this disturbance occasionally (be it very rarely) occurs in *P. bifrons*. Neither Ricken nor Buch mention the presence of 2- and 1-spored basidia (thus far unique in section *Psathyrella*), nor do they offer an explanation for the bicolouration (Ricken says of the phenomenon that it occurs 'öfter', therefore not always; he was the first author to make the observation). We therefore regard the bicolouration of the gills as abnormal. The normal colour of the gills should be rather brown judging by the colour of the 'washed' gill under the binocular lens. Indeed, Kühner & Romagnesi (1953: 358) call the gills 'brun tabac', Berkeley (1836: 114) 'pinkish-cinereous'.

Psathyrella bifrons, because of its rather strongly developed veil and very densely packed cheilocystidia, is close to *P. microrrhiza*, from which it is difficult to distinguish, but P. *bifrons* has larger spores. Excluding all spores longer than 14.4 μm and probably produced by 2- and 1-spored basidia, from our calculations, the average size of the spores of *P. bifrons* is still slightly but distinctly larger than the average size of the spores of *P. microrrhiza* (12.7 × 6.6 against 11.9 × 6.3 μm), as Romagnesi (1953: 358) already had discovered. Other differences with *P. microrrhiza*: the very broadly obtuse campanulate and more ochraceous brown cap, the consistently white gill edge, and the colour of the gills ('brun tabac' according to Kühner & Romagnesi).

Specimens of *P. microrrhiza* with a white gill edge (*P. microrrhiza* var. *pseudobifrons* Romagn., not validly published) may be difficult to distinguish from *P. bifrons*, but spore size will help.

Our specimens cannot be regarded as substerile specimens of *P. microrrhiza* since substerile forms of species of *Psathyrella* section *Psathyrella* in our experience are always barely pigmented and consequently whitish, looking like Mycenas (see *P. gracilis* f. *substerilis*, described in a previous paper, Kits van Waveren, 1971a: 267).

Psathyrella connata Kits van Wav., *sp. nov.*—Figs. 2, 23, 24

Pileus 10–35 mm latus, campanulatus deinde convexus postremo interdum margine repandus, castaneus deinde fuscus vel spadiceus, 1/2 striatus, hygrophanus, in sicco avellaneus, centro pallide ochraceus, leviter micaceus rugulosusque, haud roseus. Velum distincte formatum, album, primo exigue appendiculatum etiam pilei margine atque stipitis superficie affixum deinde in pileo stipiteque distincte fibrillosum. Lamellae marginem versus ventricosae, rectae, ascendentes, late adnatae, 3–5 mm latae, obscure purpureo-griseae basi nonnihil brunneae, acie alba. Stipes 50–80 × 1.5–3 mm, aequalis, rectus, firmus, albus, fistulosus, apice pruinosus, plures radice communi exorti. Caro cinereofusca in pileo, albida in stipite. Sporae in cumulo obscure castaneae.

Sporae (10.8–)11.3–12.6 × 6.3–6.8 μm, ellipsoideo-amygdaliformes, in aqua observatae rubiginosae, poro germinativo lato et distincto (±2 μm). Basidia 24–32 × 9.6–12 μm, 4-sporigera. Pleurocystidia (55–)65–80(–100) × 10–12 μm, numerosissima, procera, subcylindrica, sublageniformia, collo longo, tenui-tunicata. Cheilocystidia 27.5–45 × 6–12 μm, conferta, sublageniformia vel subfusiformia. Cellulae spheropedunculatae et clavatae paucae, 15–20 × 7.5–10 μm. Trama lamellarum colorata, basi distincte brunnea, aciem versus pallescens. Cuticula pilei cellularis. Hyphae stipitis fibuligerae.

Cespitosa ad trunci Fagi basin.

TYPUS: 'The Netherlands, prov. Overijssel, Ommen, "Ada's Hoeve", 13 Oct. 1962, *E. Kits van Waveren*' (L).

CHIEF CHARACTERISTICS.—Cespitose growth; cap hemispherical, campanulate-hemispherical, later spreading to convex, with marginal area sometimes revolute; dry cap pale brown, showing neither pink nor concentric zones; veil well developed and in young stages even appendiculate; gills dark purplish brown, edge white; stems rooting and springing from a common root; spore print very dark reddish brown; spores (10.8–)11.3–12.6 × 6.3–6.8 μm, predominantly brown; pleurocystidia (55–)65–80(–100) × 10–12 μm, very numerous, very long and slender; cheilocystidia abundant, intermixed with a small number of spheropedunculate to somewhat clavate cells.

MACROSCOPIC CHARACTERS.—Cap 10–35 mm in diam., 8–10 mm high, hemispherical, then campanulate-hemispherical, later expanding to convex and sometimes in the end with revolute marginal area and then sometimes seemingly umbonate, dark reddish brown (M. 5 YR 3/4, 4/2), then very dark (purplish) brown (M. 7.5 YR 3/2, 4/2), later just dark brown (M. 7.5 YR 4/4, 4/2), particularly at centre, or entirely dark reddish grey (M. 5 YR 4/2); in young stages very slightly striate at margin, later slightly or moderately striate up to half-way from margin to centre, hygrophanous, when dry still conspicuously though pallidly brown (M. 10 YR 6/3), with centre pale ochre, without pink shades, very slightly micaceous and rugulose, without concentric zones.

Veil on cap well developed, white, in young specimens both conspicuously appen-

diculate and forming radially arranged fibres and bundles of fibres up to 1/4 from margin upwards, in mature specimens still forming distinct fibres reaching even half-way up to centre.

Gills 3–5 mm broad, ventricose near margin of cap, then ascending and straight, broadly adnate, at first reddish grey, purplish (M. 5 YR 5/2), later dark reddish grey, dark purple and reddish brown (M. 5 YR 4/1, 3/2), only slightly but distinctly browner towards base, with white edge.

Stem 50–90 × 1.5–3 mm, cylindric, straight, firm, even in mature specimens covered with a white velar coating, white, hollow; apex pruinose; several stems springing from a common short root.

Flesh of cap 1–1.5 mm in centre, dark greyish brown; flesh of stem white.

Spore print very dark reddish brown.

Trama of 'washed' gill under binocular lens distinctly brown (M. 10 YR 6/3) in area near base, remainder of gill paler brown (M. 10 YR 7/3), palest (M. 10 YR 7/2) near the edge.

MICROSCOPIC CHARACTERS.—Spores (10.8–)11.3–12.6 × 6.3–6.8 μm (average 11.5 × 6.1 μm), ellipsoid-amygdaliform, in water yellowish red (M. 5 YR 4/8, 5/6), in NH_4OH 10% darker reddish brown (M. 5 YR 4/4), in KOH 5% dark sordid brown (M. 10 YR 4/3), opaque, with distinct, ±2 μm wide germ pore, and small but distinct hilar appendix.

Basidia 24–32 × 9.6–12 μm, 4-spored.

Pleurocystidia (55–)65–80(–100) × 10–12 μm, strikingly numerous, very slender, subcylindrical, sublageniform with very long subcylindrical neck gradually passing into very slightly ventricose lower part, rarely slightly swollen at apex, thin-walled, apex very thin-walled, colourless, without mucus or crystals.

Cheilocystidia 27.5–45 × 6–12 μm, densely packed (80–90% of total number of marginal cells), sublageniform to subfusiform, thin-walled, colourless, without mucus or crystals, intermixed with a small number (10–20% of total number of marginal cells) of spheropedunculate and somewhat clavate cells, 15–20 × 7.5–10 μm, thin-walled; gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%) distinctly brown from membranal pigment at base of gills, colour gradually becoming fainter towards but still present at edge, with many yellowish hyphal septa and encrustations in basal part.

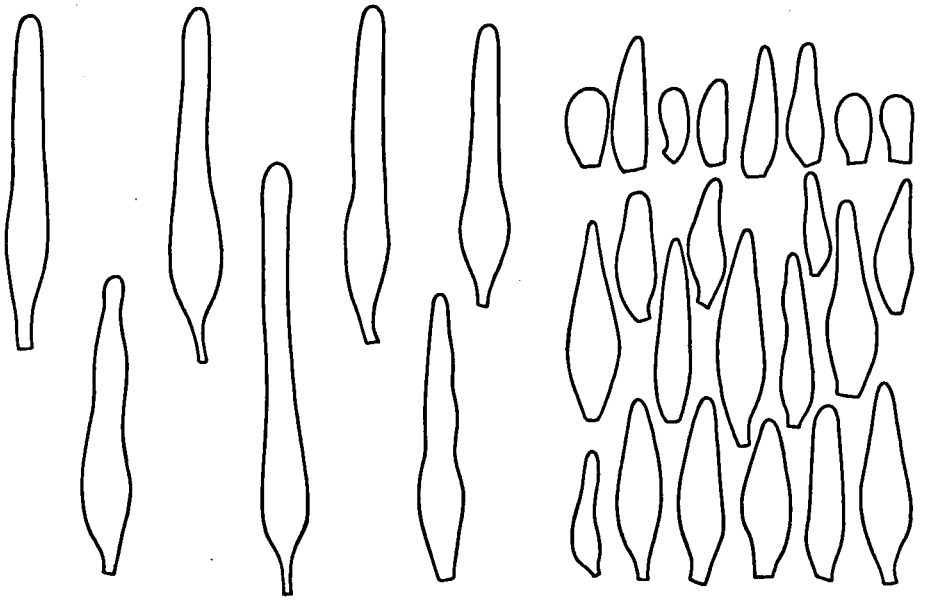
Cuticle of cap cellular; cells 24–48 μm in diam., colourless.

Clamps on hyphae of stem rather numerous.

HABITAT. — Cespitose against large beech stump in wood on sandy soil. October. Known only from type locality.

COLLECTON EXAMINED.—THE NETHERLANDS, Overijssel, Ommen, estate 'Ada's Hoeve', 13 Oct. 1962, *E. K. v. W.* (holotype: L).

At first we believed that this collection from Ommen might represent *P. polycystis* on account of its very numerous pleurocystidia. But in the end we decided that it could not be that species because of the lack of pink in the dry cap, the white gill edge, the rather strongly developed (in young specimens even appendiculate) veil, the remarkably firm stem, the cespitose growth from a common root, and the not swollen apex of the pleurocystidia. The species differs from *P. melanophylla* by its pigmented trama of the gills, its hemispherical-campanulate not conical cap, the by no means very dark spores with a distinct germ pore, and the very numerous pleuro-



Figs. 23, 24. *Psathyrella connata*, 13 Oct. 1962. — 23. Pleurocystidiogram (×575). — 24. Cheilocystidiogram (×575).

cystidia. *Psathyrella longicauda* differs in its non-cespitose growth, black spore print, very dark spores with an indistinct germ pore, different pattern of the lining of the gill edge, the spheropedunculate cells being very numerous, densely packed and fairly large (15–30×7.5–15 μm), whereas with *P. connata* it is the other way round, the cheilocystidia being densely packed and the spheropedunculate cells rather small, both in number and size (15–20×7.5–10 μm).

In A. H. Smith's classification, *P. connata* obviously belongs to subsection *Squamifera* of section *Pannucia*, subgenus *Pannucia*, in which it is closest to *P. longicystis*. Of the latter species the pleurocystidia are said to be abundant, ventricose near the base with a greatly elongated neck and to measure 50–80×10–15 μm. The caps of *P. longicystis*, however, are very small (8–12 mm in diam.), their colour is strikingly pale (pale cinnamon-brown when young, drab-grey to pale fuscous when mature), the veil is not appendiculate and much less developed (surface at first covered by delicate pallid flecks of fibrils), the stem measures only 40–60 mm, the apical germ pore is inconspicuous and the species does not grow cespitosely on wood but occurs on decaying leaves.

PSATHYRELLA GRACILIS (Fr. ex Fr.) Quél.

For a full description of *P. gracilis* and its forms f. *corrugis* (Pers. ex Fr.) Kits van Wav., f. *clavigera* Kits van Wav., f. *albolimbata* Kits van Wav., and f. *substerilis* Kits van Wav. we refer to our earlier paper (1971a: 249–280). In the same paper are given the means of distinguishing *P. gracilis* from *P. microrrhiza* and seemingly intermediate forms between these two species mentioned.

Our study of *P. melanophylla* (see p. 370) has shown that the following names have to be added to the synonymy of *P. gracilis*:

Agaricus (*Coprinus*) *caudatus* Fr., Obs. mycol.: 187. 1818. — *Agaricus gracilis* β *A. caudatus* (Fr.) ex Fr., Syst. mycol. **1**: 299. 1821. —*Agaricus caudatus* (Fr. ex Fr.) Fr., Epicr.: 239. 1838.— *Psathyrella caudata* (Fr. ex Fr.) Quél. *in* Mém. Soc. Emul. Montbéliard, sér. 2, **5**: 258. 1872. — *Coprinarius caudatus* (Fr. ex Fr.) Quél., Ench. Fung.: 120. 1886. — *Panaeolus caudatus* (Fr. ex Fr.) Quél., Fl. mycol. Fr.: 55. 1888. — *Psathyra caudata* (Fr. ex Fr.) J. E. Lange, Fl. agar. dan. **4**: 99, pl. 155A. 1939 (misappl.) .— *Drosophila caudata* (Fr. ex Fr.) Kühn. & Romagn., Fl. anal.: 359. 1953 (misappl.).

Under *Psathyrella gracilis* f. *corrugis* in the same publication should have been mentioned that *Psathyra corrugis* sensu Ricken is *Psathyrella bipellis* (Quél.) A. H. Smith.

In an earlier paper (1971a: 277) we discussed the not infrequently occurring difficulty in distinguishing between *P. gracilis* and *P. microrrhiza*, arising from the fact that with regard to quite a number of characters considerable overlapping exists between the two species. We ended our paper by stating that it cannot be denied that between these two closely related species seemingly intermediate forms occur. We were glad to read in Romagnesi's latest paper (1975) that like us he had come across specimens which he considered as being atypical for either *P. gracilis* or *P. microrrhiza*. His '*Drosophila* cf. *microrrhiza*?' (No 1014) is described as having only 'quelques traces de voile marginal à la loupe', whereas normally *P. microrrhiza* has quite a strongly developed veil. He also described a '*Drosophila* sp.' (No 909) of which even the young specimens did not show a trace of a veil, of which the numerous pleurocystidia were *gracilis*-like, but of which he considered the pigmentation 'un peu plus vive' so that he hesitated between *P. gracilis* and *P. microrrhiza*. We (1971a) described exactly the same combination of characters and hesitation with regard to the ultimate identification of a collection. We regret that Romagnesi in these descriptions did not use the density of the cheilocystidia at the gill edge as a means of distinguishing between the two species (see Kits van Waveren, 1971a: 278).

PSATHYRELLA LONGICAUDA P. Karst.—Pl. 62; Figs. 6, 25–28

Psathyrella longicauda P. Karst. *in* Hedwigia 30: 298. 1891; *in* Bidr. Känn. Finl. Nat. Folk 54: 175. 1893. — *Drosophila longicauda* (P. Karst.) Kühn. & Romagn., Fl. anal.: 359. 1953 (incomplete reference to basionym).

SELECTED DESCRIPTION.—Kühn. & Romagn., Fl. anal.: 359. 1953.

CHIEF CHARACTERISTICS.—Cap 13–30 mm, hemispherical, campanulate-hemispherical, spreading to convex, sometimes vaguely umbonate, showing neither pink nor concentric zones when dry; veil distinct; gills greyish brown, with white edge, stem rooting (pseudorrhiza 10–30 mm); spores (10.8–)11.3–13.5×6.3–7.2 μm, germ pore indistinct; pleurocystidia 50–80×9–12.5 μm, slender, sublageniform or subfusiform, with subcylindric neck; edge of gill chiefly covered by spheropedunculate cells; hymenophoral trama brownish.

MACROSCOPIC CHARACTERS.—Cap 13–30 mm in diam., 8–10 mm high, hemispherical to campanulate-hemispherical, spreading to convex, sometimes vaguely umbonate but without revolute margin, dark reddish brown (M. 5 YR 3/3), later less reddish, approaching dark brown colour of cap of *Agrocybe erebia* (M. 7.5 YR 3/2), moderately striate up to 1/2 from margin upwards, hygrophanous, when drying for a long time remaining remarkably brown (M. 7.5 YR 5/6, 5/8), finally fairly pale brown (M. 10 YR 7/4), with centre darker yellowish ochre (M. 7.5 YR 6/6), without pink shades, not micaceous, distinctly though not strongly rugulose.

Veil on cap well developed, white, in young specimens forming a conspicuously appendiculate collar, 1–2 mm broad, around entire margin with radially arranged fine fibres up to 1 mm from margin upwards, very fugacious.

Gills 2–3 mm broad, ventricose near margin of cap, then straight and ascending, broadly adnate, pale brownish grey near edge (M. 10 YR 6/2), browner (M. 10 YR 5/2) towards base, and darker greyish brown (M. 10 YR 6/3) at base itself, with white edge.

Stem 20–65×3–3.5 mm, straight or wavy, remarkably firm, cylindric but base thickened, glossy, white, hollow, with pruinose apex, without velar remnants, rooting, its pseudorrhiza 10–30 mm long and tapering towards its end.

Flesh of cap 1–1.5 mm thick in centre, dark brown (M. 10 YR 3/4), flesh of stem conspicuously brown (M. 7.5 YR 5/4; 10 YR 5/3) but with superficial layer pure white.

Spore print purplish black.

Trama of 'washed' gill under binocular lens distinctly brown (M. 10 YR 6/3) in a narrow zone along base; remainder of gill paler towards edge (M. 10 YR 7/2).

MICROSCOPIC CHARACTERS.—Spores (10.8–)11.3–13.5×6.3–7.2 μm (average 12.2×6.7 μm), ellipsoid-amygdaliform, in water very dark reddish brown, mahogany colour (M. 2.5 YR 2/2, 2/4), in NH_4OH 10% still darker (M. 2.5 YR 2/2, 2/4) and in KOH 5% strikingly dark, almost black (M. 10 YR 3/2), opaque, with ±1.8 μm wide but indistinct germ pore and small but distinct hilar appendix.

Basidia 25–30×9–11 μm, 4-spored.

Pleurocystidia 50–80×9–12.5 μm, scattered, slender, sublageniform or subfusiform, with subylindric neck and distinct stalk, thin-walled, colourless, without mucus or crystals.

Spheropedunculate cells densely packed (±80% of total number of marginal cells) and rather large, 15–30×7.5–15 μm; in between them a fair number (±20% of total number of marginal cells) of irregularly scattered (fewer in number near margin of cap) sublageniform cheilocystidia, their necks often subcylindrical, 27.5–35(–40)×7.5–10 μm, colourless, thin-walled, without mucus or crystals; gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%) distinctly brown from membranal pigment at base, less brown in remainder of gill and very pale brown near edge, with few yellow hyphal septa and without encrustations.

Cuticle of cap cellular; cells 24–48 μm in diam., colourless.

Clamps on hyphae of stem fairly numerous.

HABITAT.—Gregarious in manured (cow dung) grass (meadow), or (Karsten) among rotting leaves. October–November. Very rare.

COLLECTIONS EXAMINED.—THE NETHERLANDS, Zuid-Holland, Goedereede, 'Middelduinen', 11 Nov. 1969, *E. K. v. W.* (L).

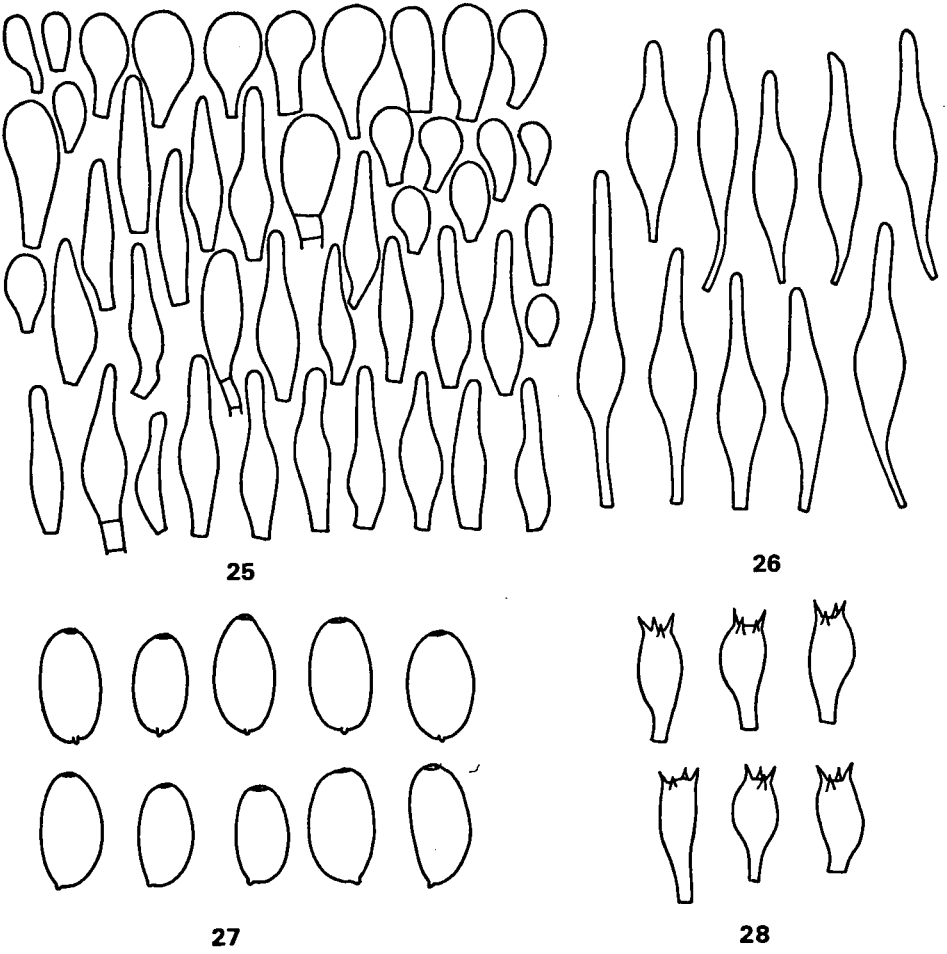
FINLAND, Tammela, Mustiala, Oct. 1891, *P. A. Karsten* (type: H).

The above description is based entirely on our rich collection from Goedereede, which corresponds very well with Karsten's type material received on loan by courtesy of the Director of the Museum Botanicum at Helsinki. Karsten's protologue of this species comprises a full description (1891: 298). The roots of the stems in our material went up to 30 mm long, those of Karsten's were even longer, up to 60 mm. The lengths of the pleurocystidia in Karsten's and our material are slightly different but in our opinion the difference falls within the range of variability to be expected, whereas the shape is the same in both collections. The 5 pleurocystidia we found in the type material measured 40–50 × 8–10 μm; Karsten himself described them as measuring 55–60 × 15 μm, in our material they are longer, 50–80 × 9–12.5 μm, and Romagnesi (1953: 359) states that they are 'souvent remarquablement sveltes, 45–82 × 10–12 μ,'. We regard the fact that in both the type material and our own collection the spores are of the same very dark colour and have an indistinct germ pore, as of decisive importance. It is interesting to note that Karsten found the spores of *P. longicauda* to be darker than those of *P. gracilis*—as indeed they are—and that according to him this is one of the characters by which this species is distinguished from *P. gracilis*.

Prof. Romagnesi very kindly sent us from his herbarium a very small specimen identified by him as *P. longicauda*. In this specimen we found slender sublageniform pleurocystidia, moderately numerous, and measuring 42.5–60 × 7.5–11 μm, but the spores were by no means as dark as those of the type material and our own collection, and the germ pore was ample, so that we believe that this material does not represent Karsten's *P. longicauda*. Romagnesi apparently, and in our opinion quite rightly, regards the distinctness of the pore as an important character (see his description of *Drosophila caudata*, 1953: 369, and his description of *P. pellucidipes*, 1967: 541).

Psathyrella longicauda differs from *P. melanophylla*, which like *P. longicauda* has dark spores and an indistinct germ pore, by the hemispherical-campanulate cap, the absence of concentric zones in the drying cap, the habit of the whole plant (remarkably firm stem), and the gills being not black but brownish grey. The differences with *P. ridicula* and *P. connata* are pointed out in the discussion on these species.

Psathyrella longicauda is hardly mentioned in the literature; the only descriptions we found were those in the descriptive keys of Kühn. & Romagn. (1953: 359) and Moser (1967: 215). Moser's description, however, is obviously a copy of the one given by Kühn. & Romagn., Dennis, Orton & Hora (1960: 146) refer only to the description of Kühn. & Romagn., while Konrad & Maublanc (1928: 77) range *P. longicauda* under 'espèces peu connues douteuses ou à exclure'. Ricken and Lange do not mention the species. A. H. Smith (1972: 334) states that *P. longicauda* is possibly the same as *P. caudata*, but this is certainly not so. With *P. caudata* sensu Kühn. & Romagn.



Figs. 25–28. *Psathyrella longicauda*, 11 Nov. 1969. — 25. Cheilocystidiogram (×575). — 26. Pleurocystidiogram (×575). — 27. Spores (×1212). — 28. Basidia (×575).

the cap is largely conical and in the end its margin is revolute, the veil is rudimentary, the gills are conspicuously greyish black to black without a trace of brown. With *P. longicauda* the cap is largely hemispherical to campanulate and its margin is not revolute, the veil is distinct and the gills are dark greyish brown. The spores of both species have an indistinct germ pore, whereas Smith describes the germ pore in his *P. caudata* as broad and even somewhat truncate. A re-examination of the two collections cited by Smith seems desirable.

Psathyrella longicauda as described by Malençon & Bertault (1970: 186) does not

correspond with our description of this species. They describe the veil in young specimens as consisting of only 'des fibrilles très fugaces', the edge of the gills as 'non nettement discolore, ni blanche ni rose, mais jaune cannelle sale', the colour of the spores as 'brun foncé,' the apex of the spores as 'à sommet tronqué par un pore évident', and the cheilocystidia as utriform.

Psathyrella melanophylla Kits van Wav., *spec. nov.* —Figs. 3, 4, 29, 30

Pileus in primo aetate ellipsoideus, castaneus, apice margineque mox fuscescens, parte media semper castaneus, deinde 10–30 mm latus, typice conicus, postremo expansus, margine repandus, recens omnino castaneus, postea apice margineque fulvescens, zona lata media fusca, 2/3 striatus, hygrophanus, in sicco e avellaneo sordide alutaceus, variis zonis brunneis variegatus, haud tamen roseus, rugulosus, micaceus. Velum fugax e fibrillis nonnullis, albis. Lamellae marginem versus ventricosae, rectae, ascendentes, late adnatae, 2–5 mm latae, cinereae nigrescentes, acie alba. Stipes 70–150 × 1–3.5 mm, rectus, aequalis, albus, deorsum isabellinus, fistulosus, apice pruinosus, basi strigosus, radicans (radix 10–70 mm). Caro fusca in pileo, albida in stipite, apice tamen fusca. Sporae in cumulo atrae.

Sporae (11.7–)12.2–14.4 × 6.8–8.1 μm, ellipsoideo-amygdaliformes, in aqua observatae castaneae, opacae, poro germinativo tenui obscuroque instructae (± 1.8 μm). Basidia 4-sporigera, 25–38.4 × 10–13.6 μm. Pleurocystidia 35–60 × 9–15 μm, pauca, ventricosa sublageniformia interdum collis cylindricis, longitudine pedicellorum et collorum variabili, tenuitunicata. Cellulae marginales: cellulae spheropedunculatae 10–27.5 × 4–12.5 μm, numerosae, confertae, pilei marginem versus majorae (20–30 × 8–17.5 μm); cheilocystidia (25–)30–45 × 6–15 μm, dispersa, haud numerosa, pleurocystidia similia. Trama lamellarum incolor vel fere incolor. Cuticula pilei cellularis. Hyphae stipitis fibuligerae.

Cespitosa vel subcespitosa vel interdum solitaria, terrestris.

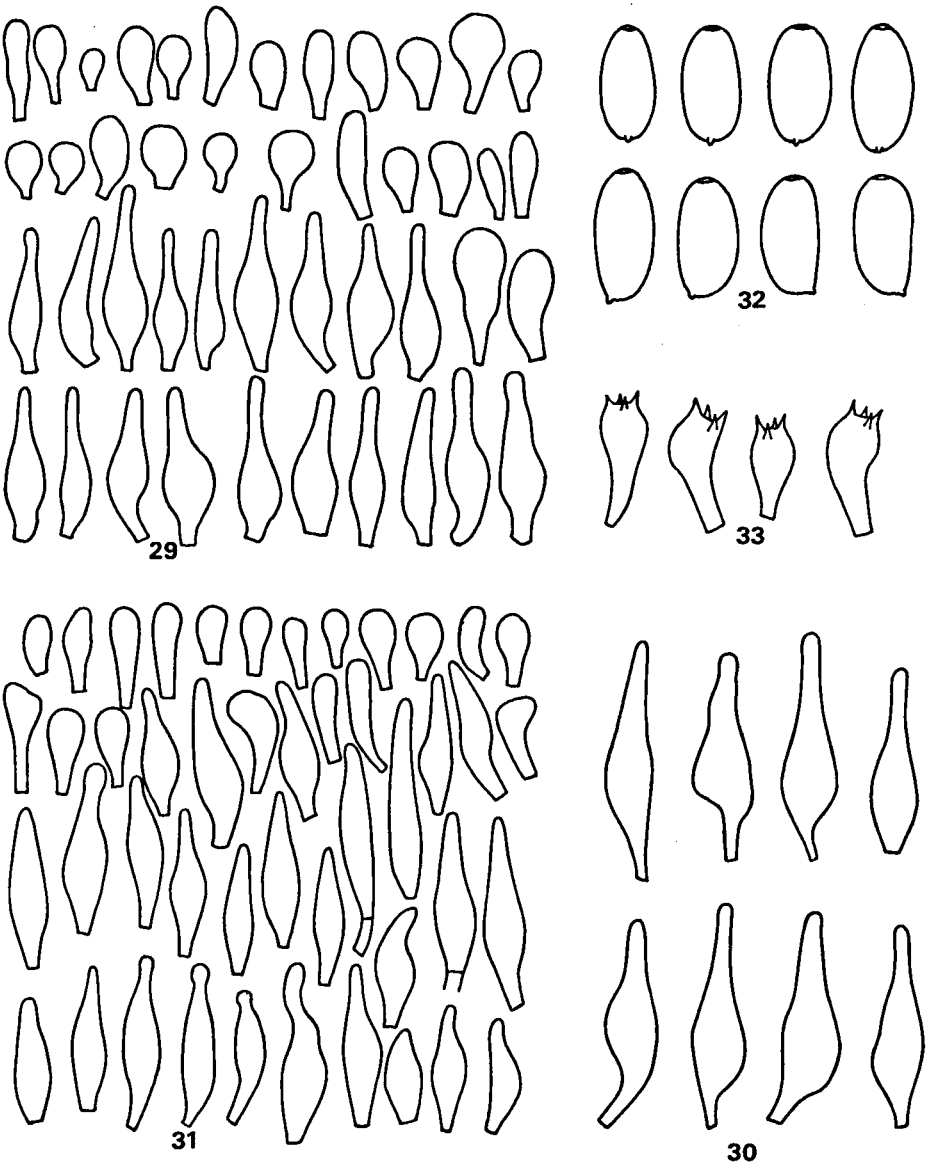
TYPUS: 'The Netherlands, prov. Overijssel, Oldenzaal, estate "Dijkhuis", 16 Oct. 1963, *E. Kits van Waveren*' (L).

MISAPPLIED NAMES.—*Psathyra caudata* (Fr. ex Fr.) J. E. Lange *sensu* J. E. Lange, Fl. agar. dan. **4**: 99, pl. 155A. 1939. — *Drosophila caudata* (Fr. ex Fr.) Kühn. & Romagn. *sensu* Kühn. & Romagn., Fl. anal.: 359. 1953. — *Psathyrella caudata* (Fr. ex Fr.) Quél. *sensu* Hennig *in* Michael/Hennig, Handb. Pilzfr. **4**: 280, fig. 278. 1967; *sensu* Moser *in* Gams, Kl. KryptogFl. **2** (b2): 214. 1967 (spore size excluded); non *Agaricus caudatus* (Fr. ex Fr.) Fr., Epicr.: 239. 1838 (=form of *P. gracilis*).

SELECTED DESCRIPTIONS AND ILLUSTRATIONS.—Ricken, Blätterp.: pl. 68 fig. 1. 1913 (as *P. caudata*); J. E. Lange, Fl. agar. dan. **4**: 99, pl. 155A (as *Psathyra caudata*); Kühn. & Romagn., Fl. anal.: 359. 1953 (as *Drosophila caudata*); Cooke, Ill. Brit. Fungi, pl. 622/596 (as *Agaricus microrrhizus*).

CHIEF CHARACTERISTICS.—Cespitose, subcespitose or sometimes solitary; cap 10–30 mm, conical but marginal area in mature specimens revolute, on drying showing concentric zones but no pink; veil rudimentary; gills conspicuously dark grey to greyish black, broadly adnate, with white edge; stem rooting (pseudorrhiza 10–70 mm); spores (11.7–)12.2–14.4 × 6.8–8.1 μm, with indistinct germ pore; pleurocystidia 35–60 × 9–15 μm, scarce, sublageniform; cheilocystidia scattered among abundant spheropedunculate cells; hymenophoral trama colourless or almost so.

MACROSCOPIC CHARACTERS.—Cap at first (primordia, diam. of cap 3 mm, height 4 mm) ellipsoid, not or barely striate, dark reddish brown (M. 5 YR 3/3, 3/4) but



Figs. 29, 30. *Psathyrella melanophylla*, 16 Oct. 1963. — 29. Cheilocystidiogram (×575). — 30. Pleurocystidiogram (×575).

Figs. 31–33. *Psathyrella melanophylloides*, 21 Oct. 1973. — 31. Cheilocystidiogram (×575). — 32. Spores (×1212). — 33. Basidia (×575).

very soon both at top and in marginal zone dark yellowish brown (M. 10 YR 4/4), along margin itself paler yellowish brown (M. 10 YR 6/4), next, as cap gets larger (diam. 10 mm, height 9 mm) apex becoming glossy, remaining brown (M. 10 YR 4/4, 3/4), marginal area becoming paler brown (M. 10 YR 6/3) and zone in the middle either remaining dark reddish brown (M. 5 YR 3/3) for a while or (soon) becoming dark brown (M. 10 YR 3/3, 3/4). Mature caps 10–30 mm in diam., 10–18 mm high, characteristically conical to hardly campanulate-conical, in later stages marginal area or even peripheral 1/3 of cap usually characteristically spreading and becoming revolute, strongly striate almost to centre; when very fresh dark reddish brown all over (M. 5 YR 3/4), very soon both top and marginal area dark brown (M. 10 YR 3/3, 3/4), and then colour in between both areas either still distinctly reddish brown (M. 5 YR 3/4) or soon changing into very dark brown (M. 10 YR 3/4, 3/3, 4/3), following which both marginal area and top becoming paler brown (M. 10 YR 4/4, 5/4), and extreme margin whitish, hygrophanous, drying out via dark greyish brown (M. 10 YR 5/2, striae ± 10 YR 3/3) to sordid pale brown (M. 10 YR 6/3, 7/4, 7/3, 7/2) or pale brownish grey (M. 10 YR 6/2) in peripheral half usually with one or two concentric broad zones of slightly different shades of pale brown, rugulose or even rugose, slightly to distinctly micaceous but without any pink shades.

Veil in primordia and very young stages consisting of a very thin but dense layer of fibres, running from apex of stem to margin of cap; in mature stages rarely present as minute remnants on surface of margin of cap, usually, however, absent from cap but present as scattered minute white fibres on stem.

Gills 2–5 mm broad, ventricose only near margin of cap (this part sometimes protruding below margin of cap), then straight, ascending, very broadly adnate (rarely with a tooth), conspicuously grey to dark grey (M. 10 YR 5/1), finally greyish black (M. 10 YR 4/1, 3/1, 3/2), with white, minutely fimbriate edge.

Stem 70–150 × 1–3.5 mm, straight and rather firm (especially when thick), cylindric, white but slightly isabelline in its lower 1/3–2/3, pruinose at apex, distinctly and often strongly rooting; pseudorrhiza 10–70 mm long, tapering towards its end and springing from an occasionally very slightly thickened base, which is strongly to sparsely strigose with white hairs.

Flesh of cap 1–2 mm thick in centre, dark brown (M. 10 YR 3/4, 4/3, 4/4); flesh of stem white but very pale brown in centre, and dark brown in extreme apex.

Spore print black.

Trama of 'washed' gill under binocular lens practically colourless to very pale greyish brown (M. 2.5 Y 7/2; 10 YR 7/2, hardly 7/3), near base sometimes only slightly darker and at base itself in a very narrow strip yellowish brown (M. 10 YR 6/4).

MICROSCOPIC CHARACTERS.—Spores (11.7–)12.2–14.4 × 6.8–8.1 μm (averages 13.1–13.5 × 7.2–7.6 μm), ellipsoid-amygdaliform, in water dark reddish brown, mahogany colour (M. 2.5 YR 3/4, 3/6), in NH_4OH 10% slightly darker (M. 2.5 YR 3/2, 2/4; 5 YR 3/3), in KOH 5% very dark greyish brown (M. 10 YR 3/2, 3/3), opaque, thin-walled, with small hilar appendix and rather wide (± 1.5–1.8 μm) but indistinct apical germ pore.

Basidia 25–38.4 × 10–13.6 μm, 4-spored.

Pleurocystidia 35–60 × 9–15 μm, with 3–5 μm wide neck, rather scarce, scattered, ventricose-sublageniform, often with subcylindric neck, thin-walled, colourless, without mucus or crystals; length of both stalks and necks variable; neck sometimes elongate.

Gill edge sterile. Spheropedunculate cells (some clavate) densely packed (80–90% of total number of marginal cells, near margin of cap even up to 100%), 10–27.5 ×

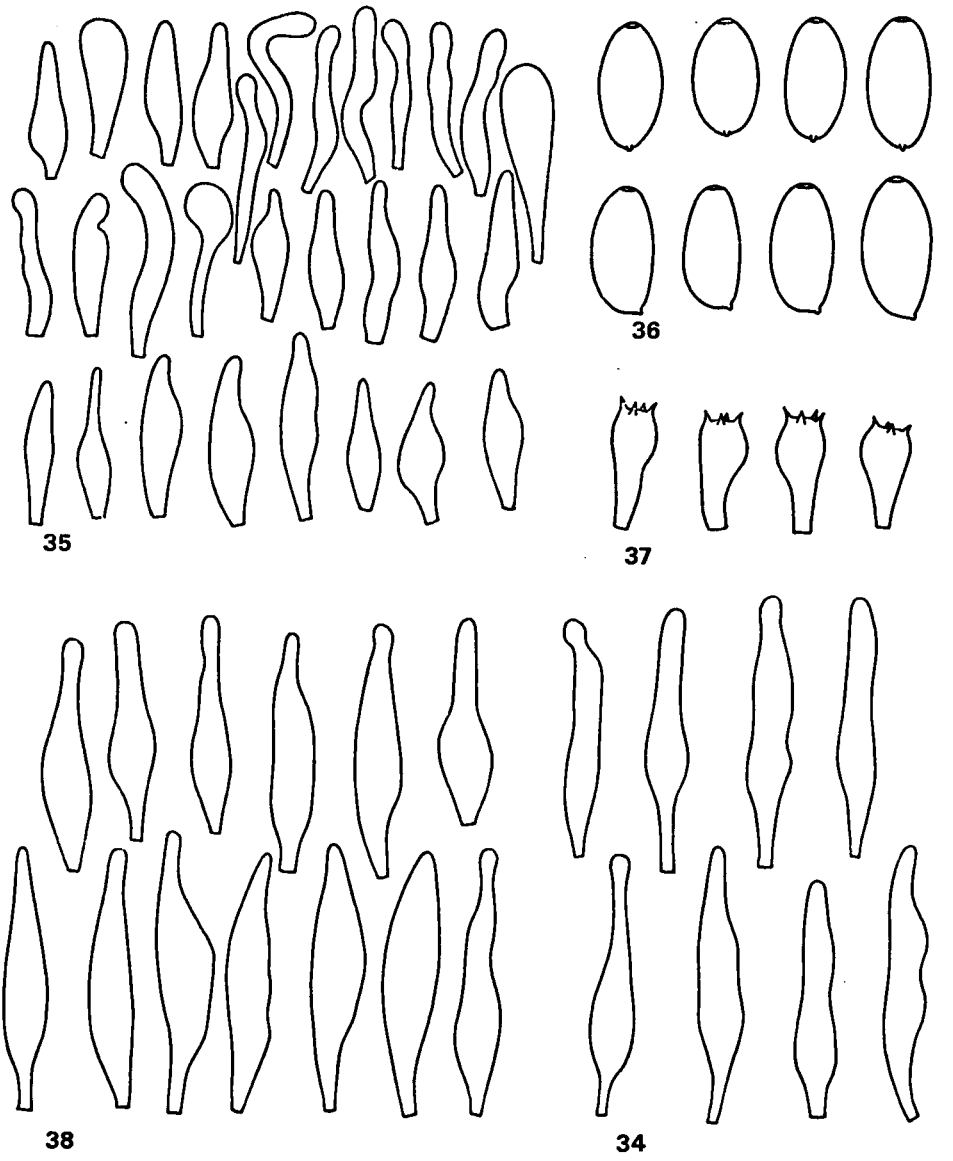


Fig. 34. *Psathyrella melanophylloides*, 21 Oct. 1973. — Pleurocystidiogram (×575).
Figs. 35–38. *Psathyrella ochracea*, 3 Oct. 1944. — 35. Cheilocystidiogram (×575). — 36. Spores (×1212). — 37. Basidia (×575). — 38. Pleurocystidiogram (×575).

4–12.5 μm, increasing in size towards margin of cap (20–30×8–17.5 μm), thin-walled, intermixed with a variable and usually small number (up to ±20% of total number of marginal cells) of scattered cheilocystidia (none or very few near margin of cap), often in local accumulations near middle of gill edge, similar to pleurocystidia, 27.5–45×6–15 μm, thin-walled, without mucus or crystals.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%): trama practically colourless to very pale brown from membranal pigment, very few encrustations, and yellow hyphal septa (slightly more at base).

Cuticle of cap cellular, 15–40 μm in diam., colourless.

Clamps present on hyphae of stem.

HABITAT.—Usually cespitose or subcespitose, sometimes isolated, terrestrial against small pieces of wood. September–October. Rare.

COLLECTIONS EXAMINED.—THE NETHERLANDS, prov. Overijssel: Oldenzaal, estate 'Dijkhuis', 16 Oct. 1963, *E. K. v. W.* (holotype; L); Delden, estate 'Twickel', 19 Sept. 1964, *E. K. v. W.* (L); Denekamp, estate 'Singraven', 18 Oct. 1974, *E. K. v. W.* (L).

FRANCE, dép. Oise, Coye-la-Forêt, 14 Sept. 1946, *H. Romagnesi* (Herb. Romagn.).

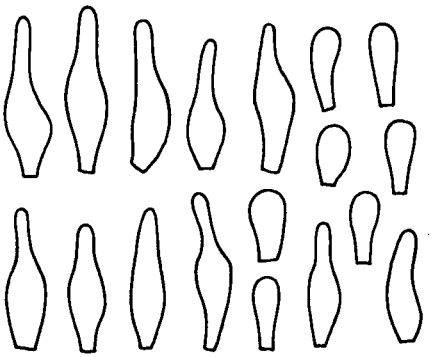
NOTE.—The above description is chiefly based on the type collection, which consists of some 10 fruit-bodies in very good condition.

Psathyrella melanophylla differs from *P. gracilis*, with which it may easily be confused, by its usually cespitose growth, the conspicuously greyish black gills, the white gill edge, the conical shape of the cap whose marginal area in later stages turns up, the absence of pink and usually the presence of concentric zones on the drying cap, and the presence, be it rudimentary, of a veil. On account of these characteristics *P. melanophylla* is easily discernible in the field from *P. gracilis* by those who are familiar with *P. gracilis* and the variability of that species. Romagnesi (1953: 359) moreover noted that the spores of *P. melanophylla* have an indistinct germ pore, whereas the spores of *P. gracilis* have a large and very distinct germ pore.

Psathyrella melanophylla differs from *P. melanophylloides* in several characters, outlined in the observations on the latter species, and from *P. polycystis* by the shape of its cap, the greyish black gills, the white gill edge, the usually cespitose growth, the pleurocystidia being neither very numerous nor swollen at their apex, and the indistinct germ pore. *Psathyrella longicauda* has not greyish black but browner gills (its hymenophoral trama is coloured), its cap is campanulate, with the margin not turning up in later stages, and on drying the cap does not show concentric zones, the veil is much more developed and accordingly clearly mentioned in Karsten's (1891: 298) original description.

Colours play a major part in characterizing *P. melanophylla*: the gills are conspicuously greyish black (Romagnesi, rightly puts this character in bold face letters in the 'Flore analytique'), the gill edge is white, and pink is lacking in the colour of the drying and the dry cap.

Romagnesi (1953: 371, note 4) states correctly that Fries' *Agaricus caudatus* differs from *Drosophila caudata* as described by Romagnesi (this description corresponds in every way with our description given above) in that Fries' plant turns pink on drying (in 'Epicr.' and 'Hym. europ.': 'in carneum vergens'; in 'Monogr. Hym. Suec.':



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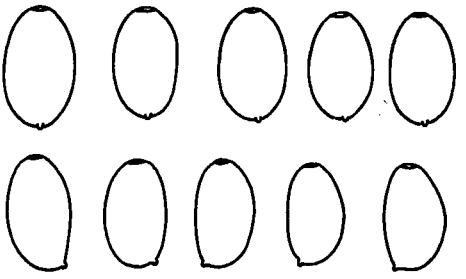

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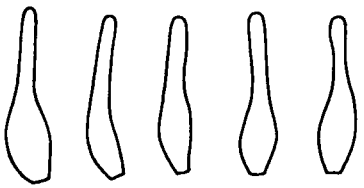

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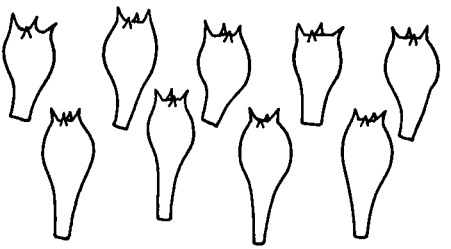

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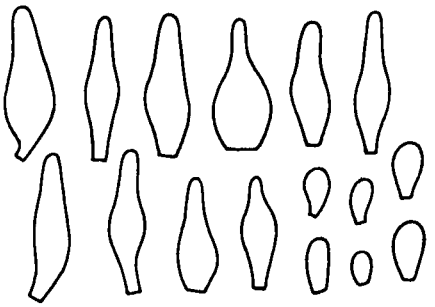

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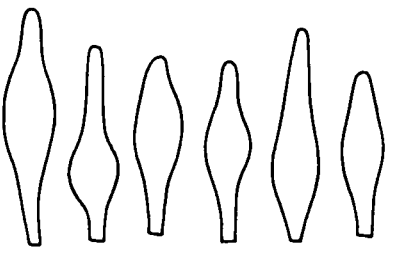

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Figs. 39, 40. *Psathyrella opaca*, 12 Sept. 1946. — 39. Cheilocystidiogram (×575). — 40. Pleurocystidiogram (×575).

Figs. 41–44. *Psathyrella orbicularis*, 1 Oct. 1966. — 41. Cheilocystidiogram (×575). — 42. Spores (×1212). — 43. Basidia (×575). — 44. Pleurocystidiogram (×575).

'in carneum obsolete vergens'), is very fragile, splits in rainy weather, and is deliquescent. Romagnesi might have added that Fries' plant is not said to be cespitose, that in all his publications the size of the cap is given as rather large ('2 unc.'=50 mm; with Romagn. 10–30 mm, like in our material) and, most important of all, that its gill edge is red. In 1821(: 299) Fries mentioned *A. caudatus* as a mere variety of *A. gracilis* ('*A. gracilis*, ...β *A. caudatus*, major, radicatus &c.'), referring for a full description to his elaborate description under the name *Agaricus* (*Coprinus*) *caudatus* in his 'Observationes' (1818: 187). In that description the gills are said to have a 'margine incarnato-roseis'. The gill edge is not mentioned in his later publications (Epicr., Hym. europ.) but in the 'Monographia' the edge is said to be 'concolore' (to the greyish black gills). In all these descriptions Fries, however, refers to his original description of 1818 in which the presence of a 'margine roseae' is clearly mentioned. Fries all through the years apparently was in doubt whether his *Agaricus caudatus* was a larger form of *Psathyrella gracilis*, equipped with a remarkably long pseudorrhiza, or a good species. Since Fries, mycologists have either merely copied Fries' descriptions of *A. caudatus* or else have given descriptions of *Agaricus* or *Psathyrella caudata* which are incomplete or in some respects slightly deviate from Fries' concept of *A. caudatus*. What later became known as *Psathyrella caudata* was almost always based on Fries' descriptions and, as pointed out above, these do not tally with the species described by Romagnesi under the name *Drosophila caudata* and by us under the name *P. melanophylla*.

Of the many descriptions under the name *Psathyrella caudata* in the literature only those given by J. E. Lange (1939: 99), Hennig (1967: 280), and Moser—except for spore size—(1967: 214) tally sufficiently with *Drosophila caudata* sensu Romagnesi and our *Psathyrella melanophylla*.

Romagnesi (1953: 359) rightly refers—even with an exclamation mark—to Lange's plate 155A (1939), which indeed (apart from the large size, the cap measuring 50 mm) depicts our species very well (the largest cap, however, does seem to show a trace of pink). Lange's description (1939: 99) also tallies with our species; the species is called subfasciculate, its cap conical with irregularly upturned marginal area, and without pink shades when dry, the gills dark grey and their edges whitish. Lange calls this species *Psathyra caudata*.

Romagnesi also refers to Ricken's plate 68 fig. 1, which depicts specimens of what Ricken calls *Psathyrella caudata* Fr., obviously in the mature and fresh stage. Again, the caps are rather large (diam. of cap 40 mm), and their marginal areas are not revolute, as is typical for *P. melanophylla*. In his description, however, Ricken (1913: 265) clearly mentions a pink colour of the dry cap ('trocken ledergelb oder scherbenrötlich'), and he does not mention the cespitose growth, neither the concentric zones on the drying cap nor the presence of a veil, and the gill edge is said to be concolorous. We therefore doubt the conspecifity of the species described by Ricken with *P. melanophylla*.

Dennis, Orton & Hora (1960: 143) refer to Lange's plate 155A and to Ricken's plate 68 fig. 1, but also to Cooke's plate 639/637 of *Agaricus* (*Psathyrella*) *caudatus*.

The latter plate depicts only dry specimens, whose caps measure no less than 60 mm in diam., and have a distinctly pink broad marginal zone (1/2 R). The gills moreover are narrow and practically free from the stem. We therefore do not consider that the plate depicts the species we describe above.

In our opinion Cooke's plate 622/596, according to Cooke himself depicting *Agaricus* (*Psathyra*) *microrrhizus*, shows the species we describe above. This figure shows fresh specimens of which the caps are small, conical and dark brown, and do not show traces of a veil (which they should if the plate depicted *P. microrrhiza*). The margin of the cap moreover is upturned, the gills are broad and grey and do not show a red edge, and no pink is shown in the colour of the cap. Pearson & Dennis (1948: 185) also interpreted Cooke's plate 622/596 as *Psathyrella caudata*.

Romagnesi (1953: 359) introduced an important character of the present species by stating that its spores have a 'tout petit pore'. Prof. Romagnesi very kindly sent us material of this species in which the germ pore turned out to be fairly large but strikingly indistinct (as compared with the germ pore of for instance *P. gracilis* and *P. microrrhiza*) obviously because of the thinness of the spore wall in combination with the opacity and dark colour of the spores. When we brought this to the attention of Prof. Romagnesi, he replied (in lit.) that by 'tout petit pore' he had really meant to say 'pore bas et peu tronquant', and 'quand j'ai écris "pore petit" il ne s'agissait pas de la largeur.'

In the material Prof. Romagnesi sent us we found that the pleurocystidia measured 30–37.5 × 8–12.5 μm, whereas in the 'Flore analytique' Romagnesi calls these cells '± longues (30–)45–75 × 8–12.5 μ.' In our own material we have never come across pleurocystidia of that length, our figures being (30–)35–55 × 8–12.5 μm. In all these cases, however, the shape of the cells was fairly uniform.

The description Moser (1967: 214) gives under *Psathyrella caudata* fully corresponds with *P. melanophylla* (the concentric zones on the drying cap and the indistinct germ pore, however, are not mentioned) except for the spore sizes, which are too large (12–16 × 8–9 μm). Nevertheless we consider the species as described by Moser to be conspecific with our species.

A. H. Smith's description (1972: 334) under *Psathyrella caudata*, however, does not fit in at all with our species (although his keys lead directly to this name), as Smith himself admits. Smith describes the cap as 'obtusely conic, becoming broadly conic and then with a flaring or turned up margin', and the gill edge as white; he also does not mention a pink shade in the dry cap but the colour of the gills is called 'pallid cinnamon-buff, soon dark greyish to purplish brown', the apical germ pore broad, the apex of the spore even somewhat truncate, and the species is not called cespitose. In his observations on the species he finally says that a veil is lacking. Accordingly Smith specifically states that *P. caudata* as described by him is not *P. caudata* sensu Moser. For the same reasons it cannot be *P. melanophylla* either, and we do not venture upon an interpretation.

In conclusion we believe that *Psathyrella caudata* (Fr. ex Fr.) Quél. is nothing but a large form of *P. gracilis*, equipped with a long pseudorrhiza, and that the species

described by Romagnesi in the 'Flora analytique' as *Drosophila caudata* (F. ex Fr.) Kühn. & Romagn, and by us above is a species in its own right, for which we propose the name *Psathyrella melanophylla.*

Psathyrella melanophylloides Kits van Wav., *spec. nov.*—Figs. 5, 31–34

Pileus 10–26 mm latus, typice conicus, postremo expansus et margine subrepandus, 2/3 striatus, haud umbonatus, centro spadiceus, marginem versus fuscus, margine extrema pertenuis, albidus, recens veri-similiter castaneus, hygrophanus, in sicco cremeus alutaceus, distincte roseus, rugulosus, leviter micaceus. Velum non visum. Lamellae ventricosae, anguste adnatae, 2.5–4 mm latae, ravidae, acie alba. Stipes 35–70 × 1–2 mm, rectus, aequalis, albus, fistulosus, apice leviter pruinosus, radicans (radix 8–10 mm), basi strigosus. Caro fusca in pileo, albida in stipite. Sporae in cumulo atropurpureae.

Sporae 10.8–13.5(–14.4) × (5.4–)5.9–6.8(–7.2) μm, ellipsoideo-amygdaliformes, in aqua observatae castaneae, poro germinativo obscuro instructae (± 1.8 μm). Basidia 22.5–40 × 10–12.5 μm, 4-sporigera. Pleurocystidia 55–70 × 7.5–10 μm, modice numerosa, tenuia, subcylindrica, sublageniformia vel subfusiformia, apice interdum subincrassata. Cellulae marginales: cellulae spheropedunculatae vel cellulae subclavatae, confertae, 15–20 × 5–8 μm vel leviter majorae, 25–30 × 10–20 μm; cheilocystidia 22.5–47.5 × 7.5–10 μm, dispersa, subfusiformia usque ad sublageniformia. Trama lamellarum incolor. Cuticula pilei cellularis. Hyphae stipites fibuligerae.

Cespitosa, terrestris.

TYPUS: 'The Netherlands, prov. Overijssel, Delden, Zaagmolenweg, 21 Oct. 1973, *E. Kits van Waveren*' (L).

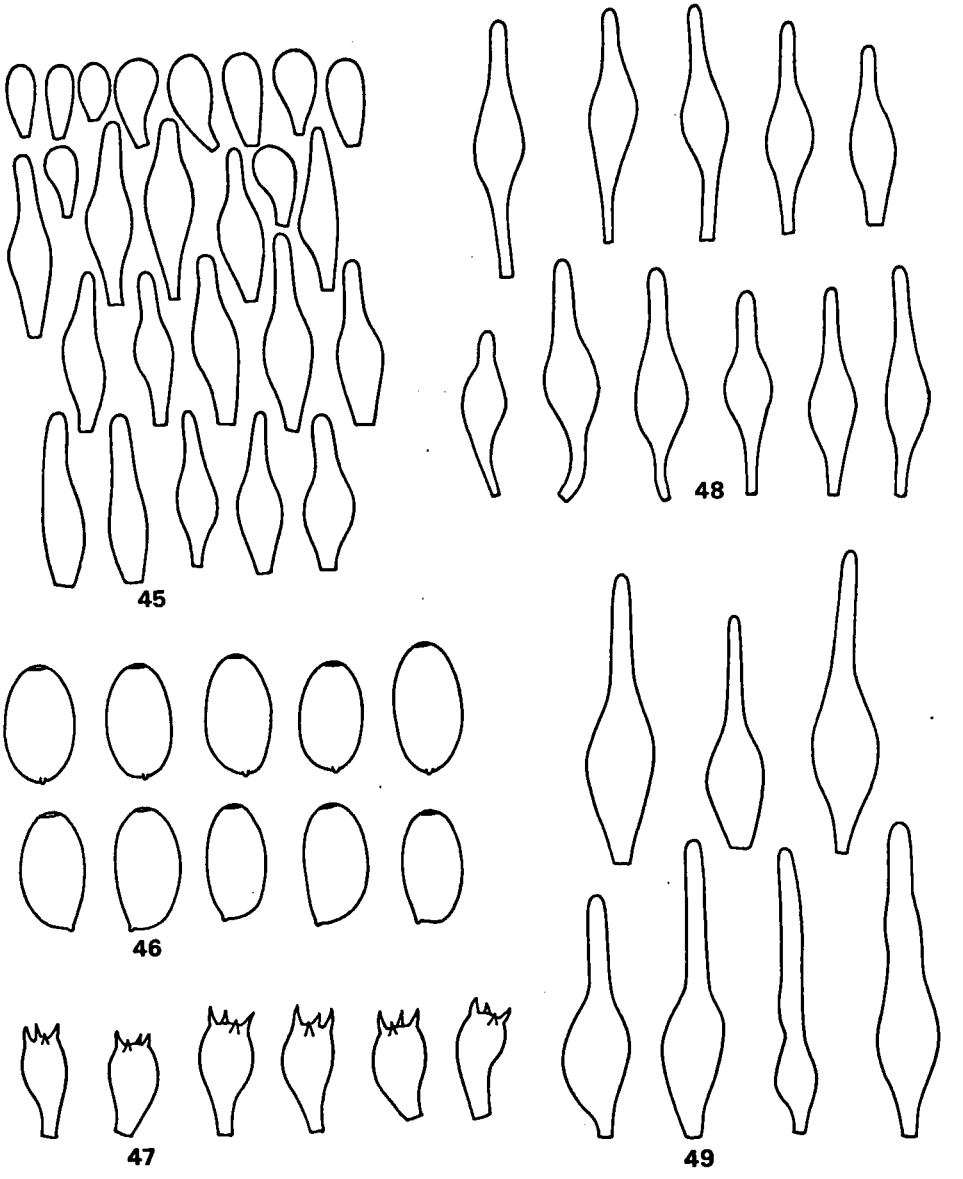
CHIEF CHARACTERISTICS.—Cespitose growth; cap 10–26 mm, conical with peripheral half tending to become revolute, on drying without concentric zones but distinctly pink; veil (probably) absent; gills very dark grey, ventricose and narrowly adnate, with white edge; stem rooting (pseudorrhiza 8–10 mm); spore print dark purple; spores 10.8–13.5(–14.4) × (5.4–)5.9–6.8(–7.2) μm, germ pore indistinct; pleurocystidia 55–65 × 7–10 μm, subcylindrical, very slender, rather numerous; hymenophoral trama colourless.

MACROSCOPIC CHARACTERS.—Cap 10–26 mm in diam., 8–10 mm high, conical with a distinct tendency of its peripheral half to turn up, without umbo, deep brown to very dark yellowish brown (M. 5 YR 4/4; 10 YR 4/4) in central 1/3, and greyish brown (M. 10 YR 4/2) in peripheral 2/3, at extreme margin very thin and whitish,[2] striate up to 2/3 from margin upwards, hygrophanous, drying out to pale yellow (M. 10 YR 8/4) at centre, distinctly pink (M. 5 YR 7/4) in a broad zone in the middle, and very pale brown (M. 5 YR 7/4) in peripheral 1/4, conspicuously rugulose, slightly micaceous, without concentric zones.

Veil not seen on either cap or stem (primordia not available).

Gills 2.5–4 mm broad, distinctly but not strongly ventricose, ascending and narrowly adnate without tooth, very dark grey (M. 10 YR 4/1), pale grey (M. 10 YR 5/1) only near margin of cap, no traces of brown or even purple, with white edge.

[2] Our description of the colours of the cap is based on caps which—although seemingly fresh when the specimens were collected—may well have been at the onset of the process of drying out. In earlier still fresher stages the colour of the cap is most likely to have been some shade of dark reddish brown like in all other species of this group.



Figs. 45–49. *Psathyrella pellucidipes*. — 45–48. 19 Sept. 1967. — 45. Cheilocystidiogram (×575). — 46. Spores (×1212). — 47. Basidia (×575). — 48. Pleurocystidiogram (×575). — 49. 29 May 1966. — Pleurocystidiogram (×575).

Stem 35–70 × 1–2 mm, straight, cylindric but sometimes slightly thickening towards base, rooting with 8–10 mm long, white, hollow pseudorrhiza, only slightly pruinose at apex, strigose at base.

Flesh of cap 2–3 mm thick in centre, dark brown (M. 10 YR 4/4); flesh of stem white but greyish brown in extreme apex and here with conspicuous narrow reddish zone alongside attachment of gills (like usually in P. gracilis).

Spore print very dark purple.

Trama of 'washed' gill under binocular lens hyaline, practically colourless (M. 2.5 Y 7/2) from base to edge with only just a trace of brown at the very base.

MICROSCOPIC CHARACTERS.—Spores 10.8–13.5(–14.4) × (5.4–)5.9–6.8(–7.2) μm (average 12.4 × 6.3 μm), ellipsoid-amygdaliform, in water dark reddish brown (M. 2.5 YR 3/6; 5 YR 4/4), in NH_4OH 10% scarcely darker (M. 5 YR 4/4), in KOH 5% very dark greyish brown (M. 10 YR 4/3, 3/3), opaque, thin-walled, with ±1.8 μm wide but indistinct germ pore and small hilar appendix.

Basidia 22.5–40 × 10–12.5 μm, 4-spored.

Pleurocystidia 55–70 × 7.5–10 μm, rather numerous, strikingly slender, subcylindrical, sublageniform or subfusiform with elongate neck, often slightly wavy, with subacute or sometimes slightly swollen apex, colourless, thin-walled, without crystals or mucus.

Spheropedunculate and slightly clavate cells small, 15–20 × 5–8 μm, but occasionally some or a number of these cells somewhat larger, 25–30 × 10–20 μm, densely packed (±80% of total number of marginal cells), shape and size fairly uniform, hyaline, thin-walled, intermixed with a fair number (±20% of total number of marginal cells) of cheilocystidia, irregularly scattered along gill edge (sometimes grouped together in small groups), subfusiform to sublageniform and quite a few subcapitate, shaped differently from the pleurocystidia and smaller, 22.5–47.5 × 7.5–10 μm, thin-walled, colourless, without crystals or mucus; gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%): trama practically colourless, without encrustations and without yellow hyphal septa.

Cuticle of cap cellular; cells 16–48 μm in diam., colourless.

Clamps present on hyphae of stem but scarce.

HABITAT.—Terrestrial and cespitose against a small branch lying in clayey soil. October. Known only from type locality.

COLLECTION EXAMINED.—THE NETHERLANDS, Overijssel, Delden, Zaagmolenweg, 21 Oct. 1973, *E. K. v. W.* (holotype; L).

No primordia were found, but as in none of the specimens traces of a veil were detected either on the cap or the stem, it is assumed that the velar development corresponds with that in *P. gracilis*, in which the scarcely developed veil inserts at the margin of the cap.

The species is close to *P. gracilis*, with which it has in common the colourless trama of the gills, the absence of a veil, the pink colour of the drying cap, and the slender pleurocystidia. But it differs from that species by the shape of the cap, the cespitose growth, the white gill edge, the spheropedunculate cells of the gill edge being non-elongate, irregularly shaped and often thick-walled as in *P. gracilis*, and the indistinct germ pore. *Psathyrella melanophylloides* closely resembles *P. melanophylla*, especially older specimens of that species, when they have lost their velar remnants. It has in

common with *P. melanophylla* the conical chape of the cap, the distinct tendency of the marginal area of the cap to turn up, the cespitose growth, the conspicuously grey to greyish black gills, the white gill edge, the indistinct germ pore, and the colourless hymenophoral trama. The differences with *P. melanophylla* are the distinctly ventricose and narrowly adnate gills, the drying cap showing a very marked pink colour and no concentric zones, the pleurocystidia being numerous, not scarce like in *P. melanophylla*, and moreover strikingly slender, the dark purple and not purplish black spore print and accordingly the spores being browner under the microscope. *Psathyrella melanophylloides* is to be regarded as intermediate between *P. gracilis* and *P. melanophylla*, with both of which, however, it shows so many differences that we have decided to regard it as being a species in its own right.

Psathyrella melanophylloides differs from *P. polycystis* in the shape of the cap, the greyish black gills, the white gill edge, the absence of a veil, the cespitose growth, the indistinct germ pore, and its pleurocystidia being not, as in *P. polycystis*, strikingly numerous and not having a swollen apex. In *P. stellata* and *P. orbicularis* the gills are not grey but show a distinct brown or purple tinge and the gill edge is red, the pleurocystidia are lageniform, and the germ pore is distinct. *Psathyrella melanophylloides* differs from P. *longicauda* in the shape of the cap, which in the latter species is hemispherical to campanulate without revolute marginal area and without pink shades in the dry stage, the lack of a brown colour in the gills and accordingly its colourless hymenophoral trama, the lack of a veil, and finally its cespitose growth.

In A. H. Smith's keys (1972) *P. melanophylloides* finds its place in series *Psathyrella* of subsection, section and subgenus *Psathyrella* on account of the distinct pink colour of the drying cap, the decisive character by which subsection *Psathyrella* is split by Smith into series *Psathyrella* and *Tenerae*. In series *Psathyrella P. melanophylloides* would adjoin *P. gracilis*. If it had not been for the presence of this pink colour *P. melanophylloides* would have found its way into series *Tenerae* where it would have adjoined *P. melanophylla* (=*P. caudata* with Smith).

PSATHYRELLA MICRORRHIZA (Lasch) Konr. & Maubl.

For a full description of this species, its synonymy, its distinguishing characters, and a discussion on seemingly intermediate forms between this species and *P. gracilis*, see our earlier paper (1971a: 249–280). Continued studies in *Psathyrella* have shown us that the following additions to and corrections of the earlier cited synonyms, descriptions, and illustrations are necessary.

SYNONYM—*Psathyrella badiovestita* P. D. Orton *in* Trans. Br. mycol. Soc. **43**: 368. 1960.

MISAPPLIED NAME.—*Psathyra semivestita* (Berk. & Br.) Ricken sensu Ricken, Blätterp.: 258. 1913.

SELECTED DESCRIPTIONS AND ILLUSTRATIONS.—Ricken, Blätterp.: 257 (as *Psathyra microrrhiza*) and 258 (as *Psathyra semivestita*) 1913. — Not Cooke, Ill. Br. Fungi, pl. 622/596, as mentioned in our previous paper (1971a: 269; =*P. melanophylla*).

An additional annotation on the epithet '*microrrhiza*' is needed since Smith (1972: 198) disagreed with this epithet, which he replaced by '*squamifera* Karst.'. Smith wrote that '...The original concept of *P. microrrhiza* Lasch as copied by Saccardo (1887: 1073) states of the pileus "Pileo ... primitus luteo-piloso..." which to me indicates clearly that the species has a yellow veil. It also had close narrow gills. On the basis of these characters I do not accept the current concepts of *P. microrrhiza.*'

The full text of Lasch's description (1828: 426) is 'Initio totus, praesertim ad stipitem, pilis brevibus, erectis, luteis, deciduis, ad marginem pilei vero, cortina tenui, floccoso-annulata, fugacissima vestitus', in other words: 'in the beginning entirely, particularly near the stem, clothed with erect yellow but falling short hairs, at the margin with a thin floccose annulate very fugacious cortina.' This description, particularly its last part, portrays the characteristics of the veil in *P. microrrhiza* rather accurately except for the words 'short, erect, yellow hairs', which we would consider to be an error.

Smith's second objection to the epithet '*microrrhiza*' is that Lasch's species 'also had close narrow gills'. Smith himself, however, calls the gills of his *P. squamifera* close and narrow, but does not give a figure for their width. It is interesting to observe that Karsten describes the gills of his *P. squamifera* as being 2 mm wide, which also means that they are narrow, this width however still lying within the normal limits we (1971a: 269) found in 33 collections of *P. microrrhiza.*

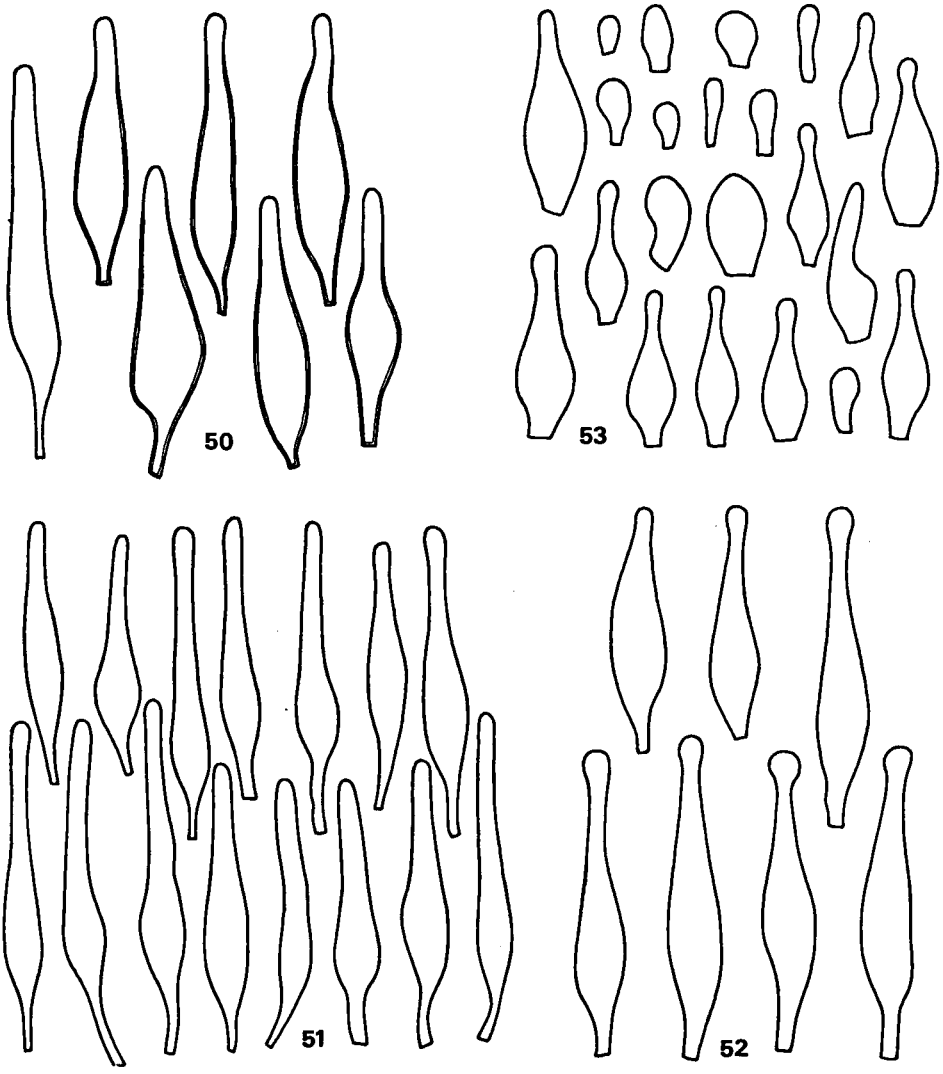
In conclusion, we stick to choosing the epithet '*microrrhiza*' as the correct name for this species as it is the oldest. In doing so we are in line with all authors (except J. E. Lange, who calls it *Psathyra squamifera*) who have given descriptions of the species. Romagnesi (1953: 358) added '*sensu* Ricken' as Ricken was the first to interpret Lasch's species as the species we described under that name in our previous paper (1971a: 269), and the first to give a full and correct description.

Romagnesi (1953: 358) quotes Cooke's plate 622/596 (according to Cooke himself, *P. microrrhiza*) but in our observations on *P. melanophylla* we pointed out that in our opinion it is that species that is represented on this plate.

As for the correct spelling of the epithet '*microrrhiza*' with double r, Romagnesi (in lit.) who is a Latin scholar, very kindly explained to us that from the point of grammar 'c' est un barbarisme d'en mettre un seul r'. The Code of Nomenclature provides for such orthographic corrections in the original spelling of names.

From the very clear description given by Orton (1960: 368) of his *Psathyrella badiovestita* it is evident that this species is conspecific with *P. microrrhiza.* All its characters (cap 10–37 mm, at first with scattered white fibrils or fibrillose scales in outer part, persisting at margin, drying cap sometimes with pinkish tinge round margin, gill edge sometimes pinkish flocculose, veil remnants present in lower part of stem, spores 11–14×6–7 μm, shape and size of pleurocystidia, etc.) are identical with those given in our description of *P. microrrhiza* (1971a: 269). Orton's figures 185–188, 357, and 484 are also in complete agreement with our figures for this species. Two important features are missing in Orton's description, i.e. the width and shape of the basidia and the rooting of the stem. But Orton states that his species

is *Psathyra semivestita* sensu Ricken, and this species is described and depicted by Ricken with a distinct pseudorrhiza. *Psathyrella semivestita* sensu Ricken, however, is considered by us conspecific with *P. microrrhiza* (Ricken's pl. 67 fig. 4 is typical for *P. microrrhiza*). Accordingly Romagnesi (1953: 371) in a note states about *P. semi-*



Figs. 50–53. *Psathyrella polycystis*. — 50–52. Pleurocystidiograms (×575). — 50. 22 Sept. 1962. — 51. 28 Sept. 1962. — 52. 13 Nov. 1962. — 53. Cheilocystidiogram, 13 Nov. 1962 (×575).

vestita sensu Ricken '...Nous comprenons mal comment il la distinguait de *microrrhiza*.' Indeed Ricken's description corresponds in every way except for the absence of a red gill edge (an inconsistent character, as we pointed out in an earlier paper) with our own description of *P. microrrhiza* (1971a: 269).

Orton argues that his *Psathyrella badiovestita* is not *Agaricus semivestitus* Berk. & Br. because the latter has smaller and narrower spores, viz. 10–12 × 5.5–6.5 μm (examination of type material by Orton). These figures, however, lie within the range of variability for *P. microrrhiza*, which we found to be 9.9–13.5 × 5.9–7.2 μm (examination of 33 collections). A. H. Smith (1972) does not mention *P. badiovestita* in his recent monograph. This is not the proper place to attempt to arrive, if at all possible, at the true interpretation of *Agaricus semivestitus* Berk. & Br. It may be a species in its own right. Romagnesi has not included the species in his key to the species of the genus *Drosophila*.

For seemingly intermediate forms between *Psathyrella microrrhiza* and *P. gracilis* see p. 366.

PSATHYRELLA OCHRACEA (Romagn.) Moser—Figs. 35–38

Drosophila ochracea Romagn. *in* Bull. Soc. linn. Lyon **21**: 152. 1952. — *Psathyrella ochracea* (Romagn.) Moser *in* Gams, Kl. KryptogFl. **2** (b/2): 213. 1967.

SELECTED DESCRIPTION.—Kühn. & Romagn., Fl. anal.: 357. 1953.

CHIEF CHARACTERISTICS.—Cap 8–18 mm in diam., campanulate, when young already pale ochraceous, drying out to very pale cream colour, without pink, strongly reticulate, with often very dark wrinkles, even cerebroid; veil absent (even in primordia); gills dark brown, with edge seemingly pale or red (see observations); stem rooting; spores large, (11.7–)12.6–15.3 × 6.3–7.2 μm; pleurocystidia 50–67.5 × 10–13 μm, numerous, subfusiform often with elongate neck, hymenophoral trama brownish.

MACROSCOPIC CHARACTERS[3].—Cap small, 8–18 mm in diam., campanulate, obtuse, usually not or barely umbonate, in young specimens, when wet, ochraceous and already pale, slightly hygrophanous, subsequently very pale cream or first cream then subochraceous (not pink), strongly reticulate from often very dark wrinkles, at apex even ± rugose-cerebroid.

Veil none (absent even in primordia).

Stem 40–75 × 1–2.2 mm, flexuous, with long pseudorrhiza, villose, white, then straw yellow or ochraceous, glossy.

Gills distant, adnate, slightly uncinate-decurrent, ventricose, brown, fairly dark, with pale edge, without red (but see observations).

Trama of 'washed' gill under binocular lens distinctly yellowish brown (M. 10 YR 6/4) only slightly paler near edge, and with very distinct dark greenish brown subhymenial zone under marginal cells, in many places interrupted over very short distance, and no doubt signifying the presence of a red gill edge.

MICROSCOPIC CHARACTERS[3].—Spores (11.7–)12.6–15.3 × 6.3–7.2 μm (average 13.5 × 6.5 μm), ellipsoid-amygdaliform, in water reddish brown (M. 2.5 YR 3/6),

[3] The macroscopic characters of the fruit body have been taken from Romagnesi's Latin diagnosis. The description of the characters of the trama of the gills and of the microscopic characters is based on our own examination of the type material.

in NH_4OH 10% dark reddish brown (M. 5 YR 3/3, 3/4), in KOH 5% greyish brown (M. 10 YR 3/2, 4/2), opaque, with ±2 μm wide, very distinct germ pore and small hilar appendix.

Basidia 25–30 × 11–12.5 μm, 4-spored.

Pleurocystidia 50–67.5 × 10–13 μm, numerous, subfusiform and often with elongate neck, slender, with subacute apices, thin-walled, colourless, without mucus or crystals.

Marginal cells predominantly (±90%) vermiform, often flexuous, subcylindric and at apex slightly swollen, intermixed with rather small number (±10%) of small fusiform to sublageniform cheilocystidia, 30–45 × 7–10 μm, and scattered fairly large clavate cells with broad apex, 32.5–47.5 × 10–12 μm; all these cells colourless, thin-walled, and without mucus or crystals; gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%) pale yellowish brown from membranal pigment but without yellow septa or encrustations, with distinct, narrow, yellowish brown strip with some short interruptions running directly under marginal cells, and indicating the presence of a red gill edge.

Cuticle of cap cellular; cells 20–40 μm wide, colourless.

Clamps present on hyphae of stem, but scarce.

HABITAT.—In humus, gregarious, rare.

COLLECTION EXAMINED.—FRANCE, dép. Yvelines, St-Germain-en-Laye, 3 Oct. 1944, *H. Romagnesi* (lectotype: Herb. Romagnesi D 425; fragments in L).

In some respects the description of this species given by Romagnesi in the 'Flore analytique' differs slightly from the Latin one: the cap is called 'conique-obtus à campanulé', and the colour of very young specimens is described as being 'd'un ocracé légèrement fauvâtre, mais remarquablement clair', meaning that there is a slight reddish hue in the colour. It is furthermore stated that the caps dry very quickly 'devenant d'un ocracé pâle avec le sommet concolore ou plus ocre', and the gills are called 'brun-tabac à brun-bistre obscur'. This colour of the gills, as described by Romagnesi, does not correspond at all with his definition (1953: 355) of his group *Graciles*, in which he says 'Trame sensiblement incolore (...), totalement hyaline dans les lam., ...'.

We have never come across this characteristic species of which Romagnesi gives a full length Latin description (1952: 152) and the chief characteristics (1953: 357). Moser (1967: 213) also pays attention to the species. On examination of the type material we were particularly struck by the peculiar shape of the vast majority of the marginal cells, unique in section *Psathyrella*. While studying the colour of the hymenophoral trama of a 'washed' gill under a binocular lens we immediately noticed a very conspicuous greenish brown, in several places over a short distance interrupted zone under the marginal cells. This pigmentation was confirmed on microscopical examination, and in our experience signifies the presence of a red gill edge. Having brought this to the attention of Prof. Romagnesi we received (in lit.) his reply that in his Latin description with regard to the gill edge, in writing '*non visa*' he had merely meant to express that he had not been sure about either the absence or presence of a red zone at the gill edge (his description in the 'Flore ana-

lytique' does not mention the colour of the gill edge). He added that he had noticed that this colour, at times hardly visible and doubtful in fresh material, often becomes more distinct with age, and above all during the process of drying, and that one should mistrust examinations of exsiccata. We are inclined to draw a somewhat different conclusion. At least in this case it is probable that the pigment is already present in fresh material but becomes more manifest in dried fruit bodies. If there is doubt about the presence of a red gill edge in the fresh stage therefore we again strongly recommend washing the gill, as we described earlier (1971a: 249).

Psathyrella ochracea differs from all other species of this group in the pale ochraceous colour of the fresh cap, the very strongly veined, rugose (cerebroid) surface of the dry cap, the absence of a veil, the large spores, and the abundant vermiform cells on the gill edge.

PSATHYRELLA OPACA (Romagn.) Moser—Figs. 39, 40

Drosophila opaca Romagn. *in* Bull. Soc. linn. Lyon **21**: 152. 1952. — *Psathyrella opaca* (Romagn.) Moser *in* Gams, Kl. KryptogFl. **2** (b/2): 214. 1967.

SELECTED DESCRIPTION.—Kühn. & Romagn., Flore anal.: 357. 1953 (as *Drosophila opaca*).

CHIEF CHARACTERISTICS.—Cap 6–20 mm in diam., campanulate or hemispherical, drying out remarkably rapidly, and then opaque, pale alutaceous-ochraceous without pink; veil absent; gills brown, with white edge; stem rooting; spores 11.7–12.6 (–13.5) × (5.4–)6.3–6.8 μm; pleurocystidia 35–40 × 7.5–10 μm; hymenophoral trama coloured.

MACROSCOPIC CHARACTERS[4].—Cap 6–20 mm in diam., campanulate or hemispherical, then convex, barely hygrophanous, only in primordia translucent, from pale ochraceous becoming brownish, soon opaque, when dry pale argillaceous, ochraceous or whitish, not distinctly tinged with pink, slightly micaceous and wrinkled.

Veil none, or scarcely any (?).

Gills fairly close to fairly distant, adnate, ascending, ± ventricose, whitish, then brown, with pruinose, white edge.

Stem 35–65 × 0.7–1.5 mm, straight, rooting, white, finally smooth and glossy.

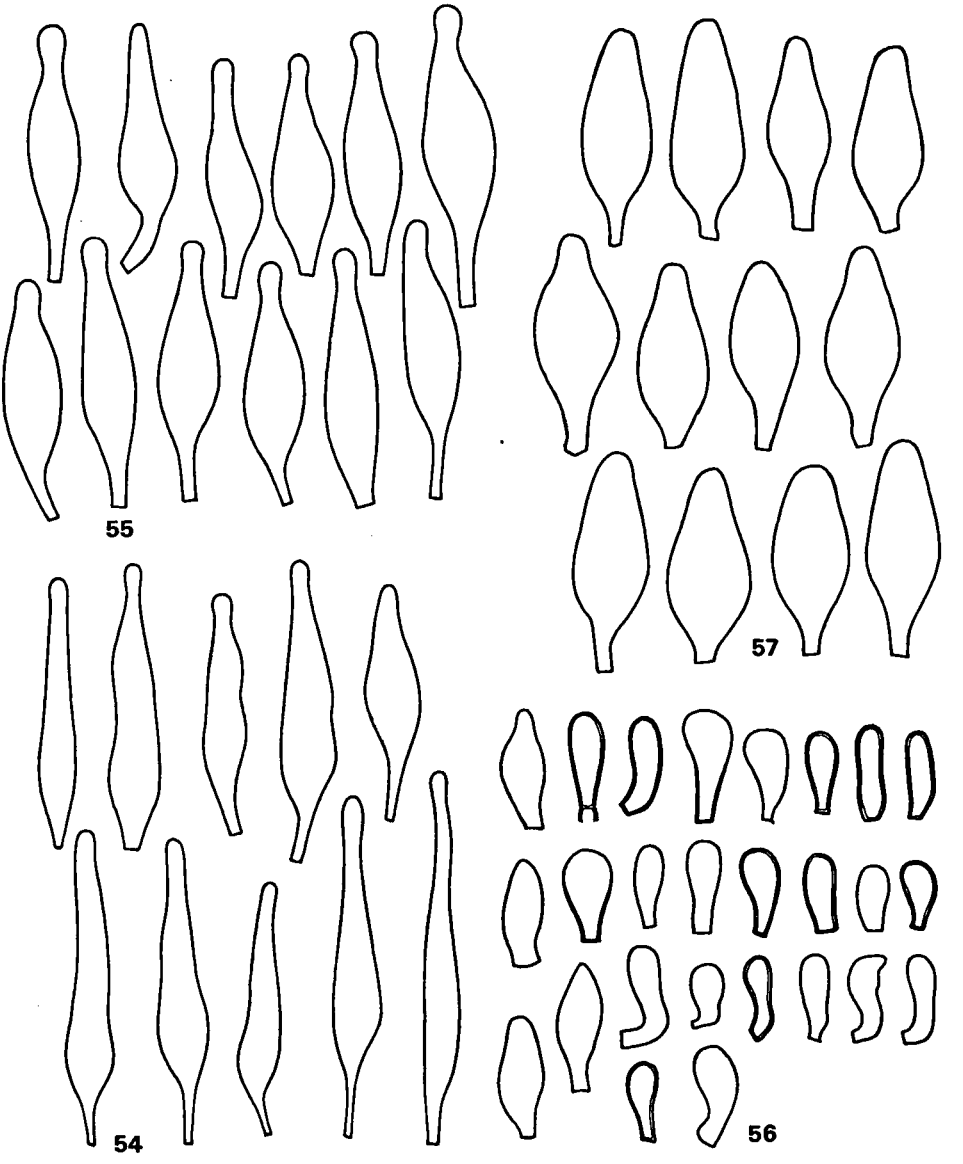
Trama of 'washed' gill under binocular lens distinctly brown, be it pale (M. 10 YR 6/3), from base to edge, no sign of a red gill edge.

MICROSCOPIC CHARACTERS[4].—Spores 11.7–12.6(–13.5) × (5.4–)6.3–6.8 μm (average 12 × 6.4 μm), ellipsoid-amygdaliform, in water dark reddish brown (M. 2.5 YR 3/4), in NH_4OH 10% slightly darker (M. 2.5 YR 3/2, 2/4), in KOH 5% dark greyish brown (M. 10 YR 4/2), opaque, with small hilar appendix, and distinct, ±2 μm wide apical germ pore.

Basidia 22.5–27.5 × 10–12 μm, 4-spored.

Pleurocystidia 35–40 × 7.5–10 μm (neck 3–5 μm thick), scattered and rather scarce, lageniform with cylindric neck, thin-walled, colourless, without mucus or crystals.

[4] The macroscopic characters of the fruit body have been taken from Romagnesi's Latin diagnosis. The description of the characters of the trama of the gills and of the microscopic characters is based on our own examination of the type material.



Figs. 54, 55. *Psathyrella polycystis*. — Pleurocystidiograms (×575). — 54. 11 Nov. 1967. — 55. 7 Nov. 1959.

Figs. 56, 57. *Psathyrella pseudogracilis*, 16 Aug. 1963. — 56. Cheilocystidiogram (×575). — 57. Pleurocystidiogram (×575).

Cheilocystidia 27.5–37.5 × 7.5–10 μm wide, scattered and not numerous (±20% of total number of marginal cells), lageniform, colourless, thin-walled, without mucus or crystals, with at their base, not easily detectable, a large number (±80% of total number of marginal cells) of narrow, small, spheropedunculate and clavate cells, 15–22.5 × 6–8 μm; gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%): trama distinctly pale yellowish brown from membranal pigment, particularly in basal 1/3, and in this area with a number of yellow hyphal septa and a few encrustations.

Cuticle of cap cellular; cells 16–32 μm in diam., colourless.

Clamps present on hyphae of stem, but very few.

HABITAT.—In humus, among grass or moss.

COLLECTION EXAMINED.—FRANCE, 'Asnière-Oix', 12 Sept. 1946, *H. Romagnesi* (lectotype: Herb. Romagnesi No. 523; fragments in L).

This species has never been found in the Netherlands, and we have never seen fresh material. Romagnesi's original Latin description, the one in the descriptive key in the 'Flore analytique', and Moser's (1967: 214) very short description, which is an abstract of the one in the 'Flore analytique', are the only ones available in the literature. We have accepted the species on the strength of Romagnesi's description, and are grateful that we could study material he made available to us.

In the description of this species in the 'Flore analytique' (1953: 357) Romagnesi states (in bold face letters) that the cap dries remarkably rapidly, and that as a result the fresh stage can be studied only in very young specimens, in which the colour then turns out to be pale, brown or ochre, vaguely lilac near the margin; the gills are called tobacco brown, and the pleurocystidia are said to measure 32–63 × 9.5–14.5 μm.

Psathyrella orbicularis (Romagn.) Kits van Wav., *comb. nov.*

Figs. 7, 8, 41–44

BASIONYM: *Drosophila stellata* var. *orbicularis* Romagn. *in* Bull. Soc. linn. Lyon **21**: 153. 1952; Kühn. & Romagn., Flore analytique: 357. 1953.

CHIEF CHARACTERISTICS.—Cap 10–17 mm in diam., conical or hemispherical-campanulate, showing neither pink nor concentric zones when dry; veil distinct; gills dark purple or tobacco colour, with red edge; stem rooting (pseudorrhiza 5–15 mm); spores 11.3–13.5(–14.4) × 6.3–7.2 μm; pleurocystidia (35–)40–65(–75) × 10–15 μm, sublageniform, ventricose-lageniform or subfusiform; cheilocystidia densely packed; hymenophoral trama brownish.

MACROSCOPIC CHARACTERS.—Cap 10–17 mm in diam., 4–6 mm high, conical or hemispherical-campanulate, finally spreading to convex, sometimes with fairly distinct umbo, dark reddish brown, chestnut brown when very fresh (M. 10 R 3/4; 2.5 YR 3/4), very soon with only a trace of red at centre, the remainder just dark brown (M. 7.5 YR 3/2, 4/2) with marginal area somewhat paler and margin itself even whitish, striate up to 1/2–2/3 from margin upwards, hygrophanous, drying out via pale brown (M. 10 YR 6/3), and in centre darker brown (M. 7.5 YR 5/4; 10 YR

7/4) to ultimately very pale brown, alutaceous or greyish (M. 10 YR 7/1, 7/2) but without pink, as a rule distinctly micaceous but not or only just rugulose.

Veil forming a very distinct network of white fibres, isolated or bundled into small groups, reaching almost up to centre of cap; not appendiculate.

Gills 2–4 mm broad, ventricose near margin of cap, then straight and ascending, broadly adnate and sometimes with distinct tooth, in which case edge even slightly concave towards stem, very dark purple or reddish brown, tobacco colour (M. 5 YR 3/2; 7.5 YR 3/2, 4/2) or dark greyish brown (M. 10 YR 4/2), with red but sometimes seemingly white edge (red on microscopical examination of 'washed' gill).

Stem 35–70 × 1 mm, cylindric but base sometimes slightly thickened, straight, distinctly rooting, pseudorrhiza 5–15 mm long, strigose at base with white hairs, white in upper part, isabelline lower down, glossy, at apex conspicuously pruinose, hollow.

Flesh of cap 1 mm thick in centre, dark reddish brown; flesh of stem whitish and pale brown in basal part.

Spore print purplish black.

Trama of 'washed' gill under binocular lens in basal half of gill distinctly brown (M. 10 YR 6/3), towards edge paler (M. 10 YR 7/3, 7/2), practically colourless near edge.

MICROSCOPIC CHARACTERS.—Spores 11.3–13.5(–14.4) × 6.3–7.2 μm (averages 12–12.5 × 6.4–6.8 μm), ellipsoid-amygdaliform, in water dark reddish brown (M. 2.5 YR 3/6, 4/6; 5 YR 3/4), in NH_4OH 10% darker (M. 2 5 YR 3/4, 3/6), in KOH 5% dark greyish brown (M. 10 YR 3/3), opaque, with distinct, ± 2 μm wide germ pore and small hilar appendix.

Basidia 17.6–35 × 9–12 μm, 4-spored.

Pleurocystidia (35–)40–65(–75) × 10–15 μm, fairly scarce to moderately numerous, sublageniform, ventricose-lageniform or subfusiform, with neck sometimes subcylindrical and then sharply delimited from the ventricose cell body, with obtuse to subacute apex, thin-walled, colourless, without mucus or crystals.

Cheilocystidia 25–40(–45) × 7.5–14 μm, densely packed, of same shape as pleurocystidia but smaller, colourless, without mucus or crystals, at their base intermixed with a small number (±30% of total number of marginal cells) of small and unobtrusive spheropedunculate cells, 10–17.5(–20) × 5–8(–10) μm; gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%) distinctly pale brown from membranal pigment, darkest at and near base of gills, paler towards edge, colourless or faintly coloured at edge, with a fair number of yellowish hyphal septa and few encrustations, both in somewhat larger number at and near base, and absent in peripheral 1/3 of gills.

Cuticle of cap cellular; cells 16–32 μm in diam., colourless.

Clamps on hyphae of stem fairly numerous.

HABITAT.—Solitary, terrestrial against small pieces of wood in deciduous woods. October. Very rare.

COLLECTIONS EXAMINED.—THE NETHERLANDS, prov. Noord-Holland, Overveen, estate 'Elswout', 23 Oct. 1959 and 1 Oct. 1966 (2 collections in two widely separated places), *E. K. v. W.* (L).

FRANCE, dép. Yvelines, Grignon, 29 Sept. 1951, *H. Romagnesi* (lectotype: Herb. Romagnesi D 642; fragments in L).

This is a small and rooting species of *Psathyrella* whose gills have a red edge (microscopical verification perhaps needed) so that it easily might be taken for

P. gracilis. But the mature cap is dark reddish brown, the veil is well developed, the hymenophoral trama is brownish, and the pleurocystidia differ from those of *P. gracilis*. The species is a good deal smaller than *P. stellata*, the margin is not undulating, lobed or sulcate as in *P. stellata*, and the veil is very distinct. On account of these characters we believe the species deserves specific rank, although Romagnesi described it as a mere variety of *P. stellata*.

PSATHYRELLA PELLUCIDIPES (Romagn.) Galland—Figs. 9, 45–49

Drosophila pellucidipes Romagn. *in* Bull. Soc. mycol. Fr. **82**: 541. '1966' [1967]. — *Psathyrella pellucidipes* (Romagn.) Galland *in* Rev. Mycol. **36**: 151. 1972.

CHIEF CHARACTERISTICS.—Solitary. Cap 13 mm in diam., campanulate, marginal area not revolute, on drying showing neither concentric zones nor pink; veil rudimentary; gills dark grey, broadly adnate, with white edge; stem rooting (pseudorrhiza 8 mm); spores 11.7–13.5 × 6.3–7.2 μm, with indistinct germ pore; pleurocystidia 40–55 × 10–12.5 μm; marginal cells chiefly consisting of spheropedunculate cells; hymenophoral trama practically colourless.

MACROSCOPIC CHARACTERS.—Cap 13 mm in diam., 12 mm high, campanulate, with marginal area not revolute, extreme margin not extending beyond end of gills, strikingly very dark reddish brown (M. 5 YR 3/2; 2.5 YR 3/2), hygrophanous, rapidly becoming paler when drying, becoming brown or yellowish brown (M. 10 YR 6/4), distinctly micaceous, rugulose but without pink, and without concentric colour zones, striate half-way up from margin.

Veil not seen on cap, but stem with scattered white velar fibres.

Gills 3 mm broad, straight, ascending, broadly adnate, strikingly grey (M. 10 YR 5/1) with only a trace of purple, with white edge contrasting conspicuously with grey face of gill.

Stem 70 × 1.75 mm, cylindric, straight, at extreme base slightly thickened, covered with very thin coating of greyish tissue and scattered with velar fibres, ending in a distinct but short (8 mm) tapering pseudorrhiza, whitish to pale brown (M. 7.5 YR 6/4), hollow, minutely pruinose at apex, its cavity loosely filled with white spongy tissue.

Flesh of cap in centre 1 mm thick, very dark brown (M. ±10 YR 3/4); flesh of stem pale brown (M. 7.5 YR 6/4) but dark brown (M. 10 YR 3/4) at extreme apex along insertion of gills.

Spore print black

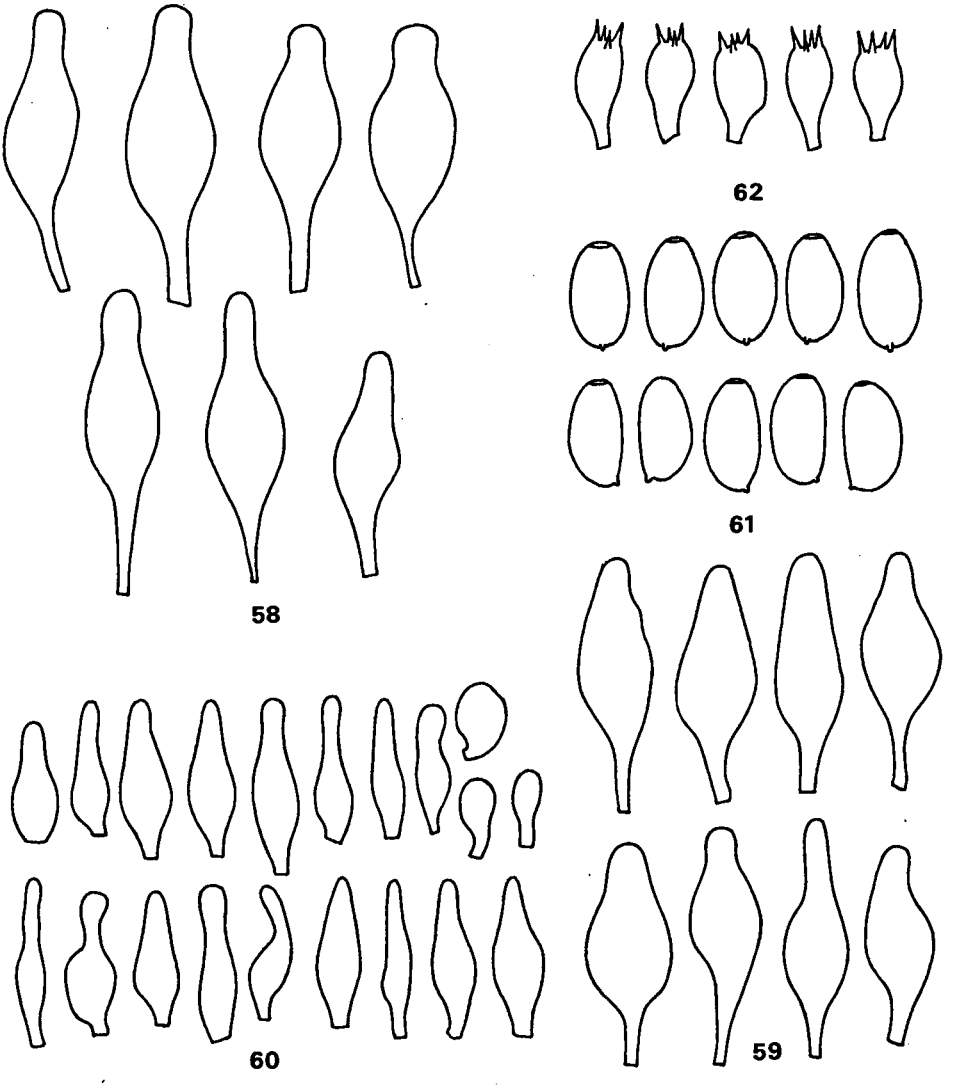
Trama of 'washed' gill under binocular lens practically colourless (M. 10 YR 7/2) with very narrow yellowish brown (paler than M. 10 YR 5/6) strip at base.

MICROSCOPIC CHARACTERS.—Spores 11.7–13.5 × 6.3–7.2 μm (average 12.7 × 6.7 μm), ellipsoid-amygdaliform, in water dark reddish brown (M. 2.5 YR 3/2, 3/4), in NH_4OH 10% slightly darker (M. 2.5 YR 3/4, 2/4), in KOH 5% dark greyish brown (M. 10 YR 3/2), opaque, with ±1.8 μm wide but indistinct germ pore.

Basidia 22.5–27.5 × 10–12 μm, 4-spored.

Pleurocystidia 40–55 × 10–12.5 μm, neck 4–5 μm wide, scattered and rather scarce, slightly ventricose-sublageniform with fairly long stalk and long subcylindrical neck, colourless, without mucus or crystals.

Spheropedunculate cells 15–22.5 × 7.5–12.5 μm, abundant (±80% of total number of marginal cells), fairly small but increasing in number and size towards



Figs. 58, 59. *Psathyrella pseudogracilis*. — Pleurocystidiograms (×575). — 58. 24 July 1962. — 59. 27 July 1961.

Figs. 60–62. *Psathyrella ridicula*, 11 Aug. 1962. — 60. Cheilocystidiogram (×575). — 61. Spores (×1212). — 62. Basidia (×575).

margin of cap (near margin some measuring up to 32.5 × 17.5 μm), intermixed with scattered cheilocystidia ±20% of total number of marginal cells but in some places more numerous, similar to pleurocystidia but smaller, 35–47.5 × 8–12.5 μm, with stalks shorter than those of pleurocystidia but necks fairly long and subcylindric, colourless, without mucus or crystals.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%): trama practically colourless, very pale brown near and at base from membranal pigment, with in basal region a small number of yellow hyphal septa and a few encrustations.

Cuticle of cap cellular; cells 24–48 μm in diam., colourless.

Clamps present on hyphae of stem.

HABITAT.—Solitary. In grass field.

COLLECTIONS EXAMINED.—GREAT BRITAIN, Shropshire, Oswestry, estate 'Llangedwyn', 19 Sept. 1967, *E. K. v. W.* (L).

FRANCE, dép. Oise, Comelle à Orry-la-Ville, 29 May 1966, *Mesplède* & *Soleillant* (holotype: fragments in L).

The above description is based exclusively on the only specimen of this species we ever found. It answers Romagnesi's description (1966: 541) very well. Prof. Romagnesi, to whom we sent a drawing of our specimen, answered that it 's'adapte bien à mon *pellucidipes*.' With him it is also a small species (cap 7.5–14 mm, stem 50–80 × 0.7–2 mm), with very rapidly disappearing remnants of a rudimentary veil, neither pink nor concentric colour zones on the dry cap, which is rather brown, a very short pseudorrhiza, grey gills with a white gill edge, a black spore print, and an indistinct germ pore ('à pore large mais très aplati, très bas'). Prof. Romagnesi stated (in lit.) that he believed that *P. pellucidipes*, although 'la microscopie est à peu près la même' as in *P. caudata* (sensu Romagn. = *P. melanophylla*), distinguishes itself from the latter species by its 'physionomie', the species being 'très fragile, à pied presque transparent, de port tout à fait différent'. The shape of both cap and gills of Romagnesi's figure (1967: fig. 2 g) are in every respect identical with those of our Fig. 9.

Obviously, and Romagnesi says so in his observations, the species is very close to *Psathyrella melanophylla*. It differs from that species mainly in its much smaller size and its campanulate cap, neither conical nor with revolute marginal area. According to Romagnesi, other differences are that in *P. melanophylla* the pseudorrhiza is longer, the cap 'plus coloré et bien plus hygrophane', and the pleurocystidia 'constamment plus petites et à col plus court.' The latter statement must be an error since in the 'Flore analytique' the pleurocystidia of *P. caudata* (sensu Romagnesi = *P. melanophylla*) are said to be '±longues (30–)45–75 × 8–12.5 μ.'; Romagnesi's figures for *P. pellucidipes* being practically the same, 60–75 × (8–)10–18 μm.

Prof. Romagnesi very kindly sent us fragments of the holotype of *Psathyrella pellucidipes* for study. We found exactly the same pleurocystidia (Fig. 49) as those depicted by Romagnesi (1967: 543, fig. 2a, b). As is clear from comparison of the figures of the pleurocystidia of the holotype with those of our Welsh collection (Fig. 48) the cells of the two collections differ somewhat. This, we believe, is just

another example where the pleurocystidia within a single species differ from one collection to another; in his figure 2c Romagnesi depicts a cystidium with a rather long neck, far more slender and subfusiform than those of his figures 2a and 2b; the cystidium in figure 2c bears more resemblance to the cells of our Welsh collection.

As for the length of the pseudorrhiza and the colour of the cap, 'brun-bistre ochracé un peu fauvâtre' according to Romagnesi, the variability of characters like these is too great to rely on them in the delimitation of species in this part of the section *Psathyrella*. Also, according to Romagnesi *P. melanophylla* is supposed to be 'plus hygrophane', and *P. pellucidipes* 'peu hygrophane'. If this should be so it is difficult to understand why in spite of this Romagnesi states that the cap of *P. pellucidipes* is 'très vite déshydraté et récolté généralement pâle'. This statement makes it very likely that really fresh caps of *P. pellucidipes* are a good deal darker than 'brun-bistre ochracé un peu fauvâtre', but, instead, dark reddish brown, as indeed the colour of the cap of our specimen was.

PSATHYRELLA POLYCYSTIS (Romagn.) Moser—Figs. 10–14, 50–55

Drosophila polycystis Romagn. *in* Bull. Soc. linn. Lyon **21**: 152. 1952. — *Psathyrella polycystis* (Romagn.) Moser *in* Gams, Kl. Kryptog Fl. **2** (b/2): 214. 1967.

SELECTED DESCRIPTION. — Kühn. & Romagn., Fl. anal.: 358. 1953 (as *Drosophila polycystis*).

CHIEF CHARACTERISTICS.—Cap 13–30 mm in diam., conico-campanulate to convex, dark reddish brown, showing pink when dry; veil present; gills purplish grey, browner towards base, with red edge; stem rooting (pseudorrhiza 3–30 mm); spores 10.8–14.4 × 5.9–7.2 μm; pleurocystidia (40–)55–85(–90) × 7.5–15 μm, very numerous, slender, subfusiform with long necks and swollen apex; hymenophoral trama brownish.

MACROSCOPIC CHARACTERS.—Cap 6–25(–30) mm in diam., 4–12 mm high, conico-campanulate, later spreading to conico-convex; in young but also older stages conspicuously dark reddish brown (M. 2.5 YR 3/4; 5 YR 3/3, 3/4), when starting to dry out soon losing reddish colour, becoming pale brown (M. 10 YR 5/2, 5/3, 5/4, 6/3, 7/4) in marginal area, just brown (M. 7.5 YR 4/3, 5/4; 10 YR 4/3) towards centre, and dark brown (M. 7.5 YR 3/2) in and around centre, with extreme edge often whitish; striate up to 2/3 from margin upwards, hygrophanous, drying out to pale brown (M. 10 YR 8/4, 7/3) or greyish brown, alutaceous (M. 10 YR 7/2), at centre remaining slightly darker or yellowish brown (M. 7.5 YR 6/6; 10 YR 7/4, 8/4), at periphery these colours usually distinctly mixed with pink (M. 5 YR 8/4; 7.5 YR 7/4), slightly but sometimes more distinctly micaceous and rugulose.

Veil sometimes very conspicuous, sometimes hardly developed, usually leaving quite a number of velar fibres or even small networks of fibres on young caps, sometimes even up to the apex, but fibres few on mature caps.

Gills 2–4 mm broad, ventricose near margin of cap, then straight, ascending and broadly adnate, rarely slightly ventricose and narrowly adnate, when young pale brown (M. 7.5 YR 6/4) or with trace of purple (M. 7.5 YR 5/2), when old grey to fairly dark purplish grey (M. 10 YR 5/1; 5 YR 5/1, 4/1) near edge, and browner towards base (M. 10 YR 5/2), with distinctly red edge.

Stem 35–80(–95) × 1–3 mm, straight, cylindric or gradually thickening (2–4 mm) towards base, slightly to distinctly rooting (with 3–30 mm long pseudorrhiza),

practically smooth or minutely longitudinally striate and usually covered with a small to fairly large number of white fibrillose velar remnants, white in upper part, lower down isabelline or even pale brown (M. 10 YR 7/3, 6/3) towards base, strigose with white hairs at base, pruinose at apex, hollow.

Flesh of cap in centre 1–2 mm thick, dark brown (M. 7.5 YR 3/2; 10 YR 3/4, 4/3); flesh of stem white or whitish in upper part, isabelline or pale brown (M. 10 YR 6/4) lower down.

Spore print purplish black.

Trama of 'washed' gill under binocular lens usually distinctly but not strongly brown in basal 1/3–1/2 of gill (M. 10 YR 6/4), gradually paler towards edge (M. 10 YR 7/4, 7/3), colour in older specimens paler, pale brown (M. 10 YR 7/4, 7/3) in basal part, elsewhere very pale brown (M. 10 YR 7/2, 7/3) or even pale yellowish brown (M. 5 Y 7/2).

MICROSCOPIC CHARACTERS.—Spores 10.8–14.4 × 5.9–7.2 μm (averages 11.4–13.1 × 6.3–6.7 μm), in water brown (M. 7.5 YR 4/4) to faintly reddish brown (M. 5 YR 3/4, 4/4), in NH_4OH 10% reddish brown (M. 5 YR 3/3, 3/4, 4/4), in KOH 5% dark greyish brown (M. 10 YR 3/3, 4/3), with distinct, ±2 μm wide germ pore and small hilar appendix.

Basidia 17.6–38.4 × 9.6–12.8 μm, 4-spored.

Pleurocystidia (40–)55–85(–90) × 7.5–15(–17.5) μm, very to exceedingly numerous, slender, subfusiform to sublageniform with long and narrow necks and practically always distinctly swollen apex ('en spathule au sommet'), thin-walled, colourless, without mucus or crystals; apex very thin-walled and unlike rest of cell not or scarcely staining red when gill is mounted in Congo red.

Cheilocystidia 25–57.5(–70) × 7.5–15 μm, usually densely (70–90% of total number of marginal cells) but sometimes less densely (±20–70%) packed or locally even scattered, subfusiform to sublageniform, with sometimes slightly swollen apex, thin-walled, colourless, and without mucus or crystals. Spheropedunculate cells 10–20 × 5–12.5 μm, usually very few (10–30% of total number of marginal cells) but sometimes in larger numbers (30–80% of total number of marginal cells), particularly near margin of cap and then also larger (20–35 × 10–17.5 μm); sometimes quite a few spheropedunculate cells and a few cheilocystidia with slightly thickened walls.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%) quite distinct but varying a good deal and strongest in young, rather faint in old specimens; trama usually very brown from membranal pigment along base of gills, distinctly brown in basal 1/3 of gill, colour gradually fainter towards edge, where trama almost colourless; yellow hyphal septa and some encrustations present in basal part of gills but disappearing towards edge.

Cuticle of cap cellular; cells 16–40 μm in diam., colourless.

Clamps numerous on hyphae of stem.

HABITAT.—Solitary, terrestrial, often against small pieces of wood in rich soil, humus or decaying leaves, in woods. September–November. Not uncommon.

COLLECTIONS EXAMINED.—THE NETHERLANDS: prov. Utrecht, Zeist, estate 'Nienhof', 22 Sept. 1962, *A. F. M. Reijnders* (L); prov. Noord-Holland: Amsterdam, Amsterdamse Bos, 7 Nov. 1959 and 13 Oct. 1960, *E. K. v. W.* (L); Santpoort, estate 'Duin en Kruidberg', 28 Sept. 1962, 3 Nov. 1962, and 13 Nov. 1962, *E. K. v. W.* (L); Heilo, Heilose Bos, 11 Nov. 1967, *E. K. v. W.* (L); Castricum, Dunes of County Water Reservoir 28 Sept. 1968, *E. K. v. W.* (L); prov. Zuid-Holland, Bodegraven, alongside Utrecht-The Hague motorway, 19 Oct. 1967, *A. F. M. Reijnders* (L).

The delimitation of this species from all other species of this section is based exclusively on the three characteristics presented by its pleurocystidia. These are (i) very numerous (hence the name), (ii) very slender (in the 'Flore analytique' Romagnesi rightly calls them, in bold face, 'très sveltes'), and (iii) almost always swollen at the extreme apex, which is very thin-walled and 'spatula'-like. Occasionally one comes across some pleurocystidia with a swollen apex in other species of section *Psathyrella*.

In the field *Psathyrella polycystis* can hardly be distinguished from *P. gracilis* as both species have about the same habit and a red gill edge, and as the veil in *P. polycystis* is very often rudimentary or has disappeared. The mature fresh caps of *P. polycystis*, however, are dark reddish brown, unlike those of *P. gracilis*, which very soon turn greyish brown to mud-grey.

Unlike *Psathyrella gracilis*, which can almost for certain be identified by a mere glance at the pattern of the cellular lining of the gill edge, this is not so in *P. ploycystis*, in which this pattern is much more variable, and in some specimens may even greatly resemble the pattern in *P. gracilis*. The cellular lining of the gill edge in our collection from Santpoort, 28 Sept. 1962, for instance was identical with that in *P. gracilis*. The pleurocystidia, however, were numerous (though not exceedingly so), they were very slender and their apices were slightly swollen; moreover the hymenophoral trama was coloured, so that after some hesitation we ranked this collection with the other collections of *P. polycystis* (seemingly a transitional from between *P. polycystis* and *P. gracilis*).

Another difficulty was presented by the specimens from Bodegraven, 19 Oct. 1967, which grew in a cespitose bunch, springing from a common pseudorrhiza. Their dry caps did not show a pink colour, the gills were slightly ventricose and narrowly adnate, and the cellular lining of the gill edge was identical with that of *P. gracilis*. We decided against describing this collection as a new species because the pleurocystidia possessed the three characteristics typical of *P. polycystis*; they are exceedingly numerous, very slender, and their apices are swollen. Here the absence of pink in the dry cap and the cespitose growth are characters in common with *P. melanophylla*, the red gill edge and the absence (through rain?) of velar remnants with *P. gracilis*, which makes this collection somewhat intermediate between *P. melanophylla* and *P. gracilis*, and also *P. polycystis* itself.

The gills of three out of our nine collections of *P. polycystis* were narrowly adnate. This mode of attachment is very rare in the species of this section; we encountered it only in *P. melanophylloides*.

In the collection from Zeist, 22 Sept. 1962, the walls of almost all pleurocystidia and many cheilocystidia were very slightly thickened but the apices of the former were swollen and very thin-walled as they should be in *P. polycystis*.

Of *Psathyrella subdebilis*—a new species described by A. H. Smith (1972: 327)—Smith states that in the field it is likely to be confused with *P. conopilea*. If this is so, we cannot think how Smith can be right in stating: '*Drosophila polycystis* Romagnesi appears to be close to this species.' *Psathyrella conopilea* and *P. polycystis* have nothing

in common, either macro- or microscopically. The colour of the cap of *P. subdebilis* is not given as being reddish brown but as pale cinnamon, it is not stated that the stem is rooting, the spores in KOH are said to be of a chocolate colour, the pleurocystidia are not described as numerous, and they measure 36–57 × 10–17 μm so that they cannot be called slender; and the apex is merely called obtuse. The true *Psathyrella polycystis* Romagn. must have been unknown to Smith.

PSATHYRELLA PSEUDOGRACILIS (Romagn.) Nathorst-Windahl

Figs. 15–17, 56–59

Drosophila pseudogracilis Romagn. *in* Bull. mens. Soc. linn. Lyon **21**: 152. 1952. — *Psathyrella pseudogracilis* (Romagn.) Nathorst-Windahl *in* Friesia 6: 300. 1961.

SELECTED DESCRIPTIONS.—Kühn. & Romagn., Flore analytique: 357. 1953 (as *Drosophila pseudogracilis*); Romagn. *in* Bull. trimest. Soc. mycol. Fr. **91**: 218. 1975 (as *Drosophila pseudogracilis* forma *minor*); Malençon & Bertault, Flore champ. sup. Maroc: 190. 1970 (as *Drosophila pseudogracilis*).

CHIEF CHARACTERISTICS.—Isolated growth, cap 9–25 mm in diam., campanulate-convex, pale yellowish brown to grey, showing pink when dry; veil rudimentary; gills dark purple, with red edge; stem rooting (pseudorrhiza 3–10 mm); spores 11.3–13.1 × 6.3–7.2 μm, with distinct germ pore; pleurocystidia 40–70 × 10–20 μm, fairly numerous and ventricose-utriform; hymenophoral trama colourless.

MACROSCOPIC CHARACTERS.—Cap 9–25 mm in diam., campanulate-convex, spreading to convex, sometimes with umbo; at first fairly dark brown (M. 10 YR 3/3, 4/3) but very soon yellowish brown (M. 10 YR 4/4, 5/4, 5/6), at centre even yellowish olive brown (M. 2.5 Y 5/4), later greyish brown or brownish grey (M. 10 YR 4/2, 5/2) with yellowish brown centre (M. 10 YR 5/4), finally predominantly and rather pallidly grey (M. 10 YR 6/2), at extreme margin very thin and whitish, strongly striate up to 2/3–3/4 from margin, hygrophanous, drying out to very pale brown or alutaceous (M. 10 YR 7/3, 7/4, 8/4) or almost whitish (M. 10 YR 8/2, 8/3; 2.5 Y 8/2) with yellowish centre (M. 10 YR 6/6, 7/6), outside centre distinctly and sometimes even strongly mixed with pink, somewhat micaceous and rugulose.

Veil usually forming some minute, scattered and fugacious white fibres along margin of cap and on stem.

Gills 2–4 mm broad, slightly ventricose from margin of cap towards midway (this part sometimes protruding below margin of cap), then ascending and straight or straight all the way up, broadly adnate, often with small tooth, grey (M. 10 YR 6/1, 5/1), then dark grey (M. 10 YR 4/1, 3/1), finally dark purple (M. 2.5 YR 3/2), with distinctly red edge.

Stem 30–75(–95) × 1–2.5 mm, cylindrical or very slightly thickening towards base, straight, white, hollow, pruinose at apex, rooting with 3–10 mm long pseudorrhiza, at base more or less strongly strigose with white hairs.

Flesh of cap 1–2 mm thick in centre, greyish brown; flesh of stem white but very pale brown around cavity.

Spore print purplish black.

Trama of 'washed' gill under binocular lens more or less colourless or very pale grey to yellowish (M. 5 Y 7/2, 7/3; 2.5 Y 7/2) or very pale brown (M. 10 YR 7/2, 7/3, 8/3).

MICROSCOPIC CHARACTERS.—Spores 11.3–13.1 × 6.3–7.2 μm (averages 11.8–12.6 × 6.4–6.9 μm), ellipsoid-amygdaliform, in water dark reddish brown (M. 2.5 YR 3/6, 3/4), in NH_4OH 10% slightly darker (M. 2.5 YR 3/4), in KOH 5% dark greyish brown (M. 10 YR 3/2, 4/2), opaque to subopaque, with small hilar appendix and ±2 μm wide, distinct germ pore.

Basidia 19.2–33.6 × 10.4–12.8 μm, 4-spored.

Pleurocystidia 40–70(–77.5) × 10–20 μm, fairly numerous, ventricose, utriform or subutriform, often with rather long stalk, thin-walled, colourless, without mucus or crystals.

Cheilocystidia 25–50 × 7.5–17.5(–20) μm, in very variable numbers, sometimes densely packed, sometimes scattered, of very variable shape, mostly subutriform but also utriform, sublageniform or subfusiform, thin-walled, colourless, rarely with droplets of mucus at apex, without crystals, intermixed with a very variable number of spheropedunculate and clavate (sometimes subcylindric) cells, (12.5–)15–25 (–30) × 5–12.5 μm, sometimes with slightly thickened walls (as in *P. gracilis*).

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%): trama practically colourless, or very pale yellowish to yellowish brown in basal part from membranal pigment, without yellow hyphal septa, and without encrustations.

Cuticle of cap cellular; cells 16–40 μm in diam., colourless.

Clamps present on hyphae of stem.

HABITAT.—Solitary, in grass along roadsides, in clayey soil. July–September. Uncommon.

COLLECTONS EXAMINED.—THE NETHERLANDS: prov. Gelderland, Zoelen, castle 'Zoelen', 9 Aug. 1974, *G. J. Tjallingii-Beukers* (L); prov. Utrecht, Breukelen, estate 'Over Holland', 28 July 1962, *E. K. v. W.* (L); prov. Noord-Holland, Amsterdam, Amsterdamse Bos, 27 July 1961, 24 July and 7 Aug. 1962, 16 Aug. 1963, *E. K. v. W.* (L).

GREAT BRITAIN, Oxfordshire, Bladon, Blenheim Park, 16 Sept. 1969, Foray British Mycological Society, *M. P. English* (L).

In the field this species can hardly be distinguished from *P. gracilis*, but the colour of its cap is slightly paler (trama less pigmented) and contains no reddish shades when fresh, not even in the early stages; it usually grows in grass. Microscopically its outstanding feature is its utriform pleurocystidia. A. H. Smith (1972: 332) states that his *P. gracilis* var. *fulva* 'may deserve rank as an autonomous species, but should be carefully compared with *P. pseudogracilis* Romagn'. the latter species being not further mentioned in his monograph. *Psathyrella gracilis* var. *fulva*, however, is described as having a deep colouration of the pileus, an undulating and in later stages all over brownish stem, large spores (13.5–16 × 6.5–7.5 μm), and fusoid-ventricose pleurocystidia whose apex is acute to subacute, and which therefore are by no means utriform.

Like Romagnesi we found the spores of *Psathyrella pseudogracilis* to be very slightly larger than those of *P. gracilis*, but Romagnesi's figures even go up to 16.5 μm for the length. In his latest publication (1975: 218) Romagnesi, however, gives smaller figures for a small form of *P. pseudogracilis* : 11.5–14.7 × 6–6.5 μm.

On 22 September 1964 we found on the estate 'Leyduin' near Vogelenzang (prov. Noord-Holland) two specimens a good distance apart, whose cap and gills were

strikingly white, 'ivory white'. The caps contained scarcely any pigment, the gills, of which the edges showed no red, none. The two specimens were substerile. Their gills were speckled with numerous purplish minute points. These contained a majority of normal and a minority of very large spores (up to 12.6–17.1 × 7.2–8.1 μm). Quite a number of basidia were—as expected—2 spored. The vast majority of the basidia had no sterigmata at all.

Psathyrella ridicula Kits van Wav., *spec. nov.*—Pl. 63; Figs. 18, 60–63

Pileus 8–20 mm latus, campanulatus, haud vel vix dilatatus, interdum exigue umbonatus, castaneus deinde fuscus, 2/3 striatus, hygrophanus, in sicco canus vel fumosus alutaceus, centro ochraceo-brunneus, exigue micaceus rugulosusque, haud roseus. Velum fugax in pileo, conspique albo-fibrillosum in stipitis parte inferiori, etiam disperse albo-flocculosum. Lamellae exigue marginem versus ventricosae, rectae, ascendentes, late adnatae, 2–3 mm latae, obscure purpureae, brunnei basi, acie alba. Stipes 30–60 × 1–2 mm, aequalis, rectus, superne albus, basin versus isabellinus, inferne pallide ochraceo-brunneus, fistulosus, apice pruinosus, radicans (radix 5–15 mm). Caro cinereofusca in pileo, albida in stipite. Sporae in cumulo purpureo-atratae.

Sporae (11.3–)11.7–13.5 × 6.3–6.8 μm, ellipsoideo-amygdaliformes, in aqua observatae castaneae, poro germinativo lato et distincto (±2 μm). Basidia 20–32 × 9.6–12.5 μm, 4-sporigera. Pleurocystidia 40–60 × 7.5–14(–17.5) μm, modice numerosa, lageniformia, in pluribus apice subincrassato. Cheilocystidia 30–45 × 6–10 μm, modice numerosa, tum subconferta tum dispersa, interdum pilei margine absentia, lageniformia. Cellulae spheropedunculatae tum dispersae tum confertae, interdum pilei margine confertissimae, 15–20 × 7–12.5 μm. Trama lamellarum distincte colorata. Cuticula pilei cellularis. Hyphae stipitis fibuligerae.

Subcespitosa, terrestris circa Fagi truncum.

TYPUS: 'The Netherlands, prov. Noord-Holland, Santpoort, "Duin en Kruidberg", 11 aug. 1962, *E. Kits van Waveren*' (L).

CHIEF CHARACTERISTICS.—Subcespitose growth; cap 8–20 mm in diam., campanulate, showing neither pink nor concentric zones when dry; gills dark purplish brown, with white edge; stem rooting with 5–15 mm long pseudorrhiza; spores (11.3–)11.7–13.5 × 6.3–6.8 μm, with distinct germ pore; pleurocystidia 40–60 × 7.5–14(–17.5) μm, lageniform, often with slightly swollen apex; hymenophoral trama brownish.

MACROSCOPIC CHARACTERS.—Cap 8–20 mm in diam., 6–11 mm high, campanulate, not or scarcely expanding, sometimes very slightly umbonate, dark reddish brown (M. 5 YR 3/3) or dark brown with just a trace of red (M. 7.5 YR 3/2), then dark brown (M. 7.5 YR 4/2), strongly striate up to 1/2–2/3 from margin upwards, hygrophanous, drying out via greyish brown (M. 10 YR 5/2) to pale grey or greyish brown, alutaceous (M. 10 YR 6/2, 7/2), at centre remaining browner or more yellowish brown (M. 10 YR 7/4, 8/6), without pink shades, very slightly micaceous and rugulose.

Veil very fugacious on cap but stem in its lower 1/2–2/3 conspicuously covered with white velar fibres, bundles of fibres and even some appressed white flocci.

Gills 2–3 mm broad, slightly ventricose near margin of cap, then straight, ascending, broadly adnate, in young specimens greyish (M. 10 YR 4/1) but with just a trace of purple or brown, in old specimens dark purple (M. 5 YR 3/2) with greyish brown tinge, brownish (M. 10 YR 3/2, 3/3) near base, with white edge.

Stem 30–60 × 1–2 mm, straight, cylindric, rooting with 5–15 mm long pseudorrhiza,

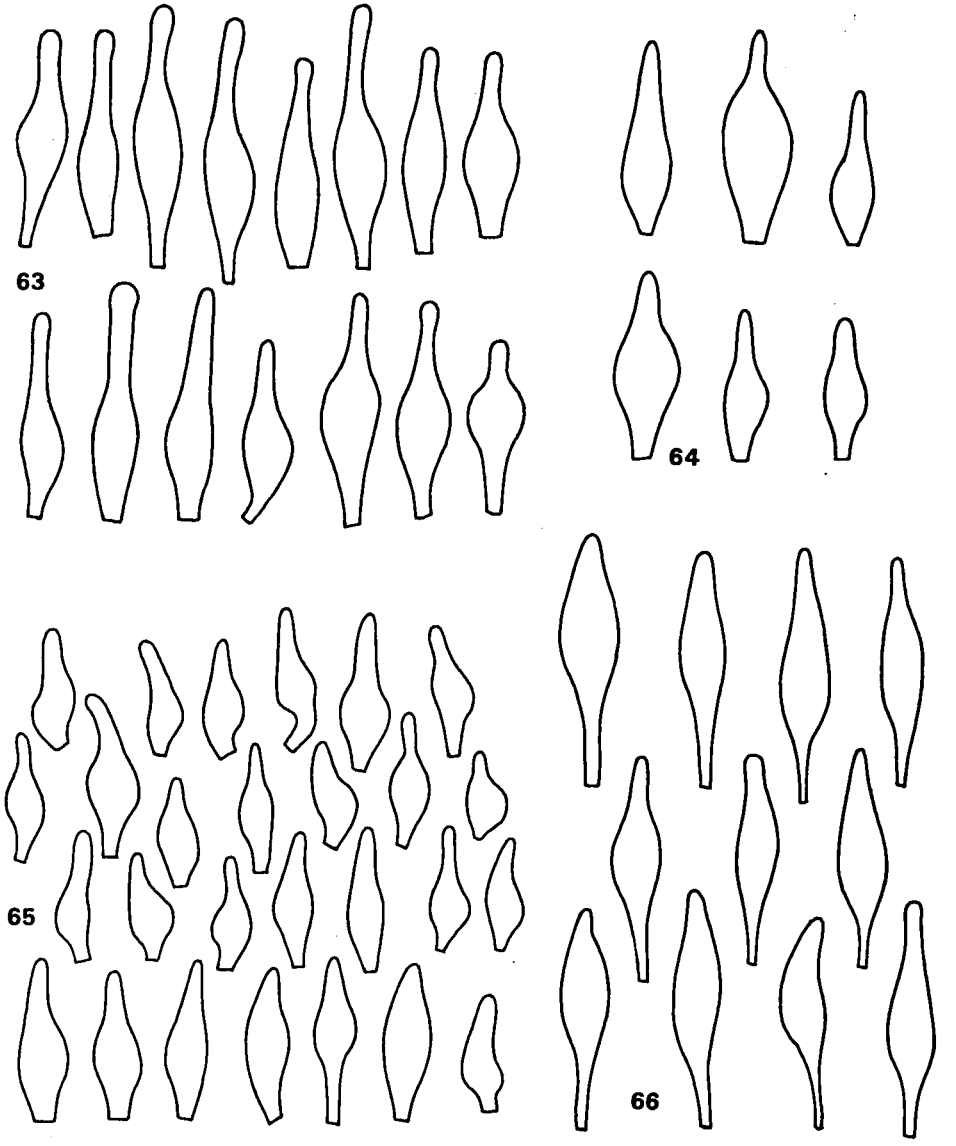


Fig. 63. *Psathyrella ridicula*, 11 Aug. 1962. — Pleurocystidiogram (×575).
Fig. 64. *Psathyrella trepida*, 20 Aug. 1945. — Pleurocystidiogram (×575).
Figs. 65, 66. *Psathyrella stellata*, Oct. 1940. — 65. Cheilocystidiogram (×575). — 66. Pleurocystidiogram (×575).

in upper part white, lower down isabelline and at base pale brown, with on lower part white velar remnants contrasting with isabelline colour.

Flesh of cap 1.5–2.5 mm in centre, dark greyish brown; flesh of stem white.

Spore print purplish black.

Trama of 'washed' gill under binocular lens distinctly brown (M. 10 YR 6/3, 7/3) in basal 1/2–2/3, and still pale brown (M. 10 YR 7/3) in area near edge.

MICROSCOPIC CHARACTERS.—Spores (11.3–)11.7–13.5 × 6.3–6.8 μm (average 12.2 × 6.5 μm), ellipsoid-amygdaliform, in water reddish brown (M. 5 YR 4/4), in NH_4OH 10% darker (M. 2.5 YR 3/6; 5 YR 3/4), in KOH 5% greyish brown (M. 10 YR 4/3), opaque, with distinct ±2 μm wide germ pore and small hilar appendix.

Basidia 20–32 × 9.6–12.5 μm, 4-spored.

Pleurocystidia 40–60 × 7.5–14(–17.5) μm, moderately numerous, sublageniform, the majority with slightly swollen apex, thin-walled, colourless, without mucus or crystals.

Cheilocystidia 30–45 × 6–10 μm, in some places fairly, elsewhere less crowded and scattered (70–30% of total number of marginal cells), sometimes even absent in area near margin of cap, sublageniform, thin-walled, colourless, without mucus or crystals; intermixed with spheropedunculate and slightly clavate cells, 15–20 × 7–12.5 μm, locally in variable numbers (30–70% of total number of marginal cells, near margin of cap sometimes 100%), small, thin-walled, colourless; gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%); trama distinctly brownish from membranal pigment at base of gill, gradually paler towards but still present at edge, with many yellowish hyphal septa and encrustations in basal part but very few near edge.

Cuticle of cap cellular; cells 16–32 μm in diam., colourless.

Clamps present on hyphae of stem, not numerous.

HABITAT.—Subcespitose against and around large beech stump in sandy ground of dunes. Known only from type locality.

COLLECTION EXAMINED.—THE NETHERLANDS, prov. Noord-Holland, Santpoort, estate 'Duin en Kruidberg', 11 Aug. 1962. *E. K. v. W.* (holotype; L).

This species might easily be confused with *Psathyrella gracilis* although on finding it we immediately realized that it was not that species. It differs from *P. gracilis* by the presence of a veil, coloured hymenophoral trama, the dark reddish brown colour of the cap not turning mud-grey on drying, the white gill edge, the absence of pink in the drying cap, and the shape of the pleurocystidia. It differs from *P. longicauda* in the absence of a long pseudorrhiza, its general habit (see Plates 62 and 63), its thinner stem, the spores having a very distinct germ pore and not being very dark, and the different shape of the pleurocystidia. It differs from *P. connata* in the much smaller sublageniform pleurocystidia, in the smaller and not expanding cap, and in the darker spores, which in *P. connata* are predominantly brown. *Psathyrella connata*, moreover, has densely packed cheilocystidia. *Psathyrella melanophylla* and *P. melanophylloides* are quite different species (conical cap, colourless hymenophoral trama, black gills, dark spores with indistinct germ pore). Because of the subcespitose growth, the dry cap not showing any trace of pink, the gill edge being white, the pleurocystidia not very numerous *P. ridicula* cannot be *P. polycystis*, although most

pleurocystidia have a slightly swollen apex. But the species must be considered as being very close to *P. polycystis*.

In A. H. Smith's classification (1972) this species should be placed in series *Tenerae* of subsection, section, and subgenus *Psathyrella*. In this series *P. ridicula* would be closest to *P. melanophylla* (=*P. caudata* with Smith), because of its rooting stem, all other species of the series being non-rooting.

While drafting the above description, and not yet having named the species, it suddenly dawned upon us how ridiculous it might be to describe yet another new species of *Psathyrella* based on only one collection, whereas so many hundreds of species of this genus have already been described. Hence the name.

PSATHYRELLA STELLATA (Romagn.) Moser—Figs. 65, 66

Drosophila stellata Romagn. *in* Bull. Soc. linn. Lyon **21**: 152. 1952. — *Psathyrella stellata* (Romagn.) Moser *in* Gams, Kl. KryptogFl. **2** (b/2): 215. 1967.

SELECTED DESCRIPTION.—Kühn. & Romagn., Flore analytique: 359. 1953 (as *Drosophila stellata*).

CHIEF CHARACTERISTICS.—Cap 22–38 mm in diam., at first obtusely conical, soon expanding and with typically undulating, lobed, sulcate margin, chestnut brown, drying out to argillaceous without pink; veil scarcely developed; gills greyish brown or brown; stem rooting; spores 10.8–11.7(–12.6) × 6.3–7.2 μm; pleurocystidia 50–60 × 9–12 μm, fusiform with conspicuous stalk; hymenophoral trama distinctly brown.

MACROSCOPIC CHARACTERS[5].—Cap 22–38 mm in diam., at first obtusely conical, soon expanding to convex or almost flat, often also more or less recurved, sometimes obtuse, sometimes umbonate, with margin typically undulating, lobed, sulcate and uneven, striate when moist, from chestnut brown turning dark brown, hygrophanous, when dry argillaceous or from rufous becoming argillaceous, at centre fulvous or deeper ochraceous; fragile.

Veil scarcely manifest.

Gills 3.5–6 mm broad, not crowded, thin, adnate, not uncinate, ventricose, from watery grey turning greyish brown or brown, with pruinose, pinkish edge.

Stem 60–90 × 2.5–4 mm, ± flexuous, rooting, at first pale reddish and shiny, pallescent.

Trama of 'washed' gill under binocular lens very distinctly brown throughout the entire gill, strongest at base and in basal 1/4 of gill (M. 10 YR 5/4), in remaining 3/4 paler (M. 10 YR 6/4).

MICROSCOPIC CHARACTERS[5].—Spores 10.8–11.7(–12.6) × 6.3–7.2 μm (average 11.5 × 6.5 μm), ellipsoid-amygdaliform, in water dark reddish brown (M. 2.5 YR 3/6; 5 YR 3/4), in NH_4OH 10% barely darker (M. 2.5 YR 3/6, 3/4), in KOH 5% dark greyish brown (M. 10 YR 4/2, 3/2), opaque, with distinct, ± 2 μm wide, apical germ pore and small hilar appendix.

[5] The macroscopic characters of the fruit body have been taken from Romagnesi's Latin diagnosis. The description of the characters of the trama of the gills and of the microscopic characters is based on our own examination of the type material.

Basidia 25–43 × 11.5–13 μm, 4-spored (Romagnesi).

Pleurocystidia 50–60 × 9–12 μm, fairly numerous, sublageniform, subfusiform with a rather conspicuous stalk, with subacute, rarely subcapitate apex, thin-walled, colourless, without mucus or crystals.

Cheilocystidia 20–40 × 8–10 μm, numerous and fairly closely packed, sublageniform to subfusiform, thin-walled, colourless, without mucus or crystals, intermixed with quite a number of small spheropedunculate and clavate cells (condition of material inadequate for measuring and drawing these cells); gill edge sterile.

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%): trama distinctly yellowish brown from base to edge from membranal pigment, strongest at and near base of gills, with a great many yellow hyphal septa and some encrustations at base, encrustations soon disappearing towards middle of gill at which a small number of yellow septa, however, still present.

Cuticle of cap cellular; cells 24–32 μm in diam., colourless.

Clamps present on hyphae of stem, but very few.

HABITAT.—Typical form on large rotting stems thrown out of a garden. Rare.

COLLECTION EXAMINED.—FRANCE, dép. Yonne, Sens, Oct. 1940, *H. Romagnesi* (lectotype: Herb. Romagnesi D 245; fragments in L).

We have never come across this species. Romagnesi's original Latin description, the one in the descriptive key in the 'Flore analytique', and Moser's short description are the only ones available in the literature. We have accepted the species on the strength of Romagnesi's description. Unfortunately the condition of the material Prof. Romagnesi very kindly let us have for study did not enable us to observe intact basidia and spheropedunculate cells.

PSATHYRELLA TREPIDA (Fr.) Gill.—Fig. 64

Agaricus trepidus Fr., Epicr.: 238. 1838; Monogr. Hym. Suec. **1**: 449. 1857; Hym. europ.: 314. 1874; Ic. sel. Hym. **2**: 38, pl. 139 fig. 2. 1879. — *Psathyrella trepida* (Fr.) Gill. Hymen. Fr.: 615. 1878. — *Coprinarius trepidus* (Fr.) Quél., Ench. Fung.: 120. 1886. — *Drosophila trepida* (Fr.) Quél., Fl. mycol. Fr.: 57. 1888. — *Psathyra trepida* (Fr.) J. E. Lange *in* Dansk bot. Ark. **9**(1): 16. 1936.

SELECTED DESCRIPTIONS AND ILLUSTRATIONS.—Fries, Ic. sel. Hym. **2**: 38, pl. 139 fig. 2. 1879. — Ricken, Blätterp.: 265, pl. 68 fig. 4. 1913. — J. E. Lange, Fl. agar. dan. **4**: 101, pl. 155B. 1939 (as *P. trepida* forma *minor*). — Kühn. & Romagn., Flore analytique: 358. 1953. — Michael/Hennig, Handb. Pilzfr. **4**: 280, fig. 279. 1967.

CHIEF CHARACTERISTICS.—Solitary in marshes, boggy and muddy areas; cap 12–30 mm, campanulate-convex, without pink shades when dry; veil rudimentary; gills blackish brown, with white edge; stem rooting with up to 5 mm long pseudorrhiza; spores 9.9–11.7 × 5.4–6.3 μm (but larger with other authors, giving figures 11–14 × 6–7 μm), with distinct germ pore; pleurocystidia 35–50 × 10–16 μm, ventricose-sublageniform; hymenophoral trama coloured.

MACROSCOPIC CHARACTERS[6].—Cap 12–30 mm in diam., campanulate, obtuse, spreading to convex, fuligineous brown, date brown, fuscous (M. 7.5 YR 3/2; 10 YR

[6] The macroscopic characters of the fruit body have been compiled from Fries' descriptions and his plate 139 fig. 2 in the Ic. sel. Hym. The description of the colour of the trama of the gill and of the microscopic characters is based on our own examination of material received from Prof. Romagnesi.

3/2, 3/3), at sometimes slightly umbonate centre dark yellowish brown (M. 5 YR 4/6; on Fries' plate already drying?), densely striate 3/4 from margin upwards, membranaceous, hygrophanous (neither pink colour nor rugulosity mentioned).

Veil not mentioned by Fries but according to Gulden & M. Lange (1971: 16) remnants of veil present.

Gills 2–3 mm broad, faintly ventricose, ascending, broadly adnate, crowded, thin, fuligineous black (but on Fries' plate dark greyish brown, M. 10 YR 4/2, in basal half; pale brown, M. 10 YR 7/3, towards edge).

Stem 45–80 × 1–2 mm, straight, rarely slightly flexuose, cylindric but at extreme base slightly clavate (2–2.5 mm), extreme end again narrower ('pseudorrhiza'), pellucid, bare, hollow, whitish to slightly isabelline.

Spore print black.

Trama of 'washed' gill under binocular lens: entire gill distinctly but not strongly brownish (M. 10 YR 7/3, 6/3).

MICROSCOPIC CHARACTERS[6].—Spores (9.9–)10.8–11.7 × 5.4–6.3 μm (average 10.8 × 6.0 μm), ellipsoid-amygdaliform, in water reddish brown (M. 5 YR 4/4), in NH_4OH 10% scarcely darker (M. 5 YR 4/3, 4/4), in KOH 5% dark greyish brown (M. 10 YR 4/2), opaque, with small hilar appendix and distinct, ±2 μm wide apical germ pore.

Basidia 4-spored (material inadequate for measurements).

Pleurocystidia (only 6 seen) 35–50 × 10–16 μm, ventricose-sublageniform, thin-walled, colourless, without mucus or crystals.

Cheilocystidia not seen (material inadequate).

Pigmentation of hymenophoral trama under microscope ('washed' gill mounted in NH_4OH 10%): trama pale yellowish brown from base to edge, no yellow hyphal septa or encrustations seen.

Cuticle of cap cellular, cells 16–24 μm in diam., colourless.

Clamps present on hyphae of stem.

HABITAT.—Solitary in marshes and boggy and muddy areas, in moss.

COLLECTON EXAMINED.—FRANCE, dép. Val-d'Oise, Chaumontel, 20 Aug. 1945, *H. Romagnesi* (Herb. Romagnesi D. 509).

This species is universally considered to be very rare. It must be looked for in its special habitat (marshes). The cited coloured pictures by Fries, Ricken, J. E. Lange, and B. Hennig all have a striking mutual resemblance, the outstanding features of the species being the campanulate-convex, rather small and fuligineous, sooty brown, striate cap, and the long, whitish stem, about which J. E. Lange (1939: 101) is the only author to mention that it is slightly rooting. Gulden & M. Lange (1971: 16) state that the stem is 'not distinctly rooting, attached to moss', and Kühn. & Romagn. (1953: 358) rank the species with the rooting species.

Some authors who mention spore sizes, give larger figures than the ones we found: 12–14 × 6–7 μm (Rea, 1922: 420; Hennig, 1967: 280); 11–12 × 6.5–7.5 μm (Bresinsky, 1966: 15); 12–14 × 6–7.5 μm (Favre, 1960: 552); 12–14 × 5.5–6 μm (J. E. Lange, 1939: 101); 10–12(–13.2) × 6–6.5 μm (Kühn. & Romagn., 1953: 358).

A. H. Smith's description of *P. trepida* (1972: 325) leaves some doubt as to whether it pertains to *P. trepida* in the sense of Fries and subsequent authors. His description states that faded parts of the drying cap become 'dingy pinkish', whereas in none of

the descriptions in the literature is pink mentioned at any stage of development of the cap. Romagnesi (1953: 358) even specifically states about the species of his 'Groupe de *D. caudata*' to which *P. trepida* belongs, that their caps show 'pas de nuances roses par le sec'. Furthermore the colour of the gills is said to be 'pale fuscous-brown', the habitat is said to be 'organic debris', and not marshes.

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EXPLANATION OF PLATES 60–63

PLATES 60, 61

Psathyrella bifrons, 6 Nov. 1959. — Fruit-bodies (× 1).

PLATE 62

Psathyrella longicauda, 11 Nov. 1969. — Fruit-bodies (× 1).

PLATE 63

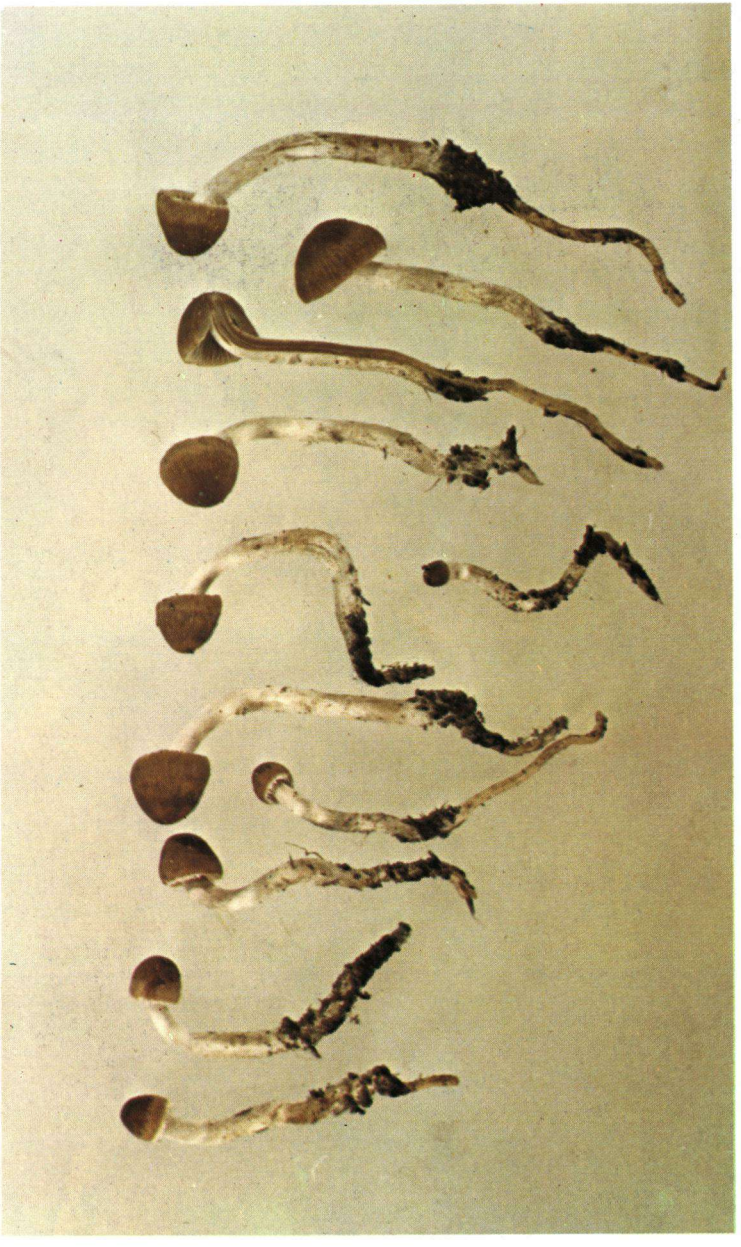
Psathyrella ridicula, 11 Aug. 1962. — Fruit-bodies (× 1).

Author's address:

E. Kits van Waveren M. D., Physician, Koninginneweg 136, Amsterdam-Z.

PSATHYRELLA BIFRONS

PSATHYRELLA BIFRONS



PSATHYRELLA LONGICAUDA

PSATHYRELLA RIDICULA