

Two new species of *Psathyrella*

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Psathyrella lutulenta and *P. ornatispora* are described as new species, found on the Iberian Peninsula. *P. lutulenta* belongs to sect. *Spadiceogriseae*, and is characterised by its limophilous habitat, pinkish-grey pileus on drying and sublageniform cystidia. Some holotypes of close North American taxa, as well as that of the European *P. almerensis* have been studied for comparison. *P. ornatispora* belongs to sect. *Cystopsathyra*, was found in a greenhouse, and is characterised by the absence of hymenial cystidia and blackish colours of the basidiomata.

Key words: Systematics, *Psathyrella lutulenta*, *P. ornatispora*, Iberian Peninsula.

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Jsou popsány dva nové druhy *Psathyrella lutulenta* a *P. ornatispora* nalezené na Pyrenejském poloostrově. *P. lutulenta* náleží do sekce *Spadiceogriseae* a je význačná růstem v bažinách. Načervenalé šedým kloboukem při zasychání a lahvicovitými cystidami. Pro srovnání byly studovány holotypy některých severoamerických taxonů, které se ukázaly býti podobné a také evropského druhu *P. almerensis*. *P. ornatispora* náleží do sekce *Cystopsathyra*, byla nalezena ve skleníku a je charakterisována nedostatkem hymeniálních cystid a černavým zbarvením plodnic.

INTRODUCTION

The genus *Psathyrella* (Fr.) Qué. is commonly considered one of the most difficult among agarics. On the Iberian Peninsula, the knowledge of this genus was very poor, but in the last decades interesting contributions have been made (Esteve-Raventós and Enderle 1992; Heykoop and Esteve-Raventós 1994; Heykoop and Moreno 1998, 2001), with descriptions of new species and a chorological compilation (Heykoop 2001), which will result in a starting-point towards a better understanding of this genus in the western mediterranean countries. In this work, we introduce two new species, one of them found in a greenhouse, hence assuming its mostly probable tropical or subtropical origin.

Holotypes are deposited at the University of Alcalá Herbarium (AH). The methods used for the morphological study of the samples has been the usual

ones for agarics. Authors abbreviations follow Kirk and Ansell (1992). Colours are referred to Munsell (1994) and spore measurements follow the method proposed by Heinemann and Rammeloo (1985).

Psathyrella lutulenta Esteve-Rav. et M. Villarreal, sp. nov.

(Figs. 1-5)

Etymology: from the Latin word "lutum" = mud, referring to the muddy soil on which it grows.

Basidiomata gregaria. Pileus 10-40 mm latus, hemisphaericus vel convexus, deinde applanatus, subumbonatus, initio brunneus marginem versus pallidior, in sicco griseo-roseus, striatus, hygrophanus, micaceus. Velum album, fugax. Lamellae c. 30 stipitem attingentes, adscendentes, -4 mm latae, liberae, primo pallide griseae, demum obscure tabacinae, acie albae. Stipes 25-70 × 1.5-3 mm, cylindraceus, cavus, albus, fibrillosus, apice pruinosis. Sporae 9-11.5 × 5.5-6.5 μm, laeves, ellipsoideae raro phaseoliformes, rufulo-brunneae, subopaeae, poro germinativo 1.2-1.5 μm lato munitae. Basidia 25-31 × 9.5-12.5 μm, clavata, 4-sporigera. Pleurocystidia 39-52 × 12-17 × 6-8 μm, numerosa, utriformia vel lageniformia, tenuitunicata. Cellulae marginales: cheilocystidia pleurocystidiis similia, numerosa; cellulae sphaeropedunculatae et clavatae 18-25 × 9-17 μm, numerosae, intermixtae. Pileipellis e cellulis formata. Terrestis ad terram lutulentam inter gramina et herbas (e. g. *Typha*, *Phragmites* et *Juncus*).

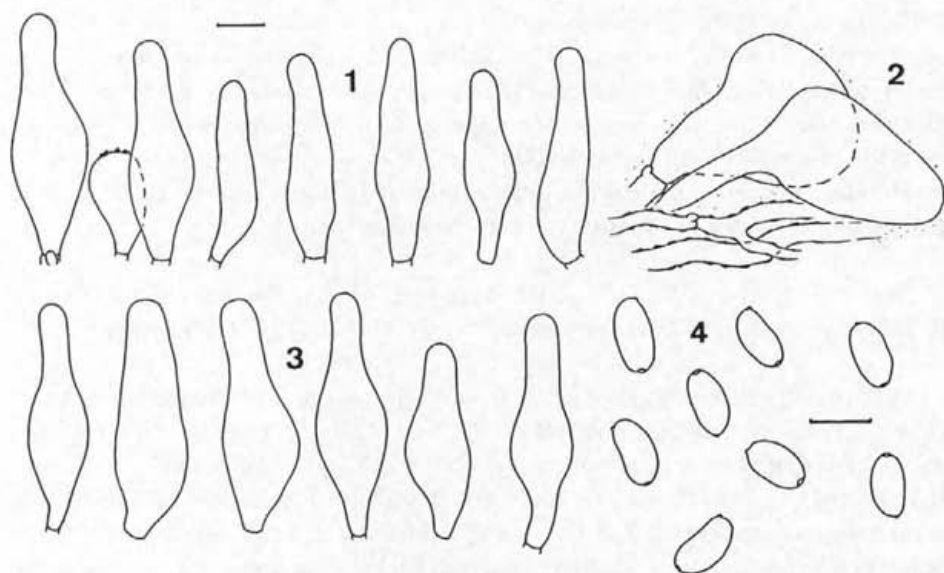
Typus: Hispania, Madrid, Coslada, 27 Nov. 1996, legit M. de la Cruz, F. Esteve-Raventós, C. Sánchez et M. Villarreal, AH 21379.

Pileus 10-40 mm in diam., hemisphaerical to convex, spreading to applanate, shallowly umbonate, at first entirely brown (Mu 7.5YR 4/3, 4/4), paler at the margin, where it is light brown to pink (7.5YR 6/3, 7/4), drying out from the centre to light reddish-brown to pink (5YR 6/3, 7/3), striate up to half-way from margin, hygrophanous, very slightly micaceous, smooth. Veil present at the margin of young primordia, leaving whitish arachnoid remnants on the pileus surface, soon evanescent. Lamellae c. 30. reaching the stipe, 1.5-4 mm broad, ascending, free, at first pinkish-grey (7.5YR 6/2), finally dark brown (7.5YR 3/4) with a slight violaceous hue, edge whitish. Stipe 25-70 × 1.5-3 mm, cylindrical, hollow, white, becoming light grey (10YR 7/1) towards the base with age, with fibrillose surface and pruinose apex. Context beige in the pileus, in the stem whitish. Smell fungoid, taste not recorded.

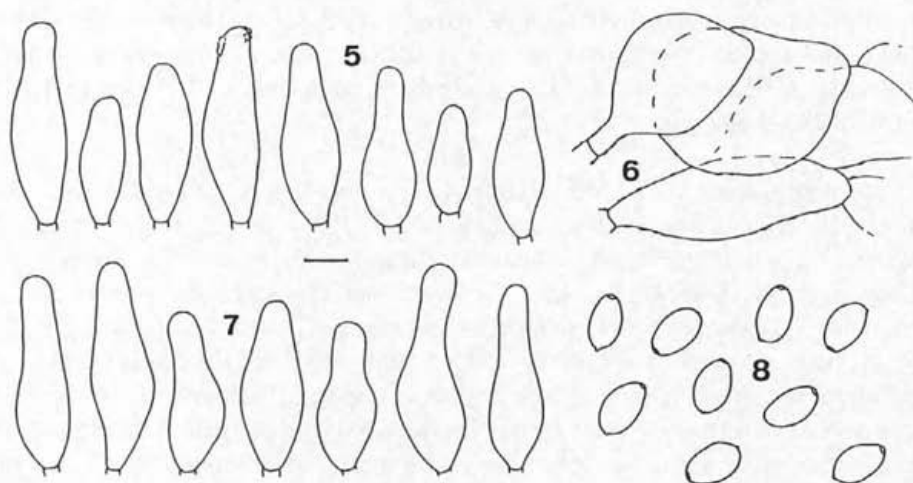
Spores (9-)9.15-10.36-11.5 × 5.5-5.97-6.42(-6.5), Q = 1.6-1.73-1.92(-1.98) [n = 21], ellipsoid in face-view, in profile usually ellipsoid, adaxially flattened, sometimes slightly phaseoliform, in water reddish-brown, in NH₄OH 10 % dark brown, subopaque, with fairly distinctive central germ pore (1.2-1.5 μm). Basidia 25-31 × 9.5-12.5 μm, clavate, four-spored, with sterigmata 4-4.5 μm long. Pleurocystidia 39-52 × 12-17 × 6-8 μm, narrowly utriform to lageniform, fairly numerous, thin-walled, hyaline. Lamellar edge formed by a mixture of rather numerous cheilocystidia, 40-49 × 11-14 × 4.5-7 μm, similar to pleurocystidia



Psathyrella lutulenta Esteve-Rav. et M. Villarreal (Holotype). Basidiomata.



Figs. 1-4. *Psathyrella lutulenta* Esteve-Rav. et M. Villarreal (Holotype): 1. Cheilocystidia; 2. Pileipellis; 3. Pleurocystidia; 4. Spores. (Bar = 10 μ m)



Figs. 5-8. *Psathyrella baileyi* A. H. Sm. (Holotype): 5. Cheilocystidia; 6. Pileipellis; 7. Pleurocystidia; 8. Spores. (Bar = 10 μ m)

in shape or slightly narrower, mixed with abundant sphaeropedunculate cells, 18-25 \times 9-17 μ m, thin-walled, hyaline. Hymenophoral trama pale yellow in NH_4OH 10 %, with parietal pigment, made up of cylindrical, parallel hyphae

4-15 μm wide. Pileipellis a hymenoderm constituted by 1-2 layers of globose to subglobose cells, (12-)17-37(-45) μm wide, slightly embedded in gelatinous material; hyphae of the hypoderm 6-11 μm wide, with yellowish-brown encrusting pigment. Caulocystidia present in the upper part of the stipe, similar to hymenial cystidia, in clusters. Clamp connections present at all septa.

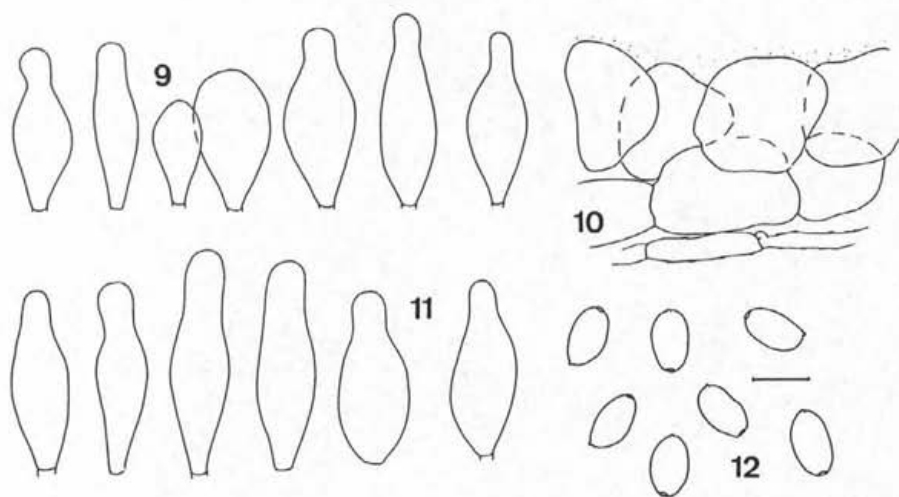
Habitat: gregarious, on muddy, nitrified soil, under the canopy of *Typha latifolia* L., *Scirpus holoschoenus* L. and *Juncus maritimus* Lam.

Material studied: SPAIN. Madrid: Coslada, 27. Nov. 1996, coll. M. de la Cruz, F. Esteve-Raventós, C. Sánchez and M. Villarreal, AH 21379 (Holotypus).

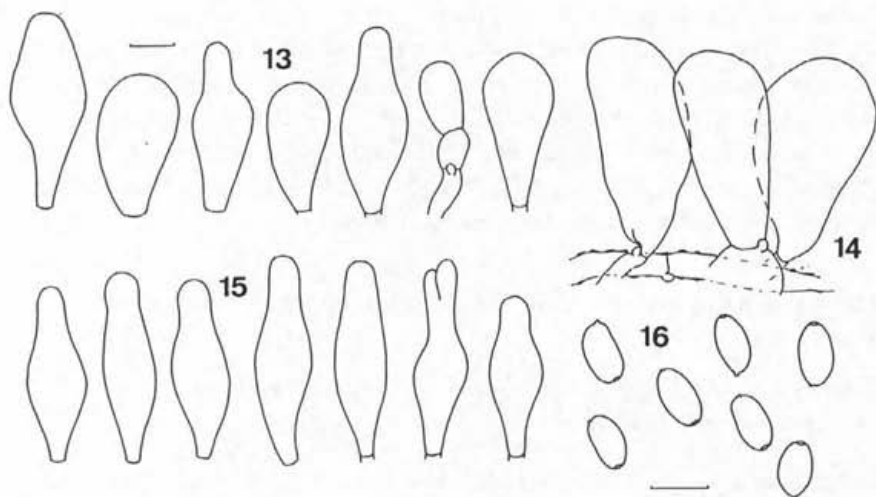
Additional material studied. *Psathyrella almerensis*: The Netherlands: prov. IJsselmeerpolders, Zuidelijk, Flevoland, 23. Nov. 1976, on rests of *Typha*, *Phragmites* and *Cirsium*, on dike of sandy clay with many shells, coll. J. Daams, (L) -holotypus-. *Psathyrella baileyi*: USA: Michigan, Isle Royale National Park, gregarious on wet earth, coll. V. Bailey, (MICH) H. & V. Bailey no. 125 -holotypus-. *Psathyrella pseudolimicola*: USA: Idaho, Papoose Creek, Nezperce National Forest, Aug., gregarious on mud in a cow pasture (mud and manure present), coll. A. H. Smith, (MICH) Smith 65850 -holotypus-. *Psathyrella subpalustris*: USA: Michigan, Washtenaw County, Pinckney Recreation Area, May, scattered on debris among sedges near edge of a bog, coll. A. H. Smith, (MICH) Smith 21412 -holotypus-. *Psathyrella vivescens*: USA: Michigan, Cheboygan County, Burt Lake, scattered on wet soil near a woodland pool, coll. A. H. Smith, (MICH) Smith 33732 -holotypus-.

The new species fits within sect. *Spadiceogriseae* subsect. *Lutenses* Kits van Wav. (Kits van Waveren, 1985, 1987; Fouchier, 1995), owing to the numerous cheilocystidia intermixed with abundant sphaeropedunculate cells. Its habitat brings to mind *P. almerensis* Kits van Wav., but this species grows directly on remnants of *Typha*, *Phragmites* and *Cirsium*, and is characterised by the more or less cylindrical to narrowly utriform cystidia and very small basidiomata.

Following the monograph of North American species by Smith (1972), several taxa would seem to come close to our taxon on account of their similar habitats or morphological features. After the revision of the holotypes of *P. baileyi* A. H. Sm., *P. pseudolimicola* A. H. Sm., *P. subpalustris* A. H. Sm., *P. vivescens* A. H. Sm. and, we have concluded that all these species belong to sect. *Spadiceogriseae* (Romagn.) ex Kits van Wav. (Kits van Waveren, *loc. cit.*); however, only *P. pseudolimicola* (Figs. 9-12) shares similar macro- and micromorphological features, on account of the ratio of cheilocystidia/sphaeropedunculate cells along the gill-edge, size of the spores and habitat. However, in this last species the pileus has a "cinnamon-buff" component, also present in the exsiccatum, the

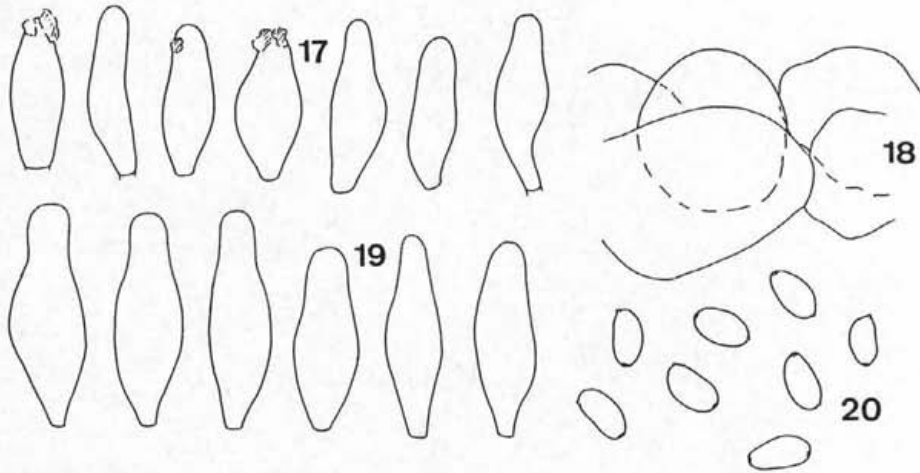


Figs. 9–12. *Psathyrella pseudolimicola* A. H. Sm. (Holotype): 9. Cheilocystidia; 10. Pileipellis; 11. Pleurocystidia; 12. Spores. (Bar = 10 μ m)



Figs. 13–16. *Psathyrella subpalustris* A. H. Sm. (Holotype): 13. Cheilocystidia; 14. Pileipellis; 15. Pleurocystidia; 16. Spores. (Bar = 10 μ m)

lamellar-edge shows mostly sphaeropedunculate cells, with few, broadly utriform, (sub-)capitate cheilocystidia, 30–40 \times 10.5–16.5 μ m, without neck, and similar pleurocystidia; its basidia are also shorter, measuring 20–23 \times 9–11 μ m. The pileipellis and spores are similar to those of *P. lutulenta*.



Figs. 17–20. *Psathyrella vivescens* A. H. Sm. (Holotype): 17. Cheilocystidia; 18. Pileipellis; 19. Pleurocystidia; 20. Spores. (Bar = 10 μ m)

P. baileyi (Figs. 5–8) and *P. vivescens* (Figs. 17–20) belong to subsect. *Lutenses*; the first differs by its long stipe (–10 cm), spores $9\text{--}9.7 \times 5.5\text{--}6.3 \mu\text{m}$, which are not adaxially flattened, and short basidia $20\text{--}23 \times 8.5\text{--}9.5 \mu\text{m}$, whereas the second shows mostly globose caulocystidia, much shorter utriform cheilocystidia ($25\text{--}35 \times 9\text{--}13 \mu\text{m}$) and smaller spores ($7.5\text{--}9.2 \times 4.3\text{--}5 \mu\text{m}$).

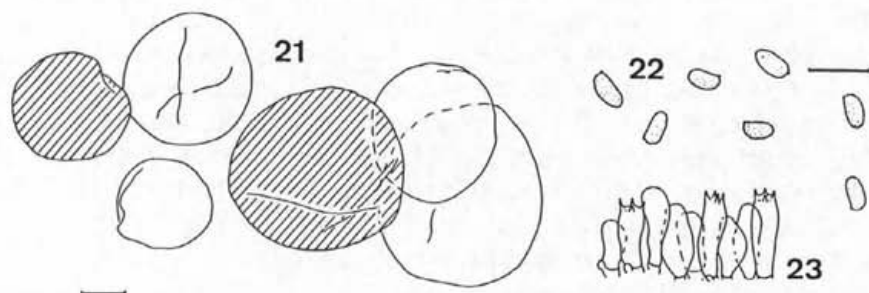
P. subpalustris (Figs. 13–16) fits within subsect. *Spadiceogriseae*; it shows a hymenoderm constituted only by one layer of globose cells, and practically only sphaeropedunculate cells along the lamellar edge.

***Psathyrella ornatispora* M. Villarreal et Esteve-Rav., sp. nov.**
(Figs. 21–23)

Etymology: from the latin word “ornatus” = ornamented and “sporis” = spores, because of its ornamented spores.

Basidiomata gregaria. Pileus 12–30 mm latus, convexus vel plano-convexus, manifeste umbonatus, obscure griseus, haud striatus, haud hygrophanus, totus granuloso-farinosus vel furfuraceus. Velo badio furfuraceus vel floccoso-squamulosus. Lamellae c. 43 stipitem attingentes, confertae, ventricosae, 1–2 mm latae, liberae, obscure tabacinae vel obscure brunneae et purpureo-tinctae, acie concolore. Stipes 30–38 \times 2.5–3.5 mm, cylindraceus, ad basim leviter incrassatus, cavus, obscure brunneo-cinereus vel brunneo-purpureus, ob velum floccoso-furfuraceus. Sporae $4.5\text{--}6.8 \times 2.5\text{--}3.4 \mu\text{m}$, punctato-asperae, ellipsoideae, griseo-luteae, perspicuae, poro germinativo nullo. Basidia $12\text{--}16 \times 5\text{--}7 \mu\text{m}$, clavata, 4-sporigera. Pleurocystidia et cheilocystidia nulla. Pileipellis e cellulis formata. Terrestri in hibernaculo subtropico.

Typus: Hispania, Madrid, Atocha Railway Station, 7. Feb. 1997, legit F. Esteve-Raventós, C. Sánchez, M. Sosa et M. Villarreal, AH 26978.



Figs. 21–23. *Psathyrella ornatispora* M. Villarreal et Esteve-Rav. (Holotype): 21. Elements of the pileipellis; 22. Spores; 23. Lamellar edge. (Bar = 10 μ m)

Basidiomata gregarious. Pileus 12–30 mm in diam., convex to plano-convex, with broad central umbo, sometimes slightly depressed with age, brown (7.5 YR 4/2, 4/3) to dark brown (7.5YR 3/2), dry, with granular mealy-scaly or furfureaceous surface, not striate, apparently not hygrophanous, margin revolute in adult specimens. Veil forming a discontinuous floccose-furfureaceous layer on cap, very dark grey (10YR 3/1) to very dark greyish brown (10YR 3/2). Lamellae c. 43, reaching the stipe, very crowded, 1–2 mm broad, ventricose, free, tobacco brown (7.5YR 4/2, 3/2) to very dark brown or nearly black (7.5YR 2.5/1, 2.5/2) with purplish hue, edge entire and concolorous. Spore-print blackish. Stipe 30–38 \times 2.5–3.5 mm, cylindrical, flexuose, somewhat bulbilous at the base, hollow, uniformly dark grey (7.5YR 4/1) to very dark grey (7.5YR 3/1) with purplish-violaceous hue, surface entirely covered by sparse blackish flocci on a fibrillose background. Context purplish-grey. Smell and taste not characteristic.

Spores 4.5–5.13–6.15(–6.8) \times 2.5–2.76–3.2(–3.4); $Q = (1.53\text{--})1.56\text{--}1.86\text{--}2.16$ (–2.2) [$n = 21$], narrowly ellipsoid to ellipsoid, minutely punctate, verruculose when observed under a S. E. M., in water pale yellowish-grey, darker in NH_4OH 10 %, translucent, without germ pore. Basidia 12–16 \times 5–7 μ m, clavate, 4-spored, hyaline, with sterigmata 1–1.5 μ m long. Pleurocystidia and cheilocystidia absent or not differentiated from basidioles. Hymenophoral trama parenchymatous, with broad cells (7–20 μ m broad), intermixed with some cylindrical hyphae 3–6 μ m broad, with intraparietal grey-yellowish pigment in NH_4OH 10 %. Pileipellis a hymenoderm formed by 2–3 layers of subglobose cells, 15–30 μ m broad, with yellowish-grey intraparietal pigment. Veil present on the pileus and stipe, consisting of chains of globose to subglobose cells, 25–55 μ m, with parietal dark brown pigment. Caulocystidia absent. Clamp connections present at all septa.

Habitat: on soil of a greenhouse.

Material studied: SPAIN. Madrid: Atocha railway station: 7. Feb. 1997, coll. F. Esteve-Raventós, C. Sánchez, M. Sosa and M. Villarreal, AH 26978 (Holotypus).

This new species shows very distinctive features and can be easily recognised and separated from other members of sect. *Cystopsathyra* (Singer) Kits van Wav. by its overall blackish colours, small punctate spores and absence of cystidia.

Gröger (1986), when describing *P. globosivelata*, made a compilation of the species belonging to this section, containing a total of six species (*P. friburgensis* not validly described yet), three of them described from Europe (Orton, 1964; Gröger, *loc. cit.*), and the rest from North America (Singer, 1959; Smith 1972). None of them shares the peculiar characters of *P. ornatispora*. Moreover ornamented spores and absence of typical cystidia seem to be previously undescribed features in this section. More recently Contú (1991) described *P. bivelata* from Cagliari Botanical Garden, a taxon which shows a granulose-punctate veil of ellipsoid, catenulate cells at the pileus centre, and a "hyphoid" whitish marginal veil.

According to Singer (1962), who considers *Cystopsathyra* a subgenus of *Psathyrella*, this taxon would be characterised not only by the granulose veil formed by sphaerocysts, but also by the presence of pleurocystidia. From a morphological point of view, *P. ornatispora* reveals that the presence of cystidia in *Cystopsathyra* is not significant.

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