

***PSEUDOBAEOSPOR*A CYANEA, A NEW AGARIC SPECIES FROM CATALONIA**

Eef ARNOLDS¹, Manuel TABARÉS² and August ROCABRUNA²

1.- Holthe 21, 9411 TN Beilen, The Netherlands

2.- Societat Catalana de Micologia, carrer de la Marina, 94, 1º, 4ª, E-08028 Barcelona

ABSTRACT. *Pseudobaeospora cyanea*, a new agaric species from Catalonia. The first record of *Pseudobaeospora* in Spain appeared to belong to a new species. *Pseudobaeospora cyanea* is described, accompanied by a colour photograph and line drawings of microscopic characters. A comparison is made with related European species of *Pseudobaeospora* (*P. dichroa*, *P. pallidifolia*, *P. pyrifer*).

Key words: Basidiomycotina, Agaricales, *Pseudobaeospora cyanea*, taxonomy.

RESUMEN. *Pseudobaeospora cyanea*, una nueva especie agaricoide de Cataluña. La primera cita de *Pseudobaeospora* en España parece pertenecer a una nueva especie. Se describe *Pseudobaeospora cyanea* acompañada por fotografías en color y dibujos de los caracteres microscópicos, y se compara con algunas especies europeas próximas (*P. dichroa*, *P. pallidifolia*, *P. pyrifer*).

Palabras clave: Basidiomycotina, Agaricales, *Pseudobaeospora cyanea*, taxonomia

RESUM. *Pseudobaeospora cyanea*, una nova espècie agaricoide de Catalunya. La primera cita de *Pseudobaeospora* a Espanya ha resultat pertànyer a una nova espècie. Es descriu *Pseudobaeospora cyanea* acompanyada per fotografies en color i dibuixos dels caràcters microscòpics i es compara amb algunes espècies europees properes (*P. dichroa*, *P. pallidifolia*, *P. pyrifer*).

Paraules clau: Basidiomycotina, Agaricales, *Pseudobaeospora cyanea*, taxonomia

INTRODUCTION

The genus *Pseudobaeospora* has been largely neglected by taxonomists for a long time. Until 1995, only two species were known from Europe, viz. *P. pillodii* (Quél.) Wasser and *P. oligophylla* (Sing.) Sing. (BAS, 1995). Recently, it was discovered that the number of European species is much larger. BAS (2002) distinguished 13 species and two provisionally defined ones. Almost all species are known from only one or a few collections and seem to be very rare. *Pseudobaeospora cyanea*, described in this paper, is another addition to this genus and the first species of *Pseudobaeospora* recorded from Spain.

The genus *Pseudobaeospora* is mainly characterised by the combination of small, collybioid basidiocarps, usually with pink, violaceous or lilac, occasionally whitish colours, small hyaline spores (< 5,5 µm) that become often thick-walled and dextrinoid when mature and a pileipellis of repent to erect hyphae (cutis or trichodermium) (BAS, 1995). The spores become thick-walled and dextrinoid when mature. On the lamellae of fresh and dried basidiocarps usually only a limited number of thick-walled spores are present, in the studied basidiocarps of *P. cyanea* less than 10 %. In spore prints, on the apex of the stipe and on the pileipellis, exclusively shed and therefore mature spores are found. That is why BAS (2002) advised to measure the size of the spores in preparations of the surface of stipe and pileus instead of the lamellae. A spore print is, of course, a good alternative. However, in *P. cyanea* we did not find any significant difference between size or shape of spores on the lamellae, in the spore print and on the pileipellis.

***Pseudobaeospora cyanea* Arnolds, Tabarés et Rocabrúna, spec. nov.**

Pileus 15-30 mm *latus*, *primo campanulatus*, *demum convexus vel plano-convexus*, *postremo expansus*, *frequenter margine revolutus*, *interdum umbonatus*, *non-striatus*, *purpureo-cyaneus vel purpureus*, *margine roseolus*, *siccus*, *tomentosus*, *interdum rugulosus*, *ad KOH 5% viridis*. *Lamellae adnexae*, *subconfertae*, *ventricosae*, *cremae vel pallide incarnatae*. *Stipes* 30-40 × 1-3 mm, *cylindraceus*, *brunneus vel purpureo-brunneus*, *apice pruinatus*, *basi strigosus*. *Caro concolor*. *Odor nullus*.

Sporae 4,0-5,5-(6,5) × 3,3-4,0-(4,8) μm, *medium* 4,5-4,8 × 3,4-3,5 μm, *Q* = (1,1)-1,2-1,5-(1,8), *medium Q* = 1,3-1,4, *ellipsoideae vel ovoideae*, *interdum oblongae*, *initio tenuiter tunicatae et inamyloideae*, *demum crasse tunicatae et dextrinoideae*, *hyalinae*. *Basidia* 20-26 × 5,0-6,5 μm, 4-(2) *sporifera*. *Cheilocystidia infrequentia*, 16-25 × 3,5-6,0 μm, *subcylindracea vel clavata*, *interdum furcata vel lobata*. *Pleurocystidia nulla*. *Pileipellis trichodermiformis*, *ope KOH 5% viridi cyanea*, *ex catenis cellularum* 20-65 × 6,5-22 μm *composita*, *elongatarum*, *ellipsoidearum vel subglobosarum*. *Caulocystidia* 15-70 × 3,0-5,0 μm, *filiformia*, *frequenter septata*. *Fibulae presentes*.

Holotypus hic designatus: *In locum Mas Llagostera dictum*, *prope Vidreres*, *Catalonia (NE Hispania)*, 200 m s.m. *sub Pinus pinaster*, *Arbutus unedo*, *et Erica arborea*, *leg. J. Carreras et M. Tabarés*, 6-11-2002, *in herb. BCN-SCMB-4742 conservatus*.

Isotypus in herbario AH 30732 (Alcalá de Henares) conservatus.

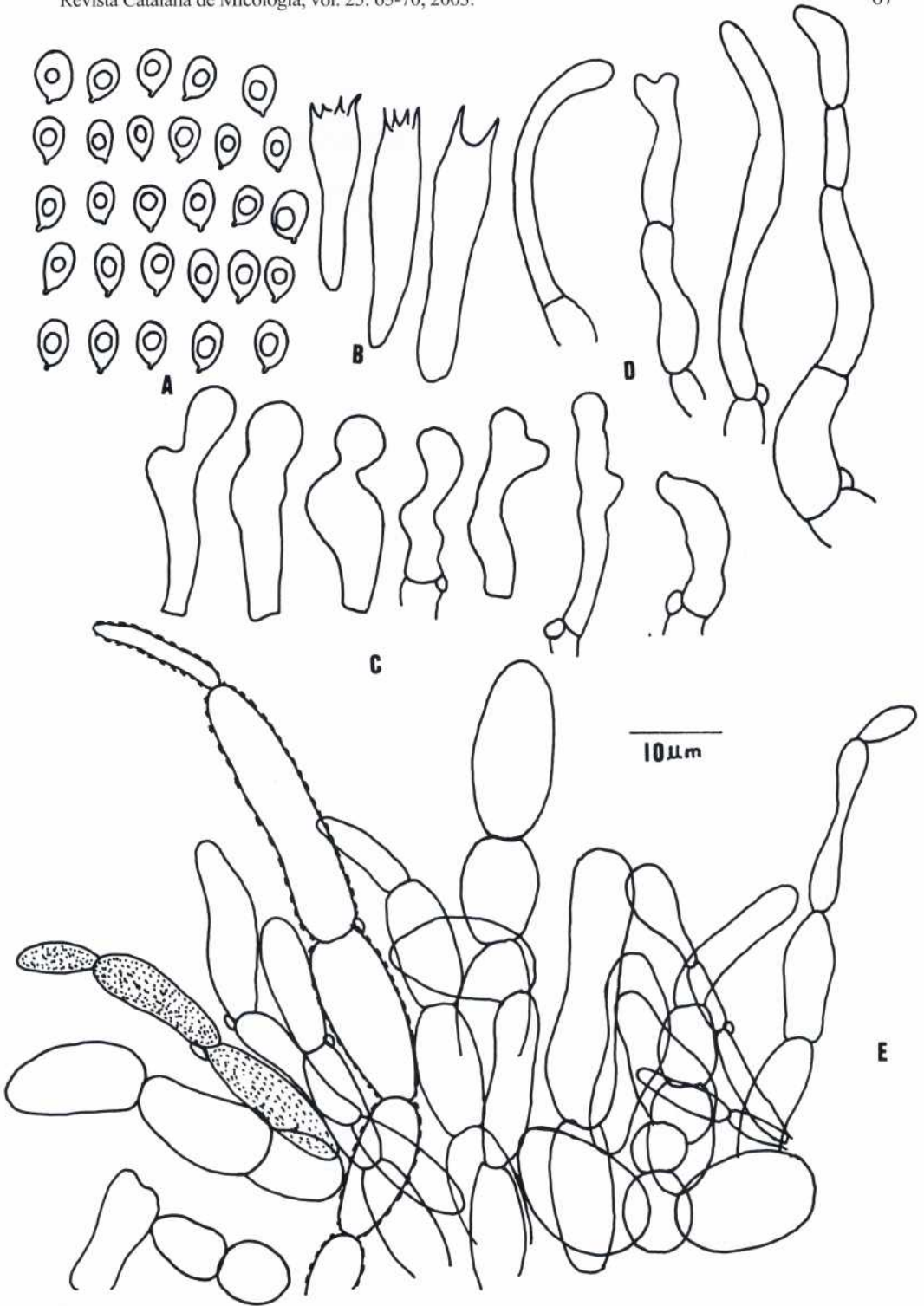
Pileus 15-30 mm broad, *campanulate at first*, then *convex to plano-convex*, finally *flattened*, often with *revolute margin*, sometimes *umbonate*, *purplish blue or purple* (SEGUY: 633, 644) with *paler pinkish margin*, *not striate*, *dry*, *velvety*, sometimes *slightly wrinkled*. *Lamellae adnexed*, rather *crowded*, *thickish*, *ventricose*, up to 4 mm broad, *cream-coloured to beige or pale flesh-coloured*. *Stipe* 30-40 × 1-3 mm, *cylindrical*, *brown to purple-brown*, at apex *white pruinose*, basal ¼ part with *striking*, *white*, *strigose hairs*, longer than *diameter of stipe*. *Context in pileus very thin*, *concolorous with surface*. *Smell and taste weak*, *not distinctive*. *Chemical reactions*: *Surface and context of pileus discolouring green with KOH 5%*. *Spore print white*.

Spores 4,0-5,5-(6,5) × 3,3-4,0-(4,8) μm, on the average 4,5-4,8 × 3,4-3,5 μm, *Q* = (1,1)-1,2-1,5-(1,8), *Qav.* = 1,3-1,4, *predominantly (broadly) ellipsoid to ovoid*, some *ellipsoid-oblong*, often in *tetrads*, *smooth*, *hyaline*, mostly with *oil-drop*, becoming *thick-walled when mature* and then *dextrinoid*, also *cyanophylic*. *Basidia* 20-26 × 5,0-6,5 μm, *clavate*, often *flexuose*, 4-spored or a few 2-spored *intermixed*. *Lamella edge heterogeneous*, made up of *basidia and scattered*, rather *inconspicuous cheilocystidia*, 16-25 × 3,5-6,0 μm, *subcylindrical to narrowly clavate*, often *flexuose*, sometimes *furcate or lobed*. *Pleurocystidia absent*. *Hymenophoral trama subregular*, made up of *cylindrical and inflated elements*. *Pileipellis a trichodermium*, made up of *loosely entangled*, *ascending and erect hyphae with subcylindrical, elliptic, clavate and subglobose elements*; *terminal elements* 20-65! × 6,5-22 μm, with *blue-violet intracellular and encrusting pigment*. *Caulocystidia* 15-70 × 3,0-5,0 μm, *filiform*, often *septate*. *Clamp-connections present in entire basidiocarp*. *Chemical reactions*: *cells of pileipellis turning blue-green in KOH 5% and ammonia 5%*.

Píleo 15-30 mm de diámetro, *acampanado al principio*, después *convexo o aplanado-convexo*, finalmente *aplanado*, a menudo con el *margen revoluto*, a veces *umbonado*, *azulado-purpúreo o púrpura* (SEGUY: 633, 644) con el *margen mas pálido rosado*, no *estriado*, *seco*, *aterciopelado*, a veces *ligeramente arrugado*. *Láminas adnatas*, más bien *densas*, *gruesas*, *ventradas*, de hasta 4 mm de anchura, de color *crema a beige o carneo pálido*. *Estipe* de 30-40 × 1-3 mm, *cilíndrico*, de *pardo a pardo purpúreo*, en el *ápice blanco pruinoso*, en el ¼ inferior *muy hirsuto*, *blanco*, con *pelos de mayor longitud que el diámetro del estipe*. *Carne del píleo escasa*, del color de la *cutícula*. *Olor y sabor poco notables*.

Reacciones químicas: Con *KOH 5%*. la *cutícula y la carne del píleo se decoloran*, pasando al *verde*. *Esporada blanca*.

Esporas 4,0-5,5 (6,5) × 3,3-4,0 (4,8) μm, de promedio 4,5-4,8 × 3,4-3,5 μm, *Q* = (1,1) 1,2 - 1,5 (1,8), *Qm.* = 1,3-1,4, *predominantemente de elipsoidales a ovoides*, a veces *elipsoidales oblongas*, *lisas*,



Pseudobaeospora cyanea Arnolds, Tabarés et Rocabruna (*Holotypus*). A: espore; B: basidia; C: cheilocystidia; D: caulocystidia; E: pileipellis.

hialinas, la mayor parte gutuladas, con paredes gruesas cuando están bien maduras y entonces dextrinoides, también cianófilas. Basidios 20-26 × 5,0-6,5 µm, claviformes, a menudo flexuosos, generalmente tetraspóricos, con unos pocos bispóricos entremezclados. Arista de las láminas heterogénea, con basidios y más raramente con muy escasos y dispersos queilocistidios, 16-25 × 3,5-6,0 µm, de subcilíndricos a estrechamente claviformes, a menudo flexuosos, a veces bifurcados y lobulados. Pleurocistidios ausentes. Trama himenial subregular, con elementos cilíndricos y subglobosos. Pileipellis en tricodermis, con hifas ascendentes, con elementos subcilíndricos, claviformes y subglobosos; terminaciones 20-65 × 6,5-22 µm, con pigmento intracelular e incrustante azul-violetáceo. Caulocistidios 15-70 × 3,0 - 5,0 µm, filiformes, a menudo septados. Fíbulas presentes en toda la fructificación. Reacciones químicas: las células de la pileipellis volviéndose de color azul-verde con KOH 5% y amoníaco 5%.

COLLECTION EXAMINED: Spain, Catalonia, Girona, La Selva, surroundings of Mas de Llagostera (UTM 31 T 0480 4622), alt. 200 m, on acidic, humus-rich soil above granite, in forest with *Pinus pinaster*, *Quercus suber*, *Arbutus unedo* and *Erica arborea*, probably saprobic, 6-11-2002, leg. J. Carreras y M. Tabarés, BCN-SCM B4742; 13-11-2002, leg. A.M. Tarín S. Tabarés y A. Rocabrana, BCN-SCM B4743.

OBSERVATIONS. Following the revision of the genus *Pseudobaeospora* by BAS (2002), *P. cyanea* keys-out in a group of three species, characterised by a greenish discoloration of the pileipellis in KOH, comprising *P. dichroa*, *P. pyriferá* and *P. pallidifolia*. It is interesting to note that this reaction was so far only observed in preparations of the pileipellis (BAS, 2002), but it appears to be also detectable macroscopically as a green spot on the fresh pileus, at least in *P. cyanea*.

Pseudobaeospora dichroa Bas differs from *P. cyanea* among other things in the reaction of the pileipellis with KOH, producing a rapidly dissolving red pigment before turning green, smaller spores and much darker lamellae. *P. pyriferá* Bas et L.G. Krieglst. has also darker, violaceous pink lamellae, considerably smaller, subglobose spores (2,8-3,7 × 2,6-3,5 µm) and broadly clavate cheilocystidia (BAS & KRIEGLSTEINER, 1998). The closest relative of our species seems to be *P. pallidifolia* Bas, Gennari et Robich, recently described from Italy (BAS *et al.*, 1997). That species is similar in pale, cream-coloured pink lamellae and spore size: (4,0)-4,5-6,0-(7,0) × (2,5)-3,0-4,5 µm. *Pseudobaeospora cyanea* differs in (1) the structure of the pileipellis, being a cutis with inflated cells in *P. pallidifolia*; (2) presence of cheilocystidia (absent in *P. pallidifolia*), (3) brighter, blue-violet colour of the pileus, (4) presence of long strigose hairs at base of stipe and (5) possibly also in slightly larger basidiocarps.

Another species of *Pseudobaeospora*, described from the Mediterranean area, is *P. jamonii* Bas, Lalli et Lonati (BAS *et al.*, 2002). It is macroscopically readily distinct from *P. cyanea* in the lilac-violaceous colour of the lamellae and the absence of strigose hairs on the stipe. Microscopical differences are, among other things, the smaller spores, measuring (3,0)-3,2-4,0-(4,3) × 2,8-3,5 µm; the abundant, well-differentiated cheilocystidia and the more regular structure of the pileipellis that is discolouring only pale green to greenish brown in KOH. *P. jamonii* was described from mixed, temperate mountain forests in Piemonte and Abruzzo, Italy.

The collectors of *Pseudobaeospora cyanea* initially supposed that their fungus might belong to the genus *Dermoloma*, mainly in view of the dextrinoid spores and the broad cells in the pileipellis. It is remarkable that also *Pseudobaeospora pallidifolia* was considered to be a *Dermoloma* at first. The genus *Dermoloma* is characterised in the first place by the structure of the pileipellis, being a regular pluristratous hymeniderm, made up of densely packed subglobose and broadly clavate cells, 10-40 µm broad (ARNOLDS, 1995). In addition, all European species known at present have brown and grey colours (without violaceous and pink tones) and a farinaceous smell and taste.

ACKNOWLEDGMENTS

We wish to thank F. Esteve-Raventós (Alcalá de Henares) and J. Ll. Siquier (Inca) for their advise and collaboration, and F. de Diego Calonge (Madrid) and G. Moreno (Alcalá de Henares) for their help in sending relevant publications.



Pseudobaeospora cyanea Arnolds, Tabarés et Rocabrana, SCMB4742



Pseudobaeospora cyanea Arnolds, Tabarés et Rocabrana, SCMB4743

REFERENCES

- ARNOLDS, E. 1995.- *Dermoloma*. In: C. Bas *et al.* (eds), *Flora agaricina neerlandica* 3: 30-34. Balkema, Rotterdam, Brookfield.
- BAS, C. 1995.- *Pseudobaeospora*. In: C. Bas *et al.* (eds), *Flora agaricina neerlandica* 3: 132-134. Balkema, Rotterdam, Brookfield.
- BAS, C. 2002.- A reconnaissance of the genus *Pseudobaeospora* in Europe I. *Persoonia* 18: 115-122.
- BAS, C., A. GENNARI & G. ROBICH. 1997.- *Pseudobaeospora pallidifolia* Bas, Gennari et Robich. Una nuova specie dall'Italia. *Rivista di Micologia* 1997: 195-199.
- BAS, C. & L. KRIEGLSTEINER. 1998.- *Pseudobaeospora pyrifer*, a new species found in southern Germany and The Netherlands. *Z. Mykol.* 64: 203-206.
- BAS, C., G. LALLI & G. LONATI. 2002.- *Pseudobaeospora jamonii*, una nuova specie in Italia. *Micol. e Veget. Medit.* 17: 31-35.