BOLETELLUS CATALAUNICUS PÖDER, MORENO, ROCABRUNA ET TABARÉS: A SYNONYM OF *XEROCOMUS RIPARIELLUS* REDEUILH

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ABSTRACT. Based on the results of a careful revision of type material and of a large number of additional collections, *Boletellus catalaunicus* Pöder, Moreno, Rocabruna et Tabarés, is synonymised with *Xerocomus riparíellus* Redeuilh. The considerably high variability of both macroscopic and microscopic characters of this species is illustrated, and its delimitation from similar taxa is discussed.

KEY WORDS: Boletales, *Boletellus catalaunicus*, *Xerocomus riparíellus*, *X. pruinatus*, *Boletus fraternus*, *Boletellus fennicus*, taxonomy.

RESUM. Partint dels resultats d'una revisió acurada del material tipus i d'un gran nombre d'altres recol·leccions, *Boletellus catalaunicus* Pöder, Moreno, Rocabruna et Tabarés es sinonimitza amb *Xerocomus riparíellus* Redeuilh. La variabilitat considerablement alta dels caràcters, tant macroscòpics com microscòpics, d'aquesta espècie és descrita i il·lustrada, i la seva delimitació respecte a altres tàxons propers és concretada y raonada.

RESUMEN: Basandose en los resultados de una profunda revisión del material tipo y de un gran número de otras recolecciones, *Boletellus catalaunicus* Pöder, Moreno, Rocabruna et Tabards debe sinonimizarse con *Xerocomus riparíellus* Redeuilh. Se describe e ilustra la variabilidad considerablemente elevada de los caracteres, tanto macroscópicos, como microscópicos de esta especie y se razona su delimitación con respecto a taxones parecidos.

INTRODUCTION

In the year 1997, two new members of European Boletales with a xerocomoid habitus, *Xerocomus riparíellus* and *Boletellus catalaunicus*, were published independently by REDEUILH (1997) and PÖDER *et al.* (1997). Microscopically, these two species share the fine ornamentation of the spore surface, and macroscopically, the mainly vivid red cap colour. *Xerocomus riparíellus* Redeuilh collected in a humid locality near Paris (France) under *Alnus* and *Quercus*, was published in March 1997 and was recombined into *Boletellus riparíellus* (Redeuilh) Redeuilh, only three months later, in June 1997. *Boletellus catalaunicus* Pöder, Moreno, Rocabruna et Tabarés was published in April 1997. The type material was collected in Catalonia (Spain), in a mixed deciduous forest under hardwoods (*Quercus ilex*, *Castanea sativa*, *Fagus sylvatica*, *Alnus glutinosa*, *Populus* sp. and *Fraxinus* sp.). Almost immediately, the authors of both species entered into a discussion about a probable synonymy of their species. One of the problems they encountered was that *X. riparíellus* is both a microscopically and macroscopically extremely variable species. This assumption was supported by data taken from the extensive collections made by Redeuilh. The structure of the pileipellis in the holotype of *B. riparíellus*, for example, represents with its cylindrical terminal hyphae one extreme of the species variabilty. The type material of *B. catalaunicus* consisted of only two vertical sections from one of two original basidiomata which had been sent to one of the authors together with a colour photograph taken in the field. Three of the five basidiomata portrayed on this

photograph belong to *Xerocomus armeniacus* (Quél.) Quél., while the remaining two represent the holotype of *B. catalaunicus*. Furthermore, half of the scarce type material was lost during the first outgoing herbarium loan. Therefore, a taxonomically promising confrontation of the two taxa has not been possible until 1998, when two of the authors of *B. catalaunicus* (Rocabruna and Tabarés) rediscovered a sufficient number of mature basidiomata (three collections) of this species at the type locality.

METHODS

Microscopic descriptions were made from sections or pieces of tissue taken from dried basidiomata, which were mounted in KOH 3% for spore measurements, in Congo red (saturated watery solution) for pileipellis examination, and in *aqua dest*. for pigment analysis. Spore measurements and size of terminal elements of the pileipellis are given in the form (min.) mean ± standard deviation (max.); Q = length/width quotient, V = approximated volume [sample size (n) for each collection = 31]. Drawings were made from video print images (CCP Color Video Camera Module, Sony Multiscan UP-930).

MATERIAL EXAMINED

Boletellus catalaunicus Pöder et al.:

Spain: Catalonia, Riells de Montseny, among litter on sandy soil under mixed hardwoods (*Quercus ilex* L., *Castanea sativa* Miller, *Fagus sylvatica* L., *Alnus glutinosa*, (L.) Gärtner, *Populus* sp., end *Fraxinus* sp.), 6-10-1994, *leg.* A. Rocabruna & M. Tabarés, det R. Pöder, G. Moreno et A. Rocabruna IB 1994/0617 (Holotype). - *Ibid.*, under *Alnus glutinosa* (L), Gärtner 16-9-1998, *leg.* & *det.* A. Rocabruna & M. Tabards, IB 1998/036.- lbid., 16-9-1998, *leg.* & *det.* A. Rocabruna & M: Tabarés, IB 1998/0361: Ibid, 11-9-1998, *leg.* & *det.* A. Rocabruna, & M. Tabarés, IB 1998/0362.

Boletus fraternus Peck ss 0olbekkink:

Netherlands: Terschelling, diunen W. of Horn, W-slope with *Salix repens* L., 7-9-1994, *leg.* & *det.* Th. Kuyper, WAG 3307. -Terschelling, Bosplaat, "paardewe", with *Salix repens* L.) in grazed dune grassland, 2-9-1992, *leg.* & *det.* Th. Kuyper, WAG 3227. - North Holland, Kartenhoeff, grassy roadside, under *Betula*, 22-09-1983, *leg.* & *det.* G. Oolbekking & W.V. Duin, L 83-23. - Aerdenhout, A.W.D., Naaldenbos, under *Populus* and *Prunus* in humusrijke zandground, 21-9-1983, *leg.* & *det.* W.V. Duin & G. 0olbekkink. L. 102.

Xerocomus riparíellus Redeuilh:

France: La forêt de Rambouillet (Yvelines), rive de l'Étang d'Or, under *Quercus* and *Salix*, 18-9-1995, *leg.* & *det.* G. Redeuilh PC 22541 P (Holotype). - under *Alnus*, *leg.* & *det.* G. Redeuilh, GR 17479.- 21-9-1992, *leg.* SMF, *det.* G. Redeuilh, GR 21189. -near Paris, Forêt Orient, 28-8-1989, *leg.* Mahieu, *det.* G. Redeuilh, GR 19815. - near Paris, Forêt Orient, 20-9-1993, *leg.* Mahieu, *det.* G. Redeuilh, GR 930920. - near Paris, Nouvelle station, 17-9-1995, *leg.* Mahieu, *det.* G. Redeuilh, GR 22465. - near Paris, Étang d'Or, 11-9-1995, *leg.* SMF, *det.* R. Redeuilh, GR 22435. Paris, Bois de Notre Dame, 16-8-1994, *leg.* SMF, *det.* G. Redeuilh GR 21948. - Bords de Loire, 20-10-1991, *leg.* Auclair, *det. det.* G. Redeuilh, GR 20755. - near Paris, Forêt Orient, 30-9-1991, *leg.* Mahieu, *det.* G. Redeuilh, GR20609. - near Paris, in humid locality, 22-9-1998, *leg.* & *det.* G. Redeuilh, IB 1998/0826.

COMPARATION OF ORIGINAL DESCRIPTIONS

The original descriptions of *X. riparíellus* and *B. catalaunicus* differ in fundamental aspects: REDEUILH (1997) based his description of *X. riparíellus* mainly on macromorphologic studies of different collections, whereas PÖDER *et al.* (1997), due to the scarce material, concentrated their research on microscopic features. Both descriptions correspond in the general habitus ("*Pileus 3-7 cm, ad marginem radialiter fissuratus-tesselatus.. Stipes +/- robustus... deorsum attenuatus, sursum poris subconcolor flocculosus, basim versus paulatim rubris floccis ornatus... vel floccis magis magisque vinosis ornatus, interdum usque ad summum subiliter maculatus..*" in *X. riparíellus*, and "*Pileus 25-45 mm latus.. ad marginem subtiliter rimosus-areolatus... Stipe solidus, aequalis vel acutus versus basim, subtiliter pruinosus sub lente, sursum poris concolorus, rubellus vel vinosus versus basim...*" in *B. catalaunicus*). Different descriptions of the context colour follow: in *X. riparíellus,* a striking context colour is described (".. *Caro albida deinde pallida citrina vel*

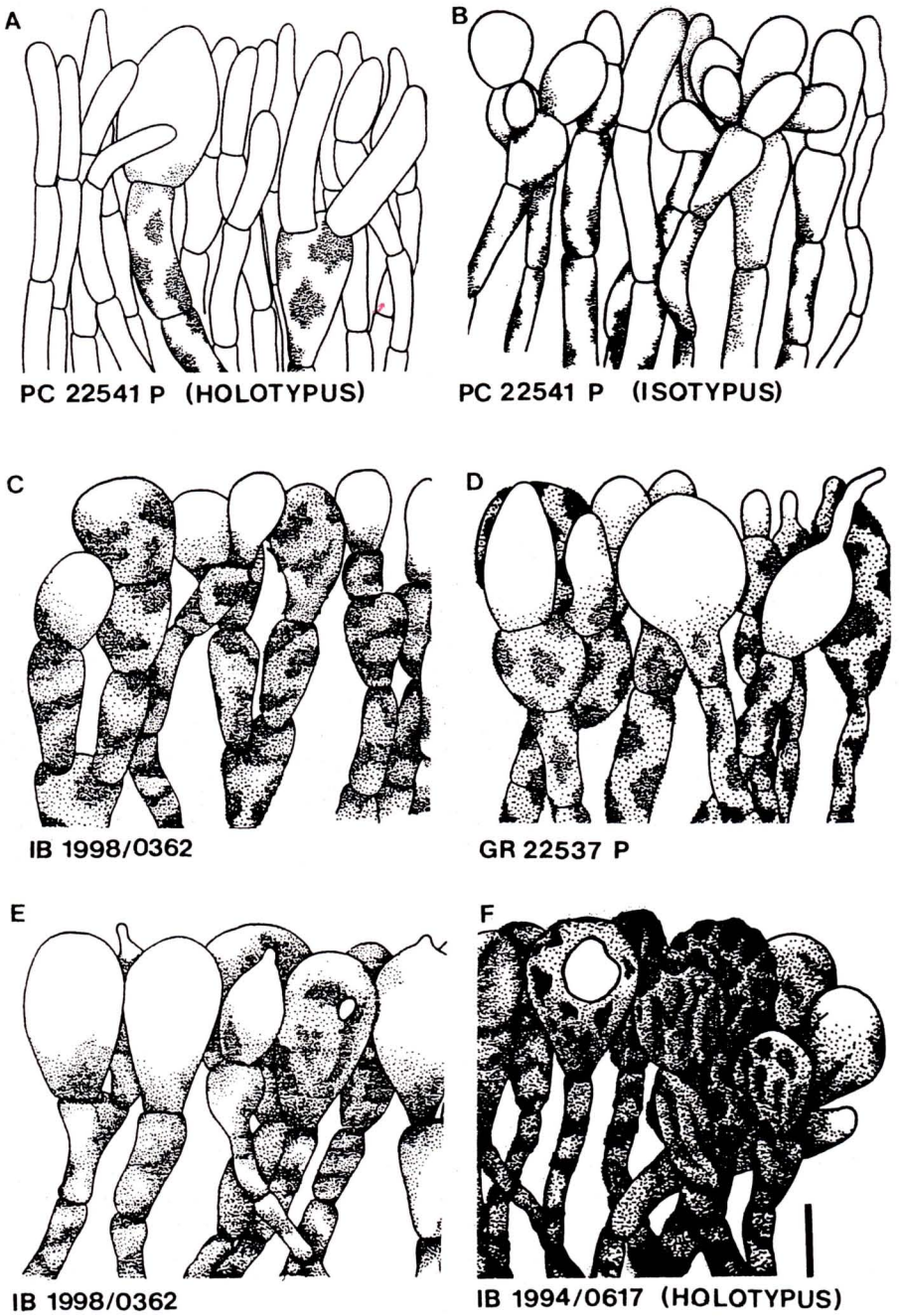

Fig. 1. A-F Transitions from a weakly pigmented trichodermal to heavily incrusted pileipellis structure in *Xerocomus ripariellus*. A) Holotype of *X. ripariellus*. B) Isotype of *X. ripariellus*. C) Topotype of *Boletellus catalaunicus*. D) *X. ripariellus*. E) Topotype of *B. catalaunicus*. F) Holotype of *B. catalaunicus*. (Bar 10 µm)

extrinsecus flava, in sectione cyanescens; basim stipitis versus sordide ochraceo-brunnea, summum versus violaceo-vinoso maculata.."); in *B. catalaunicus,* a yellow context is described *("... Contextus luteus...*"). The description of microscopic characters is rather short for *X. riparíellus*: beside the given spore measurements ((10)-11-14 (16) × (4)-4,5-5-(5,5) pm, Q = 2,6-2,8), the "*suprapellis*" is described as "*trichodermico-subhymeniformis*" with terminal elements mainly 6-15 pm wide, "*subisodiametric*" elements reaching 30-35 µm; hyphae weakly incrusted (compare fig. 1). For *B. catalaunicus,* the spore measurements are given as (12,5) 14,5 ± 0,2 (16,3) × (4,5) 5,0 ± 0,3 (5,8) µm, Q = (2,6) 2,9 ± 0,2 (3,3), volume = 190 ± 30 µm^3 (n = 31) and a fine but distinct longitudinal striation of the spore surface is described and illustrated. More differing from the *X. riparíellus* concept is the description of the pileipellis microstructure of *B. catalaunicus*. There, the pileipellis structure is described as "distinctly epithelioid" with strongly inflated, ovate, broadly pyriform to almost spherical terminal cells measuring (24) 36 ± 9 (54) × (21,5) 26,5 ± 5 (48) µm, Q = (1,1) 1,4 ± 0,2 (1,8) that are often "*heavily incrusted*" (fig. 1, F).

RESULTS AND DISCUSSION OF MICRO- AND MACROSCOPIC STUDIES

Exhaustive microscopic studies on all the available material and the comparison of photographic documentations proved that the types of *X. riparíellus* and *B. catalaunicus* in fact represent two opposite extremes of the macroscopic and microscopic variability of one species. *X. riparíellus* is as highly variable regarding its macroscopic characters (e.g. colour and size of basidiomata) as in its microscopic characters (size and shape of pileipellis elements and their state of pigmentation). The examination and/or measurements of hundreds of terminal pileipellis elements of both taxa resulted in the following average dimensions: (7,2) 29,2 ± 9,6 (63,4) × (4,3) 16,2 ± 6,6 (46,1), Q = (0,58) 2,0 ± 0,9 (7,4), (n = 930). The variability of the pileipellis structure and its transitional stages are illustrated in fig. 1 (A-F). The corresponding spore measurements are: (10,5) 13,3 ± 1,0 (16,8) × (3,8) 4,7 ± 0,3 (5,5), Q = (2,2) 3,6 ± 0,2 (2,9), vol = (85) 151 ± 24,8 (228), (n = 651); no significant differences in size, form, and ornamentation could be observed between the two taxa.

The section *Striatulisporae* (REDEUILH, 1998) includes *X. pruinatus* (Fr.) Quél. and *X. riparíellus*, both with longitudinal striated spores. Macroscopically, this two *Xerocomus* species might be confused. But thick-walled, inflated, and amyloid basidiomatal context hyphae, typical for all forms of *X. pruinatus* (LADURNER & PÖDER, 2000) have never been found in *X. riparíellus*. The recently described species *Boletellus fennicus* Harmaja (HARMAJA, 1998 and 1999) which, very likely, belongs also to the section *Striatulisporae* is characterised by its distinctly truncate spores.

Furthermore, *Boletus fraternus* Peck ss. Oolbekkink has been recognised as a misapplied name for *X. riparíellus*. The type material of *Boletus fraternus* Peck shows completely smooth spores and a different pileipellis structure without inflated terminal elements (compare also KLOFAC & KRISAIGREILHUBER, 1992).

CONCLUSION

The results of exhaustive macro- and micro-morphological studies on authentic collections of *X. riparíellus* and *B. catalaunicus* confirm the synonymy of these two species. Beside a great variation in macroscopic characters, the structures of pileipellis and their pigmentation are also highly variable in different basidiomata. In the course of these studies, no evidence was found that contradicts the conspecifity of *X. riparíellus* and *B. catalaunicus*.

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Xerocomus ripariellus Redeuilh (= *Boletellus catalaunicus*, Holotypus, IB 1994/0617)