

TAXONOMY OF ROYOPORUS PSEUDOBETULINUS COMB. NOV.

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SUMMARY

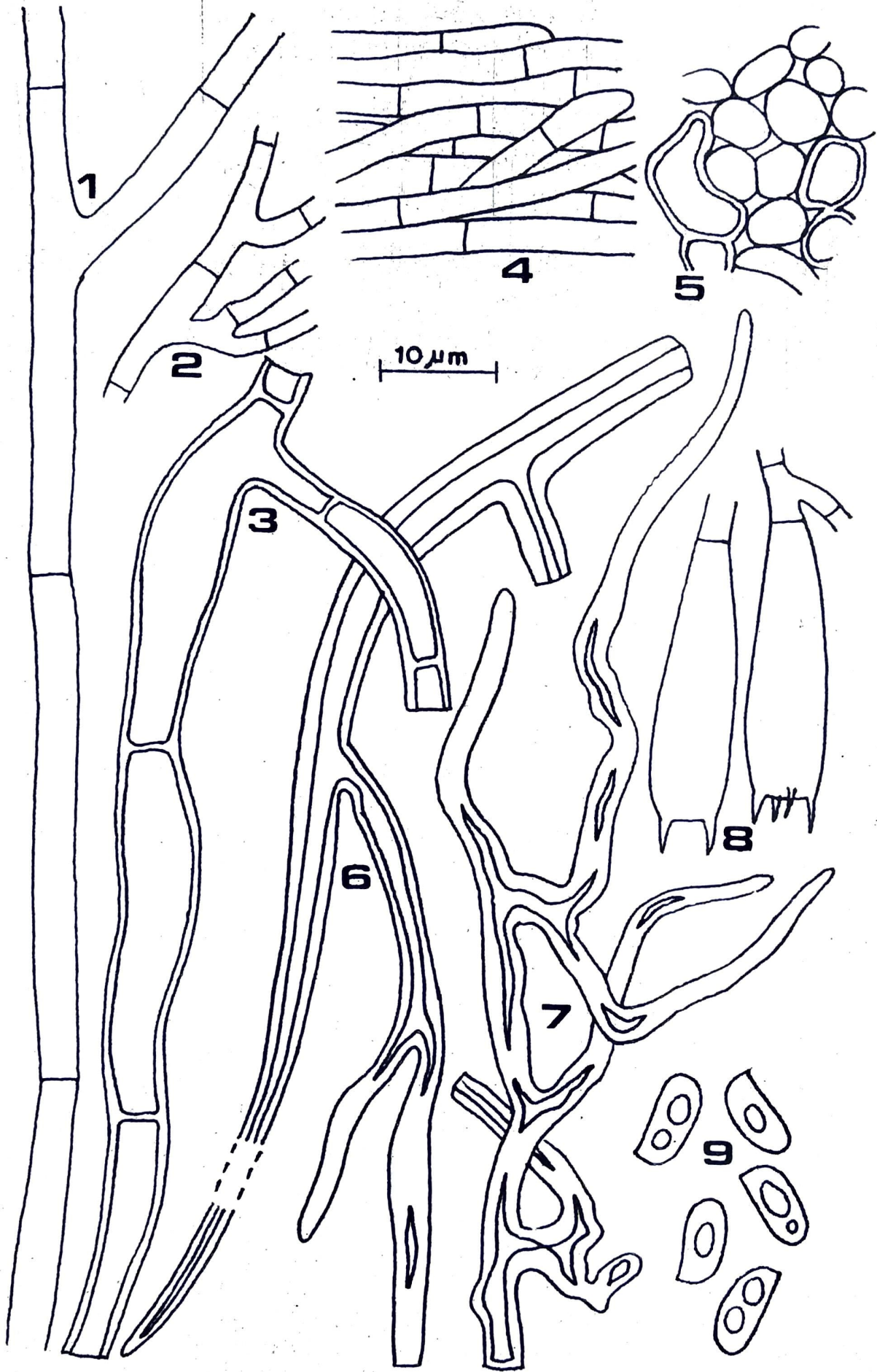
Morphological and anatomical characters of *Polyporus pseudobetulinus* (Murashk. ex Pilat) Thorn, Kotiranta et Niemela have been studied in detail and in the light of these findings the taxonomy of the fungus is discussed. The new combination *Royoporus pseudobetulinus* (Murashk. ex Pilat) De is proposed.

INTRODUCTION

Polyporus pseudobetulinus (Murashk. ex Pilat) Thorn, Kotiranta et Niemela occurs in Austria, Canada, Finland, Sweden (Niemela and Kotiranta 1991, Ryvarde 1978, Thorn *et al.* 1990), Japan and Russia (Nunez and Ryvarde, 1995). In Japan it has been found to grow on *Salix* (Nunez and Ryvarde, 1995) but in other countries it grows only on different species of *Populus* like *Populus tremula* L., *Populus nigra* L. and *Populus balsamifera* L. causing white rot (Thorn *et al.* 1990). The present paper reports the results of detailed studies on the morphological and anatomical characters of *Polyporus pseudobetulinus*. The taxonomy of the species is also discussed in the light of these findings and a new combination of the species in the genus *Royoporus* De is proposed.

MATERIALS AND METHODS

As *P. pseudobetulinus* is not reported to occur in India, sporophores of this fungus were procured from Botanical Museum, University of Helsinki, Finland (TN), and National Mycological Herbarium, Biosystematic Research Institute, Canada (DAOM). Microscopic



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character of the basidiocarps were studied from freehand sections mounted in 10% KOH and stained with 1% cotton blue.

DESCRIPTION OF BASIDIOCARPS

Royoporus pseudobetulinus (Murashk. ex Pilat) De, comb. nov.

Basionym : *Ungulina pseudobetulina* Murashk. ex Pilat, Bull. Soc. Mycol. Fr. 48 : 23, 1932.

= *Piptoporus pseudobetulinus* (Murashk. ex Pilat) Pilat, Atlas des champignons de l'Europe.3 : 123, 1937.

= *Polyporus pseudobetulinus* (Murashk. ex Pilat) Thorn, Kotiranta et Niemela, Mycologia 82(5) : 582, 1990.

Basidiocarp annual, pileate, solitary or imbricate in pairs, attached to the substratum by a narrow base or with a short stipe, pileus at first unguulate, then convex, applanate, semicircular or dimidiate, 4-17 x 5-24 x 1.4-4.5 cm., pulpy to elastic when fresh, coriaceous when dry, upper surface glabrous, azonate with a smooth, thin, peelable, glossy cuticle, cream, pale straw yellow to light brownish, often with some indistinct radial lines and with fine brownish to greyish orange fibrils, becoming areolate. Margin acute to obtuse and incurved. Context white to cream, homogeneous, up to 3 cm thick, fleshy, tough and corky on drying. Hymenial surface white when young, yellowish to orange with age and drying, pores angular, often radially aligned, 1-3 per mm, dissepiments thin, pore tubes up to 10 mm long, white to light yellowish orange.

Hyphal system dimitic. Generative hyphae simple septate, hyaline, usually thin-walled, 2.5-6.0 μm wide, occasionally branched (Fig. 1), in subhymenium very narrow, 1.5-2.5 μm wide and much branched (Fig. 2), in context some slightly thick-walled, infrequently branched and a little inflated, up to 14 μm wide (Fig. 3), on the pileus surface occur

Figs. 1-9. Microscopic structures of *Royoporus pseudobetulinus* (Murashk. ex Pilat) De. 1. Occasionally branched generative hypha. 2. Narrow, much branched generative hypha. 3. Inflated generative hypha. 4. Closely interlaced, short-celled generative hyphae forming skin-like structure. 5. Cuticular cells. 6. Dendritic binding hypha. 7. Much branched binding hypha. 8. Basidia. 9. Basidiospores.

some closely interlaced, thin-walled, short-celled, up to 6 μm wide hyphae forming skin-like structure (Fig. 4) and some thin- to slightly thick-walled pale brown mass of cuticular cells (Fig. 5). Binding hyphae hyaline, dendritic, thick-walled, in the context 3-14 μm wide showing wide lumina and usually tapering to 1-2 μm wide whip-like tips (Fig. 6), in trama much branched, frequently subsolid, 1.5-4.5 μm wide (Fig. 7). Basidia hyaline, thin-walled, clavate, with 2 and 4 sterigmata, 18-40 x 5-7 μm , simple septate at the base (Fig. 8). Basidiospores hyaline, thin-walled, smooth, cylindrical to slightly fusiform, apiculate, non-amyloid, 7-10 x 2.5-3.5 μm , some with one or more guttulae (Fig. 9). Hyphal pegs infrequent.

SPECIMENS EXAMINED : Tervola, Pisavaara Strict Nat. Reserve, Finland, 29.7.1979, Tuomo Niemela and Heikki Kotiranta, TN 1524 and TN 1573. Grey county, Letterbreen, Ontario, Canada, 10.6.1987, R.G. Thorn and L.M. Banks, DAOM 198666. Ottawa-Carleton regional municipality, Hwy. 417 at McGee Sideroad, Ontario, Canada, 19.6.1988, R.G. Thorn, DAOM 198664.

DISCUSSION

The aforesaid description indicates that *P. pseudobetulinus* has a dimittic hyphal system with generative hyphae and binding hyphae and thus agrees with the views held by Nunez and Ryvardeen (1995) and Thorn *et al.* (1990). The species lacks clamp connections. I saw only simple septa on the generative hyphae of *R. pseudobetulinus* and I did not find any clamp at the base of any basidium, i.e., the basidia were simple septate at base. Domanski *et al.* (1967) and Thorn *et al.* (1990) did not observe any clamps in this species and there are no clamps in cultures (Thorn *et al.* 1990, Stalpers 1978). Thus Nunez and Ryvardeen's (1995) report of a clamp connection at the base of basidium may be an error.

This species has been described under *Piptoporus* Karst. (Pilat 1937, Domanski *et al.* 1967) and *Polyporus* Adans. : Fr. (Nunez and Ryvardeen 1995, Thorn *et al.* 1990).

Piptoporus betulinus (Bull. : Fr.) Karst., the type species of the genus *Piptoporus*, causes a brown rot (Gilbertson and Ryvardeen 1987)

whereas *P. pseudobetulinus* causes white rot (Thorn *et al.* 1990). The evolutionary and systematic importance of white rot versus brown rot has been emphasized by Nobles (1971), David (1980), Gilbertson (1980, 1981) and Redhead and Ginns (1985), and is now generally accepted. Therefore, *P. pseudobetulinus* causing white rot can not be congeneric with *P. betulinus* which causes brown rot. Corner's (1984) suggestion that *P. pseudobetulinus* might belong in *Buglossoporus* Kotl. & Pouz. is to be rejected for the same reason.

Presence or absence of clamp connections on generative hyphae is an important character in circumscribing genera (Teixeira 1994 p. 32, De 1996, 1997). Therefore, inclusion of *P. pseudobetulinus* by Thorn *et al.* (1990) in *Polyporus*, a genus characterised by the presence of clamps in all species, can not be agreed upon.

My study revealed that *P. pseudobetulinus* exhibits a combination of characters not found in any other existing genus except *Royoporus* De. Both *Royoporus spathulatus* (Jungh.) De, the type species of the genus *Royoporus* (De 1996), and *P. pseudobetulinus* possess annual, dimidiate, solitary to imbricate, very shortly and laterally stipitate basidiocarps with poroid hymenial surface having angular, radially aligned pores; white context; a dimitic hyphal system with hyaline, simple septate generative hyphae and hyaline binding hyphae; hyaline, smooth, thin-walled cylindrical, non-amyloid basidiospores with one or more guttulae and cause white rot of angiospermic wood. So many features in common suggest a close relationship between *R. spathulatus* and *P. pseudobetulinus*.

But there are some differences between *R. spathulatus* and *P. pseudobetulinus*. *P. pseudobetulinus* possesses cream, pale straw yellow to light brownish, smooth, glossy, thin, peelable cuticle at the pileus surface but such cuticle is absent in *R. spathulatus*. Besides, basidiocarps of *P. pseudobetulinus* are relatively larger and thicker than those of *R. spathulatus*. But these exomorphological differences may be considered important only at the species level.

Therefore, it is concluded that *P. pseudobetulinus* and *R. spathulatus* are congeneric, and the transfer is proposed above.

ACKNOWLEDGEMENT

I am greatly indebted to Dr. J. Ginns, National Mycological Herbarium of Canada, for critically reviewing the manuscript. I am also indebted to the Curator, National Mycological Herbarium, Biosystematic Research Institute, Canada (DAOM) and to Dr. Tuomo Niemela, Botanical Museum, University of Helsinki, Finland (TN) for providing me with the specimens for study.

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