

SOME INTERESTING MACROMYCETES AND
THEIR DISTRIBUTION IN JUGOSLAVIA

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During recent years, greater attention has been paid to the higher fungi in our country than previously. A rich collection was made by V. Lindtner and forms part of the herbarium of the Natural History Museum (Prirodnjački muzej) in Beograd (BEO), which his sudden death in 1965 unfortunately prevented him from arranging and publishing the more interesting records. In addition to some other workers we are continuing those mycological investigations and are preparing material for a fungus flora of our country. On comparing our results, we noticed that both of us have collected a number of very interesting species in our respective regions of Croatia and Serbia, which are usually reported in the literature as rare. Some of them were not known previously from Jugoslavia. In some cases, specimens had already been collected by Lindtner from the same or other localities, which will be published jointly with our finds.

This paper deals with three species, one belonging to the family *Bondarzewiaceae* and two to the family *Polyporaceae*. All are of striking appearance and rather easily indentified. As only one species was mentioned in our earlier literature, it seems that they are really rare. The localities are shown on the map (Fig. 1).

We express our thanks to the Natural History Museum of Beograd for allowing us to examine Lindtner's collections, and to Mr. J. T. Palmer, Great Britain, for the correction of the English text.

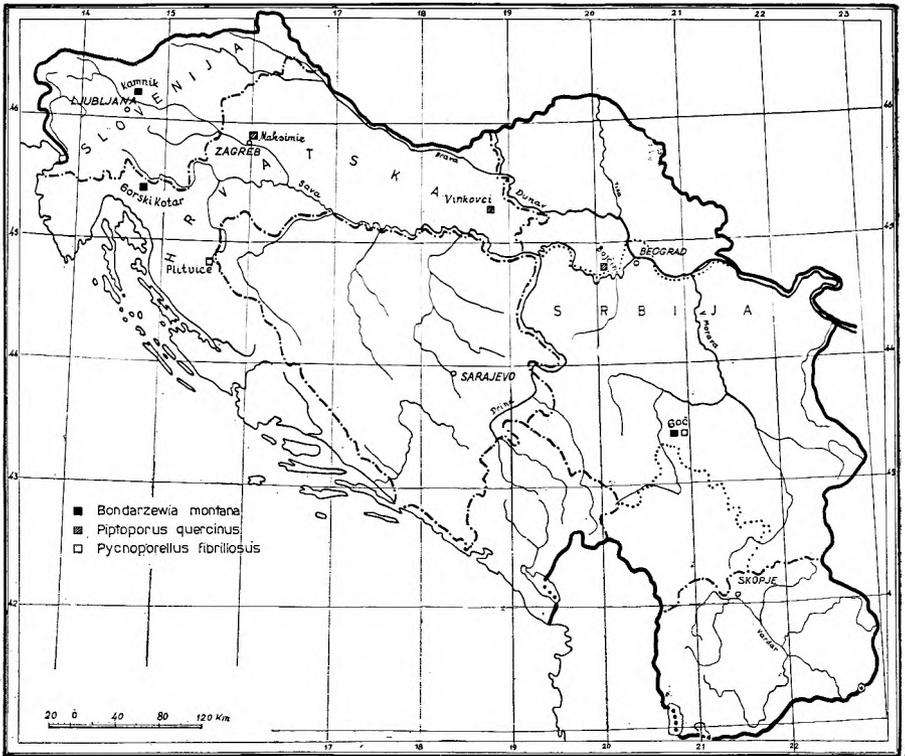


Fig. 1

Map of the localities in Yugoslavia of *Bondarzewia montana*, *Piptoporus quercinus* and *Pycnoporellus fibrillosus*.

Bondarzewiaceae

Bondarzewia montana (Quél.) Sing. This species is similar to *Meripilus giganteus* (Pers. ex Fr.) P. Karst., which were both placed by Pilát (1936—42) in the genus *Grifola*. However, as the first species is characterized by spores which differ very much from those of other *Polyporaceae*, being ornamented with amyloid warts and crests, it was separated by Singer in the genus *Bondarzewia*. Kotlaba and Pouzar (1957) erected for this genus the family *Bondarzewiaceae*, in which they also included *Amylaria* and *Hericium*. However, Donk (1964) considers the last genus as belonging to the special family *Hericiaceae*, while the position of *Amylaria* is still provisional.

Three species of the genus *Bondarzewia* are recognized, of which *B. montana* is the only one found in Europe. It grows mostly on *Abies* as a parasite or saprophyte. The fruitbodies develop at the bases of living trees, on stumps or apparently from the soil, when connected with roots. They are composed of 5—15 fan-like segments, forming a rosette, the diameter of which can reach 50 cm, and the weight 10 kgs. The upper surface is light brown and has ingrown fibrils. The tubes are whitish, up to 1 cm long, and the pores are 0,5—2,5 mm in diameter, in older fruitbodies somewhat labyrinthiform. Trama is white, tough, its taste is mild, but that of the hymenophore is very acrid. Spores subglobose, hyaline, with ornamentation turning dark blue in Melzer's reagent; measured with warts 6,5—7(7,5) x 7—8,5 μ (Fig. 2).

This rather rare species is known from Bulgaria, Czechoslovakia, France, Germany, Poland, Switzerland, USSR (Transcarpathian Ukraine and Caucasus), and was found also in Japan. It grows mostly at higher altitudes, as its name indicates, but can occasionally be found in the lowlands. Pilát (1965) reports its occurrence in a park in Prague. Although bound mostly to *Abies*, it has also been noted on *Picea* and *Tsuga* (Kreisel 1961, Jahn 1963).

The first published locality of this species in Yugoslavia was the Risnjak National Park in Croatia (Tortić 1966), where the first author collected it in several places, in a direct line only 2—4 kms apart, on 1 and 25 X 1962, 27 VII and 17 X 1963. They grew at the bases of living fir trees, on stumps and soil, at an altitude of 700—1000 m, in the beech and fir forest (*Fagetum croaticum abietetosum*) and fir forest with the hard fern (*Blechno-Abietetum*). The largest specimen measured (in the dried state) 15 cm in diameter and about the same in height.

In BEO, there exists a specimen collected and identified by V. Lindtner on 27 VIII 1960 near Kamnik in Slovenia, with dimensions similar to the above. Although it is stated that it grew "in Piceetis, ad trunco putrido", there are numerous *Abies* needles on the specimen and, as the fir is also abundant in those parts, it is probable that the stump belonged to *Abies*. The altitude cannot be ascertained, as the locality was not given precisely, but Kamnik is situated at about 400 m, and high mountains, exceeding 2000 m, occur quite near. According to the date, this would be the first find of *Bondarzewia* in our country, but it was never published (Table 1).

In Serbia, we jointly collected this species on 9 X 1967 on mountain Goč, near the small river Prerovska reka, at an altitude of about 1000—1100 m. The forest on this mountain consists of beech and fir (*Abieto-Fagetum serbicum*). Three specimens were growing at the base of living fir trees. The largest of them, which is now in the herbarium of the Botanical institute (Botanički zavod) of the Natural History faculty in Beograd, measures (in dried state) 35 cm in diameter and 25 cm in height, and now weighs 1.85 kg. In the fresh state, it was, of course, bigger, and its weight would have been about 7—8 kgs. In the following year, on 17 XI 1968, the second author found two additional specimens, but in poor conditions, at the base of a fir stump.*

* While the paper was in press, we received from S. Hočevar, forestry phytopathologist in Ljubljana, a large specimen, which she had collected 21 VIII 1967 on m. Pohorje, at the locality called Osankarica (1110 m). The specimen grew in the crotch of two living fir trees joined at the base, and was identified by the first author. Unfortunately it was too late to put the locality, which is situated in a direct line about 60—70 kms NE from the other Slovenian one (Kamnik), on the map.

The ecological conditions for the development of *Bondarzewia* are quite good in our country, since fir forests, pure or mixed with beech or other trees, occur on many of our mountains. Without doubt, other localities of this species will in time be found, although it may not be common.

Polyporaceae

Piptoporus quercinus (Schrad. ex Fr.) Pilát (*Buglossoporus quercinus* (Schrad. ex Fr.) Kotl. et Pouz.) is characteristic for oaks. The carpophores usually develop in hollow trunks of living trees, mostly at the base, rarely at any height from the ground. It can be found also on dead wood and timber, occasionally even in mines where it forms monstrous fruitbodies. Its habit and way of life is rather similar to that of *Fistulina hepatica*. Kotlaba and Pouzar (1966) are of the opinion that there are considerable differences between this and other species of the genus *Piptoporus*, and they therefore placed it in a separate genus, *Buglossoporus*.

The fruitbody varies from lighter to darker brown, is semicircular or elongated, 5—20 cm, and is narrowed into a stipe. It is covered with a thin, at first finely pubescent skin, which can be peeled off from the fresh fruitbody. The tubes are 1—5 mm long, and the pores small, 0,3—0,5 mm, at first white, but turning rusty brown on touching or with age. The trama is much thicker than the tubes, and measured 1—1,5 cm in our specimens, but is given in the literature as 2—5 cm. It is white, soft, later somewhat corky and turns slightly brown on cutting. The spores are hyaline, ellipsoid, and measure (6,5) 7—8,5 x 3—3,5(4) μ in specimens from Zagreb (Fig. 3), but (6,5) 7—10(11) x (3)3,5—4 μ in those from Bojčín.

P. quercinus has been reported for Austria, Czechoslovakia (18 localities), Denmark, France, Germany, Great Britain, Sweden and some parts of the European USSR; in Asia it has only been found in the Caucasus. It is rare in all those regions.

It was first described for the territory of modern Jugoslavia by Schulzer (Kalchbrenner et Schulzer 1873—77) from a locality near the town Vinkovci (altitude 90 m) where it grew in hollows of old oaks, under the name of *Polyporus cadaverinus* Schulzer, which refers to the horrible smell of the fruitbody: "odor Phalli impudici... per decenniam persistens". Other authors report only a sourish taste and smell. In his second manuscript, which, unpublished, is preserved in the University library, Zagreb, he redescribed the fungus (no. 1274), mentioning that it was already published and gave the same coloured figure, but used the new name of *Polyporus phalliodorus*.

Pilát (1936—42) and also Kotlaba and Pouzar (1966), cite *Polyporus flabellatus*, described by Schulzer and Bresadola (1885) as a probable synonym of this species, but with a question mark. The coloured figure of *P. flabellatus*, which is to be found in the same manuscript (no. 645), does not show much similarity with *P. quercinus*, but it would be necessary to study the description carefully to arrive at a definitive conclusion.

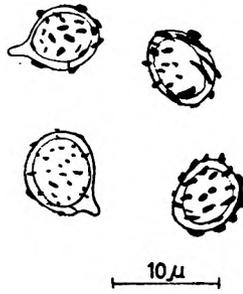


Fig. 2
Spores of *Bondarzewia montana*



Fig. 3
Spores of *Piptoporus quercinus* from Zagreb

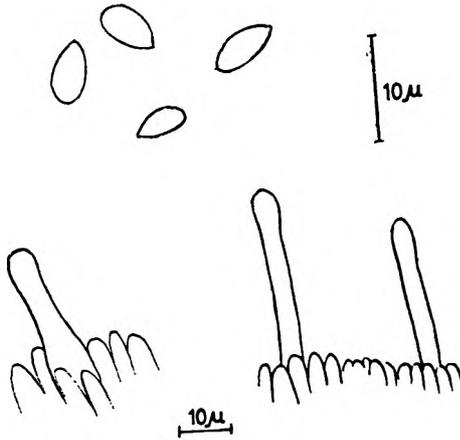


Fig. 4
Spores and cystidia of *Pycnoporellus fibrillosus*

In BEO there are four specimens from Bojčin near Progar (about 40 km W of Beograd; the altitude is 80 m). They were collected and identified by Lindtner, two on 28 VII 1957 "ad truncos *Quercus pedunculatae*", and two on 14 VIII 1959 — perhaps from the same trees. The largest specimen is now 11 cm long (with stipe) and 8,5 cm broad. The tubes are short in all the specimens, 3—4 mm (Table 2 a)

The fungus was also found in Maksimir park (altitude 130 m) in Zagreb on 20 IX 1962 by Z. Majcen on the base of a living *Quercus sessiliflora*, while collecting with the first author, and was identified later by Lindtner (Tortić 1968). The identification in this case was rendered difficult by the fruitbody being considerably deformed. Nearly two thirds of the length (the total is now 18 cm) consisted of a broad (up to 6 cm) stipe, from which arose two or three flabellate segments with 1—2 mm long tubes. The specimen, which is cut and broken into several parts, is preserved in ZA.

This species grows mostly on old oaks, which are now rather rare even in countries such as ours, where there still exist large oak forests. It ought, therefore, to be sought mainly in parks and nature reserves.

Pycnoporellus fibrillosus (P. Karst.) Mur. A very striking species of a vivid orange colour. The trama turns carmine red with KOH. It grows as a saprophyte on coniferous wood, more often on *Picea* than on *Abies*, but has exceptionally been found also on hardwoods.

The fruitbodies are sessile, imbricate, fibrillose on the upper surface, but sometimes quite resupinate, 3—5—10 cm in diameter. The trama is of a lighter orange colour, rather thin, 2—5 mm, according to the literature up to 2,5 cm. The tubes are 3—7 mm long, and the pores 0,5—1 mm in diameter, at first irregularly round, later sometimes torn, almost irpexoid. Cystidia not very numerous, thin-walled; in our specimens 4,5—6 μ broad and protruding beyond the hymenium up to 40 μ . Spores hyaline, ellipsoid, 5—6,5(7) x (2,5)3—3,5(4) μ (Fig. 4).

P. fibrillosus is a circumpolar species and is found mostly in mountain forests. It is known in Europe from Austria, Czechoslovakia, Finland, Poland, Sweden and the USSR; it is rare in all those parts except in the mountains of the Transcarpathian Ukraine. In northern Asia, it is also not common; it is more frequent in North America, and there it was found, not only on conifers, but also on broadleaved trees.

Only two localities of this species, which are published here for the first time, are now known in Yugoslavia. The first author collected a large specimen (about 10 cm in diameter) on 21 VII 1963 on a small wooden bridge close to one of the Plitvice Lakes (Prošćansko jezero) near Plitvički Ljeskovac, at about 700 m altitude. The bridge was made of coniferous wood, most probably *Abies*. The fresh specimen had a distinct smell of celery, which is not noted in the literature; it is now preserved in ZA (Table 2 b, 1 and 2). The second author found this species on Goč, at the same locality as *Bondarzewia*, on 10 VIII 1968, where there were a number

Table 1

Bondarzewia montana (Quél.) Sing. Fruitbody from above and detail of spores. Kamnik, 27. VIII 1960. L. et d. V. Lindtner. (Photo M. Jelić.)

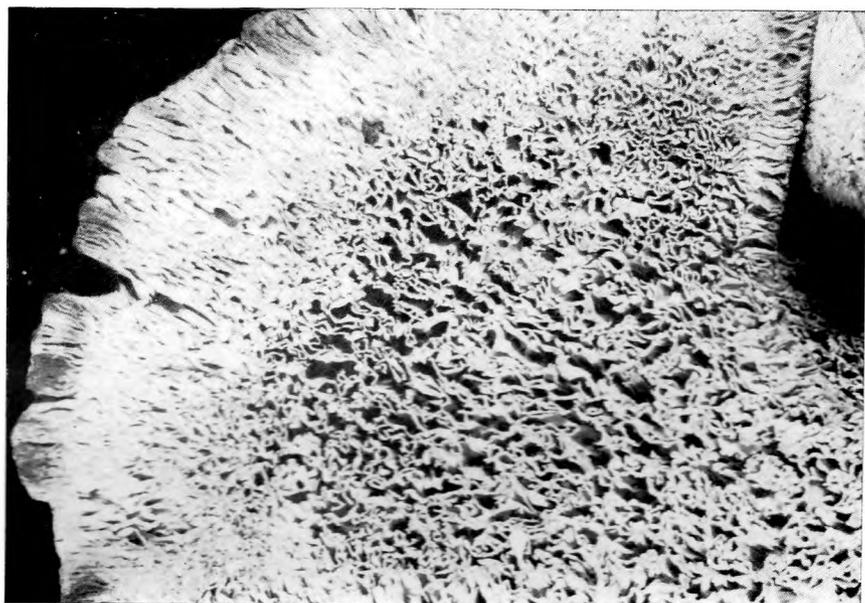
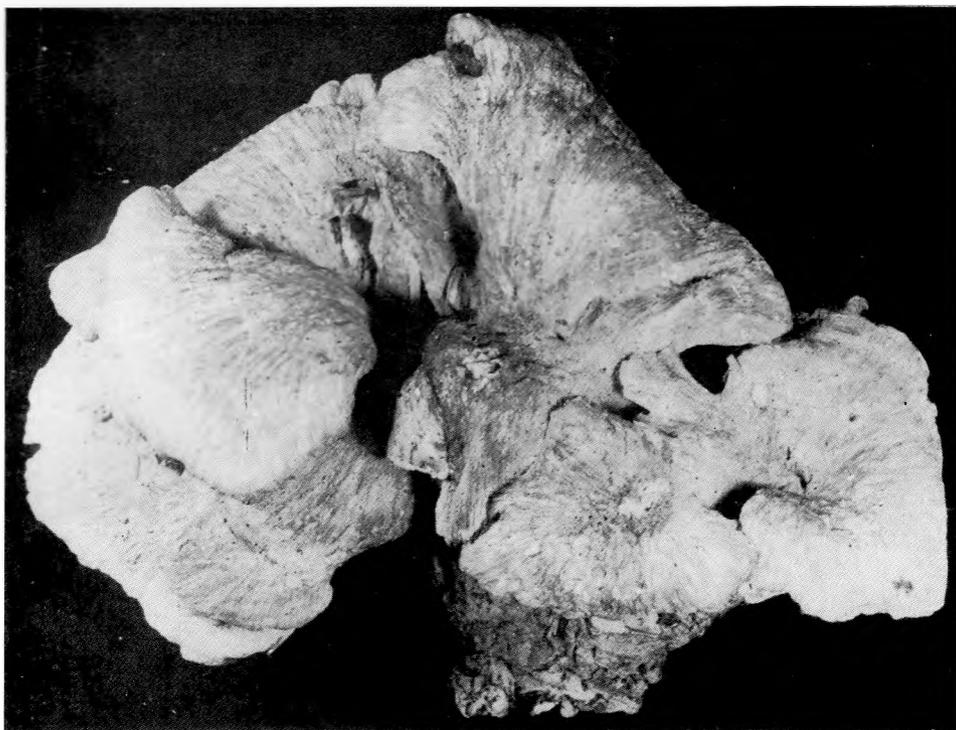


TABLE 2a

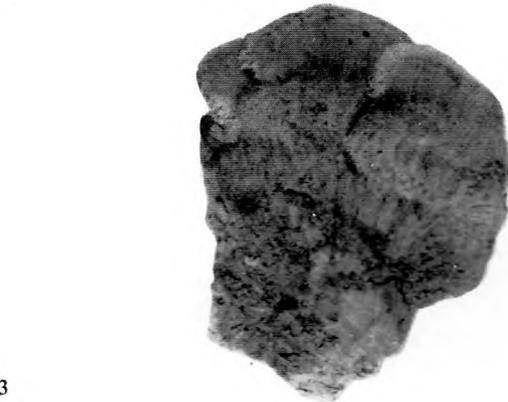
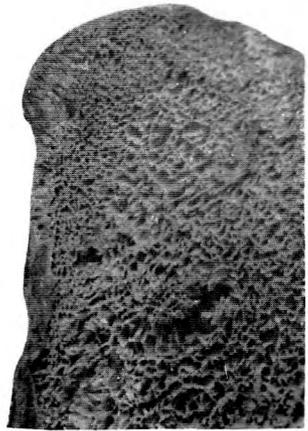
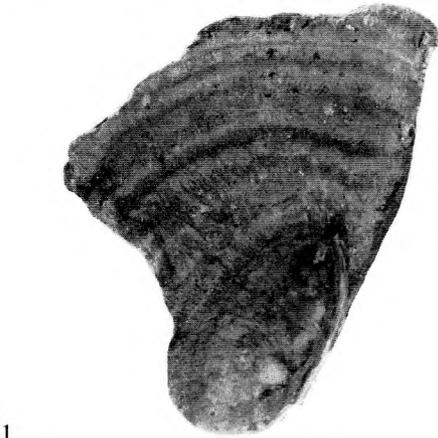
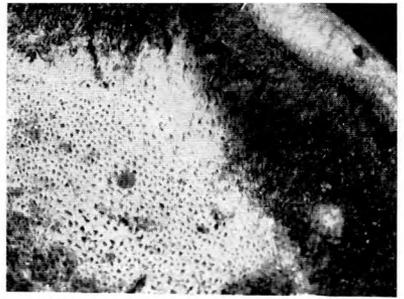
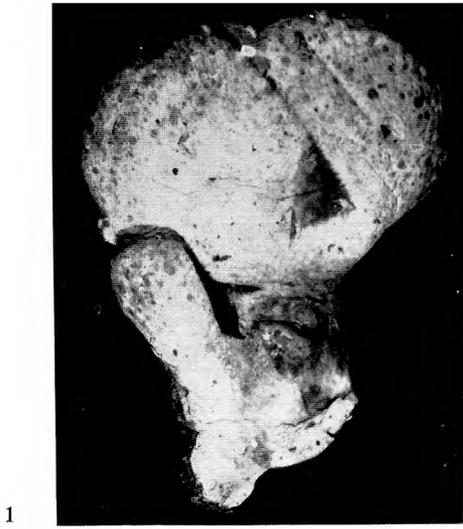


TABLE 2b

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1

2

3

4

of specimens, up to 5 cm in diameter, some of them resupinate, growing on *Abies* logs; they are preserved in the herbarium of the Botanical Institute of the Natural History faculty in Beograd (Table 2 b, 3 and 4).

Several specimens, also from Goč, but from another locality not far from the above, are in herb. BEO. They were collected by Lindtner in the second half of July 1950 (the date is 12—30 VII), who identified them tentatively as *Trametes carnea*, but apparently did not reach a definite conclusion, since the name is written in pencil. The biggest specimen is about 10 cm in diameter. They agree macroscopically and microscopically with ours.

It is very probable that these localities are not the only ones in Jugoslavia, and this species should also be sought, especially in *Picea* forests.

Summary

The distribution in Jugoslavia of *Bondarzewia montana*, *Piptoporus quercinus* and *Pycnoporellus fibrillosus* is presented. Only two or three localities of each species are so far known, as shown on the map. However, since the ecological conditions favourable for their development exist also in many other parts of the country, there is a great probability that they will be found elsewhere, although they may be rare. *P. quercinus* was already noted in the last century, but the other two species have only been recently collected; *B. montana* was published in 1966 while this is the first report of *P. fibrillosus*.

Table 2 a

Piptoporus quercinus (Schrad. ex Fr.) Pilát. 1 Fruitbody from above, 2 Detail of the pores, 3 Cross-section of the fruitbody, Bojčin 28. VII 1957. and 14. VIII 1959. L. et d. V. Lindtner. (Photo M. Jelić.)

Table 2 b

Pycnoporellus fibrillosus (P. Karst.) Mur. 1 Fruitbody from above, 2 Detail of the pores, Plitvički Ljeskovac 21. VII 1963. L. et d. M. Tortić, 3 and 4 A fruitbody from above and below, Goč 10. VIII 1968. L. et d. M. Jelić. (Photo M. Jelić.)

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S A D R Ź A J

NEKI ZANIMLJIVI MAKROMICETI I NJIHOVO RASPROSTRANJENJE U JUGOSLAVIJI

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Prikazano je rasprostranjenje vrsta *Bondarzewia montana*, *Piptoporus quercinus* i *Pycnoporellus fibrillosus* u Jugoslaviji. Na karti se vidi da su dosad poznata samo po dva ili tri lokaliteta od svake vrste. Kako su, međutim, i u mnogim drugim dijelovima naše zemlje ekološki faktori povoljni za njihov razvitak, vjerojatno je da će se naći i drugdje, iako su po svojoj prilici i kod nas rijetke. *P. quercinus* je jedini zabilježen još u prošlom stoljeću; ostale dvije vrste su ustanovljene tek nedavno, pa je *B. montana* publicirana tek 1966, a *P. fibrillosus* se ovdje navodi prvi puta. O *B. montana* vidi i bilješku na str. 381.