

## A HANDFUL OF POLYPORES, RARE OR NOT PREVIOUSLY PUBLISHED FROM JUGOSLAVIA

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Received September 9, 1975

The mycoflora of Yugoslavia is very far from being thoroughly investigated. Species not recorded for this country up to now are being continually discovered by Yugoslav investigators as well as by foreign visitors (this is also the case of the second author). The authors present here 22 species of polypores either not published for Yugoslavia at all, or, if mentioned in earlier works, without exsiccates because of which they could not be checked. Four, published earlier, are repeated with additional localities. The fungi were collected separately by either author (a few by other collectors) and the material was in most cases revised by both of them. Included are four species published by Pilát and Lindtner (1938) under incorrect names, the exsiccates of which were revised by F. Kotlaba and Z. Pouzar, and three of which were recently also found in other localities.

Many of the species presented here were noted in only one or two localities. This, of course, does not mean that they are all that rare, and it may be safely assumed that at least some will be found again.

Several species were collected in dense natural forests on the mountains of Šara, Kopaonik, Korab etc., or in forests with a primeval character, like those in the Plitvice National Park and Sutjeska National Park (the last includes the famous primeval forest »Peručica«). Others, however, were found not only in cultivated forests, but also near human habitations, in coppices, villages, parks and on solitary planted living trees in towns.

The species are arranged alphabetically according to their modern generic names. Their most prominent features will be given for the rare or little known polypores, or the characters not found in the current literature, or those which are necessary for comparison with a related species will be indicated.

*Amyloporia crassa* (P. Karst.) Bond. et Sing. ex Sing. = *Poria crassa* (P. Karst.) Sacc. grows mostly in mountain forests on dead wood of conifers in Europe and North America. It was cited for some Yugoslav coal mines by Šarić (1957) as *Poria crassa* on coniferous wood. No exsiccates, however, exist to be checked, so that the only localities backed by voucher specimens are as follows: 1) »Dragoš Sedlo« in the Perućica primeval forest (beech and fir forest) on the slopes of the mountain Maglič in Sutjeska National Park near Tjentište (SE Bosna and Hercegovina), alt. about 1300—1400 m, on a lying trunk of *Picea abies*, 20. VI 1972, leg. M. Tortić, det. Z. Pouzar (PRM 771264, ZA). — 2) »Babin Potok« in the Plitvice National Park (north of Titova Korenica, SE Croatia), alt. 800—900 m, pine forest (Helleboro-Pinetum) with admixed spruce, on prostrate *Picea abies* logs, 8. VIII 1973, leg. M. and S. Tortić, det. M. Tortić (ZA). — 3) »Čorkova uvala« in Plitvice National Park, beech and fir forest (Abieti-Fagetum), alt. 1000 m, on a stump of *Picea abies*, 2. V 1975, leg. M. and S. Tortić, det. M. Tortić (ZA). The third locality is less than 10 km away from the second in a straight line, although more than 15 km by road. (Fig. 1).

No doubt this species will be found in other localities with similar ecological factors, which are not rare in the Yugoslav mountains.

The context in *A. crassa* is chalky-granular, bitter, and the skeletal hyphae are slightly to rather strongly amyloid. They swell and dissolve in  $\text{NH}_4\text{OH}$  and  $\text{KOH}$  solutions. In the hymenium acute fusoid cystidia are abundantly present.

*Amyloporia xantha* (Fr. ex Fr.) Bond. et Sing. ex Sing. = *Poria xantha* (Fr. ex Fr.) Cooke was found in Yugoslavia in two localities: 1) »Babin Potok« in the Plitvice National Park, in forests of *Pinus sylvestris* (Helleboro-Pinetum) and *Picea abies* (Piceetum dolomiticum), alt. 800—900 m, on dead prostrate logs, and, in one instance, on a wounded living trunk of *Pinus sylvestris*, 12. X 1972, 8. VIII 1973 and 3. V 1975, leg. M. and S. Tortić, det. M. Tortić (ZA). It is apparently frequent in this locality on pine wood, particularly in the pine forest. — 2) »Kajmakčalan« mountain (SE of Bitola in S Macedonia, on the boundary with Greece), alt. unknown, on (dead?) wood of *Pinus sylvestris*, 1. X 1972, leg. V. Papazov, det. M. Tortić (ZA). The localities are far apart and it can be expected that the species will also be found somewhere in between too. (Fig. 1). The pores in all Yugoslav specimens were whitish or pale yellowish, although in this species they are usually a vivid yellow; the mycelium under the bark, was, however, bright yellow in two specimens. It is cited in the literature as occurring on both conifers and broad-leaved trees, but in Yugoslavia it was found solely on pine wood.

Although *A. xantha* and *A. crassa* are placed for the present by many authors in the same genus, they show some significant differences in addition to certain similarities. The context in *A. xantha* is chalky-granular and of a bitter taste (as is also that in *A. crassa*), but the skeletal hyphae are often strongly amyloid and do not dissolve in  $\text{NH}_4\text{OH}$  and  $\text{KOH}$  solutions. The shape and size of the spores in these two species is also very different. A thorough study is needed which would probably show that they are not so closely related as is now considered and that they belong perhaps even to different genera.

*Chaetoporus collabens* (Fr.) Pouz. = *Poria rixosa* (P. Karst.) P. Karst. is a generally rare species, which is known at present in Jugoslavia from only one locality: »Čorkova uvala« in the Plitvice National Park, alt. 1000 m, on a prostrate rotten trunk of probably *Abies alba* (too rotten for exact determination), 4. XI 1973, leg. M. and S. Tortić, det. M. Tortić (ZA). (Fig. 1). Although there was plenty of material, it was sterile. The colour of the pores, however, reminiscent of cocoa, and the characteristic long, thick-walled, heavily incrustated cystidia made it easily recognisable. The skeletal hyphae of this polypore are cyanophilous (Pouzar 1967).

*Chaetoporus nitidus* (Pers. ex Fr.) Donk = *Poria eupora* (P. Karst.) P. Karst. has been reported for Jugoslavia only by Šarić (1957) from some coal mines under the name of *Poria eupora*, but no exsiccates exist. In addition, its occurrence in mines is not cited elsewhere in the literature. The only localities with voucher specimens are the following: 1) »Ljuboten« in Sar Planina mountain (NW of Skopje, on the border between Serbia and Macedonia), alt. 1500—1800 m, on wood of *Fagus cf. moesiaca*, VII 1937, leg. A. Pilát and V. Lindtner, det. A. Pilát as *Poria gilvescens* (PRM 489384). It was published as *Poria gilvescens* on *Fagus silvatica* by Pilát and Lindtner (1938) and by Pilát (1936—42), but later revision by F. Kotlaba and Z. Pouzar showed that this specimen represented *Ch. nitidus*. — 2) »Tjentište« in the Sutjeska National Park, lower slopes of the mountain Maglič (SE Bosna and Hercegovina), alt. ca 800 m, oak forest (*Quercus petraea*, *Q. pubescens*), on a piece of oak wood, 21. VI 1972, leg. et det. M. Tortić, rev. Z. Pouzar (ZA). — 3) Near Petrinja (about 60 km south of Zagreb), alt. about 100 m, oak forest, on a fallen branch of *Quercus robur*, 19. VIII 1973, leg. et det. M. Tortić (ZA). (Fig. 1).

As the localities are far apart, we can conclude that this species is surely more widely distributed and further finds can, therefore, be expected.

*Dichomitus campestris* (Quél.) Domañ. = *Trametes campestris* Quél. is generally not an excessively rare species, but was up to now unknown in Jugoslavia. The authors each found it in two different localities: 1) At the »Kozjak« lake in the National Park Plitvice, alt. 600 m, on a dead branch of *Corylus avellana*, 2. VIII 1966, leg. F. Kotlaba, det. Z. Pouzar and F. Kotlaba (PRM 770391). — 2) Between Starigrad-Paklenica and Seline (near Zadar, S Croatia), at the sea-coast highway, alt. 15—20 m on a dead branch of *Quercus pubescens* which was still attached to the tree, 31. VII 1966 (PRM 770404) and 11. VII 1968 (PRM 770408), leg. et det. F. Kotlaba. — 3) »Žumberačko gorje« mountains, valley of the brook Bregana (about 50 km W from Zagreb), alt. about 300 m, on a stump and a dead branch attached to the living tree of *Quercus cerris*, 17. VII 1974, leg. M. and S. Tortić, det. M. Tortić (ZA). — 4) »Varoško Rebro« in Medvednica mountain north of Zagreb, alt. about 350 m, oak forest, on fallen branch of *Quercus* sp. (*Q. petraea* or *Q. pubescens*), 19. II 1975, leg. M. and S. Tortić, det. M. Tortić (ZA). (Fig. 2).

This species is characterized macroscopically by always having quite resupinate fruitbodies, which turn brown to nearly black when old, and microscopically by the dendritically branched skeletal hyphae. The fruitbodies are rather inconspicuous and apparently occur singly or as a few and rather small specimens. It has, therefore, to be specially sought, and this may be the reason that it was not found earlier. The authors think it is probably not very rare in Jugoslavia so that further finds can be expected.

*Gloeoporus pannocinctus* (Romell) J. Erikss. = *Leptoporus žameriensis* Pil. is another rare species in Yugoslavia, published first by Pilát and Lindtner (1938) as *Poria bourdotii* Pil. and by Pilát (1936—1942) as *Leptoporus bourdotii* (Pil.) Pil. A detailed description was given according to the specimens found in two places on the Šar Planina mountain near Skopje (»Crni Kamen«, alt. 1100 m and »Ljuboten«, alt. 1500—1800 m), which were growing on *Fagus* cf. *moesiaca* (cited as *F. sylvatica*). They were revised by F. Kotlaba and Z. Pouzar (1964) and cited under the name of *Tyromyces pannocinctus* (Romell) Kotl. et Pouz. This find is repeated here because, for a long time, it was the first and only one for Yugoslavia. However, two additional localities were recently established: — 2) »Čorkova uvala« in the Plitvice National Park, on a fallen trunk of *Fagus sylvatica*, where it covered the bark as well as the hymenophore of a dead *Fomes fomentarius*, which grew on the same trunk. The specimen was collected on 4. XI 1973 by M. and S. Tortić, determined by M. Tortić and revised by F. Kotlaba and Z. Pouzar (ZA, PRM 770405). In the fresh state, it had an intensive, unpleasant smell. The fruitbody was yellowish-greenish, in some places with red spots, becoming partially yellow and brown on drying. It was abundantly fertile. — 3) »Južni Kučaj« mountains near Cuprija at Ravna Reka (E Serbia), alt. 850 m, on rotten wood of *Fagus* sp., leg. V. Lindtner 22—30. IX 1947, det. M. Tortić VII 1975, (BEO 2715). (Fig. 2).

Further investigations will very probably establish this species in more localities with similar ecological factors.

*Inonotus polymorphus* (Rostk.) Pil. s. Bourd. et L. Maire was published for Yugoslavia by Pilát (1937) as *I. nodulosus* (Fr.) P. Karst., since he considered these two species as conspecific. Recent investigations showed that both fungi, which are no doubt different, are rather wide spread in Yugoslavia, sometimes occurring even on the same locality. The localities known at present for *I. polymorphus* in this country are as follows: 1) »Štirovica-Torbeški most« on the mountain Korab (W of Gostivar in W Macedonia, at the boundary with Albania) alt. about 1500 m, on *Fagus* cf. *moesiaca* (stated as *F. sylvatica*), 15. VIII 1936, leg. V. Lindtner, det. A. Pilát as *I. nodulosus* (Pilát 1937), rev. Z. Pouzar and F. Kotlaba (BEO herb. Lindtner 2114, PRM 29416). — 2) Above the village »Vitanje« on the Pohorje mountain (SW of Maribor, N Slovenia), alt. unknown, September (probably 1934), leg. et det. F. Dolšak as *Poria contigua*, rev. M. Tortić, F. Kotlaba and Z. Pouzar (LJUM). — 3) »Areh« on the Pohorje mountain, alt. 1250 m, on dead branches of beech still attached to the tree, 2. III 1975, leg. M. and S. Tortić, det. M. Tortić (ZA). This locality, although on the same mountain, is at least 25 km away in a straight line. — 4) »Japleniški vrh« near Delnice in Gorski kotar (W Croatia), alt. 700—800 m, on a fallen branch of *Fagus sylvatica*, 27. IV 1966, leg. M. Tortić, det. Z. Pouzar (PRM 770394, ZA). — 5) »Oštrica« on Medvednica mountain N of Zagreb, alt. ca 850 m, on a log and dead branch of *Fagus sylvatica*, 24. X 1961 (PRM 717036) and 26. V 1968 (ZA), leg. M. Tortić, det. F. Kotlaba and Z. Pouzar. — 6) Beech forest at the Upper Lakes in the Plitvice National Park, alt. 650 m, on a fallen branch of *Fagus sylvatica*, 13. X 1972, leg. et det. M. Tortić (ZA). — 7) »Voličina« in Slovenske gorice hills (NE of Maribor, NE Slovenia), alt. about 300—400 m, on a branch of *Fagus sylvatica*, IX 1973, leg. R. Habjanič, det. M. Tortić (ZA). (Fig. 3).

In the specimens examined the hymenial setae were often not very abundant and in these cases the tramal setae were also very scarce, whilst both could be easily found in others. The species is apparently wide spread in mountainous beech forests, though scattered perhaps.

All finds in Yugoslavia were on *Fagus*, which seems to be the most preferred or, more probably, the only substrate for this species.

Before presenting a group of three related *Inonotus* species, a short explanation is needed.

*Inonotus dryophilus* (Berk.) Murr., *I. rheades* (Pers.) Bond. et Sing. and *I. tamaricis* (Pat.) R. Maire were treated by Pilát (1936—42) as mere forms of one species, viz. *Inonotus rheades* (Pers.) Pil. Later, it was proved that, although closely related, they were in fact not conspecific but independent (Bondartsev 1971, Kotlaba and Pouzar 1969 etc.). They have three features in common: within the fruitbody (upper part) is developed the so called granular core, setae are totally absent and the spore wall is coloured. Macromorphologically, the most remarkable is no doubt *I. dryophilus*, which differs from *I. rheades* and *I. tamaricis* in larger, usually separately growing carpophores with a fine tomentose to velutinous surface of the pileus when young, which later becomes more or less glabrous. The spores of *I. dryophilus* and *I. tamaricis* are very similar in size: in the first they are (6,5) 7,5—8,7 × 5,0—6,2 (6,5) μm, in the second 6,1—8,6 × 5,0—6,1 μm, but are much smaller in *I. rheades*, 5,0—6,7 × 3,4—4,5 μ (Kotlaba and Pouzar 1969, Kotlaba 1973). All three species are parasites, specialized to different hosts, and their geographical distribution also differs. *I. dryophilus* is confined to oaks in Europe, where it is not very rare, growing on trunks and the oldest branches. *I. rheades* is predominantly found on *Populus tremula* throughout the whole northern temperate zone, with Scandinavia apparently as the centre of its distribution in Europe, while *I. tamaricis* grows exclusively on both living and dying *Tamarix* sp. in the narrow coastal zone of the Mediterranean (Kotlaba and Pouzar 1969) and Black Sea (Kotlaba has unpublished localities for Bulgaria).

All these three species were published for Yugoslavia, but this was done before their synonymy was clarified and are therefore repeated here, with additional unpublished localities.

*Inonotus dryophilus* (Berk.) Murill = *Polyporus corruscans* Fr. was published for Yugoslavia, but the oldest (Jaap 1916) is evidently incorrectly determined: On old *Morus* sp. trees in Dubrovnik (Ragusa in German), near Kotor (Cattaro) and Hercegnovi (Castelnuovo) (Jaap 1916) as *Polyporus corruscans*. The author himself placed a question mark before the name, which was most probably *Inonotus hispidus*. — 1) »Maksimir« Park in Zagreb, alt. 135 m, on *Quercus petraea* (Kišpatić 1948/59 as *Polyporus corruscans*). — 2) »Stolovi« mountains, S. of Kraljevo (Central Serbia), on *Quercus petraea*, growing in small numbers (Marinković 1954, as *Polyporus dryophilus*). In all cited papers, only the substrate and the locality of the fungus is given, without any description or notes regarding the fruitbodies. It is probable that the identification was correct in the two last collections, but as no voucher specimens exist, the occurrence of this species in Yugoslavia has not yet been proved with certainty. We hope that new collections will be made in near future.

*Inonotus rheades* (Pers.) Bond. et Sing. = *Polyporus vulpinus* Fr. was published more than ten years ago by the first author (Tortić 1964) and independently by Jelić (1964) from two widely separated localities. These were the first records of this species for Yugoslavia although this was not mentioned at the time. Later it was found once again and

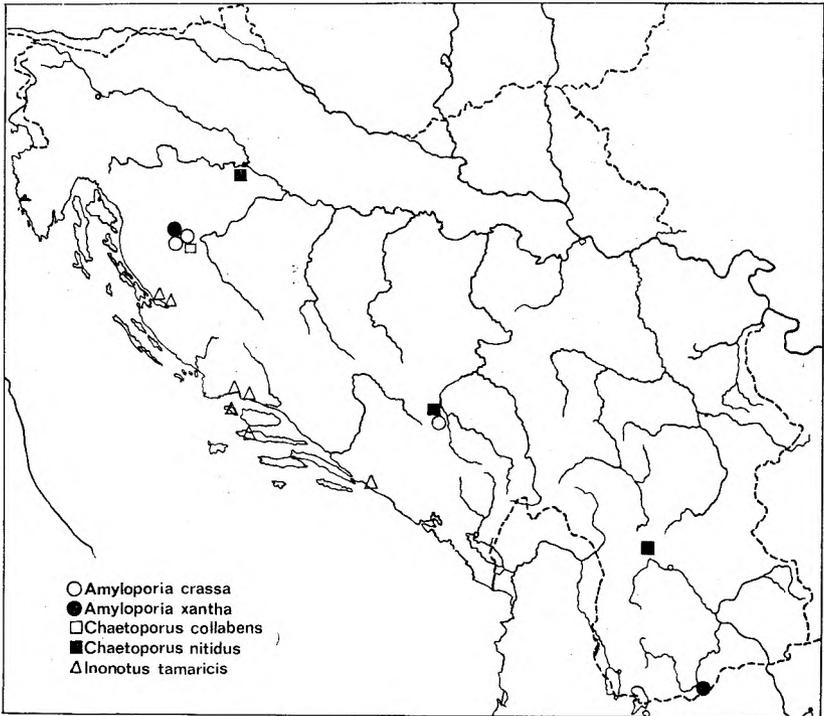


Fig. 1.

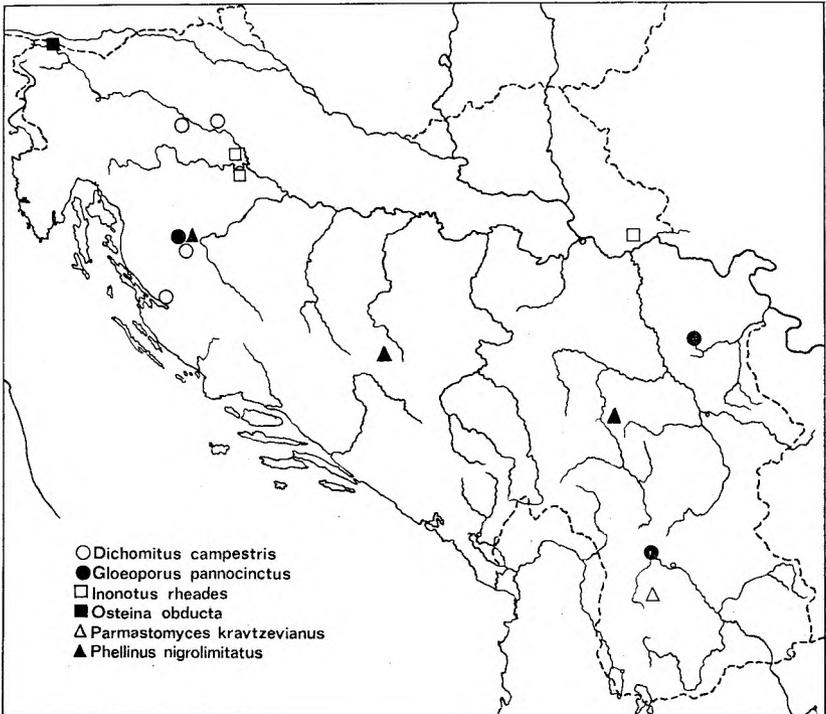


Fig. 2.

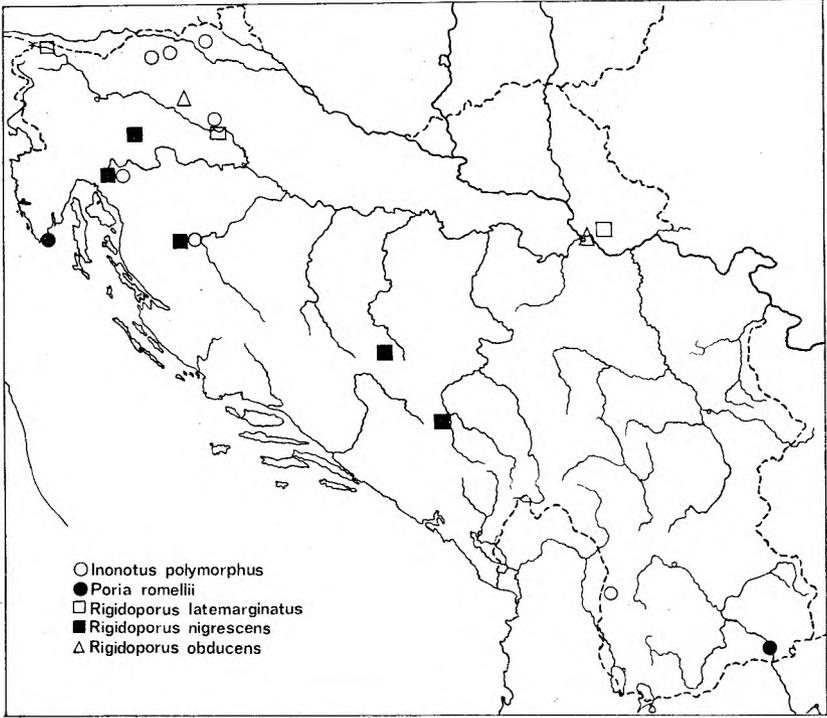


Fig. 3.

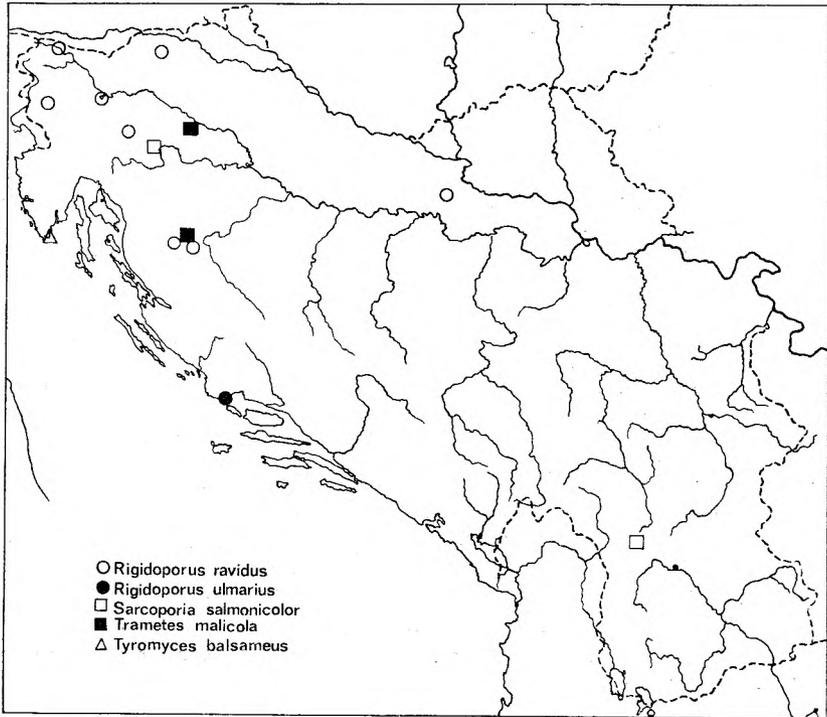


Fig. 4.

the localities known at present are as follows: — 1) »Lekenik« in Turo-polje (south of Zagreb) alt. about 100 m, on dead wood of *Populus* sp. (log set in a forest path), 15. X 1961, leg. et det. M. Tortić (PRM 710453 ZA; Tortić 1964). — 2) »Kotar« oak forest near Petrinja (south of Zagreb) alt. ca 100 m, on a dead trunk of *Populus* sp., 14. X 1965, leg. et det. M. Tortić (PRM 710406, ZA). These two localities are rather close, only about 15—20 km apart in a straight line. — 3) »Deliblatska Peš-čara« (Sands of Deliblato) NE of Beograd, alt. about 160 m, on living trunk of *Populus alba*, VII 1962, leg. et det. M. Jelić (BEO 8549; Jelić 1964). (Fig. 2).

*Inonotus tamaricis* (Pat.) R. Maire was published for Yugoslavia by J a a p (1916) from two localities, but more localities of this species were noted in the last years: 1) Starigrad-Paklenica near Zadar, on living and half-living *Tamarix gallica*, 20 VIII 1966 (PRM 770396), 5, 6. and 8. VII 1968 (PRM 770390), all leg. et det. F. Kotlaba. — 2) Between »Stara kula« and Seline at Starigrad-Paklenica near Zadar, on living and half-living trunks of *Tamarix gallica*, 5. VII 1968 (PRM 770402) and 6. VII 1968 (PRM 770401, 770407), leg. et det. F. Kotlaba. — 3) Kaštel Stari (Castel-vecchio in German) near Split, on trunks of old *Tamarix* trees (J a a p 1916 as *Polyporus tamaricis*). — 4) Split, originally given by the collector as on *Quercus ilex* but probably on a *Tamarix* sp., 30. I 1967, leg. M. Bertosi, det. F. Kotlaba and Z. Pouzar (PRM 647027, ZA). — 5) Split-Meje, on a living *Tamarix* cf. *gallica* in a garden, 12. VII 1968, leg. et det. F. Kotlaba (PRM 770399). — 6) Nečujam on the island of Solta near Split, on *Tamarix* sp. 10. VI 1971, leg. J. Lazebniček, det. F. Kotlaba (PRM, ZA). — 7) The island of Hvar (Lesina in German) on trunks of old *Tamarix* trees (J a a p 1916 as *Polyporus tamaricis*); *ibid.* on a living *Tamarix* sp., 24. V 1969, leg J. Veselsky, det. F. Kotlaba (PRM 674135, 674136). — 8) Slano near Dubrovnik, on *Tamarix* sp., IX 1971, leg. E. Georgijević, det. M. Tortić (PRM 717046, ZA). All the localities are on the sea-coast, at most perhaps 10—20 m above the sea-level. (Fig. 1).

Although the localities with voucher specimens are not very numerous, the current investigations lead us to the conclusion that the species is undoubtedly frequent all along the coast of the Adriatic where *Tamarix* bushes are growing. J a a p (1916) mentions a considerable damage being caused by this fungus in the localities which he cites, but, according to our observations, *I. tamaricis* seems to be a rather weak parasite.

*Osteina obducta* (Berk.) Donk = *Grifola ossea* (Kalchbr.) Pil. mainly growing on larch wood, is up to the present time known undoubtedly from only one locality in Yugoslavia, in the upper valley of the river Sava, near Gozd-Martuljek at Jesenice (NW Slovenia), alt. 750 m, where it was collected at the injured base of a living *Larix decidua* and on adjacent soil on 4. VIII 1971 by M. and S. Tortić and determined by M. Tortić (PRM 770395, ZA). The specimens, one without a stipe, and another (cluster of fruitbodies) elongated into short indistinct stipes, were revised by F. Kotlaba and Z. Pouzar. A large stipitate cluster grew there on 25. VIII 1975, too. The fruitbodies were white but after drying became more or less yellowish and very hard, with a glabrous upper surface and very small pores. They taste very bitter. (Fig. 2).

In the north-west part of Slovenia in Yugoslavia, larches are frequent in forests, mixed with other trees or in almost pure stands and this species will be surely found there in further localities.

*Parmastomyces kravtzevianus* (Bond. et Parm. in Parm.) Kotl. et Pouz. = *Polyporus subcartilagineus* Overh. A very rare species, published for Yugoslavia by Pilát and Lindtner (1938) from one locality: »Poreče«, dolina Oče (valley of the river Oča), south of Skopje in Macedonia, alt. ca 900 m, on the wood of *Pinus nigra*, 7. X 1937, leg. V. Lindtner, det. A. Pilát as *Leptoporus sericeomollis* (Romell) Bourd. et Galz. (PRM 490972). After revision by F. Kotlaba and Z. Pouzar and later by J. L. Lowe it was established that it was, in fact, the above mentioned extremely rare species, characterized by strongly dextrinoid and cyanophilous spores. According to Domaňski (1972) *P. kravtzevianus* was known in Europe only in Poland (Białowieża) and in the USSR (Estonia). Recently it was published from five localities in southern France (David 1972). In Yugoslavia Poreče is the first and only known locality of this remarkable polypore in south-east Europe and it therefore appears to be really very rare. (Fig. 2).

*Phellinus nigrolimitatus* (Romell) Bourd. et Galz. is a rather rare polypore in central and, especially, southern Europe, where it occurs only in mountain forests (in Scandinavia it is common also at lower altitudes — see Kotlaba 1972) on wood of conifers, mainly very old fallen trunks of *Picea abies*. In Yugoslavia, three localities are known at the present time: 1) »Kopaonik« mountain (W Serbia) on rotten logs of *Picea abies*, altitude not indicated but probably at least 1000 m, leg. V. Lindtner 28. IX 1953, det. M. Tortić, rev. F. Kotlaba and Z. Pouzar (BEO 5093, two envelopes). — 2) »Bjelašnica« mountain near Sarajevo (Bosna and Hercegovina), alt. 1250 m, on a prostrate trunk of *Picea abies*, 29. VII 1973, leg. S. Rončević, det. M. Tortić (ZA). — 3) »Čorkova uvala« in the Plitvice National Park (SE Croatia), alt. 1000 m, on a log and fallen trunk of *Picea abies*, 11. VIII and 4. XI 1973, leg. M. and S. Tortić, det. M. Tortić (ZA). A very old but still recognizable fruitbody was noted there on 2. V 1975, too. (Fig. 2).

The collections from the first two localities were fertile, whilst those from the third were both sterile, but the characteristic "black line" on sectioning the fruitbodies and the typical pocket rot they produce left no doubt about the identity of this species. In addition to resupinate fruitbodies, the specimen from Plitvice had two-three small pilei in one instance. Curiously enough, on the specimens from Kopaonik, small fragments of adhering wood seemed to show brown rot. This species will surely be found in time also in other suitable localities on the Yugoslav mountains.

*Poria romellii* Dok = *P. byssina* s. Romell was collected at the village Ližnjan near Pula (Istria, in W Croatia) alt. 60 m on a fallen twig of *Quercus pubescens* by F. Kotlaba on 11. VIII 1972 and determined by Z. Pouzar (PRM 770406, ZA). However, a specimen collected on 19. III 1939 by V. Lindtner in the south of Yugoslavia (in Macedonia), Udovo at Vardar, north of Gevgelija alt ca 100—200 m, on a twig of *Quercus coccifera* (PRM 711304) was at first determined by A. Pilát as ?*Poria calcea* (Fr.) Bres. = *P. lenis* (P. Karst.) Sacc., but after revising it, F. Kotlaba and Z. Pouzar came to the conclusion that it represented the above mentioned species. The duplicate of this collection in BEO, herb. Lindtner 4837, was revised by M. Tortić. As these two localities are nearly at the opposite ends of Yugoslavia, it is very probable that the species will be found in more localities between them. (Fig. 3).

*Poria vulgaris* (Fr.) Cooke, which is mentioned in some older literature for Yugoslavia (Schulzer et al. 1866 as *Polyporus vulgaris*, Protić 1904, 1921/22, Moesz 1938), could be either this species or *Poria lenis* (P. Karst) Sacc. or *Incrustoporia subincarnata* (Peck) Domaň., which of course cannot be decided owing to the lack of exsiccates. *Polyporus vulgaris* Fr. published by Voss (1889—92), proved to be, after revision of existing exsiccate, *Incrustoporia subincarnata* (Peck) Domaň.

*Rigidoporus latemarginatus* (Dur. et Mont. in Mont.) Pouz. = *Poria ambigua* Bres. is stated by Pilát (1936—42) as widespread in the northern temperate zone, but is apparently more frequent only in the warmer parts. In Yugoslavia it has been found in two localities, in each twice and on different substrates: 1) Pančevo near Beograd, in forests on trunks of *Populus* sp., alt. about 100 m, 28. IX 1952, leg. V. Lindtner, det. M. Tortić, rev. Z. Pouzar (BEO 4691); *ibid.*, in forests at the bank of the river Tamiš, on the bark of *Quercus* sp., 15. IX 1937, leg. V. Lindtner, det. Z. Pouzar (BEO 1895 and BEO herb. Lindtner 4223, PRM 771269). — 2) Zagreb, alt. ca 150—180 m, in a small park in Gajdek street, on an injured part of a living *Robinia pseudacacia*, 6. XII 1972, leg. M. Horvat, det. M. Tortić (ZA); *ibid.*, in a garden in Moša Pijade street, on a standing trunk of *Prunus avium*, 29. XII 1973, leg. et det. M. Tortić (ZA). (Fig. 3).

The specimens were, as usual, abundantly fertile. It is probable that this species is much more frequent in Yugoslavia as well as in some other countries, and it should be looked for especially on the banks of large rivers in riverside forests and in the hills nearby.

*Rigidoporus nigrescens* (Bres.) Donk = *Poria nigrescens* Bres. occurs, in contrast to the previous species, particularly in mountain forests. It was not previously published for Yugoslavia, but five localities are known to date: 1) »Lazac« in the Risnjak National Park in Gorski Kotar (W Croatia), alt. 1070 m, *Piceetum montanum*, on a stump of *Picea abies* (or *Abies alba*?), 17. V 1968, leg. M. Tortić, det. F. Kotlaba and Z. Pouzar (PRM 710502, ZA). — 2) »Peručica« in the Sutjeska National Park on the slopes of the mountain Maglič (SE Bosna and Hercegovina), alt. 1300—1500 m, on two rotten trunks of *Abies alba*, 23. VI 1972, leg. M. Tortić, det. Z. Pouzar (PRM 771266, ZA). — 3) »Čorkova uvala« in the Plitvice National Park, alt. 1000 m, on lying logs of *Abies alba*, 11. VII, 4. XI 1973 and 3. V 1975; on a log of *Fagus sylvatica*, 2. XI 1975. All leg. M. and S. Tortić, det. M. Tortić (ZA). — 4) »Bjelašnica« mountain near Sarajevo (Bosna and Hercegovina), alt. about 1600 m, on a rotten log of *Abies alba*, 15. VII 1973, leg. M. Tortić and S. Rončević, det. M. Tortić (ZA). — 5) »Pečke« on Kočevski Rog mountain (SE Slovenia), alt. about 900 m, on a rotten log of *Fagus sylvatica*, 28. X 1975, leg. M. Tortić and S. Hočevcar, det. M. Tortić (ZA). (Fig. 3).

Except in the first locality, all collections were made in beech and fir forests, mostly of a primeval character. This species is, no doubt, much more widely distributed in the Yugoslav mountains. Although *Abies alba* seems to be the preferred substrate, it was recently collected also on *Fagus sylvatica*.

*Rigidoporus obducens* (Pers.) Pouz. = *Oxyporus obducens* (Pers.) Donk was published for Yugoslavia in some older mycological papers (Vouk and Pevalek 1915, Škorić 1928) as *Poria obducens*, but the voucher specimens are absent. Pilát cites it in his monograph

(1936—42) from near Beograd, as *O. populinus* var. *obducens*. This specimen was collected by V. Lindtner on 4. IX 1938 in Ada Ciganlija, an island in the river Sava near Beograd, on living *Ulmus glabra*, determined by A. Pilát and revised by F. Kotlaba and Z. Pouzar (BEO herb. Lindtner 4628). However, Lindtner had collected this species already in 1933, in the Botanical gardens in Beograd and the specimen was determined by V. Litschauer as *Coriolus obducens* fa *resupinatus* = *C. connatus* (BEO herb. Lindtner 2084). Recently, *R. obducens* has been found in »Zelenjak« near Kumrovec in Hrv. Zagorje (N of Zagreb, in NW Croatia) in a cavity of a *Fagus sylvatica* log near a village road, alt. 200 m, on 17. III 1974, leg. et det. M. Tortić (ZA). This specimen, as well as the one by Lindtner from the Botanical gardens in Beograd, was also revised by F. Kotlaba and Z. Pouzar. The conidial stage was not developed in either of the specimens, but elliptical spores clearly determined the species. (Fig. 3).

*Rigidoporus ravidus* (Fr.) Pouz. = *Trametes ravida* (Fr.) Pil. = *Oxyporus ravidus* (Fr.) Bond. et Sing. was already published in a list of fungi in the Julian Alps (Tortić 1969) without emphasizing that it was the first record for Yugoslavia, and also in a revision of the Voss polypores (Tortić, Kotlaba and Pouzar, 1975). In this second paper, it was mentioned that several other localities are now known, and as this species is generally not very frequent, we decided to enumerate them here, including the ones already published: 1) Ljubljana, near the park Tivoli, alt. ca 300 m, on old posts, 10. XII 1882, leg. et det. W. Voss as *Trametes serialis*, rev. F. Kotlaba and Z. Pouzar (Tortić, Kotlaba and Pouzar, 1975). — 2) Mojstrana near Jesenice (upper valley of the river Sava, NW Slovenia), alt. 650 m, on living *Fraxinus* sp. (probably *F. excelsior*), 24. VII 1964, leg. M. and S. Tortić, det. Z. Pouzar (ZA) (Tortić 1969). — 3) »Krekovše« near Idrija (W Slovenia), alt. about 1000 m, in Dentario-Fagetum, on a log of *Abies alba*, 6. VIII 1969, leg. M. Tortić and M. Lisiewska, det. F. Kotlaba and Z. Pouzar (ZA). — 4) »Oplotnica« in the mountain Pohorje, SW of Maribor (N Slovenia), alt. about 500 m, on a stump of *Picea abies*, II 1974, leg. R. Habjanič, det. M. Tortić (ZA). — 5) »Pečke« on Kočevski Rog mountain (W of Novo Mesto, SE Slovenia), alt. 900 m, beech and fir forest, on a fallen log of *Fagus sylvatica*, 28. X 1975, leg. M. Tortić and S. Hočevar, det. M. Tortić (ZA). — 6) Plitvice National Park, Upper Lakes, alt. ca 650 m, on a fallen log of *Fagus sylvatica*, 2. VII 1963, leg. M. Tortić, det. F. Kotlaba and Z. Pouzar (ZA). — 7) »Beli Vrh« near Vrhovine (in the vicinity of the Plitvice National Park), alt 950 m, fir forest, on a lying log of *Abies alba*, 1. V 1975, leg. M. and S. Tortić, det. M. Tortić (ZA). — 8) Vinkovci (E Croatia), alt. 90 m, on trunk of a living *Platanus* sp. in the town, 4. VIII 1966, leg. et det. F. Kotlaba (PRM 770392). (Fig. 4).

Some specimens of this species were almost or quite resupinate, whilst others had small caps. The most beautifully developed fruitbodies are from Oplotnica with rather large pilei (up to  $7 \times 4$  cm). Further finds of this polypore are to be expected.

*Rigidoporus ulmarius* (Sow. ex Fr.) Imaz. in Ito = *Fomes ulmarius* (Sow. ex Fr.) Gill. Very rare species, found in Yugoslavia only twice, both on the same locality, in the town of Trogir on the Adriatic sea-coast (N of Split), alt. a few metres above the sea level, in the cavity of a living trunk of *Ulmus* cf. *effusa*, 28. VII 1966 (PRM 620753) and 12. VII 1968 (PRM 770403), leg. et det. F. Kotlaba (Fig. 4). This interesting polypore

with somewhat ochre-rose coloured tubes is evidently very thermophilic and should, therefore, be found in more localities in Jugoslavia.

*Sarcoporia salmonicolor* (Berk. et Curt.) Domaň. = *Poria aurantiaca* s. auct. = *Hapalopilus ochraceo-lateritius* (Bond.) Bond. et Sing. This very rare fungus was found in Jugoslavia only twice: 1) »Ostrvica« above Sevice, north of the mountain Šara, near Prizren, alt. ca 1500 m, on *Picea abies* (erroneously determined as: *Fagus sylvatica?*), 3. X 1937, leg. V. Lindtner, det. A. Pilát as *Poria aurantiaca* (PRM 490973, BEO 1738) (Pilát and Lindtner 1938). The remnants of the substrate were kindly revised xylogotomically by Dr. E. Opravil (Opava, Czechoslovakia) who determined it clearly as *Picea* sp. (without doubt *P. abies*). — 2) Near the village »Primostek« at Metlika (SE Slovenia), alt. ca 150 m, in a mixed broad-leaved untidy village coppice, with planted *Picea abies* and *Pinus sylvestris*, on a stump of a conifer too rotten for exact determination but certainly one of the two mentioned, 18. X 1970, leg. et det. M. Tortič as *Hapalopilus ochraceo-lateritius*, rev. F. Kotlaba and Z. Pouzar (PRM 770393, ZA). (Fig. 4). The resupinate very thin fruitbody from the second locality was growing vertically on the substrate and the pores were elongated, ca 3 (4) per mm. It was of a brick-reddish colour, greasy to the touch. With ammonia and KOH it turns red-violet, later, where touched with KOH, becoming almost black. In the context more or less globular incrustations of a red-brown substance are present, which do not dissolve in alkalines. Generative hyphae in the dissepiments are thin-walled and clamped, but have thicker walls in the subiculum and in wood. Spored shortly cylindrical, slightly curved, hyaline, smooth, small,  $3,7-5,6 \times 2,2-3,0 \mu\text{m}$ . Many authors recognize *Sarcoporia salmonicolor* and *Hapalopilus ochraceo-lateritius* as two independent species (even as belonging to two different genera!), but according to our study, it is in fact a single species. *Hapalopilus ochraceo-lateritius* represents evidently only young carpophores of *Sarcoporia salmonicolor* (= *Poria aurantiaca*) with thin fruitbodies and somewhat smaller (not quite ripe?) spores.

*Trametes malicola* Berk. et Curt. = *Coriolellus malicola* (Berk. et Curt.) Murr. was collected in Jugoslavia only on two places: 1) Beech forest above the »Kozjak« lake in the Plitvice National Park (SE Croatia), alt. ca 600 m, on a fallen beech trunk, 2. VIII 1966, leg. F. Kotlaba, det. Z. Pouzar (PRM 770398, ZA) *ibid.*, on a lying beech trunk, 1. V 1976, leg. M. and S. Tortič, det. M. Tortič (ZA). — 2) »Žumberačko gorje« mountain, valley of the brook Bregana (about 50 km W from Zagreb), alt. 300—400 m, on lying branches of *Fagus sylvatica*, 22. III 1975, and on a log of *Acer cf. obtusatum*, 26. X 1975, both leg. M. and S. Tortič, det. M. Tortič (ZA). (Fig. 4).

The fruitbodies in all specimens are almost quite resupinate, with only a few and very narrow pilei. The spores, which are rather rare, are cylindrical,  $8-10 \times 3,2-3,7 \mu\text{m}$  in the collection from the first locality, whilst in the second the length was up to  $12 \mu\text{m}$ . The hyphal system is trimitic, with thick-walled skeletal hyphae and very rare binding hyphae, which can be found in the context close to the substrate. Many authors (e. g. Domaňski 1972, etc.) are of the opinion that this species is dimitic and for this reason they place it in the genus *Coriolellus* Murrill em. Sarkar.

It is possible that other localities of this polypore will be noted during further investigations, but probably not very many as it is generally a rather rare species.

*Tyromyces balsameus* (Peck) Murr. = *Leptoporus kymatodes* (Rostk.) Pil. Collected in Yugoslavia only once: Ližnjan near Pula (Istria in W Croatia), alt. 60 m, on a felled trunk of *Pinus* cf. *halepensis*, 11. VIII 1972, leg. F. Kotlaba, det. F. Kotlaba and Z. Pouzar (PRM 770397, ZA). (Fig. 4).

The pilei are practically white, very hard, cystidia extremely rare, acute, spores elliptical,  $4,5-4,8 \times 2,0-2,2 \mu\text{m}$ . All these characteristics are also repeated for *T. apalus* (Lév.) Bond., but to establish whether it is really a good, independent species, would require a detailed study of more, especially fresh material. *T. balsameus* is apparently not a frequent polypore (it is everywhere rather rare) although it will undoubtedly be found in other localities in Yugoslavia.

**Note.** During the printing of this article additional localities of the following species were established:

*Dichomitus campestris* (Quel.) Domañ.: 5) »Crni Lug« near Delnice in Gorski kotar (NW Croatia), alt. 700 m, beech forest, on a dead standing *Corylus avellana*, 20. V 1976, leg. et det. M. Tortić (ZA). — 6) »Miločer« near Budva (Crna Gora, at the sea coast), alt. about 50 m, in a park on a dead branch attached to the living tree of *Quercus cerris*, 4. VI 1976, leg. et det. F. Kotlaba (PRM 795925).

*Inonotus tamaricis* (Pat.) R. Maire: 9) »Kotor« in Boka Kotorska (Crna Gora, at the sea coast), on a living branch of *Tamarix gallica* almost at the sea level, 26. V 1976, leg. et det. F. Kotlaba (PRM 795924). — 10) »Titograd« (capital of Crna Gora), alt. cca 50 m, in a park in the town, on the base of a living *Tamarix gallica*, 26. V 1976, leg. et det. F. Kotlaba (PRM 795926). Unlike other cited localities of *I. tamaricis*, this last one lies not at the sea coast.

*Parmastomyces kravtzevianus* (Bond. et Parm. in Parm.) Kotl. et Pouz.: 2) Island »Lokrum« near Dubrovnik, on a stump of *Pinus* sp. (?), a few m above the sea level, leg. I. Focht 5. X 1973, det. M. Tortić 16. III 1976. (ZA).

The most interesting among those finds is without doubt that of the last named species, which, although rare, may accordingly be expected to occur in Yugoslavia on more localities than are those already known.

Unfortunately, it was no more possible to put these new localities on the maps.

\*

**Acknowledgements.** The authors thank Dr. Z. Pouzar (Prague) for his help in determinating and revising most of the species listed here, and Mr. J. T. Palmer (Sutton Weaver) who kindly corrected our English manuscript. The first author is especially indebted to her husband, S. Tortić, prof. (Zagreb) who assisted in collecting most of her specimens in field.

## Summary

The authors present 22 species of pore fungi either rare or new for Yugoslavia. Five of them (*Chaetoporus nitidus*, *Gloeoporus pannocinctus*, *Inonotus polymorphus*, *Parmastomyces kravtzevianus* and *Rigidoporus ravidus*) were published earlier under incorrect names, whilst for four (*Amyloporia crassa*, *Chaetoporus nitidus*, *Inonotus dryophilus* and *I. tamaricis*), although published, no voucher specimens exist. Four species, correctly identified and supported by voucher specimens, which were

published earlier (*Inonotus rheades*, *Rigidoporus obducens*, *R. ravidus* and *Sarcoporia salmonicolor*), are repeated here with additional localities.

Thirteen of the species presented here were not previously recorded for this country.

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## SADRŽAJ

### NOVE ILI RIJETKE VRSTE FAM. POLYPORACEAE U JUGOSLAVIJI

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U posljednje vrijeme se intenzivnijim istraživanjem mikoflore stalno pronalaze vrste koje prije nisu bile poznate za Jugoslaviju, pri čemu, osim domaćih mikologa, imaju zasluga i pojedini posjetioči iz inozemstva, kao što je to drugi autor ovoga priloga. Ovdje su prikazane 22 vrste rupičavki koje ili nisu bile uopće objelodanjene za našu zemlju, ili je to bilo pod neispravnim imenom, ili, ako su se navodile u prijašnjim radovima, ne postoje herbarski primjerci koji bi se mogli provjeriti. Za nekoliko ispravno determiniranih i već prije objavljenih ponovljeni su prijašnji nalazi i dodani noviji.

Vrste su većinom ustanovljene svaka na malo nalazišta, no vrlo je vjerojatno da su neke od njih češće i da će se kasnije pronaći i drugdje.

Gljive su sabirane na raznovrsnim lokalitetima: od prostranih šuma planinskih masiva (neke od njih prašumskog karaktera) pa sve čak do ljudskih naselja: sela, gradskih parkova i sl.

U engleskom tekstu su vrste poredane abecednim redom. Za svaku su navedeni lokaliteti koji su označeni i na priloženim geografskim kartama. Ako je bilo potrebno, dodan je kratak opis ili istaknute glavne značajke.

Pod neispravnim imenima bilo je prije objavljeno pet vrsta (*Chaetoporus nitidus*, *Gloeporus pannocinctus*, *Inonotus polymorphus*, *Parmastomyces kravtzevianus* i *Rigidoporus ravidus*). Od četiriju vrsta ne postoje eksikati s prije objavljenih lokaliteta koji bi se mogli revidirati (*Amyloporia crassa*, *Chaetoporus nitidus*, *Inonotus dryophilus* i *I. tamaricis*). Četiri vrste, od kojih postoje eksikati i koje su bile ispravno determinirane, objavljene su već prije, a ovdje ponovo navedene s kasnije ustanovljenim novim lokalitetima (*Inonotus rheades*, *Rigidoporus obducens*, *R. ravidus* i *Sarcoporia salmonicolor*). Prvi put se ovdje za Jugoslaviju navodi trinaest vrsta: *Amyloporia xantha*, *Chaetoporus collabens*, *Dichomitus campestris*, *Inonotus polymorphus*, *Osteina obducta*, *Parmastomyces kravtzevianus*, *Phellinus nigrolimitatus*, *Poria romellii*, *Rigidoporus latemarginatus*, *R. nigrescens*, *R. ulmarius*, *Trametes malicola* i *Tyromyces balsameus*.

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