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Original scientific paper

MACROMYCETES OF GORSKI KOTAR (CROATIA) III

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An annotated list of non-gilled lignicolous macromycetes (*Aphylophorales* s. l. and larger *Heterobasidiomycetes*), established up to now in the region of Gorski Kotar (Croatia) is presented. Most finds are from the Risnjak National Park which was intensively investigated; other localities were visited briefly from one to a few times. Interesting or rare species are discussed.

Introduction

In previous contributions under the above title a total of 387 species of macromycetes, most of them agarics, collected in the region of Gorski Kotar (mainly in the Risnjak National Park and its vicinity) were published (TortiĆ 1966, 1966a, 1973); about 100 species were noted in that region earlier.

The investigations in the National Park continued later, less often than before, and the main object were now *Aphylophorales* s. l. only about sixty of those, mainly frequent or conspicuous polypores, were mentioned in the papers cited. Several additional localities in Gorski Kotar and its adjacent parts were visited also, one or a few times.

Presented here, in the form of an annotated list, are polypores, corticia and a few other lignicolous *Aphylophorales*, as well as some larger *Heterobasidiomycetes*, found throughout the investigations. Species already published are included not only to make the list complete, but also because many were noted in other localities as well, or were found to be more frequent than appeared at first. Moreover, in a few cases the host was not correctly identified earlier or two species are now recognised instead of the former one.

Area investigated

The positions of the localities investigated according to the UTM grid, their altitudes, main types of forests as well as dates of visits (month and year) are given here. Forest associations are specified only for the Risnjak NP. Separately, the UTM grid is indicated for the localities not visited but cited by earlier authors (Fig. 1).

Risnjak National Park near Delnice. Most investigations were made in VL72, near the village of Crni Lug which is situated at the margin of the Park and therefore a few of the points visited do not belong, strictly speaking, to the Park. This area was named Crni Lug in earlier papers, but is now designated as Risnjak. The investigations were carried out mainly at altitudes of 700—800 m, but some excursions toward the peak of the mountain Risnjak were made too, and a few collections are from the altitudes of about 1200—1400 m (Smrekovac). Main forest associations at lower altitudes are beech and fir forest (*Abieti-Fagetum*) and fir forest (*Blechno-Abietetum*), and at higher ones beech forest (*Fagetum subalpinum*). Some remote parts difficult to reach of the park (VL73) were never visited. A few excursions were made to Lazac (VL63) at the western end of the Park, 1000 m alt., where spruce forest (*Piceetum montanum*) is developed.

Risnjak National Park was visited several times every year from 1962—1966 (earliest in April, latest in October), later only once or twice in a year (VI 1967, V, IX 1968, VI, VIII 1969, X 1970, VII 1971, VIII 1972, X 1973, V 1976, VIII, X 1978, VII 1980, VII 1982, VI, IX 1988) excursions lasting from two to several days. Lazac was visited, each time for a few hours, V, IX 1968, VI 1969, VII 1980, VI 1988.

Other localities, arranged from west to east:

Drivenik VL71, 800 m, fir forest, V 1963.

Platak VL63, 1100 m, beech forest, V 1976.

Razloge VL73, from the village (about 550 m) down to the source of the river Kupa (350 m), mainly beech forest, VII 1980, VI 1988.

Gerovo VL74, 600 m, beech forest, VIII 1969.

Makov Hrib VL74, 850 m, V 1965.

Sungerski Lug near Mrkopalj VL81, 800 m, fir forest, V 1963, VIII 1972, V 1977.

Several peaks in the vicinity of Delnice VL82: Japleniški Vrh and Ponikvarski Vrh IV 1966, Doren Vrh, Resnjak, Petehovac VII 1966, Paljetinski Vrh VI 1967. Everywhere mainly beech and fir forest, in Resnjak also a stand of spruce. Altitudes from about 700 to 1000 m.

Bijele Stijene Mt. VL90, from 700 to nearly 1000 m, beech and fir forest, V 1978, VIII 1987.

Zalesina VL92, 800 m, fir forest, X 1962, IX 1968, VIII 1972, V 1977.

Skrad VL93, beech forest, about 700 m, VII 1964, X 1966, VI 1969.

Kamačnik gorge near Vrbovsko VL02, 450 m, beech forest, VIII 1972.

Klek Mt. near Ogulin WL11, slopes from 700—850 m, beech forest, also hop-hornbeam (*Ostrya carpinifolia*) forest, IV 1978, VIII 1987, VIII 1989.

Severin on the Kupa WL13, town park, 200 m, V 1977.

Vrh Kapele, a mountain pass between Velika and Mala Kapela mountain ranges WK19, 800 m, beech and fir forest, end of IV 1978, beginning of V 1982.

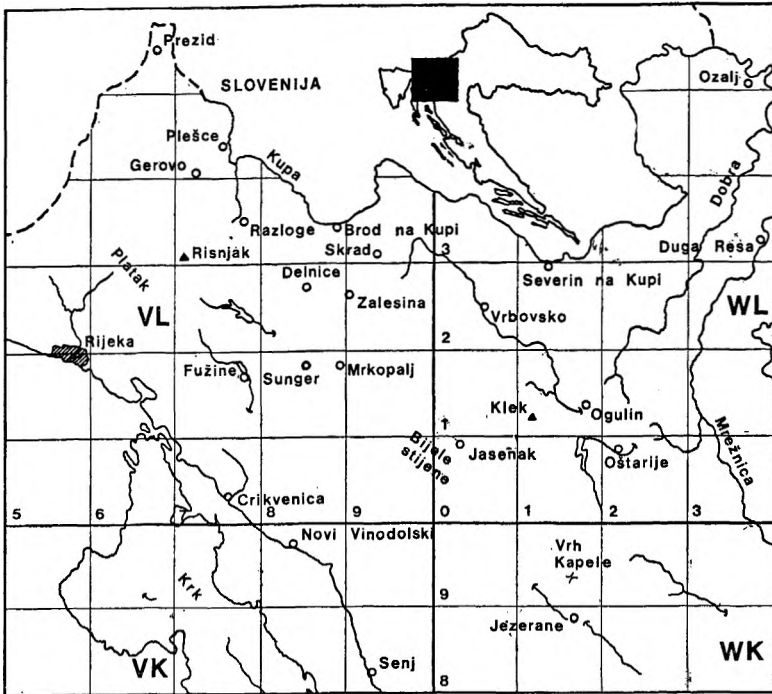


Fig. 1. Area investigated

Jasenak near Ogulin (and its vicinity) WL00, WL01, 650—700 (800) m, beech forest, beech and fir forest, spruce stands, shrubs along a brook (mostly *Corylus avellana*), V 1982, VIII 1987, VIII 1989.

In the cited literature, the following localities, not visited by the author, are named: Prezid VL65, Fužine VL71, Sv. Gora near Plešće VL74, Marija Trošt near Delnice VL82, Veliki Dragomalj, Radočaj, Brod on the Kupa, Iševnica, all in VL83, Žrnovac, Pauci, Podstene, all three in VL93, Sušički Jarak WL02.

Except Jasenak and its vicinity where investigations lasted several days in 1987 and 1989 other localities enumerated here were visited one or at most four times in transit, and the fungi collected for one or a few hours; sometimes only one species was noted.

All localities are part of the Dinaric mountain range. Their geological substrate is limestone and all have similar forest vegetation. The most frequent trees are *Abies alba* and *Fagus sylvatica*, which make extensive forests, either apart or together. In some places *Picea abies* is either admixed or makes separate forests or stands. Most fungi were collected on those three hosts, which are therefore cited only under their generic names.

The fungi grew mainly on dead wood: branches, logs, stumps, prostrate or standing dead trunks, in a few instances (which fact is pointed out) on living trees.

Common species were usually only noted; others were collected whenever possible and are preserved at the Department of Botany, Faculty of Science, University of Zagreb (ZA). Sometimes a specimen was recognisable but in too bad a state to be preserved, and sometimes it was destroyed by insects after it was dried.

Dates for interesting or rare (once or twice) finds are usually given only for the Risnjak National Park since it was visited many times, but sometimes also for other localities, to emphasize, for instance, that a generally common species was rarely observed. For other fungi months of finds are added (in Roman numerals).

List of species

Auriculariaceae

Auricularia mesenterica (Dicks: Fr.) Pers. Skrad (Tortić 1973), Kamačnik, VIII, X. Dead wood and injured part of a living *Fagus* tree. Not a rare species generally, although noted only twice.

Tremellaceae

Basidiodendron caesiocinereum (Höhn. & Litsch.) Luck-Allen. Risnjak, branch of *Abies* and Lazac, trunk of *Picea*, VII 1980; Jasenak, branch of *Abies* VIII 1989. When dry invisible and therefore easily overlooked. It occurs also in the Plitvice NP.

Eichleriella deglubens (Berk. & Br.) Reid. Jasenak, dead branch of *Corylus avellana* and of an unidentified hardwood, VIII 1989.

Exidia plana (Wigg.) Donk. Risnjak, branches of *Corylus avellana*; Klek, trunk of *Fagus*. IV, V. Generally not infrequent but mostly occurring early in the year when investigations are rarely made.

Exidiopsis calcea (Pers.: Fr.) Wells. Jasenak, only once but rather abundantly on dead branches attached to living trees of *Picea*, VIII 1989. Common on such substrate in Plitvice NP.

Pseudohydnum gelatinosum (Scop.: Fr.) P. Karst. Sušički Jarak, on rotten wood (Škorić 1928 as *Tremellodon gelatinosum*); Risnjak, Zalesina, on logs and stumps of *Abies* (Tortić 1966). Frequent in Risnjak NP and found many times also later, refound at Zalesina and noted at Skrad, Kamačnik, Sungerski Lug, on wood of *Abies*, in the last named locality on a branch of *Picea*. VIII—X.

Tremella mycophaga Martin. Risnjak, VIII, X 1978, Platak, V 1976.

T. simplex Jacks. & Martin in Martin. Risnjak, IV 1979.

Both species are characteristic parasites on living carpophores of *Aleurodiscus amorphus* growing on dead branches of *Abies*.

Tremiscus helvelloides (DC: Fr.) Donk, Drgomalj near Delnice (Forenbacher 1915 as *Gyrocephalus rufus*), Crni Lug, Prezid (Vrtar, in lit.), Risnjak, very frequent (Tortić 1966). Found also later often in the National Park on coniferous wood, mainly *Abies*, sometimes apparently on soil. Noted at Skrad, too. VII—X.

Dacrymycetaceae

Calocera cornea (Batsch: Fr.) Fr. Risnjak, Gerovo, on logs of *Fagus* (Tortić 1973), observed also later in the NP on wood of *Fagus*. Generally not rare but rather inconspicuous and escapes notice. VIII—X.

- C. *viscosa* (Pers.: Fr.) Fr. Sv. Gora near Plešće, on roots and stumps (Forenbacher 1915), Delnice, Crni Lug, Sunger, frequent on *Abies* stumps (Škorić 1928), Crni Lug (Vrtar in lit.), Risnjak, on stumps of *Abies* and near them (Tortić 1966), noted there many times also later. Other localities: Doren Vrh, Sungerški Lug, Zalesina, Jasenak. A frequent species on coniferous wood (here *Abies*, probably also *Picea*), often apparently on soil. VII—X.
- Dacrymyces stillatus* Nees: Fr. Risnjak, branch of *Abies*, VIII 1978. The species is in fact frequent in various types of forests, but invisible when dried and must be looked for.

Corticaceae s.l. (incl. Stereaceae)

- Aleurodiscus amorphus* (Pers.: Fr.) Schroet. Risnjak, branches of *Abies* (Tortić 1973). Refound later several times in the NP on dead fir branches, either cut down or attached to living tree, once also at Platak. Apparently a frequent species developed usually in large numbers but difficult to find when growing on dead branches in the crown of living fir trees. Several times with its parasite *Tremella mycophaga*, once with *T. simplex* (see there). V—X.
- Amphinema byssoides* (Pers.: Fr.) John Erikss. Risnjak, *Abies* log, IX 1988; Jasenak, *Fagus* branch, VIII 1989.
- Amylostereum areolatum* (Chaill. in Fr.) Boid. Risnjak (Lazac), IX 1968, Sungerški Lug, VIII 1972, both on *Picea* stumps (Tortić 1973/1988). Jasenak, *Picea* stump, VIII 1989.
- A. *chailletii* (Pers.: Fr.) Boid. Risnjak, several times on stumps and prostrate trunks of *Abies* (Tortić 1988); Jasenak, branch of *Abies*. VI—X.
- A. *laevigatum* (Fr.) Boid. Razloge, dead branches of *Juniperus communis*; Severin on the Kupa, town park, on the trunk of a living *Taxus baccata* (Tortić 1988). V, VII.
- Athelia epiphylla* Pers. s. 1. Vrh Kapele, trunk of *Picea*, on the cut surface, IV 1978, det. K. Hjortstam. A rather widespread species but in this region noted only once.
- Atheloderma mirabile* Parm. Risnjak, rotten log of *Abies*, VI 1988. Extremely rare species (Tortić 1989).
- Athelopsis glaucina* (Bourd. & Galz.) Parm. Risnjak, branch of prostrate trunk of *Abies*, IX 1988. In Plitvice NP mainly on *Fagus*.
- Botryobasidium angustisporum* Boid. Risnjak, log of *Picea* and trunk of *Abies*, VII 1982.
- B. *aureum* Parm. Risnjak, log of *Abies*, VI 1988, and Lazac, branch of *Fagus*, VI 1980. Both collections represent the imperfect stage *Haplotrichum aureum* (Pers.) Hol.-Jech.
- B. *botryosum* (Bres.) John Erikss. Risnjak, several times on stumps, trunks and branches of *Abies*, also at Lazac, on trunk of *Picea* and stump of *Fagus*; Jasenak, trunk of *Abies*. VII—IX. Frequent species in forests of beech and fir, also in others.
- B. *pruinatum* (Bres.) John Erikss. Risnjak, *Fagus* trunk, VII 1980 (Tortić 1989).
- B. *sphaericosporum* Boid. Cand. & Lanq. Risnjak, several times on branches and logs of *Abies*, branch of *Fagus*; Razloge, trunks of *Juniperus communis*, branches of *Carpinus betulus*, *Fagus*, *Abies* and probably *Prunus avium*, VI—IX (Tortić 1989).
- B. *subcoronatum* (Höhn. & Litsch.) Donk. Risnjak, frequent on prostrate trunks, stump and branches of *Abies*, branches of *Fagus*, at Lazac on prostrate trunks and branches of *Picea*; Jasenak, branches of *Picea*. VI—IX. The material was often in a rather bad condition and sterile, but could be identified easily by clamps present at all septa.

- Botryohypochnus isabellinus* (Fr.) John Erikss. Risnjak, log of *Abies*, VI 1988.
- Chondrostereum purpureum* (Pers.: Fr.) Pouz. Resnjak near Delnice, on *Fagus* stump (Škorić 1928 as *Stereum purpureum*), Risnjak, logs of *Fagus* (TortiĆ 1966 as *Stereum purpureum*). Found in the Risnjak NP on the same host also later. Platak, stump of *Fagus*. IV—V, IX—X.
- Cotylidia pannosa* (Sow.: Fr.) Reid. Risnjak, several times in beech and fir forest, X (TortiĆ 1966 as *Thelephora pallida*). Not refound later.
- Cylindrobasidium evolvens* (Fr.) Jülich. Vrh Kapele, trunk of *Fagus*, V 1982. Curiously, this common species (frequent, for instance in Plitvice NP) was noted only here.
- Cystostereum murrayi* (Berk. & Curt.) Pouz. Risnjak, log of *Abies* (TortiĆ 1973). Found there later, several times (including Lazac) on prostrate trunks and logs, rarely branches of *Abies*. Jasenak, trunk of *Abies*. V—X.
- C. subabruptum* (Bourd. & Galz.) John Erikss. & Ryv. Jasenak, *Fagus* log. V 1982. Probably more frequent, for instance, not rare in Plitvice.
- Dacryobolus sudans* (Alb. & Schw.: Fr.) Fr. Jasenak, branch of *Abies*, VIII 1989.
- Gloeocystidiellum citrinum* (Pers.) Donk. Risnjak, branches, stumps and logs of *Abies*, noted several times, often in large quantities, VI—IX.
- G. furfuraceum* (Bres.) Donk. Risnjak, trunk and branch of *Abies*, VII 1982, IX 1988.
- G. ochraceum* (Fr.: Fr.) Donk. Risnjak. *Abies* log, on cut surface, VI 1980, det K. Hjortstam.
- G. porosum* (Berk. & Curt. in Berk. & Br.) Donk. Risnjak, VII 1980, Razloge, VII 1980, Jasenak, VIII 1980. Always on branches of *Fagus*.
- Hyphoderma albocremeum* (Höhn. & Litsch.) John Erikss. & Strid. Risnjak, VII 1980 (rev. K. Hjortstam), VI 1988. Both on stumps of *Abies*.
- H. argillaceum* (Bres.) Donk. Risnjak, logs of *Abies*, VII 1982, VI 1988, Lazac, log of *Picea*, VI 1988.
- H. capitatum* John Erikss. & Strid. Risnjak, stump of *Abies*, X 1978. Extremely rare species. (TortiĆ 1989).
- H. guttuliferum* (P. Karst.) Donk. Risnjak, rotten trunk of *Picea* at 1100 m, VII 1982, det. K. Hjortstam.
- H. mutatum* (Peck) Donk. Klek, trunk of *Fagus* and branch of *Ostrya carpinifolia*, VIII 1989. A common species, but not yet noted elsewhere in this region.
- H. praetermissum* (P. Karst.) John Erikss. & Strid. Risnjak, on branches and logs of *Abies*, apparently frequent, VI—IX, source of the river Kupa near Razloge, log of *Castanea vesca*, VII 1980, Jasenak, branches of *Abies* and *Corylus avellana*, VIII 1989.
- H. radula* (Fr.: Fr.) Donk. Risnjak, frequent on branches of *Abies*, once on branch of *Fagus*, also at Sungerski Lug, Razloge, Platak, Vrh Kapele, Jasenak, on branches (prostrate or attached to living trees) and a trunk of *Abies*, at Jasenak also on a branch of *Alnus glutinosa*. V—X.
- H. setigerum* (Fr.) Donk. Risnjak, not rare on branches of *Fagus* and *Abies*; Jasenak, prostrate trunk of *Abies* VI—X.
- Hyphodontia* cf. *alienata* (Lund. in Lund. & Nannf.) John Erikss. Biješe Stijene, *Abies* trunk, VIII 1987.
- H. alutaria* (Burt) John Erikss. Risnjak, rather frequent on stumps and branches of *Abies*, VII—X.
- H. aspera* (Fr.) John Erikss. Risnjak, stump of *Abies*, X 1978.
- H. barba-jovis* (Bull.: Fr.) John Erikss. Risnjak, Razloge, branches of *Abies*, at Razloge attached to a living tree, VI—VII, X.

- H. cineracea* (Bourd. & Galz.) John Erikss. & Hjortst. Risnjak, branch of *Abies*, VII 1980.
- H. crustosa* (Pers.: Fr.) John Erikss. Jasenak, branches of *Corylus avellana* and *Crataegus monogyna*, VIII 1989.
- H. nesporei* (Bres.) John Erikss. & Hjortst. Risnjak, Razloge, Jasenak, branches, logs and trunks of *Abies*, everywhere rather abundant although in the last two localities observed only once each. VI—VIII.
- H. pallidula* (Bres.) John Erikss. Risnjak, log of *Abies*, VII 1982; Jasenak, trunk of *Picea*, VIII 1989.
- H. quercina* (Pers.: Fr.) John Erikss. Razloge, trunks and branches of *Carpinus betulus*, branches of *Corylus avellana*, branch of *Fagus*; Jasenak, branches, trunks and stump of *Corylus*. VI—VIII. Abundant in both localities although at Jasenak observed only in 1989.
- H. spathulata* (Fr.) Parm. Risnjak, prostrate and standing dead trunk of *Abies*, VII 1980, VII 1982.
- H. subalutacea* (P. Karst.) John Erikss. Risnjak, branch of *Abies*, IX 1988.
- Hypochnicium lundelli* (Bourd.) John Erikss. Risnjak, stump of *Abies*, VII 1980.
- H. polonense* (Bres.) Strid. Risnjak, rotten stump of *Abies*, IX 1988, source of the Kupa near Razloge, trunk of *Fagus*, VI 1988.
- H. subrigescens* Boid. Risnjak, trunk of *Abies*, VII 1980, det. K. Hjortstam.
- Laxitextum bicolor* (Pers.: Fr.) Lentz, Risnjak, branch of *Fagus*, IX 1988, Jasenak, branch of *Fagus*, VIII 1989.
- Merulius tremellosus* (Schroed.: Fr.) Fr. Risnjak, stumps and logs of *Fagus* and coniferous wood (probably *Abies*) IX—X (Tortić 1966). Curiously, this rather common species was not refound later.
- Mycoacia aurea* (Fr.) John Erikss. & Ryv. Source of the Kupa near Razloge, branch of probably *Acer* sp., VII 1980.
- Peniophora incarnata* (Pers.: Fr.) P. Karst. Paljetinski Vrh near Delnice, *Fagus* branch (Tortić 1973). VI.
- P. piceae* (Pers.) John Erikss. Risnjak, Paljetinski Vrh, branches of *Abies* (Tortić 1973), refound in Risnjak also later. VI.
- Phanerochaete sordida* (P. Karst.) John Erikss. & Ryv. Risnjak, several times rather abundantly on branches of *Abies* and *Fagus*, at Lazac also on a prostrate trunk of *Acer pseudoplatanus*; Razloge, *Abies* branch; Jasenak, branch of *Corylus avellana* and *Fagus*. VI—VIII.
- Ph. velutina* (DC: Fr.) P. Karst. Risnjak, *Fagus* branch, X 1978, det. K. Hjortstam; Jasenak, *Fagus* branch, VIII 1989.
- Phlebia georgica* Parm. Risnjak, branches and stump of *Abies*, VII 1980, VII 1982.
- Ph. lilascens* (Bourd.) John Erikss. & Hjortst. Risnjak, trunk of *Abies* at about 1000—1200 m alt., VII 1982, det. K. Hjortstam.
- Ph. livida* (Pers.: Fr.) Bres. Risnjak. abundantly on branches of *Abies*; Jasenak, branch of *Fagus*, VI—IX.
- Ph. radiata* Fr. Risnjak, log of *Fagus* (Tortić 1973). Later not refound. Škorić (1928) published from Drgomalj *Merulius aurantiacus* which is probably the same species.
- Ph. rufa* (Pers.:Fr.) M. P. Christ. Risnjak, VII 1972, det. Z. Pouzar, IX 1988. On stump and branch of *Fagus*.
- Ph. subcretacea* (Litsch.) M. P. Christ. Risnjak, *Fagus* branch, VII 1980, det. K. Hjortstam.
- Phlebiopsis gigantea* (Fr.: Fr.) Jülich. Risnjak, on *Trichaptum abietinum* growing on *Abies* branch, VI 1988; Vrh Kapele, log of *Picea*, on cut surface, IV 1978, det. K. Hjortstam.

- Radulomyces confluens* (Fr.:Fr.) M. P. Christ. Razloge, on *Clematis vitalba* VII 1980; Klek, branch of *Ostrya carpinifolia*, VIII 1989.
- Resinicium bicolor* (Alb. & Schw.:Fr.) Parm. Risnjak, stumps and logs of *Abies*, at Lazac on prostrate trunk of *Picea*; Jasenak, logs and branch of *Abies*, branch and trunk of *Picea*. V—IX.
- Schizopora paradoxa* (Schrad.:Fr.) Donk Risnjak (Lazac) on trunk of *Fagus*, VII 1980; Platak, trunk and branch of *Fagus*, V 1976; Razloge, trunk of *Carpinus betulus*, VI 1988; Jasenak, branches of *Corylus avellana* and *Carpinus betulus*, VIII 1989. All in ZA.
- S. radula* (Pers.:Fr.) Hallenberg. Risnjak, trunk of *Abies*, IX 1988. ZA. Some finds (Risnjak, Razloge and Jasenak on branches of *Fagus*, Vrh Kapele on trunk of *Abies*) were only noted as *S. paradoxa* s. l. but not collected.
- Scopuloides hydnooides* (Cooke & Masee in Cooke) Hjortst. & Ryv. Risnjak, stump and log of *Fagus*, VII 1982, VI 1988; source of the Kupa, log of *Fagus*, VI 1980; Jasenak, branch and log of *Fagus*, VIII 1989.
- Stereum hirsutum* (Willd.:Fr.) Pers. Klek (Beck 1906), Crni Lug (Vrtar in litt.), Risnjak, generally common on stumps and logs of *Fagus* (Tortić 1966). Found in the NP also on dead trunks of *Corylus avellana*. Noted in nearly all localities investigated: Japleniški vrh, Gerovo, Kamačnik, Sungerski Lug, Platak, Razloge, Klek, Jasenak, on logs, stumps and prostrate branches of *Fagus*, sometimes in large quantities. At Razloge it was found also on branches and trunk of *Carpinus betulus*, and at the base of Klek and at Jasenak on trunks of *Corylus avellana*. Since the fruitbodies are long lasting and recognisable when dried, it was noted from spring (IV) until autumn (X).
- S. insignitum* QuéL. Risnjak, stumps and logs of *Fagus*; Skrad, on *Fagus* (Tortić 1966). Refound in Risnjak also later, noted at Paljetinski Vrh and on slopes of Klek, always on trunks of *Fagus*. Not particularly frequent in this region.
- S. rugosum* (Pers.:Fr.) Fr. Risnjak, living *Fagus* tree, Japleniški Vrh, on *Fagus* (Tortić 1973). Collected later at Lazac, Platak, Vrh Kapele, Klek, source of the Kupa, Jasenak, on trunks and stumps of *Fagus*, also *Corylus avellana*, once (at Lazac) on prostrate trunk of *Acer pseudoplatanus* and on Klek in injured part of living trunk of *Ostrya carpinifolia*. IV—VIII. It is interesting to note that it was observed in Risnjak NP only twice, in spite of long term investigations. *S. gausapatum* on *Fagus*, published from Podstene by Škorić (1928) probably also represents this species (Tortić 1988).
- S. sanguinolentum* (Alb. & Schw.:Fr.) Fr. Crni Lug (Škorić 1928 as *Stereum crispum*), Risnjak, Lazac, Kamačnik, Jasenak, on branches and trunks of *Abies*, also on *Picea*. V—X. Not abundant.
- Subulicystidium longisporum* (Pat.) Parm. Source of the Kupa, twig of *Fagus*, VI 1988.
- Trechispora farinacea* (Pers.:Fr.) Liberta. Risnjak, Razloge, on stumps and branches of *Fagus* and *Abies*. VII—X.
- T. mollusca* (Pers.:Fr.) Liberta. Risnjak, logs of *Abies* VII 1980.
- T. vaga* (Fr.) Liberta. Risnjak, log and branch of *Abies*, log of *Fagus* VI 1980, VI 1988; Jasenak, branch of *Fagus*, VIII 1989.
- Tylospora asterophora* (Bon.) Donk Risnjak, branch of *Abies*, IX 1988.
- Vuilleminia comedens* (Nees:Fr.) Maire s. l. (*V. coryli* Boid., Lanq. & Gilles?), Jasenak, *Corylus avellana*, abundant, VIII 1989 (see Discussion).
- V. cystidiata* Parm. Jasenak, dead branches on living shrub of *Crataegus monogyna*, VII 1987.

Sparassidaceae

Sparassis nemecii Pilát & Vesely. Sv. Gora near Plešce at the base of old firs; coniferous forests at Fužine (Forenbacher 1915 as *S. ramosa* = *S. crispa*); Resnjak, Sungerski Lug (Škorić 1928 as *S. ramosa*), Risnjak, at the base of living trees and stumps of *Abies*, IX—X (Tortić 1966 as *S. crispa*), refound VIII 1972 on *Abies* stump.

Hericiaceae

Hericum alpestre Pers. Risnjak, stumps and logs of *Abies* several times (Tortić 1966 as *H. clathroides*), refound again on *Abies* X 1973

Lachnocladiaceae

Scytinostroma hemidichophyticum Pouzar. Klek, trunk of *Fagus*, IV 1978; Jasenak, branch of prostrate trunk of *Fagus*, V 1982.

Steccherinum fimbriatum (Pers.: Fr.) John Erikss. Risnjak, *Fagus* branch, VII 1980.

S. ochraceum (Pers.: Fr.) S. F. Gray. Risnjak, IX 1988; Razloge, VII 1980; Jasenak, VIII 1989. All on branches of *Fagus*.

Schizophyllaceae

Schizophyllum commune Fr.: Fr. Žrnovac (Škorić 1928), Risnjak (up to 1400 m), Skrad, Drivenik, on stumps, logs and branches of *Fagus* (Tortić 1966). Frequent in Risnjak on this substrate, once on a branch of *Abies*. Common species noted on beech wood also in many other localities: Japleniški vrh, Petehovac, Resnjak, Paljetinski Vrh, Kamačnik, Vrh Kapele, Klek. At Razloge it was observed also on branches of *Carpinus betulus* and at Skrad on living *Tilia* sp. Fruitbodies recognisable also when dried, therefore observable throughout the year.

Stromatoscypha fimbriata (Pers.: Fr.) Donk. Risnjak, *Abies* branch, VII 1980.

Bondarzewiaceae

Bondarzewia mesenterica (Schaeff.) Kreisel. Risnjak, at the base of living *Abies* trees several times, once on a stump, VII—X (Tortić 1966 as *B. montana*); Zalesina, *Abies* stump.

Polyporaceae s.l.

Abortiporus biennis (Bull.: Fr.) Sing. Risnjak, stump of *Fagus*, IX (Tortić 1966 as *Heteroporus biennis*).

Albatrellus criatatus (Schaeff.: Fr.) Kotl. & Pouz. Risnjak, several times in fir forests on soil, abundantly, IV, IX—X (Tortić 1966 as *Caloporus cristatus*). Curiously, later not observed.

Antrodia variiformis (Peck) Donk. Risnjak, worked wood of *Abies* (a bench in front of a mountain hut), abundant, VI 1988.

Antrodiella hoehnelii (Bres. in Höhn.) Niemelä. Jasenak, *Fagus* wood, VIII 1989.

Bjerkandera adusta (Wild.: Fr.) P. Karst. Risnjak, Zalesina, stumps of *Fagus* (Tortić 1966 as *Gloeporus adustus*). Refound several times in Risnjak, also at Zalesina, noted also at Japleniški Vrh, Doren Vrh, Kamačnik, Jasenak, always on stumps and logs of *Fagus*. V—X. A frequent species.

- Ceriporia purpurea* (Fr.) Donk. Found only once, along main road toward Rijeka, above Vrbovsko (WLO2) on living *Juglans regia*, X 1973.
- Cerrena unicolor* (Bull.:Fr.) Murr. Risnjak, several times on dead wood of *Fagus* (e. g. standing dead trunk, fence post) (Tortić 1966 as *Trametes unicolor*); Japleniški Vrh, stump of probably *Fagus*; Severin on the Kupa, living *Fraxinus* sp. IV—VI, IX—X.
- Cinereomyces lindbladii* (Berk.) Jülich. Risnjak, prostrate trunks of *Abies*, several times from 1963—1982, first det. Z. Pouzar, IV, VII, X.
- Datronia mollis* (Sommerf.:Fr.) Donk Risnjak, up to nearly 1400 m, stumps of *Fagus* (Tortić 1966 as *Trametes mollis*), found also later several times on *Fagus* branches; Jasenak, branch and stump of *Fagus*; V—IX. Tršće (VL74) sawmill, on *Juglans regia*, leg. D. Vrščaj, V 1987.
- Dichomitus campestris* (Quél.) Doman. & Orlicz, Risnjak, dead trunk of *Corylus avellana*, V 1976; Jasenak, dead branch on living *Crataegus monogyna* and standing dead trunks of *Corylus avellana*, VIII 1987, VIII 1989.
- Diplomitoporus lenis* (P. Karst.) Gilberts. & Ryv. Risnjak (Smrekovac) 1200 m, rotten trunk of *Abies*, VIII 1971, det. F. Kotlaba & Z. Pouzar.
- Fomes fomentarius* (L.:Fr.) Fr. Klek (Beck 1906), Veliki Drgomalj near Delnice on old *Fagus* trunks (Forenbacher 1915), »on *Fagus* frequent« (Škorić 1928), Crni Lug (Vrtar, in litt.), Risnjak, Zalesina, very frequent on dead living *Fagus* wood up to 1400 m (Tortić 1966). On *Fagus* also in other localities: Platak, Razloge, Kamačnik, Klek, Vrh Kapele Bijeje Stijene, Jasenak. In Risnjak observed once on *Acer pseudoplatanus* and at Razloge on (probably) *Carpinus betulus*, Perennial.
- Fomitopsis pinicola* (Sw.:Fr.) P. Karst. Risnjak, Delnice, Zalesina, Skrad on wood of *Fagus* and *Abies* up to about 1300 m. (Tortić 1966 as *Fomes marginatus*). Mainly found on dead wood (stumps, standing and prostrate dead trunks, rarely branches) of *Abies*, only in few instances on *Fagus*. At Lazac it grew on prostrate trunk of *Picea*. Other localities: Japleniški Vrh, Petehovac, Paljetinski Vrh, Resnjak, Sungerski Lug, Jasenak, Vrh kapele, Bijeje Stijene; in the last three also on wood of *Picea*, once on a living tree. A common species in montane beech and fir forests, somewhat less abundant than *F. fomentarius*. Perennial.
- Gloeophyllum abietinum* (Bull.:Fr.) P. Karst. Delnice, on wood of *Abies* (Škorić 1928 as *Lenzites abietina*), Risnjak, on logs and a fence of coniferous wood, probably *Abies* (Tortić 1966). Found there also later on worked wood of *Abies*; Klek, at the foot of the mountain on a fence of *Abies* wood. V—X.
- G. odoratum* (Wulf.:Fr.) Imaz. Crni Lug, stump of *Abies* (Škorić 1928 as *Trametes odorata*), Lazac (Vrtar, in litt.). Risnjak, Zalesina, Sungerski Lug, Makov Hrib, on stumps and logs of *Abies* (Tortić 1966 as *Anisomyces odoratus*). Further finds in this and other localities (Japleniški Vrh, Resnjak, Jasenak, Lazac) as well as in other regions showed that the host was very probably in all cases incorrectly identified, since up to now the author found this species only on wood of *Picea*. *G. odoratum* therefore is not as frequent in the investigated localities, as for instance *F. fomentarius* or *Fomitopsis pinicola*, since *Picea* is much more rare than *Fagus* or *Abies*. Perennial.
- G. sepiarium* (Wulf.:Fr.) P. Karst. Sušički Jarak, *Abies* (Škorić 1928 as *Lenzites sepiaria*), Risnjak, logs, branches and a fence of coniferous wood (Tortić 1966). Other localities: vicinity of Delnice, Kamačnik, Sungerski Lug, stumps and worked wood of *Abies* or *Picea*.

- Hapalopilus rutilans* (Pers.:Fr.) P. Karst. Risnjak, branch of prostrate trunk of *Abies*, IX 1988; Jasenak, standing dead trunk of *Corylus avellana*, VIII 1989. Mainly growing on hardwoods, but in mountain forests not rare on wood of *Abies*.
- Heterobasidium annosum* (Fr.) Bref. Sungerski Lug, on *Picea* (Škorić 1928 as *Fomes annosus*). Risnjak, Zalesina, Skrad, stumps of *Abies* (Tortić 1966 as *Fomes annosus*). Refound in Risnjak and at Zalesina, noted in the vicinity of Delnice and at Vrh Kapele, everywhere on wood of *Abies*.
- Ischnoderma benzoinum* (Wahlenb.) P. Karst. Risnjak, stump of *Abies*, IX 1962 (Tortić 1966 as *I. resinotum*), found there also V 1976. Zalesina, VIII 1972; Bijele Stijene, V 1978, both on trunks of *Abies*.
- I. resinotum* (Fr.) P. Karst. Risnjak, prostrate trunk of *Fagus*, X 1962 (Tortić 1966 as *I. resinotum*), Kamačnik, log of *Fagus*, VIII 1972. In both cases very young specimens.
At the time of the cited publications these two species were not yet distinguished and the finds were published under correct names only later (Tortić 1979).
- Laetiporus sulphureus* (Bull.:Fr.) Murr. Brod on the Kupa, on *Quercus* (Škorić 1929 as *Polyporus caudicinus*), valley of the river Kupa near Brod, on *Prunus avium*, V 1933, leg. F. Dolšak, LJU (Tortić 1976). Risnjak, on living *Fagus* several times (Tortić 1966 as *Grifola sulphurea*), Delnice, on trunks (of *Fagus*) V 1963, leg. V. Lindtner, BEO. V—X.
- Lenzites betulina* (L.:Fr.) Fr. Iševnica, Sušički Jarak, on *Betula* (Škorić 1928), Prezid (Vrtar, in litt.), Skrad, *Fagus* log (Tortić 1966 as *Trametes betulina*). Although not a rare species, it was refound in this region later only at Kamačnik, on wood of *Fagus*.
- Oxyporus populinus* (Schum.:Fr.) Donk. Risnjak, newly felled tree of *Acer pseudoplatanus*, VI 1988; Platak, living tree of *Fagus*, on injured parts, V 1976.
- O. ravidus* (Fr.) Bond & Sing. Risnjak, *Abies* log, VIII 1980.
- Perenniporia medulla-panis* (Jacq.:Fr.) Donk. Razloge, branch of *Prunus avium*, VII 1980.
- Piptoporus betulinus* (Bull.:Fr.) P. Karst. Near Plešće, on a trunk of *Betula* (Forenbacher 1915 as *Polyporus betulinus*), Sušički Jarak, on *Betula* (Škorić 1928 as *Polyporus betulinus*), Risnjak, on branches, and prostrate and standing trunks of *Betula* sp. (Tortić 1966). IV—X.
- Podofomes trogii* (Fr.) Pouz. Risnjak, a few times on stumps of *Abies* or apparently on soil (Tortić 1966 as *Fomes corrugis*, 1979). Rather rare species, not refound later but surely still present. VII—X.
- Polyporus badius* (S. F. Gray) Schw. Risnjak, apparently on soil, Skrad, on a *Fagus* log (Tortić 1973 as *Polyporus picipes*). Both specimens revised by F. Kotlaba and Z. Pouzar, but later destroyed by insects. VII, X.
- P. brumalis* (Pers.:Fr.) Fr. Delnice, Risnjak, nearly up to the peak of Mali Risnjak, 1400 m, on branches, logs and stumps of *Fagus* (Tortić 1966 as *Polyporellus arcularius*), IV—V, X.
- P. ciliatus* Fr.:Fr. Risnjak, stumps and logs of *Fagus*, IV—VI (Tortić 1966 as *Polyporellus brumalis*), Petehovac, VII 1966.
- P. melanopus* (Pers.) Fr. Risnjak, on roots and apparently on soil, a few times, VI—X (Tortić 1966 as *Polyporellus melanopus*). Petehovac, branches of *Fagus* (Tortić 1973 as *P. varius* f. *nummularius*). Unfortunately, all the material was later destroyed and could not be revised anew; one collection from Risnjak was probably *P. badius*.

- P. squamosus* (Huds.): Fr. Podcajtige, above Smrekovac (Vrtar, in litt.) Risnjak, several times on standing or prostrate dead trunks of *Fagus* up to about 1200 m (Smrekovac), in some places abundant, VI—X (Tortić 1966 as *Polyporellus squamosus*).
- P. varius* (Pers.): Fr. Resnjak, Polputa near Delnice, Sungerski Lug, all on branches of *Fagus* (Škorić 1928 as *Polyporus elegans*, *P. varius* and *P. elegans* var. *nummularius*), Crni Lug, Prezid (Vrtar, in litt.). Risnjak, several times on logs and prostrate trunk of *Fagus* up to 1300 m, also at Skrad, V—X (Tortić 1966 as *Polyporellus varius*). It was refound at Skrad on *Acer obtusatum*. In other localities also on wood of *Fagus*: Gerovo, Kamačnik, Bijele Stijene, Klek, Jasenak (on living tree). A collection from Klek by Beck, VIII 1898, is preserved in Prague (PRC), rev. F. Kotlaba.
- Porpomyces mucidus* (Pers.:Fr.) Jülich. Risnjak, *Abies* stump, VII 1971, det. F. Kotlaba & Z. Pouzar (Tortić 1973 as *Fibuloporia donkii*), found there also later on *Abies* wood (X 1978, VII 1980); Jasenak, *Abies* wood, VIII 1989.
- Postia caesia* (Schrad.:Fr.) P. Karst. Žrnovac (Škorić 1928 as *Polyporus caesius*). Risnjak, not rare on logs and stumps of *Abies*. IX—IX (Tortić 1966 as *Leptoporus caesius*).
- P. simanii* (Pilát) Jülich Risnjak, *Abies* branch, IX 1988.
- P. tephroleuca* (Fr.) Jülich. Risnjak, a resupinate specimen on the underside of a log of *Abies*, IX 1988, det. A. David.
- Pyconoporus cinnabarinus* (Jacq.:Fr.) P. Karst. Sušički Jarak, on *Betula* (Škorić 1928 as *Trametes cinnabarina*). Risnjak, branches of *Fagus* and *Betula* sp. (Tortić 1966 as *Trametes cinnabarina*) later also on a log and stump of *Fagus*. Bijele Stijene, *Fagus* log; Petehovac, *Fagus* branches. V, VII, IX.
- Rigidoporus nigrescens* (Bres.) Donk. Risnjak (Lazac) stumps probably of *Picea*, V 1968, rev. F. Kotlaba & Z. Pouzar; Vrh Kapele, stump of *Picea*, IV 1978.
- R. sanguinolentus* (Alb. & Schw.:Fr.) Donk. Risnjak, on stumps of *Abies* (Tortić 1973 as *Physisporinus sanguinolentus*), refound also later on the same host, rather frequent. IX—X.
- Skeletocutis amorpha* (Fr.) Kotl. & Pouz. Risnjak, stump of *Abies*, X 1963 (Tortić 1966 as *Gloeoporus amorphus*), Sungerski Lug, stumps of *Abies* or *Picea*, VIII 1972, Zalesina, branch of *Abies*, IX 1968. Specimen from Zalesina was revised by A. David in 1991. Others were unfortunately destroyed by insects, and it is impossible to check whether they belonged here or to the next species.
- S. carneogrisea* David. Risnjak, VI and IX 1988 on several places on *Abies* branches, rather abundantly, some on *Trichaptum abietinum*; Jasenak, on thin *Abies* trunks rather abundant, some on *T. abietinum*, VIII 1989.
- S. nivea* (Jung.) Keller. Risnjak, branch of *Fagus*, VIII 1972, Vrh Kapele, branch of *Corylus avellana*, IV 1978; Jasenak, branches of *Fagus* and *Corylus avellana*, VIII 1989.
- Trametes gibbosa* (Pers.:Fr.) Fr. Crni Lug, Smrekovac (Vrtar, in litt.). Risnjak, stumps and logs of *Fagus* up to 1300 m, several times (Tortić 1966) found also later. Other localities: Zalesina, Gerovo, Kamačnik, foot of Klek Mt., Jasenak, on stumps and logs of *Fagus*. V—X.
- T. hirsuta* (Wulf.:Fr.) Pilát. Resnjak near Delnice, on *Fagus* (Škorić 1928 as *Polystictus hirsutus*). Risnjak, in many places, on branches, stumps, logs and standing dead trees of *Fagus* up to ca 1300 m, Zalesina and Drivenik, stumps of *Fagus* (Tortić 1966). In Risnjak found also later. Other localities: Japleniški Vrh, Ponikvarski Vrh, Petehovac, Resnjak, Razloge, Skrad, Platak, Vrh Kapele, Bijele Stijene, Klek, Jasenak. Everywhere a common species on trunks,

logs and branches of *Fagus*, at Razloge also on a log of *Carpinus betulus*. IV—X.

- T. pubescens* (Schum. : Fr.) Pilát. Risnjak, several times on stumps of *Fagus*, once on a living tree, also on a branch of *Corylus avellana* and *Betula* sp. (Tortić 1960 as *T. zonata*, see Tortić 1973). Jasenak, log of *Fagus* and wood of probably *Corylus* IV, VI—X. Škorić (1928) published from Risnjak on a *Fagus* stump *Polystictus zonatus* which is probably this species.
- T. versicolor* (L. : Fr.) Pilát. Drgomalj near Delnice, *Fagus* stumps (Forenbacher 1915 as *Polystictus versicolor*), Risnjak, *Fagus* stump (Škorić 1928 as *Polystictus versicolor*), Crni Lug (Vrtar, in litt.). Risnjak, Zalesina, on stumps, logs, also on standing dead trunk of *Fagus* (Tortić 1966). Rather frequent in Risnjak, found also at Japleniški Vrh, Skrad, Kamačnik, Platak, Vrh Kapele, slopes of Klek, Razloge, Jasenak, on stumps and logs of *Fagus*, at Razloge and Jasenak also on branches of *Corylus avellana*. IV—X.
- Trichaptum abietinum* (Pers. in Gmelin : Fr.) Ryv. Pauci, on *Abies* (Škorić 1928 as *Polystictus abietinus*). Risnjak, Drivenik, on dead and living wood of *Abies* (Tortić 1966 as *Trametes abietina*), found also later in the Risnjak NP on branches, logs, standing dead trunks of *Abies* many times, usually abundantly. Noted at Japleniški Vrh, Paljetinski Vrh, Ponikvarski Vrh, Vrh Kapele, Razloge, Bijeje Stijene, all on *Abies*, at Sungerski Lug probably on *Picea* and at Jasenak on branches of both *Abies* and *Picea*. V—X.
- Tyromyces chioneus* (Fr. : Fr.) Karst. Risnjak, dead wood of *Prunus avium* (Tortić 1966 as *Leptoporus lacteus*, Tortić 1973 as *Tyromyces albellus*). Only one collection, rev. Z. Pouzar.

Ganodermataceae

- Ganoderma carnosum* Pat. Drgomalj, stump of *Abies* (Škorić 1928 as *Fomes lucidus*), Crni Lug (Vrtar, in litt. as *G. lucidum*), Risnjak in several places on stumps of *Abies* and *Fagus*, also at Zalesina, Skrad, Drivenik (Tortić 1966 as *G. lucidum*). Refound later several times (found also at Doren Vrh) but the host, when checked, always proved to be *Abies*, therefore *Fagus* was apparently a mistake. V—X.
- G. lipsiense* (Batsch) Atk. Smrekovac, on *Fagus* (Škorić 1928 as *Fomes applanatus*), Risnjak-Lazac (Vrtar, in litt.). Risnjak, on *Fagus* mostly, up to 1200—1300 m (Tortić 1966 as *Ganoderma applanatum*) Frequent in the NP. Noted also at Bijeje Stijene, Japleniški Vrh, Ponikvarski Vrh, Doren Vrh, Paljetinski Vrh, Petehovac, Zalesina, Kamačnik, Lokve (VL82), mostly on stumps and logs of *Fagus*, a few times on *Abies*. Perennial.

Hymenochaetaceae

- Coltricia perennis* (L.) Murr. Risnjak, on soil, mainly in fir forest (*Blechno-Abietetum*), several times, VI—X (Tortić 1966 as *Polystictus perennis*). Not observed later.
- Hymenochaete cruenta* (Pers. : Fr.) Donk. Paljetinski Vrh near Delnice (Tortić 1973); Risnjak, prostrate branch of *Abies*, V 1976; Platak, dead branches on living *Abies* tree, V 1976. Probably not infrequent but difficult to observe (and collect) because growing on dead branches often high in the crown of living trees.
- Inonotus dryadeus* (Pers. : Fr.) Murr. Risnjak, at the base of living *Abies* tree X 1962 (Tortić 1966), refound there later on a stump of *Abies*, VIII 1972.

- I. hastifer* Pouzar. Japleniški Vrh near Delnice, branch of *Fagus*, IV 1963, det. Z. Pouzar (Tortić & Kotlaba 1976 as *I. polymorphus*).
- I. nodulosus* (Fr.) P. Karst. Risnjak, stump of *Fagus* (Tortić 1966 as *I. radiatus* var. *nodulosus*), refound also later on branch and standing dead trunk of *Fagus* (VII 1982, IX 1988); Platak, *Fagus*, V 1976; Klek, very old specimens on prostrate trunk of *Fagus*, VIII 1989. Generally not a rare species and certainly more widely spread.
- Phellinus chrysoloma* (Fr.) Donk. Risnjak (Lazac) probably on *Picea* (Tortić 1973 as *Ph. abietis*), refound there on dead branches of living *Picea* tree, some carpophores also fallen on the ground, VI 1988.
- Ph. ferruginosus* (Schrad. in Gmelin:Fr.) Pat. Razloge, at the source of the Kupa, abundant on a log of *Acer* sp., VI 1988.
- Ph. hartigii* (Allesch. & Schnabl) Bond. Risnjak, dead wood of *Abies* (Tortić 1966 as *Ph. robustus* f. *hartigii*), refound also later. On standing or prostrate dead trunks and stumps of *Abies*. Perennial.
- Ph. igniarius* (L.:Fr.) Quéf. Risnjak, on living *Salix* sp. (Tortić 1966).
- Ph. cf. ossatus* Fischer. Platak, living trunk of *Fagus*, V 1976.
- Ph. tuberculosus* (Baumg.) Niemelä. Jasenak, Razloge, in both villages on living *Prunus domestica*.
Species published by Škorić (1928) but not refound.
- Hydnum cirrhatum* Pers. Iševnica, stump of *Prunus avium*
= *Creolophus cirrhatum* (Pers.:Fr.) P. Karst.
- Poria obducens* Pers. Crni Lug, *Fagus* stump
= *Oxyporus obducens* (Pers.:Fr.) Donk.
- Fomes laccatus* Kalchbr. Marija Trošt, on *Prunus avium*
= *Ganoderma pfeifferi* Bres. in Pat.
- Daedalea quercina* Fr. Radočaj, on *Quercus* sp.
= *D. quercina* (L.:Fr.) Pers.
- Polyporus rubiginosus* Fr. Drgomalj, *Fagus* log
= *Aurantioporus fissilis* (Berk & Curt.) Jahn or
= *Inonotus cuticularis* (Bull.:Fr.) P. Karst.

Discussion and Conclusions

The total number of species presented here is 164. Of those, 72 were published in the first two contributions to this series, as well as in several subsequent papers cited in the list at appropriate places. Also, at the end of the list five polypores are now added, published by Škorić (1928), which were not refound by the author and were not mentioned in her previous publications. Therefore, 87 species are noted here for the first time in this region.

Some of these fungi occur in various types of forests on various hosts, as *Bjerkandera adusta*, *Stereum hirsutum*, several *Trametes* species to name the most frequent. Others, growing preferably either on *Fagus* or on *Abies* (resp. *Picea*) are known mainly from forests of beech and fir where they may be frequent or rare, as for instance *Fomes fomentarius*, *Fomitopsis pinicola*, *Ganoderma lipsiense*, *Trichaptum abietinum*, *Cystostereum murrari*, various species of the genera *Gloeocystidiellum*, *Hyphoderma*, *Hyphodontia* and many others. It is interesting to point out that some generally not uncommon species in such (or other) types of forests were observed rarely, several of them even only in localities visited once or twice, as for instance *Cylindrobasidium evolvens*, *Peniophora incarnata*, *Phlebia rufa*, *Amphinema byssoides*, *Antrodiella*

hoehnelli etc. The reason may be that the visits were made at great intervals and not always in the best season for the growth of carpophores, which, at other times may have been present in larger or smaller quantities.

A few of the more interesting species are discussed here. For some others notes are added in the list.

Very rare *Atheloderma mirabile* (known only from Estonia and Sweden) and *Hyphoderma capitatum* (found in Sweden and Switzerland) were collected in the Risnjak Nat. Park, each only once (Tortić 1989). On the other hand, *Botryobasidium sphaericosporum*, described recently, does not seem to be uncommon in this region and was noted in some other localities, too (Tortić 1989a).

Sparassis nemecii is cited here under that name after Jülich (1984) to emphasize that all finds were on *Abies*. *S. ramosa* = *S. crispa* of earlier authors obviously represents this species, as it was collected on *Abies*. Kreisel (1983) is of the opinion that *S. nemecii* is identical with *S. laminosa* which occurs on hardwoods, especially *Quercus*, and that the correct name is *S. brevipes* Krombh. However, he points out its preference for *Abies* in forests of beech and fir in the mountains of Central Europe — exactly the habitat in which it was found in Gorski Kotar and a few other localities, some not yet published.

Schizopora paradoxa, in the broad sense, is widespread and was therefore often only noted. However, Hallenberg (1983) has shown that two species are involved, *S. paradoxa* and *S. radula*. Obviously, notes without specimens are not of much use and the occurrence of one or both species can be established only on the basis of specimens. The author has now examined the specimens from Gorski Kotar and found one *S. radula*, others were *S. paradoxa*. In the material from some other localities *S. radula* appears to be more frequent. A thorough study of the exsiccata available and numerous new collections are needed to obtain a picture of the distribution of those two species here.

A similar problem is presented by *Vuilleminia comedens* s.l. *Vuilleminia* was considered as a monotypic genus, with characteristic allantoid spores, and since carpophores are easily recognized macroscopically they were often only noted. However, other species with allantoid spores are now known: *V. cystidiata* from Estonia, Armenia and Siberia (Parmas to 1965), found later in some other European countries, and *V. coryli*, described very recently from France (Boidin et al. 1989). The spores of *V. comedens* and *V. coryli* are practically of the same size, but the latter differs by long cystidia rounded at the tips and occurs mainly on *Corylus*. The spores in *V. cystidiata* are smaller than in other two species, and it is characterized also by acute cystidia and the growth on *Rosaceae*, particularly *Crataegus*.

Whilst the specimen of *V. cystidiata* from Jasenak represents undoubtedly this species, collection from the same locality on *Corylus* was tentatively placed in *V. coryli* only because of its host, since cystidia by which it can be distinguished with certainty from *V. comedens* were not found. Moreover, according to Dr. F. Kotlaba, Prague (personal communication) true *V. comedens* occurs on *Corylus*, too!

Some specimens of *V. comedens* s.l. on *Corylus* from Plitvice Nat. Park were now reexamined and in two a few characteristic cystidia were seen; therefore those are the first certain finds of *V. coryli* in this country. Cystidia were rather rare and may have been overlooked in other collections, including the one from Jasenak. *Vuilleminia* on *Corylus* is not rare in various localities investigated and at least a part of the finds

might represent *V. coryli*. In this case, too, numerous new collections and the revision of existing specimens are necessary.

Postia simanii is considered by some authors as synonymous with *P. hibernica*, but others, such as Jülich (1984), Bernicchia (1990) treat them as two separate species. The present author is of the same opinion and has published some localities of both (TortiĆ 1988a, 1989) but without descriptions. This problem cannot be dealt with in detail here and only some outstanding characters are pointed out. According to Bernicchia (1990), who places both in the genus *Oligoporus* the main differences between *P. hibernica* and *P. simanii* are: in the former the spores are longer and broader, the cystidia, incrustated at the tips, are rare, sometimes apparently absent and it occurs on conifers, whilst in the latter the spores are smaller, cystidia (with rather large crystalline caps) are more or less frequent and it is found on hardwoods. Both are resupinate, in *P. simanii* the margin often a little turned down.

In the material collected and studied by the author there was also a difference in the size of the spores and the occurrence of cystidia. However, specimens identified according to those characters as *P. simanii* grew both on hardwoods and conifers, were usually much thicker than those of *P. hibernica*, had a bitter taste and in some distinct small pilei were developed. The specimen from Risnjak was resupinate, with cystidia easily seen and spores about $5 \times 1-1.5 \mu\text{m}$, and was growing on wood of *Abies*.

All the specimens of both species collected by the author were revised by Dr. A. David, Lyon and Dr. H. Grosse-Brauckmann, Seeheim, who agreed with her determinations. Without doubt, this complex should also be studied intensively in future; pure cultures are particularly needed.

The occurrence of *Inonotus dryadeus* on *Abies* was pointed out by the author in several papers (TortiĆ 1966, 1988a). TortiĆ & Lisiewska (1972) presented a map of localities of this species, where its occurrence on *Quercus*, resp. *Abies* was marked by different signs. *I. dryadeus* grows on old trees, which are now becoming rare in both oak and fir forests and is therefore nowhere frequent. Carpophores are not long lasting and may be missed if a locality is visited in a »wrong« time; also, old ones, if found, may not be identified with certainty. In Risnjak it was found on *Abies* twice, once at the base of a living tree and once on a stump. In Plitvice it was observed at the base of two or three living firs, on one of them several years in a row at the same place on the trunk, sometimes fresh carpophores, sometimes only remains, which, however, could not be anything else. A most curious find was in the vicinity of Zagreb, in the small town of Samobor (alt. ca 200 m) on living *Abies pinsapo* in a private garden (TortiĆ 1991). In North America *I. dryadeus* occurs on both oaks and firs.

The names of fungi published by Škorić (1928) were modernised, as seen in the list, but it was not always quite certain which species was meant, particularly since there are no voucher specimens extant, and a guess had to be made in some instances. The most enigmatic was *Polyporus rubiginosus* Fr., on *Fagus*, which is according to Pilát (1936—42) *Aurantioporus fissilis*, but Jülich (1984) cites this name as a synonym of *Inonotus rheades*. Since *I. rheades* is mainly found on *Populus tremula*, it does not need to be taken into consideration here, but *Aurantioporus fissilis* can occur on *Fagus*, although rarely. Dr. F. Kotlaba, Prague (personal communication) is of the opinion that *P. rubiginosus* could be *Inonotus cuticularis*, which often grows on *Fagus*.

In comparing this list with those of polypores and corticia in Plitvice (Torti \acute{c} 1985, 1988a) a great similarity can be observed, owing to the same ecological condition and type of vegetation. In the course of more intensive investigations further species will surely be found in this region.

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S a ž e t a k

MAKROMICETI GORSKOG KOTARA (HRVATSKA) III

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Na području Gorskoga kotara ustanovljene su dosad 164 vrste lignikolnih gljiva iz reda *Aphylophorales* (dodan je i malen broj krupnijih *Heterobasidiomycetes*) i prikazane u sistematskom popisu. Oko polovica je već prije publicirana, većinom iz nacionalnog parka Risnjak, no mnogo ih je sabrano naknadno i na drugim lokalitetima, ili se utvrdilo da su na tom području češće nazočne nego se mislilo.

Ovdje se za tu regiju navodi prvi put 87 vrsta.

Podaci o istraživanim lokalitetima te datumi posjeta navedeni su u engleskom tekstu, gdje su uz pojedine vrste dodane i primjedbe o njihovoj rasprostranjenosti.

Uz mnoge obične vrste pronađen je i određen broj rjeđih ili vrlo rijetkih, kako je istaknuto u diskusiji. S druge strane, neke inače česte sabrane su samo jednom ili dvaput što se može protumačiti time da su lokaliteti posjećivani u velikim vremenskim razmacima i ne uvijek u najboljoj sezoni za razvoj plodišta.

Većina ovdje publiciranih gljiva poznata je iz šuma bukve i jele u različitim našim krajevima, gdje rastu pretežno na bukvi i na jeli (odnosno smreki) i, čini se, karakteristične su za takve šume. Intenzivnijim i češćim istraživanjima sigurno bi se pronašlo još mnogo takvih vrsta, pa se ovaj popis može smatrati samo preliminarnim.

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