CZECH MYCOL. 54 (1–2), 2002

The genus Phellinus in the Šumava Mts.

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Tomšovský M. (2002): The genus Phellinus in the Šumava Mts. – Czech Mycol. 54: 45–78

The ecology and distribution of species of *Phellinus (Basidiomycetes, Hymenochaetaceae)* in the Šumava Mts. was studied. The study area represents the Czech part of the Šumava mountain range at the border of the Czech Republic, Germany and Austria. The area was intensively studied during the years 1997–2000. The data based on the author's own records were complemented with unpublished records based on collections deposited in the PRM herbarium. Altogether 18 species of *Phellinus* were confirmed for the Šumava Mts. The distribution, altitude range, substrate specificity and vegetation preference of each species are evaluated. The text is completed with distribution maps of the species.

Key words: Basidiomycetes, Hymenochaetaceae, *Phellinus*, Šumava Mts. (Czech Republic), ecology, distribution

Tomšovský M. (2002): Rod ohňovec (Phellinus) na Šumavě. – Czech Mycol. 54: 45–78

Ekologie a rozšíření zástupců rodu ohňovec *Phellinus* (Basidiomycetes, Hymenochaetaceae) na Šumavě byly studovány. Zájmové území – pohraniční hřeben Šumavy na hranicích s Německem a Rakouskem – bylo prozkoumáváno v letech 1997–2000. Celkem zde bylo potvrzeno 18 druhů rodu ohňovec. Práce zahrnuje geografické a vertikální rozšíření, substrátovou specificitu a vegetační preference sledovaných druhů. Text je doplněn mapami rozšíření jednotlivých druhů.

INTRODUCTION

The Šumava Mts. (Bohemian Forest, Böhmerwald) represent a mountain range in Central Europe forming a natural borderline between the Czech Republic on the one side and Germany (Bavaria) and Austria on the other side. The Czech part of the Šumava Mts. is situated between 470 and 1378 m above sealevel (Chábera 1987). The area is covered mainly by forest more or less influenced by human activities. However, remnants of natural vegetation are still relatively well represented. The main vegetation includes mixed montane forests with *Fagus sylvatica, Picea abies* and *Abies alba*, scree forests, montane spruce forests and numerous peatbogs. The largest part of the Šumava Mts. in the Czech Republic is protected as a National Park. The most recent studies on fungi in the Šumava Mts. are works by J. Holec (Holec 1997, 2000, Holec and Pouzar 1999, Holec et al. 1999) and N. Luschka who included data from the Bavarian part of the

Šumava Mts. (Bavarian Forest), mainly from the National Park Bayerischer Wald (Luschka 1993). This paper is based on data included in the author's MSc. Thesis (Tomšovský 2000), that deals with ecology and distribution of genera *Coltricia, Hymenochaete, Inonotus, Onnia* and *Phellinus* in the Šumava Mts.

Genus *Phellinus* Quél. is characterised by perennial, resupinate to effuse-reflexed or pileate basidiocarps. The colour of the basidiocarps is yellowish, rusty, yellowish brown, brown, dark brown or grey. The surface of the basidiocarps is tomentose, hispid, glabrous or deeply cracked. Basidiocarps turn black in KOH. Long, smooth, dark setae are usuallly present in the hymenium, in some species also in the trama. Basidiospores are globose to cylindrical, smooth, hyaline to rusty brown, thin- to thick-walled, dextrinoid or negative in Melzer's reagent. The hyphal system is dimitic. The hyphae are simply septate (without clamps), skeletals yellow to brown, often thick-walled. The genus *Phellinus* is distributed all over the world and altogether 26 species have been recorded from the Czech Republic (Kotlaba 1984, Kotlaba and Pouzar 1995, Vampola 1993): *Phellinus alni* (Bond.) Parmasto, *P. cavicola* Kotlaba et Pouzar, *P. chrysoloma* (Fr.) Donk, *P. cinereus* (Niemelä) M. Fischer, *P. conchatus* (Pers.: Fr.) Quél., *P. contiguus* (Pers.: Fr.) Pat., *P. ferrugineofuscus* (P. Karst.) Bourdot, *P. ferruginosus* (Schrad.: Fr.) Pat., *P. hartigii* (Allesch. et Schnabl) Pat., *P. igniarius* (L.: Fr.) Quél., *P. laevigatus* (P. Karst.) Bourdot et Galzin, *P. lundellii* Niemelä, *P. nigrolimitatus* (Romell) Bourdot et Galzin., *P. pilatii* Černý, *P. pini* (Fr.) A. Ames, *P. populicola* Niemelä, *P. pouzarii* Kotlaba, *P. pseudopunctatus* A. David, Dequatre et Fiasson, *P. punctatus* (P. Karst.) Pilát, *P. rhamni* (M. Bondartzeva) H. Jahn, *P. ribis* (Schumach.: Fr.) Quél., *P. robustus* (P. Karst.) Bourdot et Galzin, *P. torulosus* (Pers.) Bourdot et Galzin, *P. tremulae* (Bondartzev) Bondartzev et Borissov, *P. tuberculosus* (Baumg.) Niemelä, *P. viticola* (Schw.) Donk

Some modern authors split *Phellinus* as conceived here in several smaller genera (e.g. Hansen and Knudsen, 1997) mostly described by Murrill (1907).

MATERIAL AND METHODS

This paper is based mainly on the author's own finds from the years 1997–2000. Some records originate from excursions made together with Dr. J. Holec and Dr. Z. Pouzar. During the field work fungi were collected and essential data on their host and habitat were recorded. Dried fruitbodies are deposited in the herbarium of the Mycological Department, National Museum in Prague (PRM). Fungi found and identified by the author are marked MT.

Data collected by the author were complemented with unpublished records of specimens deposited in the PRM herbarium. Some records found by J. Holec are marked JH followed by the number of the record in his field notebook. These specimens are deposited in PRM, but do not have a PRM number yet.

Some mentioned finds that are recorded but not deposited in any herbarium marked *not.* in place of *leg.* (Kotlaba 1999). The distribution, substrate specificity, altitude range and vegetation preference of each species are evaluated. The distribution of the species is compared with data published by Luschka (1993) from the German part of the Šumava Mts. (Bavarian Forest).

Data on species distribution are complemented with maps. The maps describe the currently known distribution of the species. Records found before 1990 are not included in the maps.

RESULTS AND DISCUSSION

Phellinus alni (Bondartzev) Parmasto

Phellinus igniarius var. *alni* (Bondartzev) Niemelä, *Phellinus ossatus* M. Fischer

Number of records: 35 records from 31 localities.

Substrate: Trunks of *Alnus glutinosa* (43 %), *Sorbus aucuparia* (40 %) and *Fagus sylvatica* (17 %). The species was found on living trees (71 %), fallen trunks (14 %), stump (8 %) and dead standing trees (3 %).

Vertical distribution: 600–1120 m a.s.l.

Distribution in the Šumava Mts.: The species is distributed over the whole area of the Šumava Mts. (Fig. 1)

Results and discussion: The occurrence of the species is mainly dependent on the presence of appropriate substrate. *Phellinus alni* is more common at lower altitudes of the Šumava Mts., mainly in alder woods and stands, on the banks of streams and margins of peatbogs, but also on trees along roads and in villages.

Phellinus alni is in most literature (Breitenbach and Kränzlin 1986, Kotlaba 1984, Ryvarden and Gilbertson 1994) merged with *Phellinus igniarius.* According to studies by Fischer (1995) records from *Alnus, Fagus, Malus* and *Sorbus* belong to *Phellinus alni.* The identification of finds growing on some other tree species (*Acer, Populus, Quercus*) is questionable. Dunger (1987) reports these records as *Phellinus ossatus*, while it is the synonym of *Phellinus alni* described by Fischer (1987). The species is also known from the Bavarian Forest (Luschka 1993).

List of records:

Borová Lada, Knížecí Pláně, *Sorbus aucuparia*, 13. VIII. 1997, leg. F. Kotlaba, PRM 891464. – Borová Lada, Žďárské sedýlko, 1010 m a.s.l., *Fagus sylvatica*, 23. IX. 1999, leg. et det. MT, PRM 894234. – Horní Vltavice, Polka, 870 m a.s.l., *Sorbus aucuparia*, 23. IX. 1999, not. MT. – Horská Kvilda, 1070 m a.s.l., *Sorbus aucuparia*, 19. IX. 1999, leg. et det. MT, PRM 894229. – Horská Kvilda, Zhůří, 1140 m a.s.l., *Sorbus aucuparia*, 19. IX. 1999, not MT. – Kašperské Hory, Rýžovní stream, 610 m a.s.l., *Alnus incana*, 17. X. 1997, leg. et det. J. Holec, JII 857/97. – Kvilda, 1080 m a.s.l., *Sorbus aucuparia*, 15. IX. 1998, not. MT. – Lenora, Malá niva peatbog, 750 m a.s.l., *Alnus incana*, 3. VI. 1998, leg. J. Holec, det. MT, PRM 894039. – Modrava, Filipova Huť, 950 m a.s.l., *Sorbus aucuparia*, 24. IX. 1998, leg. et det. MT, PRM 893880. –

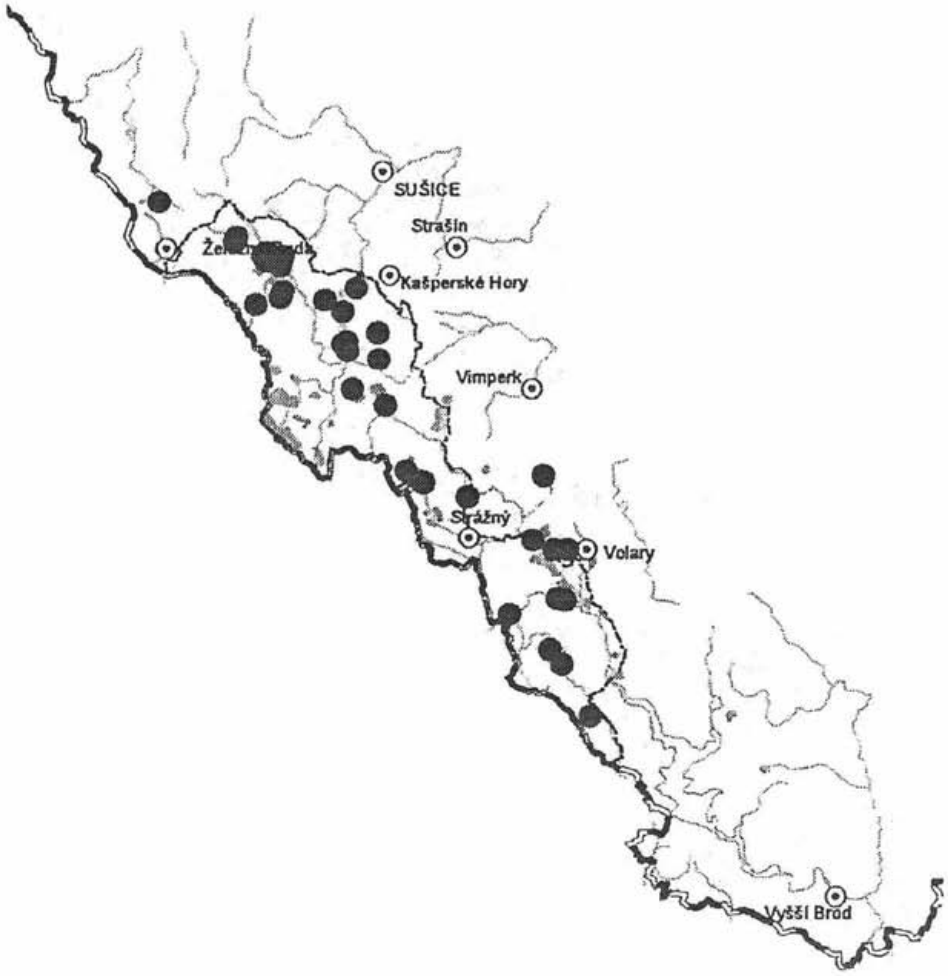

Fig. 1. Distribution of *Phellinus alni* in the Šumava Mts.

Nová Pec, Rosenauer chapel, 860 m a.s.l., *Fagus sylvatica*, 31. V. 1999, leg. et det. J. Holec, JH 4/99. – Nová Pec, Smrčina Mt., 1180 m a.s.l., *Sorbus aucuparia*, 25. IX. 1997, leg. J. Holec, det. MT, PRM 891340. – Prášily, 870 m a.s.l., *Sorbus aucuparia*, 13. VI. 1999, leg. et det. MT, PRM 894036. – Prášily, Slunečná hill, 890 m a.s.l., *Fagus sylvatica*, 11. VI. 1999, leg. et det. MT, PRM 894196. – Prášily, U Cettlovy Hůrky peatbog, 830 m a.s.l., *Alnus incana*, 16. IX. 1999, leg. et det. MT, PRM 894040; ibid. 825 m a.s.l., 17. IX. 1999, PRM 894037. – Prášily, U Cettlovy Hůrky peatbog, *Alnus incana*, 12. VIII. 1997, leg. F. Kotlaba, PRM 891490. – Prášily, Frauenthal, 810 m a.s.l., *Alnus incana*, 10. X. 1998, leg. et det. MT, PRM 893877. – Prášily, Kamenitý vrch, 830 m a.s.l., *Alnus incana*, 11. VI. 1999, leg. et det. MT, PRM 894233. – Srní, Horní Hrádky, 910 m a.s.l., *Sorbus aucuparia*, 16. IX. 1998, leg. et det. MT, PRM 893884. – Srní, Horní Hrádky, 920 m a.s.l., *Fagus sylvatica*, 19. IX. 1998, leg. et det. Z. Pouzar, PRM 897295. – Srní, Křemelná-Zadní Paště, 680 m a.s.l., *Alnus incana*, 14. VI. 1999, leg. et det. MT, PRM 893881. – Srní, Vydra stream, 890 m a.s.l., *Sorbus aucuparia*, 24. IX. 1998, leg. et det. MT, PRM 893879; ibid. 680 m a.s.l., *Alnus incana*, 24. IX. 1998, leg. et det. MT, PRM 893885. – Stožec, Černý Kříž, 740 m a.s.l., *Alnus incana*, 10. IX. 1998, leg. et det. MT, PRM 893888; ibid. 8. IV. 1999, PRM 893887; ibid. *Sorbus aucuparia*, 10. IX. 1998, leg. et det. MT, PRM 893886; ibid. 8. IV. 1999, PRM 893882. – Stožec, Spálený luh, 800 m a.s.l., *Alnus incana*, 11. VII. 1996, leg. F. Kotlaba, PRM 889716. – Stožec, Schwarzenberg Canal, 890 m a.s.l., *Sorbus aucuparia*, 27. VII. 1995, leg. J. Holec, det. MT, PRM 885016. – Volary, Brixův Dvůr, 795 m a.s.l., *Sorbus aucuparia*, 8. IV. 1999, leg. et det. MT, PRM 893883. – Volary, Dobrá, Jedlový stream, 750 m a.s.l., *Alnus incana*, 8. IV. 1999, leg. et det. MT, PRM 893878. – Železná Ruda, Hůrecké slatě peatbogs, 870 m a.s.l., *Alnus incana*, 20. IX. 1999, leg. et det. MT, PRM 894230; ibid. 875 m a.s.l., 25. VIII. 1998, PRM 8894038. – Železná Ruda, Špičák – Černé lake, 970 m a.s.l., *Fagus sylvatica*, 25. VIII. 1999, not. MT.

Phellinus chrysoloma (Fr.) Donk

Phellinus abietis (P. Karst.) Pilát, *Porodaedalea chrysoloma* (Fr.) Fiasson et Niemelä

Number of records: 20 records from 17 localities.

Substrate: Trunks and branches of *Picea abies*. 65 % of finds were found on fallen trunks, 13 % on living trunks, 5 % on dead standing trunks, 5 % on fallen branches.

Vertical distribution: 600–1230 m a.s.l.

Distribution in the Šumava Mts.: *Phellinus chrysoloma* is a rather rare species, distributied throughout the whole area of the Šumava Mts. (Fig. 2). The species occurres mainly in montane mixed forests, rarely in humid spruce forests.

Results and discussion: The species prefers localities with a natural tree composition. *Phellinus chrysoloma* was not found in artificial spruce forests nor in montane spruce forests at the highest altitudes of about 1300 m a.s.l. On the other hand the species is known from higher altitudes in the mountains of Slovakia (Kotlaba 1984).

Phellinus chrysoloma is also distributed in the Bavarian Forest (Luschka 1993).

List of records:

České Žleby, Spáleniště Mt., 930 m a.s.l., *Picea abies*, 16. VI. 1998, leg. et det. J. Holec, PRM 892398. – České Žleby, Radvanovický hřbet Mt., 890 m a.s.l., *Picea abies*, 8. X. 1998, leg. et det. MT, PRM 893901; ibid. 860 m a.s.l., 18. X. 1997, leg. et det. J. Holec, JH 861/97. –

Fig. 2. Distribution of *Phellinus chrysoloma* in the Šumava Mts.

Horská Kvilda, Zhůřské slatě peatbogs, *Picea abies*, 11. VII. 1969, leg. et det. M. Svrček, PRM 889790. – Lenora, Malá niva peatbog, 750 m a.s.l., *Picea abies*, 3. VI. 1998, leg. et det. J. Holec, PRM 892329. – Nová Pec, Houska, 730 m a.s.l., *Picea abies*, 3. VI. 1998, leg. et det. MT, PRM 893902. – Prášily, Ždanidla Mt., 1230 m a.s.l., *Picea abies*, 9. VII. 1998, leg. et det. J. Holec et MT, PRM 896978. – Srní, Dračí skály, 700 m a.s.l., *Picea abies*, 1. VII. 1999, leg. et det. MT, PRM 893903. – Srní, Křemelná stream, 760 m a.s.l., *Picea abies*, 12. VI. 1999, leg. et det. MT, PRM 894043; ibid. 810 m a.s.l., *Picea abies*, 12. VI. 1999, leg. et det. MT, PRM 894041. – Srní, Vydra stream, 680 m a.s.l., *Picea abies*, 11. X. 1997, leg. MT, det. J. Holec, PRM 893904; ibid. 680 m a.s.l., *Picea abies*, 8. X. 1997, leg. et det. J. Holec, JH 630/97; ibid. 700 m a.s.l., *Picea abies*, 24. IX. 1998, not. MT. – Stožec, Kamenná hill, 930 m a.s.l., *Picea abies*, 4. VII. 1997, leg. et det. J. Holec, PRM 890942. – Stožec, Medvědice, *Picea abies*, 24. X. 1990, leg. et det. F. Kotlaba et Z. Pouzar, PRM 871376. – Stožec, Stožecká skála, 976 m a.s.l., *Picea abies*, 23. VI. 1999, leg. et det. MT, PRM 893889. – Zátoň, Jilmová skála, 1010 m a.s.l., *Picea abies*, 13. X. 1998, leg. et det. MT, PRM 894042. Železná Ruda, Černé lake, X. 1927, leg. A. Hilitzer, det. Z. Pouzar, PRM 870569. – Železná Ruda, Pancíř Mt., 1020 m a.s.l., *Picea abies*, 27. VIII. 1998, leg. et det. MT, PRM 893905. – Železná Ruda, Hůrecké slatě peatbogs, 870 m a.s.l., *Picea abies*, 20. IX. 1999, leg. et det. MT, PRM 894044.

Phellinus cinereus (Niemelä) M. Fischer
Phellinus igniarius var. *cinereus* Niemelä

Number of records: 26 records from 20 localities.

Substrate: Trunks of *Betula*. The species was collected on living trunks (80 %), stumps (10%), dead standing trees (10 %).

Vertical distribution: 700–1140 m a.s.l.

Distribution in the Šumava Mts.: *Phellinus cinereus* is distributed mainly in the area of Vltavský luh (southern part of the Šumava Mts. between the villages Černý Kříž and Nová Pec) and in peatbogs of the central part (Fig. 3).

Results and discussion: This species grows in wet localities with birch trees, mainly on peatbog margins. *Phellinus cinereus* is very closely related to *P. nigricans* (Fr.) P. Karst. and these species are often confused in literature. According to Fischer (1995) *P. nigricans* is not distributed in Central Europe at all.

Phellinus cinereus is also known from the Bavarian Forest, but is rather rare there (Luschka 1993).

List of records:

Borová Lada, Žďárecká slať peatbog, *Betula pendula*, 13. VIII. 1997, leg. F. Kotlaba, PRM 891489. – Borová Lada, Vltavský stream, 950 m a.s.l., *Betula pubescens*, 23. IX. 1999, leg. et det. MT, PRM 894231. – Horská Kvilda, Zhůřské slatě peatbogs, 1140 m a.s.l., *Betula pubescens*, 15. IX. 1999, leg. et det. MT, PRM 894205; ibid. PRM 894224. – Horská Kvilda, Zhůřské slatě peatbogs, 950 m a.s.l., *Betula pubescens*, 1. VII. 1999, leg. J. Holec, det. MT, JH 75/99. – Lenora, Velká niva peatbog, 850 m a.s.l., *Betula pubescens*, 31. V. 1999, leg. J. Holec, det. MT, JH 9/99; ibid. *Betula* sp., 23. VIII. 1995, leg. et det. J. Holec, PRM 885117. – Lenora, Velká niva peatbog, *Betula pubescens*, 21. VII. 1965, leg. F. Kotlaba, PRM 870758. – Lenora, Soumarský most, 750 m a.s.l., *Betula pubescens*, 28. VIII. 1998, leg. et det. MT, PRM 893907; ibid. 740 m a.s.l., *Betula pendula*, 12. V. 1999, PRM 893985. – Lenora, Malá niva peatbog, 750 m a.s.l., *Betula pubescens*, 21. IX. 1999, leg. et det. MT, PRM 894226. – Nová Pec, Jezerní luh, 905 m a.s.l., *Betula pubescens*, 31. V. 1999, leg. J. Holec, det. MT, JH 3/99. – Nová Pec, Pěkná, 730 m a.s.l., *Betula pubescens*, 10. IX. 1998, leg. et det. MT, PRM 893910; ibid. *Betula*

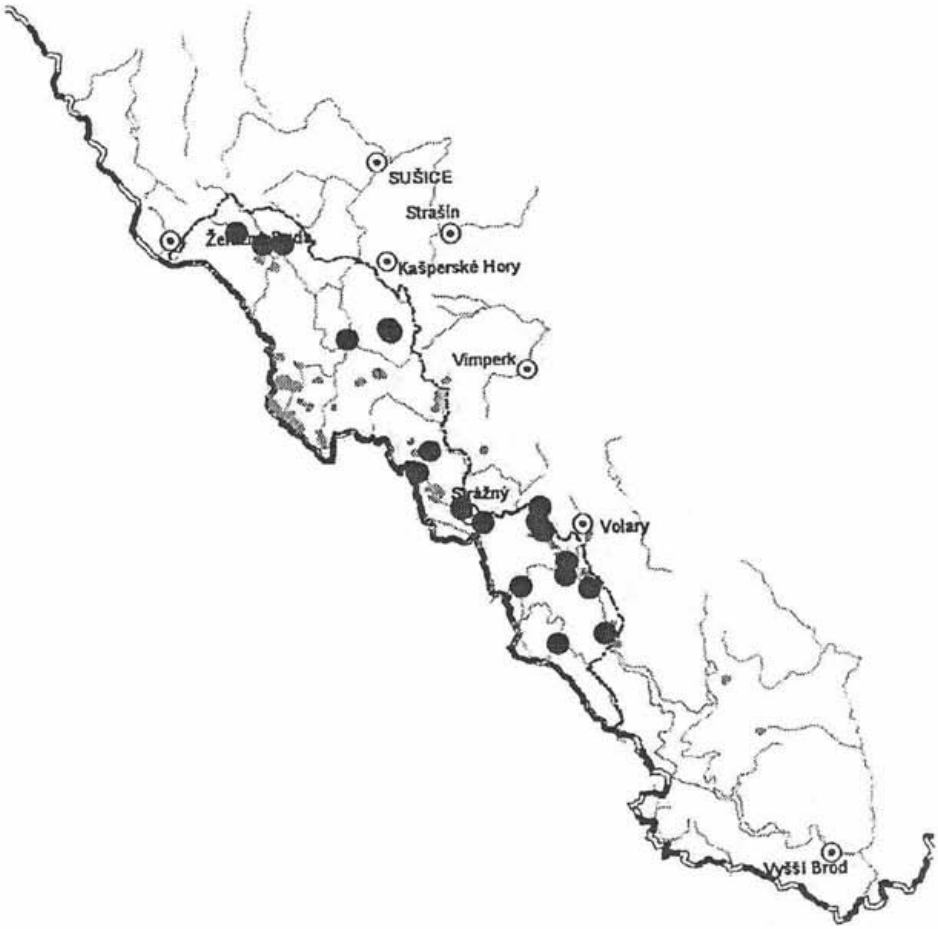

Fig. 3. Distribution of *Phellinus cinereus* in the Šumava Mts.

pendula, 12. V. 1999, PRM 893981; ibid. *Betula pubescens*, 28. VII. 1996, leg. J. Holec, det. MT, PRM 888832. – Nová Pec, Houska peatbog, 730 m a.s.l., *Betula pendula*, 27. VII. 1996, leg. J. Holec, det. MT, PRM 888829. – Prášily, U Cettlovy Hůrky peatbog, 825 m a.s.l., *Betula pubescens*, 17. IX. 1999, leg. et det. MT, PRM 893983; ibid. PRM 894199. – Prášily, Frauenthal, 820 m a.s.l., *Betula pendula*, 10. X. 1998, leg. et det. MT, PRM 893909. – Srní, Vydra stream, 890 m a.s.l., *Betula pendula*, 24. IX. 1998, leg. et det. MT, PRM 893909. – Stožec, Nové Údolí, 800 m a.s.l., *Betula pubescens*, 8. IX. 1998, leg. et det. MT, PRM 893908. – Stožec, Černý Kříž, 735 m a.s.l., *Betula pendula*, 12. V. 1999, leg. et det. MT, PRM 893975. – Strážný, 820 m a.s.l., *Betula pendula*, 23. IX. 1999, leg. et det. MT, PRM 893982. – Strážný, Splavské rašeliniště peatbog, 810 m a.s.l., *Betula* sp., 1. VIII. 1996, leg. J. Holec, det. MT, PRM 888808. – Železná Ruda, Hůrecké slatě peatbogs, 870 m a.s.l., *Betula pubescens*, 20. IX. 1999, leg. et det. MT, PRM 894225; ibid. leg. J. Holec, det. MT, PRM 894198.

Phellinus conchatus (Pers.: Fr.) Quél.
Porodaedalea conchata (Pers.: Fr.) Fiasson et Niemelä

Number of records: 6 records from 6 localities.

Substrate: Diferent species of *Salix*. The fungus was collected on living trees (3x), fallen trees (2x), a living branch and a stump.

Vertical distribution: 630–950 m a.s.l.

Distribution in the Šumava Mts.: The few localities are distributed over the entire area of the Šumava Mts. (Fig. 4). *Phellinus conchatus* grows there in stands along the streams, roads and on the margins of peatbogs.

Results and discussion: *Phellinus conchatus* is a very rare species in the Šumava Mts. This fact is rather surprising when compared with its distribution in the Carpathian Mountains in Slovakia (Kotlaba 1984), where is the species very common. Luschka (1993) presents the species as common in lower parts of the Bavarian Forest. On the other hand *Phellinus conchatus* has not been found in N. P. Bayerischer Wald. Dunger (1989) considered the species a boreal-montane-oceanic element.

List of records:

Lenora, Dobrá, 800 m a.s.l., *Salix* sp., 8. IV. 1999, leg. et det. MT, PRM 893906. – Srní, road Srní – Čeňkova Pila, 730 m a.s.l., *Salix caprea*, 24. IX. 1998, leg. J. Holec, det. Z. Pouzar, PRM 897409. – Srní, Vydra stream, 630 m a.s.l., *Salix caprea*, 3. VI. 1999, leg. et det. J. Holec, JH 21/99. – Srní, Vydra stream, 820 m a.s.l., *Salix caprea*, 9. X. 1998, leg. et det. MT, PRM 894204. – Strašín, Na buku, 750 m a.s.l., *Salix fragilis*, 23. IX. 1998, leg. et det. M. Svrček, PRM. – Železná Ruda, Nový Brunst, 950 m a.s.l., *Salix caprea*, 18. VI. 1997, leg. J. Holec, det. MT, PRM 890884.

Phellinus contiguus (Pers.: Fr.) Pat.
Fuscoporia contigua (Pers.: Fr.) G. Cunn.

Only one record of *Phellinus contiguus* is known from the Šumava foothills (Javornická hornatina) at the village of Strašín. The species is rather thermophilous. Dunger (1989) considers *Phellinus contiguus* a submeridional-temperate element. Kotlaba (1984) presents the record from the highest altitude from former

Fig. 4. Distribution of *Phellinus conchatus* in the Šumava Mts.

Czechoslovakia at 650 m a.s.l. On the other hand one record from National Park Bayerischer Wald is published (Luschka 1993). Also Jahn (1967) presents one record of this species from higher altitudes (1500 m a.s.l. in Lower Tauern).

Record:

Strašín, V luhu, cca. 700 m a.s.l., *Sambucus nigra*, 28. VII. 1998, leg. et det. M. Svrček (Holec et al. 1999)

Phellinus ferrugineofuscus (P. Karst.) Bourdot

Phellinidium ferrugineofuscum (P. Karst.) Fiasson et Niemelä

The only locality where *Phellinus ferrugineofuscus* has been recorded is the primeval forest Boubínský prales (Kotlaba 1965, 1984). This is also the only locality of the species in the Czech Republic. The species is growing on the old fallen trunks of *Picea abies*. *Phellinus ferrugineofuscus* is a significant boreal-montane element of higher mountains of central Europe (Alps, High Tatras – according to Breitenbach and Kränzlin, 1986; Kotlaba 1984) in localities with natural vegetation. The species has not been recorded from the Bavarian Forest (Luschka 1993).

List of records:

Zátoň, Boubínský prales, *Picea abies*, 12. V. 1964, leg. et det. F. Kotlaba et Z. Pouzar, PRM 868919. – Zátoň, Boubínský prales, 1050 m a.s.l., *Picea abies*, 8. I. 1988, leg. et det. J. Vlasák, PRM 869448.

Phellinus ferruginosus (Schrad.: Fr.) Pat.

Polyporus ferruginosus (Schrad.): Fr., *Fuscoporia ferruginosa* (Schrad.: Fr.) Murrill

Number of records: 6 records from 4 localities.

Substrate: *Acer pseudoplatanus, Corylus avellana, Fagus sylvatica, Padus avium* and *Ulmus glabra*. 5 records were collected on fallen trunks, one on a fallen branch.

Vertical distribution: 600–1000 m a.s.l.

Distribution in the Šumava Mts.: The species has been recorded only from the southern part of the Šumava Mts. (area of the Boubínskostožecká hornatina Mts.) (Fig. 5). Three specimens were collected in Opolenec Natural Reserve near Vimperk (Šumava foothills).

Results and discussion: *Phellinus ferruginosus* is a rather rare species of montane mixed forests of the southern part of the Šumava Mts.. On the other hand the species is rather common in localities of relative natural conditions (altitude, vegetation) in the Carpathian Mountains in the eastern part of the Czech Republic and Slovakia (Kotlaba 1984, the author's observations). Luschka (1993) mentions

Fig. 5. Distribution of *Phellinus ferruginosus* in the Šumava Mts.

Phellinus ferruginosus as being common in southern parts of the Bavarian Forest, but it is not known from National Park Bayerischer Wald.

List of records:

České Žleby, Spáleniště, 930 m a.s.l., *Fagus sylvatica*, 24. IX. 1999, leg. et det. J. Holec, JH 342/99. – Zátoň, Jilmová skála, 1000 m a.s.l., *Acer pseudoplatanus*, 13. X. 1998, leg. et det. J. Holec, PRM 897666. – Zátoň, Zátoňská hora, 970 m a.s.l., *Ulmus glabra*, 14. X. 1996, leg. et det. J. Holec, PRM 889512. – Vimperk, Opolenec, *Corylus avellana*, 14. X. 1997, leg. et det. Z. Pouzar, PRM; ibid., *Padus avium*, 5. X. 1998, PRM; ibid. 10. X. 1996, leg. J. Holec, det. Z. Pouzar, PRM.

Phellinus hartigii (Allesch. et Schnabl) Pat.

Number of records: 11 records from 11 localities.

Substrate: *Abies alba* (72 %) and *Picea abies* (27 %). The species was collected on fallen trunks (36 %), dead standing trunks (36 %), stumps (18 %) and a living trunk (one specimen).

Vertical distribution: 680–1120 m a.s.l.

Distribution in the Šumava Mts.: The species is equally distributed in the whole area of the Šumava Mts (Fig. 6).

Results and discussion: *Phellinus hartigii* occurs in the Šumava Mts. mainly in localities with *Abies* trees. The records on *Picea* are from artificial spruce forests. The species has not been collected in natural spruce forests at the highest altitudes. Luschka (1993) mentions *Phellinus hartigii* as a common species in the Bavarian Forest.

List of records:

České Žleby, Spáleniště Mt., 880 m a.s.l., *Abies alba*, 13. X. 1997, leg. MT, det. Z. Pouzar, PRM 893974. – České Žleby, Žlebský kopec, 1030 m a.s.l., *Abies alba*, 13. IX. 1999, not. MT. – České Žleby, Radvanovický hřbet Mt., 910 m a.s.l., *Abies alba*, 8. X. 1998, leg. et det. MT, PRM 893893. – Horská Kvilda, Černé stráně, 940 m a.s.l., *Abies alba*, 14. VIII. 1997, not. F. Kotlaba. – Kvilda, Lapka Mt., 1110 m a.s.l., *Picea abies*, 11. X. 1998, leg. et det. MT, PRM 893892. – Nová Pec, Smrčina Mt., 1120 m a.s.l., *Abies alba*, 16. VII. 1998, not. J. Holec. – Prášily, Hůrecký vrch, 900 m a.s.l., *Picea abies*, 10. VI. 1999, leg. et det. MT, PRM 893894. – Prášily, Frauenthal, 820 m a.s.l., *Picea abies*, 10. X. 1998, leg. MT, det. Z. Pouzar, PRM 893942; ibid. PRM 893890. – Srní, Křemelná stream, 870 m a.s.l., *Abies alba*, 14. VI. 1999, leg. et det. MT, PRM 893973. – Srní, Vydra stream, 650 m a.s.l., *Abies alba*, 12. X. 1998, leg. et det. MT, PRM 893891. – Srní, Vydra stream, 680 m a.s.l., *Abies alba*, 12. X. 1998, not. MT. – Železná Ruda, Debrník, 770 m a.s.l., *Abies alba*, 22. IX. 1999, not. MT.

Phellinus igniarius (L.: Fr.) Quél.

Fomes igniarius var. *trivialis* Bres. in Killerm.

Number of records: 16 records from 16 localities.

Substrate: Different species of *Salix*, mainly *Salix caprea* (70 %), but also *S. alba, S. aurita, S. fragilis* etc. Most specimens were collected on living trees (82 %).

Fig. 6. Distribution of *Phellinus hartigii* in the Šumava Mts.

Vertical distribution: 600–1110 m a.s.l.

Distribution in the Šumava Mts.: The species is distributed equally over the area of the Šumava Mts. (Fig. 7)

Results and discussion: The occurence of *Phellinus igniarius* is dependent on presence of species of *Salix* species and a suitable substrate is probably the most important factor for its occurrence. *P. igniarius* is distributed in the Šumava Mts. mainly in localities influenced by human activities, e.g. by road sides, in villages and on the banks of streams and rivers.

List of records:

Kašperské Hory, Amálino valley, 660 m a.s.l., *Salix* sp., 12. X. 1997, leg. et det. MT, PRM 893979. – Kvilda, 1110 m a.s.l., *Salix caprea*, 11. X. 1998, not. MT. – Lenora, Dobrá, 740 m a.s.l., *Salix alba*, 12. V. 1999, leg. et det. MT, PRM 8893976. – Lenora, Malá niva peatbog, 750 m a.s.l., *Salix caprea*, 21. IX. 1999, leg. et det. MT, PRM 894228. – Nová Pec, Klápa, 800 m a.s.l., *Salix caprea*, 4. VI. 1998, not. MT. – Prášily, Stodůlky, 840 m a.s.l., *Salix alba*, 12. VI. 1999, leg. et det. MT, PRM 893980. – Prášily, former village Stará Hůrka, 940 m a.s.l., *Salix caprea*, 10. VI. 1999, leg. et det. MT, PRM 893998. – Prášily, 860 m a.s.l., *Salix caprea*, 11. VI. 1999, leg. et det. MT, PRM 894222. – Prášily, former village Vysoké Lávky, 920 m a.s.l., *Salix caprea*, 10. VI. 1999, leg. et det. MT, PRM 893977. – Srní, Antýgl, 900 m a.s.l., *Salix caprea*, 24. IX. 1998, leg. et det. MT, PRM 894203. – Srní, Hrádecký stream, 800 m a.s.l., *Salix caprea*, 30. VI. 1999, leg. et det. MT, PRM 893897. – Stožec, Nové Údolí, 820 m a.s.l., *Salix aurita*, 8. IX. 1998, leg. et det. MT, PRM 893895. – Stožec, Spálený luh peatbog, 800 m a.s.l., *Salix fragilis*, 11. VII. 1996, leg. et det. F. Kotlaba, PRM 889718. – Strašín, U Studničky, *Salix caprea*, 27. VII. 1998, not. M. Svrček. – Strážný, Vyhlídka, 890 m a.s.l., *Salix caprea*, 23. IX. 1999, leg. et det. MT, PRM 894200. – Želnava, Záhvozdí, 840 m a.s.l., *Salix caprea*, 24. VI. 1999, not. MT.

Phellinus laevigatus (P. Karst.) Bourdot et Galzin

Number of records: 30 records from 19 localities.

Substrate: *Betula pubescens* and *B. pendula*. The species has not been found on other tree genera in the Šumava Mts. *Phellinus laevigatus* was collected on fallen trunks (63 %), fallen branches (13 %), stumps (13 %) and in one case on a fallen piece of bark.

Vertical distribution: 700–1000 m a.s.l.

Distribution in the Šumava Mts.: The species is distributed in the valley of the Vltava river in the south and on slopes of valleys of streams and rivers (the Vydra, the Křemelná, the Otava) in the central part of the Šumava Mts. One specimen was collected in the peatbog "U Cettlovy Hůrky" (Fig. 8).

Results and discussion: The occurence of the species depends strongly on the type of vegetation. In spite of its growing on birch trees, *P. laevigatus* does not occur in all types of vegetation where *Betula* is present. *Phellinus laevigatus* was found in two types of vegetation: in relict pinewoods with *Betula* on scree and in peatbogs with lots of fallen trunks and without human impact. The species is also known from the Bavarian Forest (Luschka 1993) where it

Fig. 7. Distribution of *Phellinus igniarius* in the Šumava Mts.

was recorded on *Betula* and *Salix*. Dunger (1989) considers *Phellinus laevigatus* a boreal-montane-continental element.

List of records:

Lenora, Malá niva peatbog, 750 m a.s.l., *Betula pubescens*, 3. VI. 1998, leg. et det. J. Holec, PRM 892328; ibid. 18. IX. 1998, PRM 897269; ibid. 7. X. 1997, JH 612/97; ibid. 18. IX. 1997, leg. MT, det. J. Holec, PRM 893916. – Lenora, Velká niva peatbog, *Betula pendula*, 25. X. 1990, leg. et det. Z. Pouzar, PRM 871474; ibid. *Betula* sp., 8. VIII. 1997, leg. et det. J. Holec, JH 273/97. – Vyšší Brod, Loučovice, Luč Mt., 660 m a.s.l., *Betula pubescens*, 3. VIII. 1999, leg. et det. MT, PRM 893899. – Nová Pec, Jezerní luh, 905 m a.s.l., *Betula pubescens*, 31. V. 1999, leg. et det. J. Holec, JH 2/99. – Prášily, U Cettlovy Hůrky peatbog, 845 m a.s.l., *Betula*, 12. X. 1996, leg. et det. J. Holec, JH 696a/96. – Srní, Dračí skály, 680 m a.s.l., *Betula pubescens*, 1. VII. 1999, leg. et det. MT, PRM 893898. – Srní, Horní Hrádky, 900 m a.s.l., *Betula pubescens*, 16. IX. 1998, leg. et det. MT, PRM 893911; ibid., 870 m a.s.l., *Betula pubescens*, 30. VI. 1999, leg. et det. MT, PRM 893914. – Srní, Křemelná stream, 740 m a.s.l., *Betula pubescens*, 12. VI. 1999, leg. et det. MT, PRM 894064; ibid. 750 m a.s.l., *Betula pubescens*, 12. VI. 1999, leg. et det. MT, PRM 894066. – Srní, Vydra stream, 730 m a.s.l., *Betula pubescens*, 25. IX. 1999, leg. et det. Z. Pouzar, JH 364/99; ibid. 710 m a.s.l., leg. et det. J. Holec, JH 363/99; ibid. 730 m a.s.l., *Betula pendula*, JH 366/99; ibid. leg. J. Holec, det. MT, JH 367/99. – Srní, Vydra stream, 700 m a.s.l., *Betula* sp., 24. IX. 1998, leg. et det. MT, PRM 893912; ibid. 820 m a.s.l., *Betula pubescens*, 24. IX. 1998, PRM 893915. – Srní, Vydra stream, 620 m a.s.l., *Betula pubescens*, 11. X. 1997, leg. MT, det. J. Holec, PRM 894063; ibid. 750 m a.s.l., *Betula pubescens*, leg. et det. J. Holec, JH 730/97. – Srní, Vydra stream, 760 m a.s.l., *Betula* sp., 3. VI. 1999, leg. et det. J. Holec, JH 45/99; ibid. 880 m a.s.l., *Betula pubescens*, 28. VI. 1999, leg. et det. MT, PRM 8893900; ibid. 920 m a.s.l., PRM 893913. – Srní, Vydra stream, 740 m a.s.l., *Betula pendula*, 12. X. 1998, leg. J. Holec et MT, PRM 897638; ibid. leg. et det. J. Holec, PRM 897639. – Stožec, Mrtvý luh peatbog, 740 m a.s.l., *Betula pubescens*, 16. X. 1996, leg. et det. Z. Pouzar, PRM 889539.

Phellinus lundellii Niemelä

Number of records: 14 records from 11 localities.

Substrate: *Betula* spp. Specimens of this species were found on stumps (50 %), fallen trunks (29 %) and living trunks (21 %).

Vertical distribution: 650–1120 m a.s.l.

Distribution in the Šumava Mts.: The species occurrs in the central part of the Šumava Mts., mainly in peatbogs of surroundings of the village of Modrava. One specimen was recorded in the southern part of the Šumava next to Soumarský bridge (Fig. 9).

Results and discussion: *Phellinus lundellii* is a typical montane species in the Šumava Mts. growing in localities with primary occurence of birch trees (margins of peatbogs, stream banks). Human activities are not a negative factor for occurence of this species, because one specimen was collected by a road next to Soumarský bridge.

Phellinus lundellii is also distributed in the Bavarian Forest but the species is very rare there (Luschka 1993).

List of records:

Horská Kvilda, Hamerský stream, 900 m a.s.l., *Betula pendula*, 29. VI. 1995, leg. J. Holec, det. MT, PRM 884704. Horská Kvilda, Zhůřské slatě peatbogs, 1130 m a.s.l., *Betula* sp., 15. IX. 1999,

Fig. 8. Distribution of *Phellinus laevigatus* in the Šumava Mts.

leg. J. Holec, det. MT, PRM 894221. – Kvilda, Teplá Vltava stream, 1100 m a.s.l., *Betula pubescens*, 28. VI. 1995, leg. J. Holec, det. MT, PRM 884686. – Lenora, Soumarský most, 750 m a.s.l., *Betula* sp., 12. V. 1999, leg. et det. MT, PRM 894061. – Modrava, Cikánská slať peatbog, 1090 m a.s.l., *Betula* sp., 26. IX. 1998, leg. et det. J. Holec, PRM 897479. – Modrava, Hraniční slať peatbog, 1140 m a.s.l., *Betula pendula*, 9. X. 1998, leg. et det. J. Holec, PRM 897596. – Modrava, Přední mlynářská slať peatbog, 1040 m a.s.l., *Betula pendula*, 14. X. 1998, leg. et det. Z. Pouzar, PRM 897677; ibid. leg. et det. J. Holec, PRM 897679; ibid. PRM 897681. – Modrava, Novohuťské močály peatbogs, 1215 m a.s.l., *Betula* sp., 14. IX. 1999, leg. et det. MT, PRM 894220. – Prášily, U Cettlovy Hůrky peatbog, 825 m a.s.l., *Betula* sp., 17. IX. 1999, leg. et det. Z. Pouzar, PRM 894060. – Srní, Křemelná stream, 740 m a.s.l., *Betula pubescens*, 12. VI. 1999, leg. et det. MT, PRM 894223. – Srní, Vydra stream, 650 m a.s.l., *Betula pubescens*, 11. X. 1997, leg. MT, rev. T. Niemelä, PRM 894058; ibid. 24. IX. 1998, PRM 894059.

Phellinus nigrolimitatus (Romell) Bourdot et Galzin
Fomes nigrolimitatus (Romell) Egeland

Number of records: 28 records from 16 localities, 1 unpublished record before year 1990.

Substrate: Fallen trunks of *Picea abies* usually in later stage of decomposition.

Vertical distribution: 900–1375 m a.s.l.

Distribution in the Šumava Mts.: This rare species is distributed over the whole area of the Šumava Mts. (Fig. 10).

Results and discussion: *Phellinus nigrolimitatus* grows in localities with natural character of vegetation with numerous fallen trunks of *Picea abies* and constant humidity. The species is a typical boreal montane-element that is more common in higher altitudes in primary spruce forests. Typical localities of *Phellinus nigrolimitatus* are mainly spruce forests on glacial cirques of lakes (Černé, Čertovo, Laka, Plešné and Prášilské). The species was also recorded on timber in houses (J. Vlasák, pers. comm.).

Phellinus nigrolimitatus is also distributed in montane spruce forest of the Bavarian Forest (Luschka 1993).

List of records:

České Žleby, Spáleniště Mt., 900 m a.s.l., *Picea abies*, 12. VII. 1996, leg. et det. F. Kotlaba, PRM 889709. – České Žleby, Žlebský kopec, 1050 m a.s.l., *Picea abies*, 3. IX. 1999, leg. et det. J. Holec, JH 150/99. – Kvilda, Prameny Vltavy, 1160 m a.s.l., *Picea abies*, 13. X. 1996, leg. et det. J. Holec, PRM 889482. Modrava, Cikánská slať peatbog, 1075 m a.s.l., *Picea abies*, 26. IX. 1998, leg. et det. J. Holec, PRM 897472; ibid. 1070 m a.s.l., *Picea abies*, 9. X. 1998, leg. et det. J. Holec, PRM 897595. – Nová Pec, Hraničník Mt., 1200 m a.s.l., *Picea abies*, 29. VII. 1996, leg. et det. J. Holec, PRM 888860; ibid. PRM 888834. – Nová Pec, Plechý Mt., 1330 m a.s.l., *Picea abies*, 26. VIII. 1996, leg. et det. J. Holec, PRM 889112; ibid. 1370 m a.s.l., 8. IX. 1998, leg. et det. MT, PRM 893927; ibid. 1120 m a.s.l., 23. IX. 1997, leg. et det. J. Holec, PRM 891272. – Nová Pec, Plechý Mt., 1340 m a.s.l., *Picea abies*, 30. VII. 1996, leg. et det. J. Holec, PRM 888849; ibid. 1350 m a.s.l., PRM 888848. – Nová Pec, Plešné jezero, 1120 m a.s.l., *Picea abies*, 23. IX. 1997, leg. J. Holec, det. MT, PRM 891271; ibid. PRM 891281. – Nová Pec, Smrčina Mt., 1200 m a.s.l., *Picea abies*, 4. VI. 1998, leg. et det. MT, PRM 894067; ibid. 1180 m a.s.l., PRM 894070. – Nová Pec, Trojmezná Mt., 1300 m a.s.l., *Picea abies*, 29. VIII. 1996, leg. et det. J. Holec, PRM 889183. – Prášily, Prášilské lake, 1200 m a.s.l., *Picea abies*, 2. VI. 1999, leg. et det. J. Holec, JH

Fig. 9. Distribution of *Phellinus lundellii* in the Šumava Mts.

14/99; ibid. 23. IX. 1998, leg. et det. MT, PRM 893962. – Stožec, Medvědice, 900 m a.s.l., *Picea abies*, 2. VIII. 1996, leg. et det. J. Holec, PRM 888806; ibid. 15. X. 1996, leg. et det. J. Holec, PRM 889524; ibid. *Picea abies*, 24. X. 1990, leg. et det. F. Kotlaba et Z. Pouzar, PRM 872103. – Zátoň, Boubínský prales, *Abies alba*, 8. VIII. 1956, leg. et det. Z. Pouzar, PRM 869168. – Železná Ruda, Plesná Mt., 1200 m a.s.l., *Picea abies*, 13. VI. 1999, leg. et det. MT, PRM 893926. – Železná Ruda, Černé lake, 1050 m a.s.l., *Picea abies*, 28. IX. 1994, leg. et det. J. Holec, PRM 885694; ibid. 1100 m a.s.l., PRM 885692. – Železná Ruda, Čertovo lake, 1070 m a.s.l., *Picea abies*, 16. X. 1995, leg. J. Holec, det. Z. Pouzar, PRM 885581.

Phellinus pini (Fr.) A. Ames
Porodaedalea pini (Thore) Murrill

Number of records: 4 records from 4 localities.

Substrate: Trunks of *Pinus sylvestris* and *P. rotundata*

Vertical distribution: 600–852 m a.s.l.

Distribution in the Šumava Mts.: This species was collected only in one locality in central part (peatbog "U Cettlovy Hůrky") and three localities in southern part of the Šumava Mts (peatbog "Houska" at Nová Pec, two localities near Vyšší Brod). (Fig. 11).

Results and discussion: *Phellinus pini* is a rather thermophilous species. Although it's substrate, pine trees, is widely distributed in the Šumava Mts. *Phellinus pini* is very rare there. The three older records of this species published by Kotlaba (1984) concern the surroundings of Lipno damlake. The species is also distributed in the Bavarian Forest (Luschka 1993).

List of records:

– Prášily, U Cettlovy Hůrky peatbog, 825 m a.s.l., *Pinus sylvestris*, 23. IX. 1998, leg. et det. Z. Pouzar, PRM 897392. – Nová Pec, Houska, *Pinus rotundata*, 20. VIII. 1981, 720 m., leg. S. Kučera. det. F. Kotlaba, PRM 829210. – Vyšší Brod, Loučovice, Čertova stěna, 670 m a.s.l., *Pinus sylvestris*, 3. VIII. 1999, leg. et det. MT, PRM 893917. – Vyšší Brod, Loučovice, Luč, 660 m a.s.l., *Pinus sylvestris*, 3. VIII. 1999, leg. et det. MT, PRM 893930.

Phellinus pouzarii Kotlaba

This very rare species is known from Boubín primeval forest, the only locality in the Šumava Mts. (Kotlaba 1984, Holec 1997). *Phellinus pouzarii* occurs only on thick fallen trunks of *Abies alba* and the fruitbodies often grow from its incised surface. This outstanding ecology is the cause of its sparse occurence in the Šumava Mts. There are only two other localities known from the Czech Republic (Kotlaba 1984, Beran 1996). The only locality of *Phellinus pouzarii* in Germany (Mittelsteighütte near Zwiesel) is situated in NP Bayerischer Wald (Luschka 1993, Nuss 1999).

Records:

Zátoň, Boubín-Pažení, 1100 m a.s.l., *Abies alba*, 17. X. 1995, leg. et det. J. Holec, PRM 890751; ibid. 23. VII. 1995, PRM 885015.

Fig. 10. Distribution of *Phellinus nigrolimitatus* in the Šumava Mts.

Phellinus punctatus (P. Karst.) Pilát

Fomitiporia punctata (P. Karst.) Murrill, *Phellinus friesianus* (Bres.) Bourdot et Galzin

Number of records: 37 records from 32 localities.

Substrate: *Salix* (69 %), *Alnus incana* (7 %), *Fraxinus excelsior* (7 %), *Corylus avellana* (5 %), once each also: *Fagus sylvatica, Lonicera nigra, Padus racemosa* and *Sambucus racemosa.* Most records were made on living trees (61 %), fallen trunks (13 %), stumps (10 %), dead standing trees (5 %), living branches (5 %) and dead branches (3 %).

Vertical distribution: 600–1110 m a.s.l.

Distribution in the Šumava Mts.: The species is common in the whole area of the Šumava Mts. (Fig. 12).

Results and discussion: *Phellinus punctatus* is one of the most common species of *Phellinus* in the Šumava Mts. The species is common mainly in localities with stands of *Salix* and other hardwood trees, e.g. on banks of brooks, margins of peatbogs and forests, stands along roads etc.

The species occurs also in the Bavarian Forest but it is relatively rare in the area of National Park Bayerischer Wald (Luschka 1993).

List of records:

České Žleby, Spáleniště Mt., 870 m a.s.l., *Fraxinus excelsior*, 13. X. 1997, leg. MT, det. Z. Pouzar, PRM 894052; ibid. leg. et det. J. Holec, JH 737/97. Horní Vltavice, Nová Polka, 910 m a.s.l., *Salix caprea*, 23. IX. 1999, not. MT. Horská Kvilda, Zhůří, 1050 m a.s.l., *Salix aurita*, 9. X. 1997, leg. et det. J. Holec, JH 661/97. Kašperské Hory, Rýžovní stream, 610 m a.s.l., *Corylus avellana*, 17. X. 1997, leg. et det. J. Holec, JH 853/97. Kašperské Hory, Amálino valley, 660 m a.s.l., *Salix* sp., 12. X. 1997, leg. et det. MT, PRM 894048. – Kvilda, 1110 m a.s.l., *Salix caprea*, 11. X. 1998, not. MT. – Kvilda, 1050 m a.s.l., *Salix caprea*, 1. IX. 1990, leg. et det. F. Kotlaba, PRM 872152. – Lenora, Malá niva peatbog, 750 m a.s.l., *Salix caprea*, 21. IX. 1999, leg. J. Holec, det. MT, PRM 894201. – Lenora, Dobrá, 760 m a.s.l., *Salix alba*, 12. V. 1999, leg. et det. MT, PRM 894045. – Lenora, Malá niva peatbog, 750 m a.s.l., *Alnus incana*, 21. IX. 1999, not. MT. – Modrava, Rokyta, 920 m a.s.l., *Salix caprea*, 30. VI. 1999, leg. et det. MT, PRM 894202,893926. – Nová Pec, Ovesná, 740 m a.s.l., *Salix* sp., 9. IX. 1998, not. MT. – Nová Pec, Houska, 730 m a.s.l., *Lonicera nigra*, 24. VI. 1999, leg. et det. MT, PRM 893923; ibid. *Salix* sp., 3. VI. 1998, leg. et det. MT, PRM 893919. – Nová Pec, Pěkná, 730 m a.s.l., *Alnus incana*, 10. IX. 1998, leg. et det. MT, PRM 893918. – Nová Pec, Klápa, 800 m a.s.l., *Salix caprea*, 4. VI. 1998, not. MT. – Prášily, 980 m a.s.l., *Fagus sylvatica*, 9. VII. 1998, leg. J. Holec et MT, PRM 896986. – Prášily, 880 m a.s.l., *Salix cinerea*, 26. VIII. 1998, leg. et det. MT, PRM 894049. – Prášily, 860 m a.s.l., *Salix caprea*, 11. VI. 1999, leg. et det. MT, PRM 894012. – Prášily, Slunečná-Gruberg, 890 m a.s.l., *Salix caprea*, 23. IX. 1998, not. MT. – Prášily, Frauenthal, 805 m a.s.l., *Alnus incana*, 10. X. 1998, leg. et det. MT, PRM 893924. – Prášily, Horní Ždanidla-Gsenget, 1060 m a.s.l., *Salix cinerea*, 26. VIII. 1998, leg. et det. MT, PRM 893921. – Prášily, Vysoké Lávky, 920 m a.s.l., *Salix caprea*, 10. VI. 1999, leg. et det. MT, PRM 894050. – Prášily, Stodůlky, 835 m a.s.l., *Padus racemosa*, 12. VI. 1999, leg. et det. MT, PRM 894057. – Srní, Horní Hrádky, 900 m a.s.l., *Sambucus racemosa*, 16. IX. 1998, leg. et det. MT, PRM 893922; ibid. *Salix aurita*, not. J. Holec. – Srní, road from Srní to Čeňkova Pila, 730 m a.s.l., *Salix caprea*, 24. IX. 1998, leg. J. Holec, det. MT, PRM 894045. – Srní, Vydra stream, *Salix caprea*, 3. VI. 1999, not. J. Holec. – Srní, Vydra stream, 680 m a.s.l., *Corylus avellana*, 8. X. 1997, leg. et det. J. Holec, JH 632/97. – Srní, Vydra stream, 800 m a.s.l., *Fraxinus excelsior*, 9. X. 1998, leg. et det. MT, PRM 893920. –

Fig. 11. Distribution of *Phellinus pini* in the Šumava Mts.

Stožec, Nové Údolí, 850 m a.s.l., *Salix* sp., 28. VIII. 1996, leg. J. Holec, det. MT, PRM 889167. – Strážný, Vyhlídka hill, 890 m a.s.l., *Salix caprea*, 23. IX. 1999, not. MT. – Železná Ruda, Hamry, 640 m a.s.l., *Salix caprea*, 25. VIII. 1999, leg. et det. MT, PRM 894047. – Železná Ruda, 760 m a.s.l., *Salix cinerea*, 25. VIII. 1998, leg. et det. MT, PRM 894056. – Železná Ruda, Debrník, 780 m a.s.l., *Salix* sp., 7. VII. 1998, leg. et det. MT, PRM 894054. – Železná Ruda, Nový Brunst, 990 m a.s.l., *Salix* sp., 27. VIII. 1998, leg. et det. MT, PRM 893925. Želnava, Záhvozdí, 840 m a.s.l., *Salix caprea*, 24. VI. 1999, leg. et det. MT, PRM 894053.

Phellinus tremulae (Bondartzev) Bondartzev et Borissov
Fomes tremulae (Bondartzev) Borissov

Number of records: 25 records from 21 localities.

Substrate: Trunks of *Populus tremula*. The species was collected on living trunks (68 %), fallen trunks (16 %) and dead standing trunks (16 %).

Vertical distribution: 600–1030 m a.s.l.

Distribution in the Šumava Mts.: The species is distributed over the whole area of the Šumava Mts. Most localities are situated in the valleys of the Vydra, the Vltava and the Křemelná rivers (Fig. 13).

Results and discussion: The distribution of *Phellinus tremulae* depends mainly on the presence of its only host, *Populus tremula*. The fungus occurs in most of the localities where the host species occurs, e.g. in margins of peatbogs, banks of streams and mixed forests of wet conditions.

Phellinus tremulae is also distributed in the Bavarian Forest (Luschka 1993).

List of records:

Kvilda, *Populus tremula*, 7. X. 1990, leg. et det. F. Kotlaba, PRM 872118. – Lenora, Malá niva peatbog, 750 m a.s.l., *Populus tremula*, 7. X. 1997, leg. et det. J. Holec, JH 618/97; ibid. 3. VI. 1998, leg. et det. J. Holec, PRM 892332. – Lenora, Dobrá, 800 m a.s.l., *Populus tremula*, 8. IV. 1999, leg. et det. MT, PRM 893936. – Lenora, Soumarský most, 750 m a.s.l., *Populus tremula*, 28. VIII. 1998, leg. et det. MT, PRM 893935; ibid. 25. VII. 1995, leg. et det. J. Holec, PRM 885038. – Nová Pec, Pěkná, 730 m a.s.l., *Populus tremula*, 10. IX. 1998, leg. et det. MT, PRM 893937. – Nová Pec, Rossbach, 890 m a.s.l., *Populus tremula*, 22. VI. 1999, leg. et det. MT, PRM 893939. – Prášily, former village Zadní chalupy, 850 m a.s.l., *Populus tremula*, 11. VI. 1999, leg. et det. MT, PRM 894232. – Prášily, Stodůlky, 835 m a.s.l., *Populus tremula*, 12. VI. 1999, leg. et det. MT, PRM 894065. – Srní, Hrádecký stream, 790 m a.s.l., *Populus tremula*, 30. VI. 1999, leg. et det. MT, PRM 893934. – Srní, Horní Hrádky, 900 m a.s.l., *Populus tremula*, 30. VI. 1999, leg. et det. MT, PRM 893943. – Srní, Křemelná stream, 760 m a.s.l., *Populus tremula*, 12. VI. 1999, leg. et det. MT, PRM 894051. – Srní, Vydra stream, 680 m a.s.l., *Populus tremula*, 24. IX. 1998, leg. et det. MT, PRM 893933; ibid. 760 m a.s.l., leg. et det. MT, PRM 893931; ibid. 720 m a.s.l., 11. X. 1997, leg. MT, det. Z. Pouzar, PRM 893938; ibid. 760 m a.s.l., 9. X. 1998, leg. et det. MT, PRM 893941, ibid. ca. 800 m a.s.l., 7. VIII. 1998, leg. et det. F. Kotlaba, PRM 892708. – Srní, Zadní Paště, 790 m a.s.l., *Populus tremula*, 14. VI. 1999, leg. et det. MT, PRM 893932. – Strašín, Zábrdí, 650 m a.s.l., *Populus tremula*, 22. X. 1997, leg. et det. M. Svrček, PRM. – Vyšší Brod, Loučovice, Luč Mt., 630 m a.s.l., *Populus tremula*, 3. VIII. 1999, leg. et det. MT, PRM 893940. – Železná Ruda, Hamry, 640 m a.s.l., *Populus tremula*, 25. VIII. 1999, leg. et det. MT, PRM 894068. – Železná Ruda, Špičácké sedlo, 1030 m a.s.l., *Populus tremula*, 27. VIII. 1999, leg. et det. MT, PRM 894218. – Želnava, Záhvozdí, 840 m a.s.l., *Populus tremula*, 24. VI. 1999, not. MT.

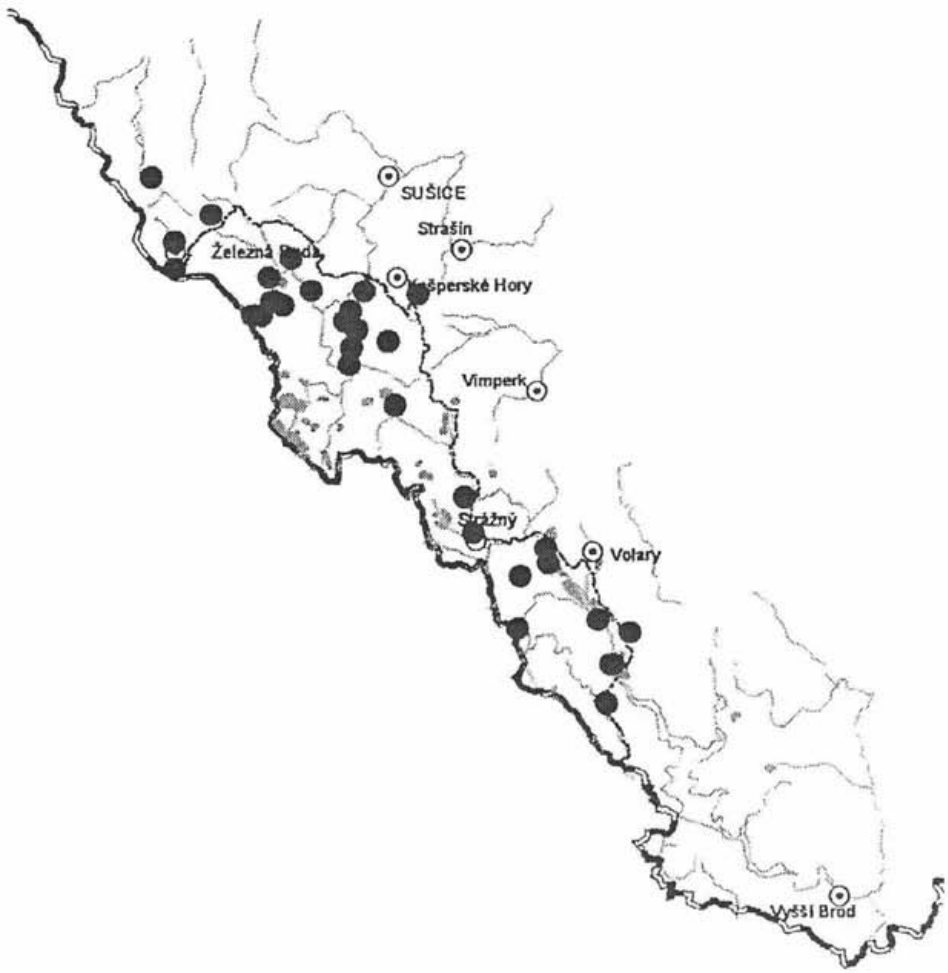

Fig. 12. Distribution of *Phellinus punctatus* in the Šumava Mts.

Phellinus tuberculosus (Baumg.) Niemelä
Phellinus pomaceus (Pers.) Maire

Number of records: 5 records from 4 localities.

Substrate: *Prunus* (*Prunus domestica, P. spinosa*), and *Cerasus avium*. The fungus was collected on living trees (2 specimens), dead standing trees and a fallen branch.

Vertical distribution: 600–950 m a.s.l.

Distribution in the Šumava Mts.: *Phellinus tuberculosus* has been recorded from three localities in the central part of the Šumava Mts. and one locality in the Šumava foothills (nature reserve Opolenec near Vimperk) (Fig. 14).

Results and discussion: *Phellinus tuberculosus* is a typical parasite of fruit trees. So that specimens of this species were collected mainly in old orchards and gardens of former villages in the central part of the Šumava Mts. The species also occures in the Bavarian Forest, but it is rare in the area of National park Bayerischer Wald (Luschka 1993).

List of records:

Prášily, Stará Hůrka, 940 m a.s.l., *Cerasus avium*, 10. VI. 1999, leg. et det. MT, PRM 894062. – Srní, road from Srní to Čeňkova Pila, 730 m a.s.l., *Prunus domestica*, 1. VII. 1999, leg. et det. MT, PRM 893944. – Srní, Zadní Paště, 790 m a.s.l., *Prunus domestica*, 14. VI. 1999, leg. et det. MT, PRM 893945. Sudslavice, Opolenec, 600 m a.s.l., *Prunus spinosa*, 2. IX. 1990, leg. et det. F. Kotlaba, PRM 872096; ibid. 630 m a.s.l., 5. X. 1998, not. Z. Pouzar.

Phellinus viticola (Schw. in Fr.) Donk
Phellinus isabellinus (Fr.) Bourdot et Galzin, *Fuscoporia viticola* (Schw. in: Fr.) Murrill

Number of records: 135 records from 96 localities.

Substrate: *Picea abies* (93 %), more rarely *Pinus *pseudopumilio* (6 %), one record on *Pinus sylvestris*. The species was collected mainly on fallen trunks (93,8 %), fallen branches (6 %), sometimes also on stumps.

Vertical distribution: 600–1378 m a.s.l.

Distribution in the Šumava Mts.: The species is very common in the entire Šumava Mts (Fig. 15).

Results and discussion: *Phellinus viticola* is one of the most common polypores of the spruce forests in the Šumava Mts. The fungus occurs in all types of spruce forest, in mixed forests and sometimes also on margins of peatbogs on *Pinus *pseudopumilio*. *Phellinus viticola* is a typical boreal – montane element that is more common at higher altitudes.

The species is also very common in the Bavarian Forest (Luschka 1993).

List of records:

Borová Lada, Buková slať peatbog, *Pinus *pseudopumilio*, 13. VIII. 1997, leg. et det.

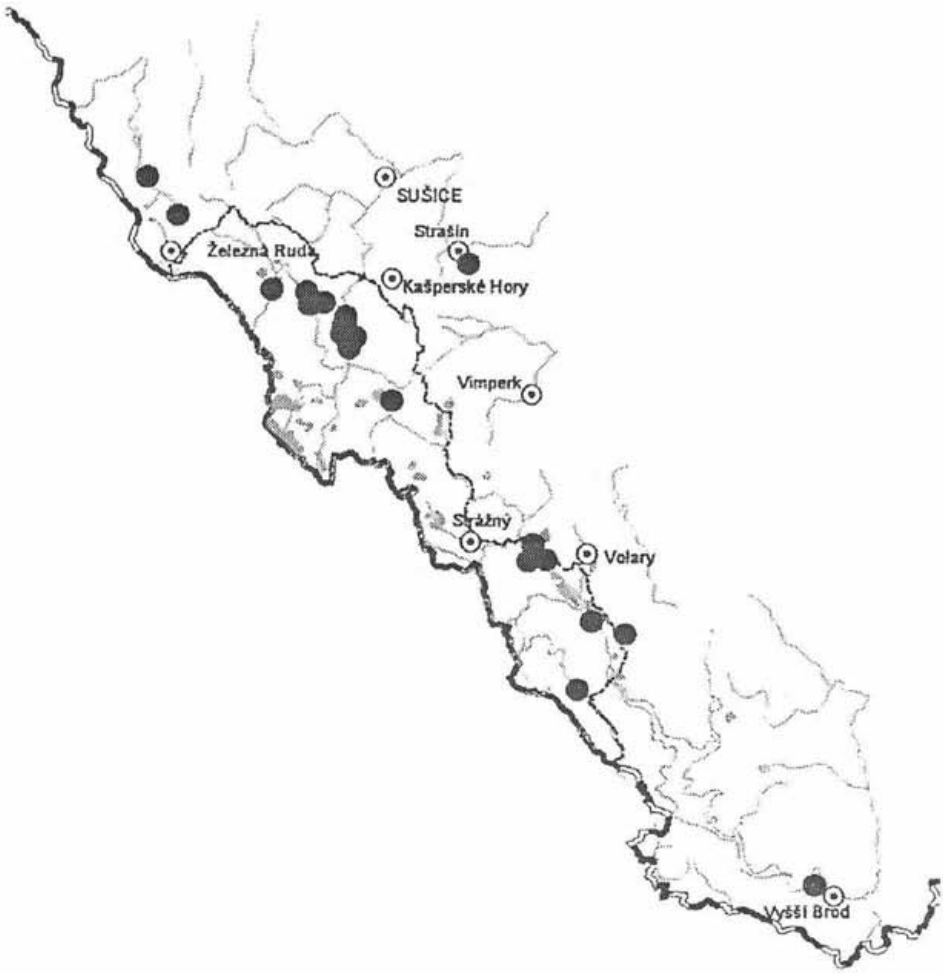

Fig. 13. Distribution of *Phellinus tremulae* in the Šumava Mts.

F. Kotlaba, PRM 891475. – Borová Lada, Františkov, *Picea abies*, 5. IX. 1990, leg. et det. F. Kotlaba, PRM 872099. – Borová Lada, Vyhlídka Mt., 1065 m a.s.l., *Picea abies*, 22. IX. 1994, leg. et det. Z. Pouzar, PRM 882349. – Borová Lada, Žďárecká slať peatbog, 980 m a.s.l., *Picea abies*, 7. VIII. 1997, leg. et det. J. Holec, JH 233/97; ibid. JH 238/97; ibid. JH 240/97. – České Žleby, Radvanovický hřbet, 950 m a.s.l., *Picea abies*, 8. X. 1998, leg. et det. MT, PRM 893952. – České Žleby, Žlebský kopec, 990 m a.s.l., *Picea abies*, 13. IX. 1999, leg. et det. MT, PRM 894088. – Horská Kvilda, Sokol Mt. (Antýgl), 1200 m a.s.l., *Picea abies*, 4. IX. 1990, leg. et det. F. Kotlaba, PRM 872145. – Horská Kvilda, Zhůřské slatě peatbogs, 1130 m a.s.l., *Picea abies*, 15. IX. 1999, leg. et det. MT, PRM 894208; ibid. *Pinus *pseudopumilio*, PRM 894209; ibid. 3. IX. 1990, leg. et det. F. Kotlaba, PRM 872079. – Horská Kvilda, Mezilesní slať peatbog, 1100 m a.s.l., *Picea abies*, 18. IX. 1999, leg. et det. MT, PRM 894082. – Horská Kvilda, Zhůří – Nad hutí, *Picea abies*, 23. X. 1990, leg. et det. Z. Pouzar et F. Kotlaba, PRM 872108. – Kvilda, Prameny Vltavy, 1070 m a.s.l., *Picea abies*, 7. IX. 1990, leg. et det. F. Kotlaba, PRM 872091. – Kvilda, Olšinka, 1035 m a.s.l., *Picea abies*, 21. IX. 1994, leg. et det. Z. Pouzar, PRM 882350. – Kvilda, Hamerské domky, 1100 m a.s.l., *Picea abies*, 20. IX. 1994, leg. et det. Z. Pouzar, PRM 882342. – Kvilda, Tetřevská slať peatbog, 1130 m a.s.l., *Picea abies*, 2. X. 1994, leg. et det. Z. Pouzar, PRM 882356; ibid. *Pinus *pseudopumilio*, PRM 882344. – Kvilda, Tetřev Mt., 1255 m a.s.l., *Picea abies*, 24. IX. 1994, leg. et det. Z. Pouzar, PRM 882345; ibid., 1250 m a.s.l., PRM 882357. – Kvilda, between Vilémov and Františkov, 1080 m a.s.l., *Picea abies*, 15. IX. 1998, leg. J. Holec, det. MT, PRM 894092. – Kvilda, Pod Tetřevem, 1130 m a.s.l., *Picea abies*, 15. IX. 1998, leg. et det. MT, PRM 893969. – Kvilda, Lapka Mt., *Picea abies*, 1. IX. 1990, leg. et det. F. Kotlaba, PRM 872154. – Kvilda, Tetřevská slať peatbog, 1140 m a.s.l., *Picea abies*, 18. VI. 1998, leg. et det. J. Holec, PRM 892408. – Kvilda, Stanová hora Mt., 1040 m a.s.l., *Picea abies*, 25. IX. 1994, leg. et det. Z. Pouzar, PRM 882348. – Lenora, Velká niva peatbog, 850 m a.s.l., *Picea abies*, 31. V. 1999, not. J. Holec. – Lenora, Malá niva peatbog, 750 m a.s.l., *Picea abies*, 18. IX. 1997, leg. et det. MT, PRM 893949; ibid. 3. VI. 1998, leg. et det. J. Holec, PRM 892335. – Modrava, Blatenská slať peatbog, *Picea abies*, 24. VIII. 1993, leg. et det. F. Kotlaba, PRM 878605; ibid. *Pinus *pseudopumilio*, 15. VIII. 1997, leg. et det. F. Kotlaba, PRM 891499. – Modrava, Blatenská slať peatbog, 1210 m a.s.l., *Pinus *pseudopumilio*, 14. IX. 1999, leg. et det. MT, PRM 894091. – Modrava, Cikánská slať peatbog, 1070 m a.s.l., *Picea abies*, 26. IX. 1998, leg. et det. J. Holec, PRM 897467. – Modrava, Hraniční slať peatbog, *Picea abies*, 26. VI. 1996, leg. et det. J. Holec, PRM 888405. – Modrava, Novohuťské močály peatbogs, 1210 m a.s.l., *Pinus *pseudopumilio*, 14. IX. 1999, leg. et det. MT, PRM 894241; ibid. *Picea abies*, PRM 894219. – Modrava, Přední mlynářská slať peatbog, 1060 m a.s.l., *Picea abies*, 1. X. 1994, leg. et det. Z. Pouzar, PRM 882354; ibid. *Pinus *pseudopumilio*, 8. VII. 1996, leg. et det. F. Kotlaba, PRM 889714. – Modrava, Roklanská slať peatbog, 1100 m a.s.l., *Picea abies*, 30. IX. 1997, leg. et det. J. Holec, JH 502/97. – Modrava, Rokytecké slatě peatbogs, 1110 m a.s.l., *Picea abies*, 19. VI. 1998, not. J. Holec. – Modrava, Rybárenská slať peatbog, *Picea abies*, 11. VIII. 1997, leg. et det. F. Kotlaba, PRM 891501. – Modrava, Smrkový vrch, 900 m a.s.l., *Pinus *pseudopumilio*, 6. IX. 1990, leg. et det. F. Kotlaba, PRM 872106. – Nová Pec, Chornice, 950 m a.s.l., *Picea abies*, 22. VI. 1999, leg. et det. MT, PRM 894188. – Nová Pec, Hraničník Mt., 1200 m a.s.l., *Picea abies*, 29. VII. 1996, leg. J. Holec, det. MT, PRM 888864. – Nová Pec, Jelení lake, 950 m a.s.l., *Picea abies*, 9. IX. 1998, leg. et det. MT, PRM 893963. – Nová Pec, Jezerní luh, 910 m a.s.l., *Picea abies*, 26. IX. 1997, leg. et det. J. Holec, PRM 891357. – Nová Pec, Plechý Mt., 1340 m a.s.l., *Picea abies*, 30. VII. 1996, leg. J. Holec, det. MT, PRM 888858; ibid. 1310 m a.s.l., 15. VII. 1998, leg. et det. J. Holec, PRM 897063; ibid. 1330 m a.s.l., 26. VIII. 1996, leg. et det. J. Holec, PRM 889078. – Nová Pec, Plešné lake, 1280 m a.s.l., *Picea abies*, 8. IX. 1998, leg. et det. MT, PRM 893957. – Nová Pec, Říjiště, 950 m a.s.l., *Picea abies*, 22. VI. 1999, leg. et det. MT, PRM 893960. – Nová Pec, Plechý Mt., 1370 m a.s.l., *Picea abies*, 8. IX. 1998, leg. et det. MT, PRM 893955. – Nová Pec, Smrčina Mt., 1180 m a.s.l., *Picea abies*, 4. VI. 1998, leg. et det. MT, PRM 894090; ibid. 1200 m a.s.l., PRM 894085. – Nová Pec, Trojmezná Mt., 1300 m a.s.l., *Picea abies*, 29. VIII. 1996, leg. et det. J. Holec, PRM 889122; ibid. 1350 m a.s.l., 8. IX. 1998, leg. et det. MT, PRM 893959. – Prášily, 890 m a.s.l., *Picea abies*, 10. VI. 1999, leg. et det. MT,

Fig. 14. Distribution of *Phellinus tuberculosus* in the Šumava Mts.

PRM 894073. – Prášily, 1000 m a.s.l., *Picea abies*, 9. VII. 1998, leg. et det. MT, PRM 894217; ibid. 18. VI. 1997, leg. et det. J. Holec, JH 39/97. – Prášily, Frauenthal, 820 m a.s.l., *Picea abies*, 10. X. 1998, leg. et det. MT, PRM 893954, ibid. PRM 893900. – Prášily, Hůrecký hill, 1010 m a.s.l., *Picea abies*, 10. VI. 1999, leg. et det. MT, PRM 894237. – Prášily, Kamenitý hill, 830 m a.s.l., *Picea abies*, 11. VI. 1999, leg. et det. MT, PRM 894219; ibid. PRM 894075. – Prášily, Prášilské lake, 1115 m a.s.l., *Picea abies*, 23. IX. 1998, leg. et det. MT, PRM 893956; ibid. 1250 m a.s.l., PRM 893971. – Prášily, Slunečná Mt., 900 m a.s.l., *Picea abies*, 11. VI. 1999, leg. et det. MT, PRM 894084. – Prášily, U Cettlovy Hůrky peatbog, 825 m a.s.l., *Picea abies*, 23. IX. 1998, leg. J. Holec, det. MT, PRM 894211. – Prášily, Ždanidla Mt., 1180 m a.s.l., *Picea abies*, 9. VII. 1998, leg. et det. MT, PRM 894078; ibid. 1250 m a.s.l., PRM 894081; ibid. 1200 m a.s.l., 13. VI. 1999, PRM 893953. – Srní, Dračí skály, 700 m a.s.l., *Picea abies*, 1. VII. 1999, leg. et det. MT, PRM 893971; ibid. PRM 893964. – Srní, Horní Hrádky, 740 m a.s.l., *Picea abies*, 30. VI. 1999, leg. et det. MT, PRM 8893951; ibid. 920 m a.s.l., 16. IX. 1998, leg. et det. MT, PRM 893968; ibid. 800 m a.s.l., *Picea abies*, 15. X. 1998, leg. J. Holec, det. MT, PRM 894212; ibid. 910 m a.s.l., *Picea abies*, 30. VI. 1999, leg. et det. MT, PRM 893946; ibid. 850 m a.s.l., *Picea abies*, 19. IX. 1998, leg. J. Holec, det. MT, PRM 894087. – Srní, Hrádecký stream, 770 m a.s.l., *Picea abies*, 30. VI. 1999, leg. et det. MT, PRM 893928; ibid. 780 m a.s.l., *Picea abies*, 18. VI. 1998, leg. et det. J. Holec, PRM 892417; ibid. 810 m a.s.l., 7. X. 1998, PRM 897531. – Srní, Křemelná Mt., 760 m a.s.l., *Picea abies*, 12. VI. 1999, leg. et det. MT, PRM 894074. – Srní, Vydra stream, 680 m a.s.l., *Picea abies*, 11. X. 1997, leg. et det. J. Holec, JH 726/97; ibid. 750 m a.s.l., leg. MT, det. J. Holec, PRM 894077. – Srní, Vydra stream, 840 m a.s.l., *Pinus sylvestris*, 19. IX. 1998, leg. et det. Z. Pouzar, PRM; ibid. 740 m a.s.l., *Picea abies*, 24. IX. 1998, leg. J. Holec, det. MT, PRM 894210; ibid. 820 m a.s.l., *Picea abies*, leg. et det. MT, PRM 893950; ibid. 880 m a.s.l., *Picea abies*, 9. X. 1998, leg. et det. MT, PRM 893948. – Srní, Vydra stream, 760 m a.s.l., *Picea abies*, 3. VI. 1999, leg. J. Holec, det. MT, JH 35/99; ibid. 800 m a.s.l., *Picea abies*, 25. VI. 1996, leg. et det. J. Holec, PRM 888404; ibid. 920 m a.s.l., 28. VI. 1999, leg. et det. MT, PRM 893970. – Stožec, Jelení vrch, 860 m a.s.l., *Picea abies*, 9. IX. 1998, leg. et det. MT, PRM 893961. – Stožec, Kamenná hill, 970 m a.s.l., *Picea abies*, 11. VII. 1996, leg. et det. F. Kotlaba, PRM 889710; ibid. 960 m a.s.l., 23. VI. 1999, leg. et det. MT, PRM 893958. – Stožec, Medvědice, *Picea abies*, 24. X. 1990, leg. et det. Z. Pouzar et F. 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VIII. 1998, leg. et det. MT, PRM 893966; ibid. 1100 m a.s.l., PRM 894098; ibid. PRM 894094; ibid. 1150 m a.s.l., *Picea abies*, 26. VIII. 1999, leg. et det. MT, PRM 894096; ibid. 1160 m a.s.l., PRM 894206. – Železná Ruda, Plesná Mt., 1120 m a.s.l., 26. VIII. 1998, leg.

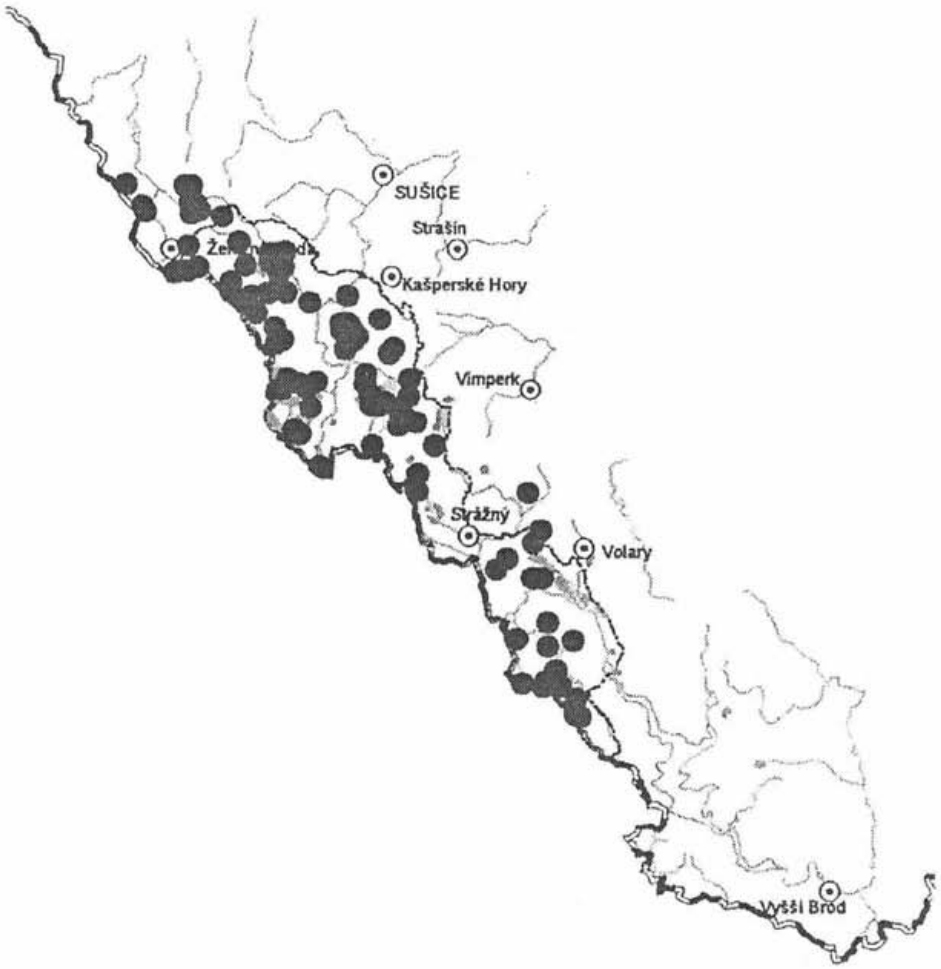

Fig. 15. Distribution of *Phellinus viticola* in the Šumava Mts.

et det. MT, PRM 894097; ibid. 1080 m a.s.l., PRM 894071; ibid. 1110 m a.s.l., PRM 894079; ibid. 1190 m a.s.l., 13. VI. 1999, PRM 893967; ibid. 1250 m a.s.l., *Picea abies*, 10. VII. 1996, leg. et det. F. Kotlaba, PRM 889708. – Železná Ruda, Prameniště, 950 m a.s.l., *Picea abies*, 13. IX. 1996, leg. J. Holec, det. MT, PRM 889410; ibid. 960 m a.s.l., 26. VIII. 1999, leg. et det. MT, PRM 894086.

CONCLUSIONS

Altogether 18 species of *Phellinus* have been confirmed for the Šumava mountains and their distribution, substrate specifity, altitude range and vegetation preference was evaluated.

The occurrence of species in the Šumava mountains is influenced mainly by the following factors: available substrate, altitude and impact of human activities on the vegetation. Four ecological groups of species can be distinguish, each influenced by different combinations of the following factors:

a) substrate (tree species) and type of substrate (e.g. living trunks, fallen branches etc.): *Phellinus alni, P. cinereus, P. hartigii, P. igniarius, P. punctatus, P. tremulae, P. tuberculosus, P. viticola.*

b) substrate and naturalness of vegetation: *P. ferrugineofuscus, P. nigrolimitatus, P. pouzarii.*

c) substrate and altitude: *Phellinus contiguus, P. conchatus, P. lundellii, P. pini.*

d) substrate, naturalness of vegetation and altitude: *Phellinus laevigatus.*

AKNOWLEDGEMENTS

I would like to thank Dr. J. Holec and Dr. Z. Pouzar (National Museum, Prague), whom I consulted several times in this matter. The work was enabled by financial support from the Ministry of Culture of the Czech Republic (projects Nos. RK96P01OMG024 and RK99P03OMG002). I would also like to thank J. Wild (Institute of Botany, Academy of Science of the Czech Republic) for help with construction of distribution maps.

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