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Polypore (Aphyllophorales, Basidiomycetes) studies in Russia. 2. Central Ural

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One hundred and sixty-one polypore species are reported from the Central Urals. Two of them, *Anomoporia vesiculosa* Y.C. Dai & Niemelä and *Junghuhnia semisupiniforme* (Murr.) Ryvarden, are reported for the first time from Russia. The material consists of literature data and 838 collections and observations, and according to the data of the authors, the most frequent species are *Fomitopsis pinicola* (Sw. : Fr.) P. Karst., *Trichaptum fuscoviolaceum* (Ehrenb. : Fr.) Ryvarden, *Fomitopsis rosea* (Alb. & Schewin. : Fr.) P. Karst., *Postia caesia* (Schrad. : Fr.) P. Karst., and *Bjerkandera adusta* (Willd. : Fr.) P. Karst., respectively. These contain 22 per cent of all observations, but only 3.9 per cent of all the species. Thirty-two species (25.2%) were collected only once, 16 species twice (12.6%) and 10 species (7.9%) three times, respectively. The collecting sites are briefly described, the host trees listed and descriptions and illustrations of some species given.

Key words: Aphyllophorales, floristics, Central Urals, polypores, Russia, taxonomy

Introduction

The main purpose of this article was to survey the polypore diversity in the Central Urals (Middle Urals), since no up-to-date lists of the species are available. Even if this list did not cover the whole species richness in the study area, it gives basic information for e.g., the red listing of the polypore species in the Central Urals. Without such a list it is impossible to make any evaluations of the potentially threatened species or of the commonness or rareness of the species. The material is, however, incomplete to make reliable comparisons with vast areas like the European part of Russia. Therefore the only reasonable comparison which could be made was that with the polypores of Finland (Niemelä 2005) and the South Urals (Kotiranta *et al.* 2005). In the latter study the methods were the same as in this study.

The first list of fungi of the Central Urals (Perm region) was published by Sjuzev (1898). Naumov (1915) published “The Fungi of Urals” with 15 polypore species collected mostly near the towns Perm and Ekaterinburg. Vanin and Solovjev (1948) investigated predominantly the pathogens of pine, birch, and larch forests, and Bondartsev (1953) mentioned some of Stepanova-Kartavenko’s collections from the Central Urals. Demidova (1963) was the first who published the known wood-decaying fungi including some 60 species of polypores though all, however, were not found in the study area. Stepanova-Kartavenko's (1967) long-term research lists 120 species from the Central Urals. Stavishenko studied the biodiversity and ecology of polypores and the influence of windfalls on polypores in Visimskiy Nature Reserve in 1996–1997 (Stavisenko 2000). The Red Data Book of the Central Urals (Bolshakov & Gorchakovskiy 1996) noted five polypore species. Moreover, some papers devoted to the influence of anthropogenic press on the polypores (Khramova 1998, Bryndina 2000) have been published.

Material and methods

Administratively, the Central Urals belong to the Perm region (western part) and the Sverdlovsk region (eastern part). The Central Urals (55°55´–59°08´N) is the lowest part of the Ural mountains, being mostly 250–450 m above sea level, and the highest peaks are 800–1000 m a.s.l. The climate is continental, but both the climate and the vegetation are naturally highly dependent on the local relief (altitude, slope orientation). On the western slopes and foothills the precipitation is higher than on the eastern side of the mountains. The western side is covered predominantly with fir (*Abies sibirica*) and spruce (*Picea abies*) forests (dark coniferous taiga) and the eastern sides are pine (*Pinus sylvestris*) dominated forests intermixed with larch (*Larix sibirica*), birch (*Betula* spp.) and aspen (*Populus tremula*).

In each collecting site all the species were collected or noted only (some easily identified species like *Fomes fomentarius*, *Fomitopsis pinicola*, *Piptoporus betulinus*, etc.) as accurately as possible. However, many sites were visited unfortunately only briefly and only in one year.

The list of species below is based mostly on our own collections. Species mentioned by Stepanova-Kartavenko (1967) to occur in the Central Urals, and also collected by us, are marked with an asterisk (*), and those not found by us are referring to Stepanova-Kartavenko (1967).

The material studied is preserved either in the herbarium of the Institute of Plant and Animal Ecology, Russian Academy of Sciences, Ural Division, Ekaterinburg (IEE) or in the herbarium of the University of Helsinki (H). The specimens collected by Nadya Ushakova (NU) and Victor Mukhin (VM) are in IEE and those of Heikki Kotiranta (HK) in H.The mounting media used were IKI (Melzer's reagent), CB (Cotton Blue) or KOH (5%). In many cases only a few spores are measured, and then the number of spores (*n* value) is not given. The nomenclature of polypores is not found in any manual, but it mostly follows Niemelä (2003) and Ryvarden and Gilbertson (1993, 1994). The nomenclature of vascular plants is according to Czerepanov (1995) and the climate and geographical data according to Smolonogov (1995). The authors of species names are found in that publication and are not repeated here. In this paper the epithets "spruce" and "*Picea*" refer to *Picea abies*, "pine" and "*Pinus*" to *Pinus sylvestris*, birch to *Betula pendula* or *B. pubescens* and "aspen" and "*Populus*" to *Populus tremula*, "*Tilia*" to *Tilia cordata*, "larch" or "*Larix*" to *Larix sibirica* and "fir" or "*Abies*" to *Abies sibirica*, *Caragana* to *Caragana arborescens*, *Padus* or bird cherry to *Padus* spp. and *Salix* or willow(s) to *Salix* spp., respectively.The polypore species are arranged alphabetically and after the number of the collecting site (*see* below), the substrate(s) and collector(s) are mentioned. Some rare species are described and illustrated, but notes on some common species are also given because also the common species are sometimes difficult to identify especially for untrained mycologists. All the descriptions are based on our material from the Central Urals if not otherwise stated.

The descriptions of the natural conditions and relief of the Central Urals is made by NU and of the collecting sites by NU, VM, and HK. The discussion is by HK and the text is finished by all authors. The descriptions of the species, measurements and drawings are by HK and the map of collecting sites by NU.

Collection sites (Fig. 1)

Sverdlovsk region

1. Biological station of the Ural State University, incl. Dvurechensk, 56°35´N, 61°03´E,

(HK 13.VIII.1993, 16.IX.1994, 3.VIII.1995, 25.VIII., 27–28.VIII.2002, NU 18.IX.2002, 3–23.VIII.2003)

The Biological station of the Ural State University is situated on the eastern foothills of the Urals, the altitude being 250–280 m a.s.l. The climate is moderately continental. The mean annual temperature is 1.5 °C, the mean temperature for January –17 °C and for July 18 °C. The annual precipitation is 300–350 mm.The pre forest-steppe forests are dry pine forests intermixed with a few birches and aspen trees. The forests are partly heavily managed, partly selective cuttings have been made. The amount of dead wood is 5–20 m^3 ha^{-1}. On river sides, willows, alders and *Padus* species grow.

Dvurechensk forest is treated here because it is close to the Biological Station. It is a pine dominated poor forest with high natural radioactive bedrock. However, the specimens in this area looked completely normal and the amount of dead wood per hectare is 5 m^3.

2. Oleni Ruchi National Park, Bazhukovo biol. stat., 56°31´N, 59°13´E, (HK 19–20.VIII.2002, NU 2–3.IX.2004)

The national park is situated on the western slope of the Bardymskiy range, 280–400 m a.s.l. The mean temperature for January is –16.5 °C, for July 16.7 °C, and the annual precipitation 500 mm. The old-growth forests are composed of fir, pine, spruce, larch and aspen and, around the station and the old mining area, there grow also e.g., young birches, rowans and bird cherries. The amount of dead wood varies greatly within the area: in the old-growth forest there is 30–50 m^3 ha^{-1}, in the old mining area 5–10 m^3 ha^{-1}.

3. Ekaterinburg, 56°47´N, 60°36´E, (VM 16–19.IX.2002)

The city is situated on the eastern slope and the area is 1142 km^2 with 1.3 million inhabitants. The native trees are pine, birch and aspen, but in the parks there are naturally introduced species such as *Acer negundo* and *Padus maackii*, etc. The collecting was made in the down town from living trees, fallen branches and stumps.

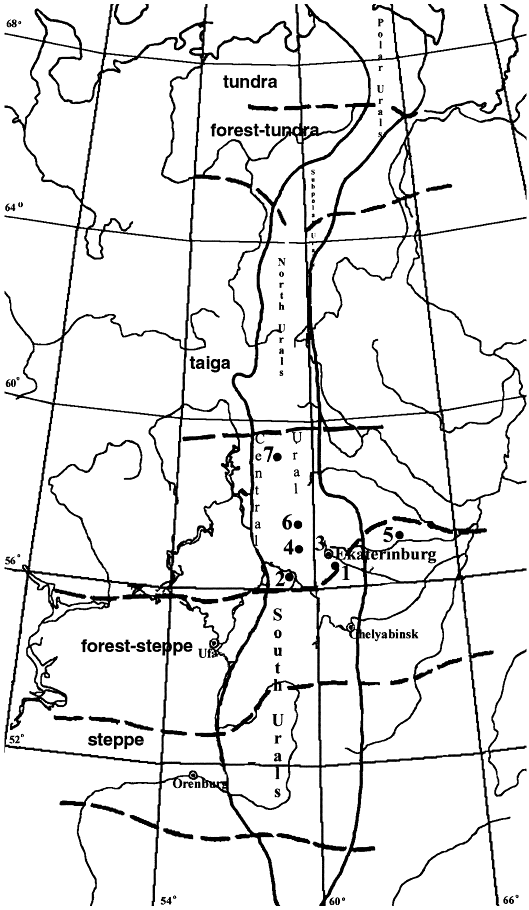

Fig. 1. The collecting sites in the Central Urals. (1) Biological Station of the Ural State University, (2) Oleni Ruchi National Park, (3) Ekaterinburg, (4) Khomutovka, (5) Pripyshminskiye bory National Park, (6) Visimskiy Nature Reserve, (7) Basegi Nature Reserve.

4. Khomutovka, 56°50´N, 59°48´E, (NU 13–18.VIII.1997, 23–24.VIII.1997, HK 26.VIII.2002)

Khomutovka (close to the town Revda) is 400 m above sea level on the western slope of the Central Urals. The climate is continental; the mean annual temperature is 1 °C, with a January mean of –17 °C and a July mean of 17 °C, and the annual precipitation is 500 mm. The forests (dark taiga) consist predominantly of fir and spruce intermixed with deciduous trees. The amount of dead wood per hectare was in some parts of the forest high, over 50 m^3. The forests have been very heavily damaged by air pollution since 1940s, and in many sites this has led to the death of the forests. The copper-fusing factories in the area release SO_2 (134088 tonnes/year), HF (1015 tonnes/year), Cu (2610 tonnes/year), Zn (1753 tonnes/year), As 639 (tonnes/year) and Pb (563 tonnes/year), respectively (Vorobeichik *et al*. 1994).

5. Pripyshminskiye bory National Park, 57°00´N, 63°42´E (NU 25–31.VII.1997, 21–22.IX.2001, VM 25.IX.2002)

The national park is between the eastern foothills of the Central Urals and the West Siberian plain, 220–250 m a.s.l. The climate is continental with a mean annual temperature of 1 °C. The mean annual precipitation is 500 mm. The forests are mainly intermixed pine–birch forests, but also more or less pure aspen and birch forests occur. Only three per cent of the forests are fir and spruce dominated.

6. Visimskiy Nature Reserve, 57°26´N, 59°44´E, (HK & VM 17–18.IX.1994, NU 4–7.VIII.1997)

The reserve is situated on a watershed, so that the western part lays on the western slope of the Central Urals (Europe) and the eastern part on the eastern slope (Asia). The altitude of the study area is 250–300 m a.s.l. (the highest peak is Bolshoi Sutuk, 699 m). The climate is moderately continental; the mean annual temperature is –0.1 °C; in January –17 °C; in July 17 °C; and the mean annual precipitation is 500 mm. The luxuriant old-growth forest is dominated by fir and spruce or spruce and Siberian pine (*Pinus sibirica*) and the vascular plant vegetation consists of tall grasses and herbs. The amount of dead wood per hectare was in some parts of the reserve very high, 100–200 m^3. After our investigations large areas of the forest were fully fallen by a storm, so that now there is far over 300 m^3 of dead wood per hectare.

Perm region

7. Basegi Nature Reserve, 58°57´N, 58°30´E (NU 11–21.IX.1999, 10–19.IX.2000)

The area is in the north western part of the Central Urals and the highest peak of the Central Urals is found here (Sredniy Baseg, 997 m). The climate is continental; the mean temperature for January is –18 °C; for July 13 °C; and the annual precipitation varies very much from year to year, being between 500 mm and 1070 mm. The old-growth forests are dominated by fir and spruce.

Results

Altogether 838 collections and observations were made and 127 species identified. Species found only once, counted 32 (25.2%), twice 16 (12.6%) and three times 10 (7.9%), respectively. The rare species (1–3 observations) form 45.7% of all the species, whereas the 28 common species (over 10 observations), form 22% and the rest (4–9 observations) 32.3%, respectively. The 28 most common species include 59.3% of all observations.

****Abortiporus biennis*** (Bull. : Fr.) Sing.

6 *Betula* (Stavishenko 2000)

Albatrellus confluens (Fr.) Kotl. & Pouzar

6 Stepanova-Kartavenko (1967)

Albatrellus ovinus (Schaeff.: Fr.) Kotl. & Pouzar

6, and Nighneserginskyi area close to *Abies*, *Picea* (Stepanova-Kartavenko 1967)

****Amylocystis lapponica*** (Romell) Singer

2 *Picea* (NU 1227), **6** *Abies*, *Picea* (Stavishenko 2000), **7** *Picea* (NU 655d, NU 710, 797)

****Anomoporia bombycina*** (Fr.) Pouz.

5 *Picea* (NU 844)

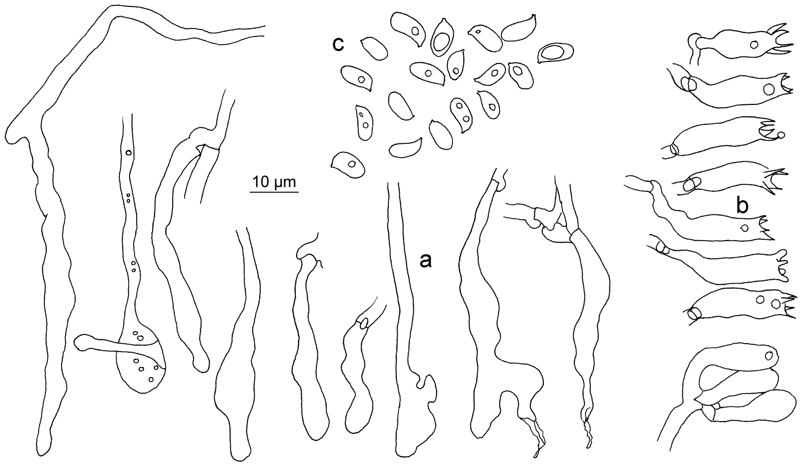

Fig. 2. *Anomoporia vesiculosa* (from *Kotiranta 11966*). — **a**: Inflated hyphae. — **b**: Basidioles and basidia. — **c**: Spores.

Anomoporia vesiculosa Y.C. Dai & Niemelä (Fig. 2)

1 *Pinus* (HK 11966). New to Russia.

Basidiocarp resupinate, very soft, fawn with a reddish hue. Pores round or angular, 1.5–2(–3)/mm, sterile margin thinning out, of the same colour as the pore surface, but a bit lighter. Hyphal system monomitic, hyphae clamped. Tramal hyphae thin-walled, 2.5–4 μm wide. Cystidia none, but inflated, sometimes moniliform hyphae in subiculum and upper trama common and in dissepiment edge fairly common, 38–80 × 7–10 μm, thin- or fairly thin-walled, contents cyanophilous. Basidia clavate, basally clamped, somewhat stalked, 20–30(–40) × 5.5–8 μm. Spores cylindrical, (5.6–) 5.9–8.2 × 3–3.6 (–4) μm, L = 6.9 μm, W = 3.3 μm, Q = 1.8–2.6, Q^* = 2.1, thin-walled, CB–, amyloid, often with a small apiculus (*HK 11966*, n = 30).

When describing the species, Dai and Niemelä (1994) had only one specimen and its spores are smaller than in our material, *viz.*, (4.8–)5.3–7(–7.6) × (2–)2.4–3.3(–3.7) μm. *Anomoporia vesiculosa* is a rare species and reported besides the type locality in China, from Hokkaido, Japan, (Núñez & Ryvarden 2001).

The growth site of *A. vesiculosa* was a relatively old, poor pine-dominated forest and the substrate was decorticated and fairly decayed (brown rot).

Antrodia albobrunnea (Romell) Ryvarden

1 *Pinus* (NU 1035), **4** *Picea* (NU 149b), **5** *Picea* (NU 862), **7** *Picea* (NU 635)

In Fennoscandia *A. albobrunnea* is known to grow almost solely on pine, but here the most common substrate is spruce.

Antrodia crassa (P. Karst.) Ryvarden

Nighneserginskyi area *Abies*, *Picea* (Stepanova-Kartavenko 1967)

**Antrodia heteromorpha* (Fr. : Fr.) Donk

7 *Abies* (NU 733), *Picea* (NU 547, 703), hardwood (NU 716)

**Antrodia macra* (Sommerf.) Niemelä

2 *Populus* (HK 19721, NU 1188)

Basidiocarp resupinate. Pore surface cream or honey-coloured, margin white, distinct; pores roundish or slightly angular, dissepiments fairly thick, almost entire, sometimes slightly dentate, 2–3(–4)/mm. Hyphal system dimitic, generative hyphae clamped. In subiculum strongly intertwined skeletals dominate, 2.5–3(–3.5) μm wide. Generative hyphae few, relatively thin-walled, 2.5–3.5 μm wide. In trama thick-walled, subparallel, 3–4(–5) μm wide skeletals dominate; lumen normally clearly visible especially in the thinner hyphae; generative hyphae thin-walled, (2.5–)3(–3.5) μm wide. Cystidia none, but pointed cystidioles present. Basidia basally clamped, subclavate or subcylindrical, 24–32 × 6–6.5 μm, with four sterigmata. Spores cylindrical, tapering often to the apical end, (8–)8.3–10.1 × 3.2–3.8(–4) μm, L = 9 μm, W = 3.5 μm, Q = 2.3–2.9, Q* = 2.6, thin-walled, CB–, IKI– (*HK 19721*, *n* = 30).

Antrodia pulvinascens (Pilát) Niemelä (Fig. 3)

2 deciduous tree (HK 19668), *Populus* (HK 19674, 19741)

Basidiocarp annual, strictly resupinate, up to 3 mm thick, fairly tough. Pore surface even or slightly irregular, white or cream-coloured, glancing with a grey tone when turned, because the substrate appears through the very thin subiculum. Pores roundish or angular, (1.5–)2–3(–5) per mm, dissepiments thin, almost entire or somewhat lacerate, often finely pruinose, sterile margin in vividly growing basidiomata white, distinct. Hyphal system dimitic, all hyphae CB–, IKI–, KOH–, generative hyphae clamped. Subiculum very thin, up 50 μm thick or almost lacking, consisting predominantly of skeletal hyphae, 2.5–3 μm wide, with a hardly visible lumen; generative hyphae very few, thin-walled, 2–2.5 μm wide. Trama dominated by intertwined skeletal hyphae 2.5–3 μm wide, with a barely visible lumen except in the dissepiment edge. Generative hyphae thin-walled, 2–2.5 μm wide. Cystidia or cystidioles none. Basidia clavate, basally clamped, (11–)13–18(–20) × 4.5–6 μm, with four thin sterigmata. Spores cylindrical, sometimes slightly fusiform or gently S-formed, rarely with a blunt apical end (especially long spores), (5–)6–8.5 × 2.1–2.8 μm, L = 6.5 μm, W = 2.4 μm, Q = 2.4–3.1, Q* = 2.7 (*HK 19674*, *n* = 30, H), (5.7–)6–8.1(–9) × 2.2–2.8(–3.1) μm, L = 6.7 μm, W = 2.5 μm, Q = 2.4–3, Q* = 2.7 (*HK 19668*, H, H.K., *n* = 30), (very) thin-walled, CB–, IKI–.

Our specimens are microscopically not typical, and hence a comparison with Finnish *A. pulvinascens* specimens and some fairly similar looking species is made.

When young, *A. pulvinascens* is macroscopically very similar to *Antrodia macra*. However, the spores of *A. macra* are fusiform and clearly larger, *viz*. (8–)8.5–10.5(–10.8) × 3.7–4.5(–4.7) μm, L = 9.6 μm, W = 4.1 μm, Q = 2.1–2.6, Q* = 2.3 (*Kotiranta 7955*, *Niemelä & Penttilä*, H.K.) (*see* also above, under *A. macra*). Well developed, perennial Finnish specimens of *A. pulvinascens* were studied and in that material the spores are slightly shorter, but especially clearly wider, *viz*. (5.2–)5.6–6.8(–7.4) × 3–3.7 μm, L = 6.1 μm, W = 3.4 μm, Q = 1.5–2.1, Q* = 1.8 (*Kotiranta 7500*, *Gilbertson*, *Ryvarden & Niemelä*, H.K.), (5.4–)5.6–6.6 × 2.6–3.2 μm, L = 6 μm, W = 2.9, Q = 1.9–2.3, Q* = 2.1 (*Kotiranta 1700*, H.K.), (5–)5.3–7(–8) × 2.8–4(–4.3) μm, L = 6 μm, W = 3.3 μm, Q = 1.5–2.2, Q* = 1.9 (*Kotiranta 5476*, H.K.). Dai and Niemelä (2002) report the spores of *A. pulvinascens* to be much narrower than in the Finnish collections studied by ourselves. In fact they come very close to our Russian material. Unfortunately Dai and Niemelä (2002) do not mention to which specimen the spore measurements refer to. Niemelä (1978), when describing *A. plicata* (= *A. pulvinascens*), gives almost the same size as measured by ourselves from the Finnish material, but still wider than in the Russian material.

According to Gilbertson and Ryvarden (1986) also *A. oleracea* lacks cystidioles, but its trama consists predominantly of generative hyphae. *Antrodia alpina* is bright citric yellow when fresh and its spores are only 4–5 μm long and *A. malicola* is effused-reflexed and it has larger pores, only 2–3/mm (Ryvarden & Gilbertson 1993).

To conclude: even if the Russian specimens are annual, lack cystidioles and have narrower spores than the "normal" Finnish specimens, we keep them in *A. pulvinascens*. Especially the gently S-formed spores are not familiar to typical *A. pulvinascens*.

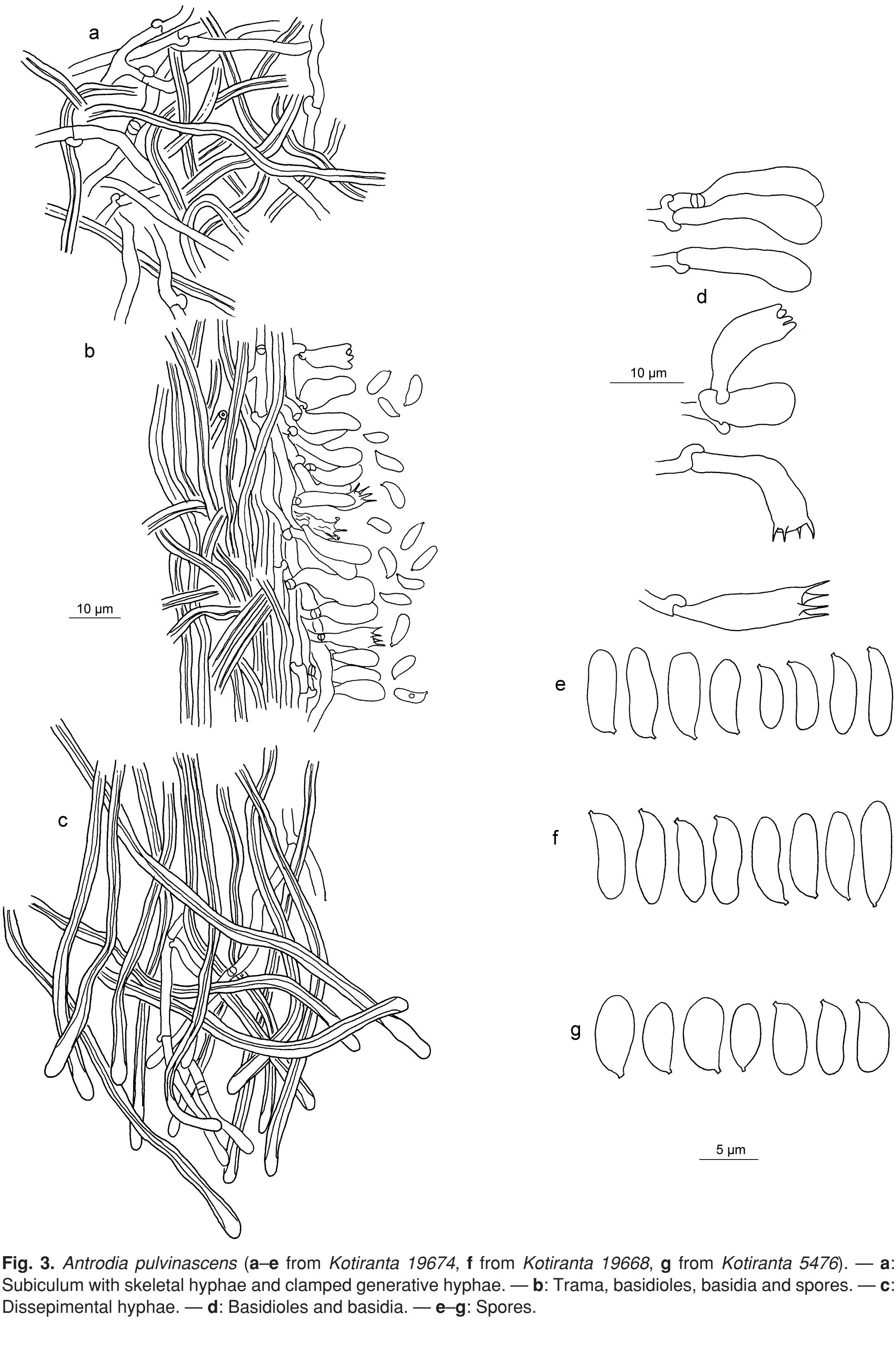

Fig. 3. *Antrodia pulvinascens* (**a**–**e** from *Kotiranta 19674*, **f** from *Kotiranta 19668*, **g** from *Kotiranta 5476*). — **a**: Subiculum with skeletal hyphae and clamped generative hyphae. — **b**: Trama, basidioles, basidia and spores. — **c**: Dissepimental hyphae. — **d**: Basidioles and basidia. — **e**–**g**: Spores.

Antrodia ramentacea (Berk. & Broome) Donk

Nighneserginskyi area *Picea Pinus* (Stepanova-Kartavenko 1967)

****Antrodia serialis*** (Fr.) Donk

2 *Picea* (NU 1146, 1165), **4** *Picea* (NU 138a), **5** *Picea* (NU 13, 14, 29, 37, 843, 847), **6** *Abies* (Stavishenko 2000), *Picea* (HK 11780, Stavishenko 2000), **7** *Picea* (NU 571a, 603)

****Antrodia sinuosa*** (Fr.) P. Karst.

1 *Pinus* (HK 11014, 19785, sight X 2, NU 1038), **2** *Picea* (NU 1166, 1176, 1177), **3** *Pinus* (VM 22553), **4** *Picea* (HK 19832, NU 156a, 191b), **6** *Picea* (Stavishenko 2000), *Pinus* (HK 11783), **7** *Picea* (NU 567, 571b, 595, 719, 795, 782)

Basidiocarp resupinate, tough. Pore surface ochre-coloured, pores angular 4–5(–6)/mm on horizontal surface, 2/mm when growing on vertical surface, pore mouths lacerate or dentate. Pleasant liquorice (sal ammoniac) smell. Hyphal system dimitic, generative hyphae clamped, all hyphae CB–, IKI–, KOH–. Intertwined, 2–3 μm wide skeletal hyphae, with a narrow lumen, dominate in context. Subparallel skeletal hyphae, 1.5–2.5(–3) μm wide, with a narrow lumen, reach the dissepiment edge, and dominate in trama. Generative hyphae thin-walled, 2–3 μm wide. Cystidia none, but pointed cystidioles, 12–16 × 3–4 μm, fairly frequent. Basidia basally clamped, subcylindrical or subclavate, 15–16 × 4–4.5 μm, with four sterigmata. Spores subcylindrical, slightly bent, 4–5(–5.3) × 1.2–1.6(–1.8) μm, L = 4.5 μm, W = 1.4 μm, Q = 2.8–3.8, Q^* = 3.1, very thin-walled, CB–, IKI– (*HK 19832*, n = 30).

****Antrodia vaillantii*** (DC. : Fr.) Ryvarden

Fibroporia vaillantii (DC. : Fr.) Parmasto
7 *Picea* (NU 705)

****Antrodia xantha*** (Fr. : Fr.) Ryvarden

Amyloporia xantha (Fr. : Fr.) Bondartsev & Singer

1 *Pinus* (NU 1039), **2** *Abies* (NU 1159), **4** *Picea* (HK 19833, NU 151, 154b), **5** *Pinus* (NU 851), **6** *Picea* (NU 95), **7** *Picea* (NU 713, 998b)

Antrodiella hoehnelii (Bres.) Niemelä

Nighneserginskyi area *Populus* (Stepanova-Kartavenko 1967)

****Antrodiella romellii*** (Donk) Niemelä

2 *Caragana* (HK 19661)

Basidiocarp resupinate, moderately thin. Pore surface cream-coloured, margin white, entire or finely fimbriate. Pores angular, 6–7/mm, dissepiments thin, somewhat lacerate or dentate. Hyphal system dimitic, generative hyphae clamped. Thin-walled, horizontal generative hyphae (1.5–)2–3 μm wide, dominate next to the substrate till middle context where they give rise to thick-walled, tightly intertwined, 2.5–3 μm wide skeletal hyphae, which may be branched. These skeletal hyphae dominate in lower part of context (above the tubes). Trama dominated by similar skeletals as in context, but thinner walled. Cystidia none. Basidia basally clamped, subcylindrical, 16–19 × 4–4.5 μm. Spores ellipsoid, 3.4–4(–4.4) × 2.1–2.8 μm, L = 3.7 μm, W = 2.4 μm, Q = 1.4–1.8, Q^* = 1.6, thin-walled, CB–, IKI– (n = 20).

The upper part of subiculum, containing generative hyphae parallel to the substrate, is similar to that seen in *A. pallasii* (Johannesson *et al.* 2000). No other polypores were seen on the substrate of our specimen.

Antrodiella semisupina (Berk. & M.A. Curtis) Ryvarden

1 *Betula* (HK 19860), **2** *Betula* (HK 19683), **4** *Salix* (HK 19802), **7** *Betula* (NU 546), *Padus* (NU 738)

Basidiocarp thin, effused-reflexed, flexible and tough when fresh. Pore surface whitish, pores angular or almost round, (5–)7–8/mm, dissepiments thin, dentate or lacerate. Hyphal system trimitic, generative hyphae clamped. In subiculum skeletals, (2–)3–4(–6) µm in diam., with a wide lumen dominate. Binding hyphae thick-walled, 2–2.2 µm wide, generative hyphae thin- or thick-walled, (2–)3–5(–6) µm wide. In trama skeletals, 2–3 µm wide, reach the dissepiment edge. No cystidia or cystidioles. Spores ellipsoid, when unripe, both sides convex, when ripe ventral side concave, (3.3–)3.5–4.1(–4.6) × 1.8–2.2 µm, L = 3.8 µm, W = 1.9 µm, Q = 1.7–2.1, Q^* = 2 (*HK 19802*, n = 10), 3–3.5 × 1.7–2.1 µm, L = 3.2 µm, W = 1.9 µm, Q = 1.5–2, Q^* = 1.7 (*HK 19860*, n = 30), thin-walled, CB–, IKI–.

The spores of the specimen *HK 19860*, which grew together with *Fomes fomentarius*, are smaller than usual (e.g., Niemelä 2005).

****Bjerkandera adusta*** (Willd. : Fr.) P. Karst.

1 *Betula* (HK 19872, sight), *Populus* (HK 10982), *Salix* (HK 19902, NU 1086), **2** *Abies* (NU 1126), *Picea* (NU 1190), **3** *Acer* (VM 22528, 22534, 22536, 22581), *Amelanchier* (VM 22541), *Crataegus* (VM 22585), *Malus* (VM 22575), *Padus* (VM 22510, 22573), *Populus* (VM 22500, 22507), *Ulmus* (VM 22578), **4** *Picea* (NU 130c, 153), *Salix* (HK 19798), **6** *Picea* (NU 82), *Salix* (HK 11784), **7** *Betula* (NU 537)

****Bjerkandera fumosa*** (Pers. : Fr.) P. Karst.

1 *Alnus* (NU 1087), **3** *Acer* (VM 22588)

****Ceriporia purpurea*** (Fr.) Donk

4 *Abies* (NU 173)

Ceriporia reticulata (Hoffm. : Fr.) Domański

6 *Populus* (Stepanova-Kartavenko 1967)

Ceriporia viridans (Berk. & Broome) Donk

Nighneserginskyi area *Sorbus*, *Ulmus* (Stepanova-Kartavenko 1967)

Ceriporia tarda (Berk.) Ginns

Nighneserginskyi area *Abies* (Stepanova-Kartavenko 1967)

****Ceriporiopsis aneirina*** (Sommerf.) Domański

2 *Populus* (HK 19704)

Basidiocarp annual, strictly resupinate, relatively thick. Pores angular, 1–2/mm, dissepiments thin. Hyphal system monomitic, hyphae clamped. Subicular hyphae thin-walled, 3–3.5 µm, wide. Tramal hyphae subparallel, thin-walled, some heavily encrusted, 3–4 µm wide. Cystidia or cystidioles none. Spores ellipsoid, 5–6.2 × (3–)3.2–4 µm, L = 5.6 µm, W = 3.6 µm, Q^* = 1.7, very thin-walled, CB–, IKI– (*HK 19704*, n = 10).

Normally easy to distinguish from *C. resinascens*, which has clearly thick-walled subicular hyphae and which look like skeletal hyphae, but are sparsely clamped.

Ceriporiopsis gilvescens (Bres.) Domański

Nighneserginskyi area *Betula*, *Sorbus* (Stepanova-Kartavenko 1967)

Ceriporiopsis mucida (Pers. : Fr.) Gilb. & Ryvarden

7 *Picea* (NU 700)

Ceriporiopsis pannocincta (Rom.) Gilbn. & Ryvarden

Gelatoporia pannocincta (Romell) Niemelä

2 *Abies* (NU 1153)

****Ceriporiopsis resinascens*** (Romell) Domański

2 *Abies* (NU 1144)

Ceriporiopsis subvermispora (Pilát) Gilbn. & Ryvarden (Fig. 4)

Gelatoporia subvermispora (Pilát) Niemelä

7 *Abies* (NU 637)

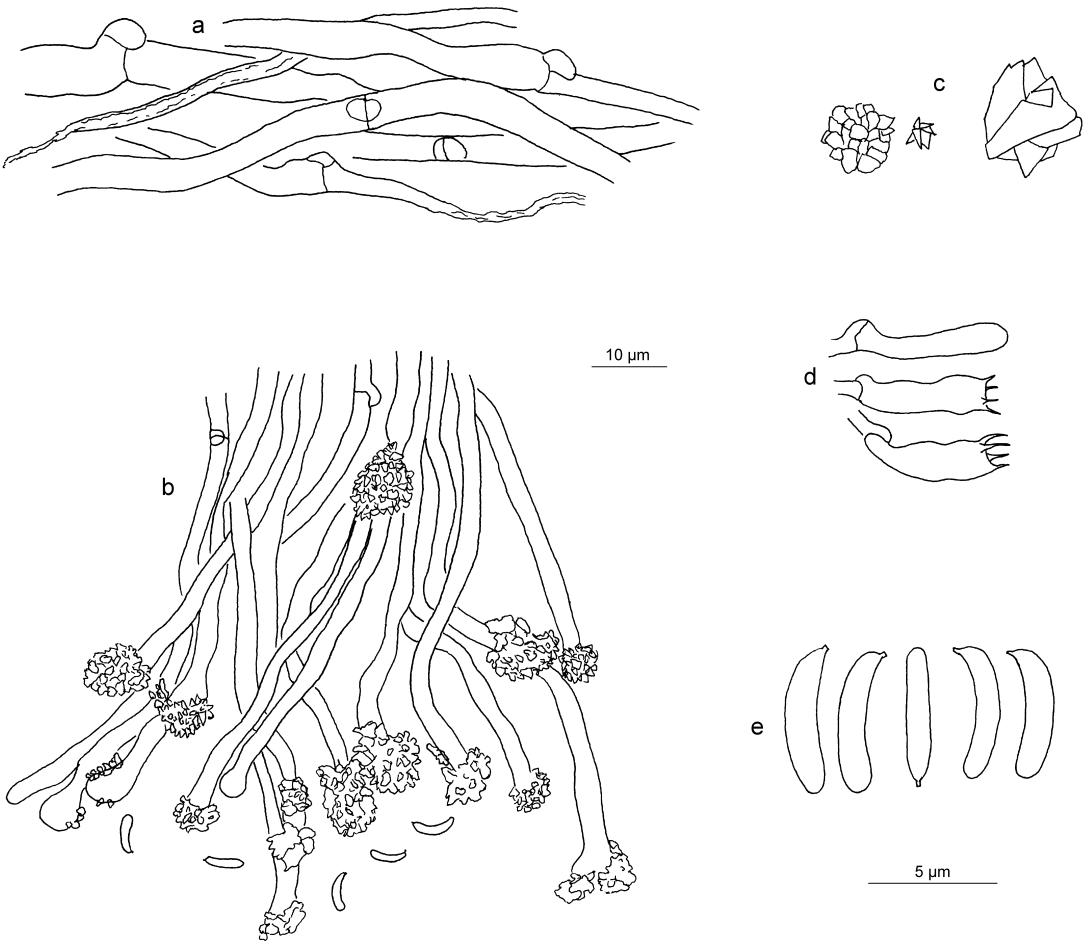

Fig. 4. *Ceriporiopsis subvermispora* (from *Ushakova 637*). — **a**: Subicular hyphae. — **b**: Encrusted dissepimental hyphae. — **c**: Crystals from trama. — **d**: Basidia. — **e**: Spores.

Basidiocarp resupinate, pore layer pale cream-coloured. Pores soft, angular, splitting when dry, 3–4/mm, dissepiments lacerate or dentate. Margin distinct, without rhizomorphs, but in parts slightly fimbriate. Subiculum brownish, clearly darker than the pore layer, corneous or cartilaginous when dry. Hyphal system monomitic, hyphae clamped, CB–, IKI–, KOH–. Subicular hyphae horizontally arranged, uneven in width, 3–7 μm in diam., thin- or slightly thick-walled, when old gelatinized and difficult to discern. Hyphae in upper trama often gelatinized, in middle and lower trama subparallel to parallel, thin-walled, 2.5–3.5(–4) μm wide. Dissepimenal hyphae thin- or very thin-walled, apically swollen, up to 7 μm wide, normally heavily encrusted with relatively large aggregates of "popcorn"-like crystals. Subhymenial hyphae very thin-walled, richly branched, 2.5–3.5 μm wide. Cystidia none. Basidia basally clamped, clavate or subcylindrical, (13–)15–19 × 4.5–5 μm, with four, up to 3.5 μm long sterigmata. Spores allantoid or very rarely subcylindrical, (5–)5.2–5.8(–6.5) × 1–1.3 μm, L = 5.5 μm, W = 1.1 μm, Q = 3.6–6.5, Q^* = 5, very thin-walled, CB–, IKI– (*NU 637*, n = 30).

****Cerrena unicolor*** (Bull. : Fr.) Murrill

1 *Betula* (HK 11011, sight, NU 1019), **3** *Acer* (VM 22579), *Betula* (VM 23583), *Padus* (VM 22549), **6** *Alnus* (Mukhin & Ushakova 2001), *Betula* (HK 11804), **7** *Betula* (NU 573, 742)

****Climacocystis borealis*** (Fr.) Kotl. & Pouzar

4 *Picea* (HK 19823, NU 168), **7** *Picea* (NU 568, 762)

****Coltricia perennis*** (L.: Fr.) Murrill

5 on the ground (VM 22903)

****Daedaleopsis confragosa*** (Bolton : Fr.) J. Schroet.

1 *Betula* (NU 1020), *Salix* (HK 11030), **3** *Padus* (VM 22530), *Salix* (VM 22524), **4** *Salix* (HK 19796, 19801), **6** *Salix* (HK 11787, Stavishenko 2000), **7** *Populus* (NU 650), *Sorbus* (NU 722b)

Daedaleopsis septentrionalis (P. Karst.) Niemelä

1 *Betula* (NU 1021), **3** *Betula* (VM 22518), **6** *Alnus* (Mukhin & Ushakova 2001), **7** *Betula* (NU 538)

****Daedaleopsis tricolor*** (Bull. : Fr.) Bondartsev & Singer

1 *Betula* (HK 11026, 11750, 19859, 19882, sight X 4), *Padus* (HK 19903, NU 1022), **6** *Betula* (HK 11802, Stavishenko 2000), **7** *Populus* (NU 644), *Sorbus* (NU 722a)

****Datronia mollis*** (Sommerf. : Fr.) Donk

1 *Alnus* (NU 1023), **2** *Betula* (HK 19679), *Populus* (HK 19662), **3** *Acer* (VM 22533, 22560), *Padus* (VM 22505, 22531, 22551), **6** *Padus*, *Populus* (Stavishenko 2000), **7** *Salix* (NU 647), *Sorbus* (NU 613)

****Datronia stereoides*** (Fr. : Fr.) Ryvarden

3 *Malus* (VM 22576), **6** *Alnus* (Mukhin & Ushakova 2001)

****Dichomitus squalens*** (P. Karst.) D.A. Reid

1 *Pinus* (HK 19864, NU 1101), **5** *Picea* (NU 17, 21, 858), **6** *Picea* (Stavishenko 2000), **7** *Picea* (NU 765, 767)

****Diplomitoporus flavescens*** (Bres.) Ryvarden

1 *Pinus* (HK 10993, NU 1078)

Hyphal system dimitic, generative hyphae clamped. Skeletals in trama thick-walled, 3.5–4 μm in diam., IKI faintly amyloid, KOH–. Cystidia none. Spores subcylindrical or suballantoid, 7 × 2.5 μm, thin-walled, CB–, IKI– (*HK 10993*).

Diplomitoporus lindbladii (Berk.) Gilb. & Ryvarden

Cinereomyces lindbladii (Berk.) Jülich
2 *Pinus* (NU 1229), **4** *Picea* (HK 19826)

Basidiocarp resupinate, fairly thick, when young white; when old silver grey. Pores roundish when young, later angular, 3–4/ mm, dissepiments first thick, entire, later thin, somewhat lacerate. Smell very astringent when touched (fresh). Hyphal system dimitic, generative hyphae clamped. Thick-walled skeletals, 3–4 μm in diam., with a narrow lumen dominate in context. Generative hyphae thin-walled, about the same width as skeletals. Tramal skeletals similar to those in context, often amyloid or strongly amyloid, swelling, and later disappearing in KOH. Cystidia none. Spores subcylindrical, or suballantoid, 5–6 × 2 μm, thin-walled, CB–, IKI– (*HK 19826*).

Easy to identify in the field because of the strong smell and the grey colour of mature basidiocarps. The amyloid skeletals which swell and disappear in KOH are very characteristic for *D. lindbladii*.

****Fomes fomentarius*** (L. : Fr.) Fr.

1 *Betula* (HK 10985, sight X 6, NU 1033), **2** *Populus* (HK 19693), **3** *Betula* (VM 22582), *Populus* (VM 22558), **4** *Betula* (HK sight), **6** *Alnus* (Mukhin & Ushakova 2001)

****Fomitopsis cajanderi*** (P. Karst.) Kotl. & Pouz. (Fig. 5a)

6 *Picea* (HK 11823, NU 85), **7** *Picea* (NU 570, 786)

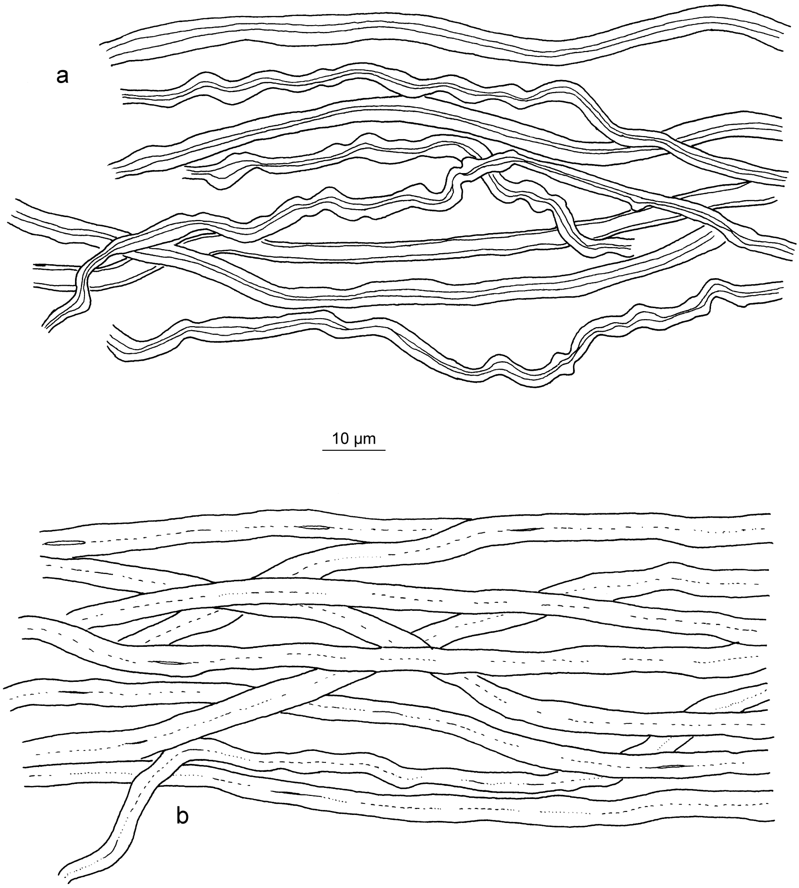

Fig. 5. *Fomitopsis cajanderi* (**a** from *Kotiranta 11823*) and *Fomitopsis rosea* (**b** from *Kotiranta 19835*). — **a**: Skeletal hyphae in subiculum. — **b**: Skeletal hyphae in subiculum.

Fomitopsis epileucina (Pilát) Gilbn. & Ryvarden

6 and Nighneserginskyi area *Alnus*, *Betula*, *Populus* (Stepanova-Kartavenko 1967)

****Fomitopsis pinicola*** (Sw. : Fr.) P. Karst.

1 Deciduous wood (HK 11742), *Betula* (HK sight), *Pinus* (HK sight X 3, NU 1040), **2** *Abies* (NU 1197a), **3** *Padus* (VM 22512), *Populus* (VM 22506), **4** *Abies* (NU 126a, 138c, 158a, 159c, 169, 174a), *Picea* (HK 19834, sight X 5, NU 110a, 113a, 130a, 131b, 134a), **5** *Picea* (NU 6, 16, 24, 26, 59, 62, 65, 69, 73), **6** *Alnus* (Mukhin & Ushakova 2001), *Picea* (NU 77b, 84a, 86, 89a, 97, 98, 104c, 105)

****Fomitopsis rosea*** (Alb. & Schwein. : Fr.) P. Karst. (Fig. 5b)

1 *Pinus* (HK 10989, NU 1041), **2** *Abies* (NU 1189), *Populus* (HK 19673), **4** *Abies* (NU 114a, 116a, 138d, 142a, 145a, 148b, 154a, 156b, 161c, 165, 174b, 189a), *Picea* (HK 19818, 19835, 19838, NU 111a, 123a), **5** *Picea* (NU 1, 4, 27, 30, 32, 39, 46, 49, 52, 61, 67, 74, 864a), **6** *Picea* (HK 11767), **7** *Abies* (NU 565a), *Picea* (NU 723)

Fomitopsis rosea is sometimes difficult to distinguish from *F. cajanderi*. This is especially when very young or very old basidiocarps are studied. If there are no spores, the best distinguishing characteristics are in the contextual skeletal hyphae: according to Niemelä (1985) the skeletals of *F. cajanderi* remain pink in KOH and the wall is easily seen, whilst the skeletals of *F. rosea* turn brownish and the wall thickness is hardly visible. We can confirm the thickness of the walls, but the colour depends on the age of the fruit body. Skeletals of old fruit bodies of *F. cajanderi* also turn brown in KOH. Another reliable distinguishing characteristic is that the skeletals of *F. rosea* are almost straight, solid, while those of *F. cajanderi* are often bent. Moreover, the hyphae of *F. rosea* are slightly wider, (3–)4–4.5(–5) μm, than those of *F. cajanderi*, *viz*. (2.5–)3–4(–4.5) μm.

Funalia cervina (Schwein.) Y.C. Dai

Trametes cervina (Schwein.) Bres.

3 in Botanical garden *Salix* (Stepanova-Kartavenko 1967)

****Funalia trogii*** (Berk.) Bondartsev & Singer

Trametes trogii Berk

1 *Padus* (NU 1026), *Populus* (HK 10981, 11964), **2** *Populus* (HK 19722), **3** *Acer* (VM 22554), *Padus* (VM 22502), *Populus* (VM 22526, 22547, 22559, 22569), *Salix* (VM 22571), **4** *Salix* (HK 19800), **6** *Padus*, *Populus* (Stavishenko 2001), Nighneserginskyi area *Abies* (Stepanova-Kartavenko 1967)

Basidiocarp pileate, effused-reflexed or resupinate, small or large, tough. Upper surface with long, stiff, brown hairs. Pore surface brownish, pores isodiametric, 1–2(–3)/mm. Context, hairs and pore surface turn brown when treated with a droplet of KOH. Hyphal system di/trimitic, generative hyphae clamped. The hairs on cap composed of strictly parallel, thick-walled skeletal hyphae, (3–)4–5(–6) μm wide, with some adventitious septa and a narrow lumen, except in the thin-walled apical ends and a few very thin-walled generative hyphae, 3 μm wide. Tightly interwoven, sometimes branched, thick-walled, CB faintly blue, IKI–, KOH–, skeletals, (3–)4–5 μm in diam., dominate in context. Trama dominated by intertwined , often branched skeletals of the same width as in context. Basidia basally clamped, clavate, 19–22 × 5.5. –7.5 μm, thin-walled with four sterigmata. Spores cylindrical, fairly often bent, (9.5–)10–13(–13.5) × 2.9–3.5(–4) μm, L = 11.1 μm, L = 3.3 μm, Q = 2.6–4.1, Q^* = 3.4, thin-walled, CB–, IKI– (*HK 11964*, n = 30).

****Ganoderma lipsiense*** (Batsch) G. F. Atk.

1 *Betula* (NU 1058), deciduous wood (HK 11746), **2** *Picea* (NU 1182), *Sorbus* (HK 19659), **3** *Acer* (VM 22509, 22535), *Populus* (VM 22555, 22557), **4** *Picea* (NU 130b, 131a), **6** *Betula* (HK 11824, Stavishenko 2000), **7** *Sorbus* (NU 562)

****Ganoderma lucidum*** (M. A. Curtis : Fr.) P. Karst.

2 *Picea* (NU 1223), **5** *Abies* (VM 22902), *Betula* (VM 22905), **7** *Betula* (NU 558, 693, 655a, 720)

****Gloeophyllum abietinum*** (Bull. : Fr.) P. Karst.

1 *Pinus* (HK 19850, NU 1042), **2** *Abies* (NU 1186, 1199b), **4** *Abies* (NU 160), *Picea* (HK 19836, NU 145b, 148a, 188a), **5** *Picea* (NU 2, 3, 19, 34, 44, 48, 54), **6** *Abies* (Stavishenko 2000), *Picea* (HK 11772, 11843, Stavishenko 2000)

****Gloeophyllum odoratum*** (Wulfen : Fr.) Imaz.

2 *Picea* (NU 1174), **4** *Picea* (NU 177), **6** *Picea* (HK 11840, NU 89b, 109), **7** *Picea* (NU 754)

****Gloeophyllum protractum*** (Fr.) Imaz.

1 *Pinus* (NU 1043)

****Gloeophyllum sepiarium*** (Wulfen : Fr.) P. Karst.

1 *Pinus* (HK 11748, NU 1045), **2** *Abies* (NU 1197b), **4** *Picea* (HK 19819, 19825, 19837, NU 142b, 158b, 159b, 161b, 162, 163, 164a), **5** *Picea* (NU 18), **6** *Picea* (NU 77a, 79, 80, 81, 83, 84b, 90, 104b), **7** *Picea* (NU 536, 545)

****Gloeophyllum trabeum*** (Pers. : Fr.) Murrill

1 green house (NU 1044)

****Gloeoporus dichrous*** (Fr. : Fr.) Bres.

1 *Padus* (NU 1110), **7** *Salix* (NU 662b)

****Gloeoporus taxicola*** (Pers. : Fr.) P. Karst.

Meruliopsis taxicola (Pers. : Fr.) Bondartsev

1 *Pinus* (HK 10991, NU 1111), **2** *Abies* (NU 1192), **5** *Pinus* (NU 8), **6** *Picea* (HK 11779), **7** *Picea* (NU 597, 774)

Hapalopilus rutilans (Pers. : Fr.) P. Karst.

1 *Betula* (HK 19874, NU 1092), **2** *Abies* (NU 1151), **4** *Abies* (NU 180), **6** *Abies*, *Betula*, *Populus* (Stavishenko 2000), **7** *Betula* (NU 798)

Pores angular 3–4(–5)/mm, dissepiments relatively thin, fimbriate or lacerate. Spores ellipsoid, 3.3–4 × 2–2.3(–2.5) μm, L = 3.7 μm, W = 2.2 μm, Q = 1.6–1.9, Q^* = 1.7, thin-walled, CB–, IKI– (*HK 19874*, n = 30, from spore print).

Auriporia aurulenta David, Tortić & Jelic

7 *Abies* (NU 800)

Heterobasidion annosum (Fr.) Bref.

Nighneserginskyi, Achit and Schalya areas *Pinus*, *P. sibirica* (Stepanova-Kartavenko 1967)

****Heterobasidion parviporum*** Niemelä & Korhonen

2 *Picea* (NU 1141, 1193), **4** *Picea* (NU 128b, 134b, 136b), **5** *Picea* (NU 25, 841), **6** *Picea* (HK 11781, NU 102), **7** *Abies* (NU 582a), *Picea* (NU 592, 663, 748, 757, 785)

Hyphodontia paradoxa (Schrad. : Fr.) E. Langer & Vesterholt

Nighnesergiskyi area *Alnus*, *Betula*, *Tilia* (Stepanova-Kartavenko 1967)

Inonotus hispidus (Bull. : Fr.) P. Karst.

3 *Malus domestica* in a garden (Stepanova-Kartavenko 1967)

****Inonotus obliquus*** (Pers. : Fr.) Pilát

1 *Betula* (NU 1066), **6** *Alnus* (Mukhin & Ushakova 2001)

Inonotus radiatus (Sowerby : Fr.) P. Karst.

1 *Alnus* (NU 1067), **3** *Caragana* (VM 22565), **4** *Betula* (HK 19805), **6** *Alnus* (Mukhin & Ushakova 2001), **7** *Sorbus* (NU 670, 789)

****Inonotus rheades*** (Pers.) P. Karst.

1 *Populus* (NU 1150), **2** *Populus* (NU 1208), **6** *Alnus* (Mukhin & Ushakova 2001)

****Irpex lacteus*** (Fr. : Fr.) Fr.

1 *Betula* (NU 1996), *Padus* (HK 11759), **2** *Sorbus* (HK 19667), **3** *Acer* (VM 22562), *Caragana* (VM 22501, 22566), *Cerasus* (VM 22556), *Crataegus* (VM 22521), *Padus* (VM 22508, 22516, 22517), *Ulmus* (VM 22577), **4** *Salix* (HK 19797), **6** *Alnus* (Mukhin & Ushakova 2001), *Salix* (HK 11786), **7** *Salix* (NU 626)

****Ischnoderma benzoinum*** (Wahlenb. : Fr.) P. Karst.

2 *Abies* (NU 1215), **4** *Abies* (NU 122), **7** *Picea* (NU 645, 793)

Ischnoderma resinosum (Fr.) P. Karst.

2 *Populus* (NU 1172)

****Junghuhnia collabens*** (Fr.) Ryvarden

Steccherinum collabens (Fr.) Vesterholt
6 *Abies* (Stavishenko 2000)

****Junghuhnia nitida*** (Pers. : Fr.) Ryvarden

Steccherinum nitidum (Pers. : Fr.) Vesterholt
1 *Betula* (BU 1097), **2** *Abies* (NU 1175, 1183), **6** *Alnus* (Mukhin & Ushakova 2001)

Junghuhnia semisupiniforme (Murr.) Ryvarden (Fig. 6)

1 *Alnus ?* (HK 11752). New to Russia.

Fruit body pileate or effused-reflexed, 2 cm

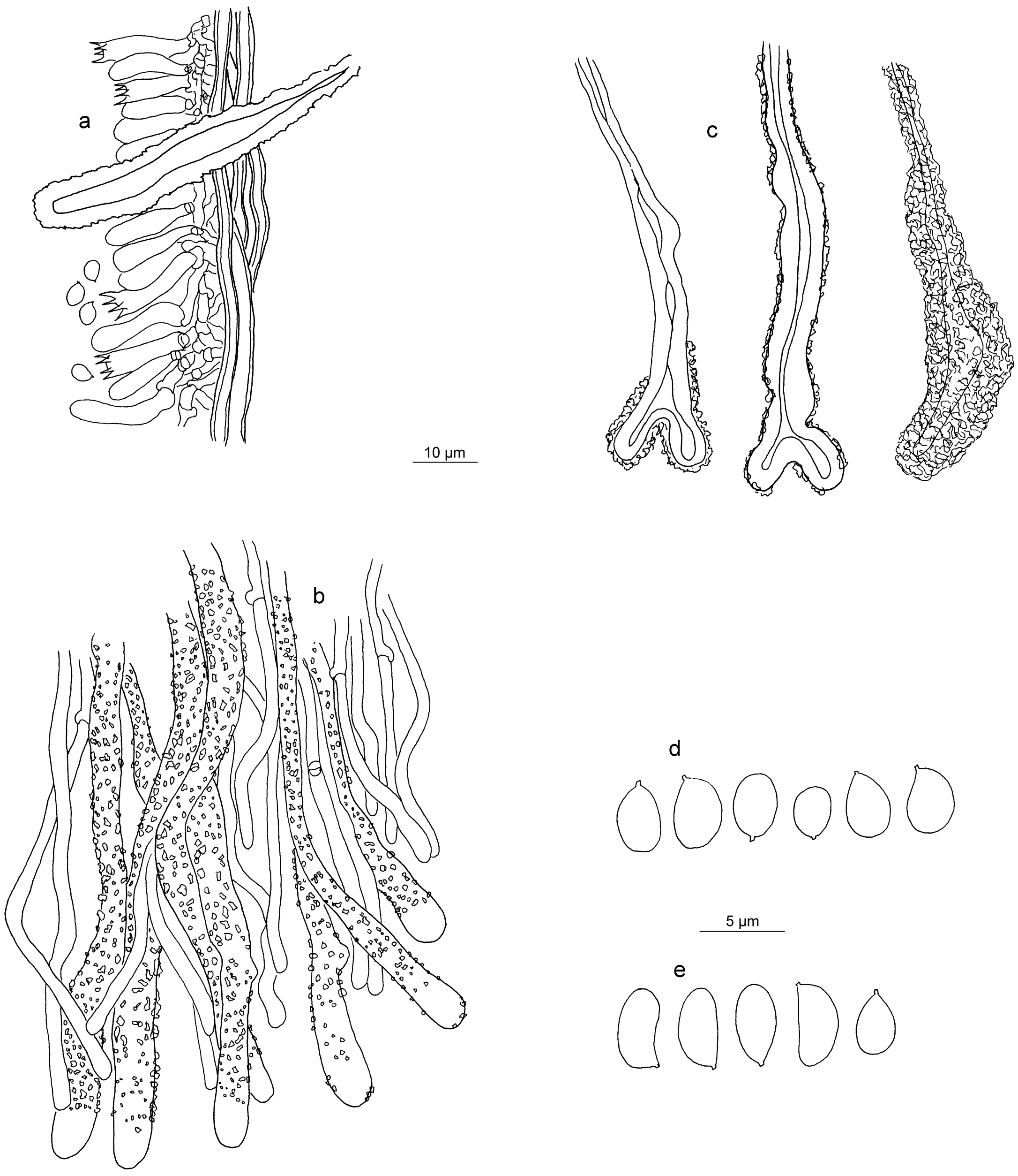

Fig. 6. *Junghuhnia semisupiniforme* (**a**–**d** from *Kotiranta 11752*) and *J. pseudozilingiana* (**e** from *Kotiranta 10130*). — **a**: Trama with a skeletocystidium, basidioles, basidia and spores. — **b**: Encrusted dissepimental hyphae. — **c**: Skeletocystidia. — **d** and **e**: Spores.

wide, protruding about 1 cm, fairly hard when dry. Cap thin, upper surface matted, fawn or buff, margin sharp, slightly velutinous (× 50). Pore surface of the same colour as the cap. Pores 5–7/mm, angular, dissepiments fairly thin, lacerate or dentate, cowered with white encrusted hyphae (× 50). Context thin, pale-creamish, tubes darker, honey-coloured, up to 2 mm long. Hyphal system dimitic, generative hyphae clamped, all hyphae CB–, IKI–. In subiculum thick-walled (walls up to 2 μm thick), skeletals 4–4.5 μm in diam., dominate. Generative hyphae in subiculum thin-walled, 3 μm wide. Tramal hyphae subparallel. Trama dominated by thick-walled, 3–4(–5) μm wide skeletals. Generative hyphae thin-walled 2.5–3 μm in diameter. In dissepiment edge encrusted, (4–)6–8 μm wide, fairly thin-walled skeletals and smooth, 2.5–3 μm wide, thin-walled, apically roundish generative hyphae. Subhymenial hyphae very thin-walled, richly branched, 2–3 μm wide. Skeletocystidia fairly abundant, thick-walled, embedded in trama or slightly projecting over the basidia, sometimes furcated, mostly heavily encrusted with small crystals, the encrusted part being up to 140 μm long and up to 12 μm wide. Basidia basally clamped, clavate or subcylindrical, (10–)13.5–15 × 4–5 μm, with four thin, up to 3 μm long sterigmata. Spores ellipsoid or more often broadly ellipsoid, rarely subglobose, sometimes glued in pairs – tetrads, 3–3.6(–3.8) × 2.2–2.6(–2.8) μm, L = 3.3 μm, W = 2.4 μm, Q = 1.2–1.5, Q^* = 1.4, very thin-walled, CB–, IKI– (*HK 11752*, n = 30).

According to Ryvarden and Gilbertson (1993) *Junghuhnia semisupiniforme* is a very rare species in Europe. In East Asia it has been found only in Japan (Núñez & Ryvarden 2001). *Junghuhnia pseudozilingiana*, is another effused-reflexed *Junghuhnia* species which, according to Ryvarden and Gilbertson (1993), differs from *J. semisupiniforme* in having larger pores, *viz.* 2–3/mm and oblong ellipsoid spores. We studied two specimens of *J. pseudozilingiana* (Estonia. Tartu distr., Laane, 13.X.1991, *HK 10127*, *10130*, *Parmasto & Kõljalg*, H.K.) to compare them with our specimen of *J. semisupiniforme*. The young basidiocarp is fairly soft when dry, creamish white, effused-reflexed, with very small caps. Pores are angular or almost labyrinthiform, 2–3(–4)/mm, dissepiments relatively thick, entire or slightly lacerate. The old basidiocarp is honey-coloured, fully resupinate, with angular pores, 1–3/mm. Hyphal system is dimitic and generative hyphae are clamped. Subiculum is composed predominantly by generative hyphae which are up to 5 μm wide and sometimes thick-walled (wall up to 1 μm thick). Skeletal hyphae are few, 2.5–3.5 μm wide. Trama is composed mostly by fairly thin-walled generative hyphae, (2–)2.5–3.5(–4) μm in diameter. Skeletals few, (2–)3–3.5 μm wide, not reaching the dissepiment edge. Dissepimental hyphae are thin-walled, smooth, variable in width. Skeletocystidia are fairly rare, covered with large crystals and no furcated cystidia were seen. Basidia basally clamped, clavate or subcylindrical, 15–18 × 5–5.5 μm, with four sterigmata. Spores ellipsoid, 3.5–4.2 × 2–2.4 μm, L = 3.8 μm, W = 2.2 μm, Q = 1.5–1.9, Q^* = 1.7 (*HK 10127*, n = 30), 3.7–4.5(–5) × 2.1–2.5 μm, L = 4.1 μm, W = 2.2 μm, Q = 1.7–2, Q^* = 1.9 (*HK 10130*, n = 30), very thin-walled, CB–, IKI–.

The spores of the young basidiocarp (*HK 10127*) are very similar to those seen in *J. semisupiniforme*, whereas those of the old one (*HK 10130*) are differently shaped, having the Q^*-value 1.9. It seems that the young basidiocarp produces shorter spores than the old one, which also had a fairly large proportion of spores with straight or even concave ventral side (Fig. 6e). Such spores were not observed in *J. semisupiniforme*. However, the best distinguishing characteristics between these two species seem to be the almost resupinate, relatively soft basidiocarp of *J. pseudozilingiana* (a few skeletals only), the size of the pores, the hyphal structure, the dissepimental hyphae and the size of the crystals on cystidia. Moreover, *J. pseudozilingiana* is associated with trees infected by *Phellinus tremulae* and even grow often on dead basidiocarps of *P. tremulae*, while *J. semisupiniforme* was the only polypore species on the tree.

The habitat of *J. semisupiniforme* was a luxuriant river-side thicket with dead alders and bird cherries.

****Laetiporus sulphureus*** (Bull. : Fr.) Murrill

6 *Picea* (Stavishenko 2000)

****Lenzites betulinus*** (L. : Fr.) Fr.

1 *Betula* (NU 1024), **2** *Betula* (HK 19677), **3** *Crataegus* (VM 22584), **4** *Betula* (HK 19813, sight), **6** *Betula* (Stavishenko 2000)

****Leptoporus mollis*** (Pers. : Fr.) Pilát

1 *Pinus* (NU 1056), **2** *Picea* (NU 1214), **6** *Picea* (HK 11825), **7** *Picea* (NU 627, 627, 787)

Oligoporus balsameus (Peck) Gilb. & Ryvarden

Nighneserginskyi area *Picea* (Stepanova-Kartavenko 1967)

Oligoporus ptychogaster (F. Ludw.) Falck

2 *Picea* (NU 1167)

****Oligoporus rennyi*** (Ber. & Broome) Donk

2 *Picea* (NU 1222), **7** *Picea* (NU 714)

****Oligoporus sericeomollis*** (Romell) M. Bondartseva

6 *Picea* (HK 11768), *Pinus* (HK 11782), **7** *Picea* (NU 792)

****Onnia leporina*** (Fr.) Jahn

Inonotus leporinus (Fr.) Gilbn. & Ryvarden

2 *Picea* (NU 1140), **4** *Picea* (NU 113b, 144), **5** *Abies* (VM 22904), *Picea* (NU 57), **6** *Picea* (Stavishenko 2000), **7** *Picea* (NU 788, 794)

****Onnia tomentosa*** (Fr.) P. Karst.

Inonotus tomentosus (Fr.) Teng

5 on the ground (VM 22900), **6** on the ground (HK 11813)

Onnia triquetra (Lenz) Imazeki

Inonotus triqueter (Fr.) P. Karst.

6 and Nighneserginskyi areas *Picea*, *Pinus sibirica* (Stepanova-Kartavenko 1967)

****Oxyporus corticola*** (Fr.) Ryvarden

1 *Betula* (NU 1133), *Populus* (HK 11754), **2** *Abies* (HK 19730), *Populus* (HK 19692, 19699, 19703, 19716, 19740), **6** *Picea* (Stanvishenko 2000)

Oxyporus cuneatus (Murrill) Aoshima

7 *Abies* (NU 731)

Oxyporus latemarginatus (E.J. Durand & Mont.) Donk

2 *Abies* (NU 1152)

****Oxyporus populinus*** (Schumach. : Fr.) Donk

2 *Betula* (NU 1201), **3** *Acer* (VM 22525, 22567, 22580), *Betula* (VM 22543), **6** *Alnus* (Mukhin & Ushakova 2001), **7** *Sorbus* (NU 596, 718, 751)

Parmastomyces mollissimus (Maire) Pouzar

1 *Pinus* (NU 1015), **2** *Picea* (NU 1179, 1194, 1216)

Perenniporia fraxinea (Fr.) Ryvarden

Achit, Nighneserginskyi areas *Salix*, *Ulmus* (Stepanova-Kartavenko 1967)

Perenniporia medulla-panis (Jack. : Fr.) Donk

6 and Achit and Nighneserginskyi areas *Abies*, *Betula*, *Padus*, *Pinus*, *Ulmus*, (Stepanova-Kartavenko 1967)

****Perenniporia subacida*** (Peck) Donk

2 *Picea* (NU 1170, 1213), **7** *Picea* (NU 587, 760)

Phaeolus schweinitzii (Fr.) Pat.

6 and Nighneserginskyi area *Larix*, *Picea*, *Pinus*, *P. sibirica* (Stepanova-Kartavenko 1967)

Phellinus alni (Bondartsev) Parmasto

6 *Alnus* (Mukhin & Ushakova 2001)

Phellinus chrysoloma (Fr.) Donk

5 *Picea* (NU 47), **6** *Picea* (Stavishenko 2000), **7** *Abies* (NU 615a), *Picea* (NU 686, 799)

Phellinus cinereus (Niemelä) M. Fischer

4 *Betula* (HK 19808)

****Phellinus conchatus*** (Pers. : Fr.) Quél.

6 *Salix* (HK sight)

Phellinus contiguus (Pers. : Fr.) Pat.

Nighneserginskyi area *Alnus*, *Ulmus* (Stepanova-Kartavenko 1967)

****Phellinus ferrugineofuscus*** (P. Karst.) Bourdot

2 *Abies* (NU 1145), **6** *Abies* (HK 11819), *Picea* (Stavishenko 2000), **7** *Abies* (NU 576, 678), *Picea* (NU 706)

Phellinus ferruginosus (Schrad.: Fr.) Bourdot & Galzin

6, Achit and Nighneserginskyi areas *Alnus*, *Betula*, *Padus*, *Picea*, *Pinus sibirica*, *Ulmus* (Stepanova-Kartavenko 1967).

****Phellinus hartigii*** (Allesch. & Schnabl.) Bondartsev

2 *Abies* (NU 1157, 1191), **4** *Abies* (NU 137, 175), **6** *Abies* (HK 11794, Stavishenko 2000), **7** *Abies* (NU 741)

Phellinus igniarius (L. : Fr.) Quél.

Common wherever *Salix* spp. occur (Stepanova-Kartavenko 1967)

****Phellinus laevigatus*** (Fr.) Bourdot & Galzin

1 *Betula* (NU 1075)

Phellinus lundellii Niemelä

1 *Betula* (NU 1075), **6** *Betula* (Stavishenko 2000)

****Phellinus nigrolimitatus*** (Romell) Bourdot & Galzin

6 *Picea* (HK 11774), **7** *Picea* (NU 605, 790, 684, 776, 784)

****Phellinus pini*** (Brot.: Fr.) A. Ames

1 *Pinus* (HK sight X 2, NU 1068), **3** *Pinus* (VM 22548), **4** *Pinus* (NU 190), **6** *Pinus* (Stavishenko 2000)

****Phellinus punctatus*** (P. Karst.) Pilát

1 *Padus* (HK 11751, 19863), *Salix* (HK 11029, NU 1069), **2** *Salix* (HK 19706), *Sorbus* (HK 19666), **3** *Salix* (VM 22532), **5** *Populus* (NU 854), **6** *Alnus* (Mukhin & Ushakova 2001), *Salix* (HK 11788), **7** *Salix* (NU 662a)

Phellinus sulphurascens Pilát

6 *Picea* (HK 11826)

****Phellinus tremulae*** (Bondartsev) Bondartsev & Borisov

1 *Populus* (NU 1974), **5** *Populus* (NU 856), **6** *Populus* (Stavishenko 2000)

Phellinus tuberculosus (Baumg.) Niemelä

3 in Botanical garden *Prunus* (Stepanova-Kartavenko 1967)

****Phellinus viticola*** (Schwein. *ex* Fr.) Donk

1 *Pinus* (NU 1070), **2** *Abies* (NU 1148), *Pinus* (HK 19690, NU 1160), **5** *Picea* (NU 12, 70, 840, 852), *Pinus* (NU 840, 852), **6** *Picea* (HK 11776), **7** *Picea* (NU 585)

Physisporinus sanguinolentus (Alb. & Schwein. : Fr.) Pilát

6 and Nighneserginskyi area *Abies*, *Picea*, *Pinus sibirica* (Stepanova-Kartavenko 1967)

Physisporinus vitreus (Pers. : Fr.) P. Karst.

Nighneserginskyi area *Abies* (Stepanova-Kartavenko 1967)

*__Piptoporus betulinus__ (Bull. : Fr.) P. Karst.

1 *Betula* (HK sight X 2, NU 1046), **6** *Betula* (Stavishenko 2000), **7** *Betula* (NU 539)

Polyporus alveolaris (DC. : Fr.) Bondartsev & Singer

Nighneserginskyi area *Fraxinus*, *Ulmus* (Stepanova-Kartavenko 1967)

*__Polyporus arcularius__ Batsch. : Fr.

1 *Alnus* (NU 1105)

Polyporus badius (Pers.) Schw.

7 *Betula* (NU 655c), *Populus* (NU 666)

*__Polyporus brumalis__ (Pers. : Fr.) Fr.

1 *Salix* (NU 1106), **6** *Alnus* (Mukhin & Ushakova 2001)

Polyporus ciliatus Fr. : Fr.

1 *Alnus* (NU 1107), **6** *Alnus* (Mukhin & Ushakova 2001), **7** *Betula* (NU 1106)

*__Polyporus leptocephalus__ (Jacq. : Fr.) Fr.

Polyporus varius Fr.
1 *Betula* (NU 1108), **2** *Betula* (HK 19678, 19886), *Populus* (NU 1224), **6** *Betula* (Stavishenko 2000)

*__Polyporus melanopus__ (Pers. : Fr.) Fr.

2 *Tilia* roots (NU 1225), **7** *Populus* (NU 755)

Polyporus pseudobetulinus (Pilát) Thorn, Kotir. & Niemelä

Nighneserginskyi area *Populus* (Stepanova-Kartavenko 1967)

*__Polyporus squamosus__ Huds. : Fr.

3 *Acer* (VM 22589), *Ulmus* (HK 12654)

*__Polyporus tubaeformis__ (P. Karst.) Ryvarden & Gilb.

4 *Betula* (HK 19847)

Polyporus tuberaster Jack. : Fr.

Achit, Nighneserginskyi areas *Betula*, *Populus*, *Sorbus*, *Tilia* (Stepanova-Kartavenko 1967)

Postia alni Niemelä & Vampola

2 *Populus* (NU 1200, 1212), **4** *Padus* (HK 19807)

Spores subcylindrical, curved, 4.7–5.2 × 0.9–1.1 μm, extremely thin-walled, CB–, IKI faintly amyloid, KOH hyaline or very faintly greenish (*HK 19807*).

*__Postia caesia__ (Schrad. : Fr.) P. Karst.

1 *Pinus* (HK 19754, NU 1047), **2** *Abies* (NU 1149, 1185, 1199a), **3** coniferous timber (VM 22519), **4** *Abies* (NU 132, 133, 157, 171, 183, 185, 186), *Picea* (NU 117, 120, 123b, 124, 134c, 167, 170), **5** *Picea* (NU 22, 31, 51, 55), **6** *Picea* (HK 11775, Stavishenko 2000), **7** *Abies* (NU 590), *Picea* (NU 541, 555, 651, 746), coniferous timber (NU 610)

Spores narrowly cylindrical, only slightly bent, tapering towards the base, (5.2–)5.4–6.7(–7.5) × 1.3–1.7(–1.9) μm, L = 6.1 μm, W = 1.5 μm, Q = 3.2–4.7, Q^* = 4, thin-walled, CB–, amyloid (*HK 19754*).

*__Postia floriformis__ (Quél.) Jülich

Oligoporus floriformis (Quél.) Gilb. & Ryvarden
1 *Pinus* (NU 1049), **5** *Picea* (NU 56), **7** *Abies* (NU 616)

*__Postia fragilis__ (Fr.) Jülich

Oligoporus fragilis (Fr.) Gilb. & Ryvarden

1 *Pinus* (HK 19900, NU 1050), **4** *Abies* (NU 116b), *Picea* (NU 125)

Postia guttulata (Peck) Jülich

Oligoporus guttulatus (Peck) Gilb. & Ryvarden

1 *Pinus* (NU 1052), **2** *Picea* (NU 1143), **4** *Picea* (NU 115, 139, 178), **5** *Picea* (NU 5, 58), **6** *Picea* (HK 11828), **7** *Picea* (NU 603, 657, 743)

Postia hibernica (Berk. & Broome) Jülich

1 *Pinus* (NU 1051), **4** *Abies* (NU 114b), **5** *Picea* (NU 45, 857)

Postia leucomallella (Murrill) Jülich

1 *Pinus* (HK 10990, 11001, 11009, 11013, 11023, 19888, NU 1053), **2** *Abies* (NU 1187, 1217), **3** *Pinus* (VM 22544), **4** *Picea* (HK 19820), **5** *Picea* (NU 63), **6** *Picea* (HK 11770, 11831), *Pinus* (HK 11766), **7** *Picea* (NU 675)

Basidiocarp pileate, effused-reflexed or resupinate, relatively soft when fresh, fragile when dry. When young, upper surface white, later with brown spots. Pore surface white, when touched turning slowly brown. Pores angular or almost round, (2–)3–5(–6)/mm, dissepiments thin, dentate or lacerate. Hyphal system monomitic, all hyphae clamped, CB–, IKI–. Tramal hyphae thin-walled, intertwined, richly branched, (2.5–)3(–3.5) μm wide. Gloeocystidia normally abundant, clavate, 20.5–35(–45) × 5.5–6.5 μm, contents blue in CB, yellowish in IKI and KOH. Basidia basally clamped, subcylindrical, cylindrical or clavate, (15–)17–20(–26) × 4–5 μm, with four, up to 5 μm long sterigmata. Spores narrowly cylindrical, often slightly bent, 4.5–5.3 × 1.1–1.3 μm, $L = 4.8$ μm, $W = 1.2$ μm, $Q = 3.8–4.7$, $Q^* = 4$, (*HK 11001*, $n = 20$), (4.6–)5.2–6.3 × 1.2–1.8 μm, $L = 5.8$ μm, $W = 1.5$ μm, $Q = 3.3–5.1$, $Q^* = 3.9$, thin-walled, CB–, IKI– (*HK 19821*, $n = 30$).

The spores are slightly narrower than in the Finnish material, where $Q = 3.2–3.9$ (Niemelä 2005).

****Postia placenta*** (Fr.) M.J. Larsen & Lombard

1 *Pinus* (HK 11032, NU 1054), **2** *Picea* (NU 1221), **7** *Picea* (NU 729)

Basidiocarp strictly resupinate, fairly thick, juicy when fresh, pale-cream coloured or pink. Pores angular, 3–4/mm, dissepiments fairly thin, almost entire. Hyphal system monomitic, but appears dimitic because some contextual hyphae are thick-walled. All hyphae clamped. Tramal hyphae relatively thin-walled, 3.5–4.5 μm wide, subhymenial hyphae thin-walled, 2.5–3.5 μm wide. Cystidia none. Spores cylindrical, 4.9–6.3(–6.8) × 2–2.4 μm, $L = 5.5$ μm, $W = 2.2$ μm, $Q = 2.2–2.8$, $Q^* = 2.5$, thin-walled, CB–, IKI– (*HK 11032*, $n = 15$).

****Postia stiptica*** (Pers. : Fr.) Jülich

Oligoporus stipticus (Pers. : Fr.) Gilb. & Ryvarden

1 *Pinus* (HK 19857), **2** *Abies* (NU 1180), *Picea* (NU 1202), **4** *Picea* (NU 184, 188c), **5** *Picea* (NU 10), **6** *Picea* (NU 76a)

Pores round, 5–7/mm. Monomitic, clamped. Tramal hyphae intertwined, fairly thick-walled, 2.5–3 μm wide, CB–, IKI–. Cystidia none. Basidia subcylindrical, 15–19 × 4.5–5 μm. Spores broadly subcylindrical, often slightly bent, (3.8–)4–4.8(–5) × 1.8–2.1 μm, $L = 4.2$ μm, $W = 1.9$ μm, $Q = 2–2.4$, $Q^* = 2.1$, thin-walled, CB–, IKI– (*HK 19857*, $n = 30$).

****Postia tephroleuca*** (Fr.) Jülich

1 *Pinus* (HK 10996), **6** *Betula* (Stavishenko 2000), **7** *Picea* (NU 766)

Pores angular, 4–6/mm, dissepiments thin, lacerate. Monomitic, clamped. Tramal hyphae subparallel, (3–)3.5–4(–4.5) μm wide, slightly thick-walled or thick-walled (up to 1.2 μm thick), especially in upper trama, CB–, slightly amyloid or dextrinoid. Cystidia none. Spores cylindrical, slightly bent, 4–4.3 × 1.2–1.4 μm, thin-walled, CB–, IKI– (*HK 10996*, $n = 5$).

****Postia undosa*** (Peck) Jülich

5 *Picea* (NU 11)

****Pycnoporellus alboluteus*** (Ellis & Everhart) Kotl. & Pouzar

7 *Picea* (NU 685)

****Pycnoporellus fulgens*** (Fr.) Donk

1 *Pinus* (NU 1057), **2** *Picea* (NU 1230), **4** *Abies* (NU 126b, 169a, 191a), **6** *Picea* (NU 101b), **7** *Picea* (NU 620, 628, 739)

****Pycnoporus cinnabarinus*** (Jacq.: Fr.) P. Karst.

1 *Padus* (NU 1025), **6** *Salix* (Stavishenko 2000), **7** *Sorbus* (NU 612)

****Rigidoporus crocatus*** (Pat.) Ryvarden (Fig. 7)

2 *Betula* (NU 1171), *Picea* (NU 1150, 1220), **4** *Betula* (HK 19848), **5** *Betula* (NU 855), **6** *Abies* (HK 11797), *Betula* (HK 11808, 11815), **7** *Picea* (NU 621)

Basidiocarp resupinate, annual or perennial, fairly thick, reddish-brown, turning dark brown when bruised. Margin sterile, cream-coloured, lighter than the pore surface, distinct, loosening from the substrate. Pores round or somewhat angular, 7–8/mm, dissepiments almost entire, in some parts slightly wavy. Subiculum straw-coloured with a reddish hue, of the same colour as pores. Hyphal system monomitic, all septa without clamps. Subiculum next to the substrate composed of randomly orientated, thick-walled (up to 2 μm), (5–)5.5–8 μm wide hyphae. Context above the tubes consists of horizontal parenchymatic tissue of thick-walled, (4–)5–6 μm wide, hyphae. Tramal hyphae parallel, fairly thin-walled, very uniform in width, (4–)5(–6) μm, wide. Some dissepimental hyphae apically encrusted (crystals dissolving at least partly in KOH). Cystidia none, but thin-walled, pointed cystidioles, (13–)17–25 × 5–7 μm present. No ripe basidia seen, but basidioles subcylindrical or subclavate, small, 11–13 × 6 μm. Spores broadly ellipsoid or subglobose, 4.1–5.2(–5.5) × 3.7–4.5 μm, L = 4,7 μm, W = 4 μm, Q = 1.1–1.4, Q^* = 1.2, with a negligible apiculus, very thin-walled, CB–, IKI– (*HK 19848*, n = 30).

Rigidoporus crocatus, when growing on birch, may be seen at a distance as *Phellinus laevigatus*, because of the brown-reddish colour.

****Skeletocutis amorpha*** (Fr. : Fr.) Kotl. & Pouzar

1 *Pinus* (HK 19752, NU 1083), **2** *Picea* (NU 1173), **4** *Picea* (HK 19817), **5** *Picea* (NU 42), **6** *Pinus* (HK 11763), **7** *Picea* (NU 604, 702, 770, 778)

Skeletocutis carneogrisea A. David

1 *Pinus* (HK 11002, 11016, NU 1084), **5** *Picea* (NU 853), **7** *Abies* (NU 678b, 711)

Skeletocutis kuehneri A. David

1 *Pinus* (HK 10992a, 11965, 19755)

Basidiocarp strictly resupinate, fairly thin. Pore surface cream-coloured, margin white, not loosening from the substrate. Pores angular, (3–)4–6(–7)/mm, dissepiments very thin-walled, lacerate. Subiculum white. Hyphal system dimitic, generative hyphae clamped. Subiculum dominated by partly encrusted skeletals, 2.5–3 μm wide, CB–, IKI–, KOH– or slightly swelling, intertwined with thin-walled generative hyphae, 2.5 μm wide. Tramal hyphae subparallel. Trama dominated by 2.5–3.5 μm wide skeletals (some slightly amyloid), generative hyphae thin-walled, 2.5 μm wide. Cystidia none, but thin-walled, pointed cystidioles, 8–12 × 3 μm, fairly abundant. Basidia clavate, 9–10 × 3.5–4 μm. Spores subcylindrical, curved or suballantoid, 3–3.5 × 0.6–0.8 μm, L = 3.3 μm, W = 0.7 μm, Q = 3.9–5, Q^* = 4.8 (*HK 10992*, n = 6), 3(3–)3.2–3.7(–3.9) × 0.5–0.9 μm, L = 3.4 μm, W = 0.7 μm, Q = 3.7–7, Q^* = 4.8, thin-walled, CB–, IKI– (*HK 11965*, *n = 30*).

The spore size in our specimens is close to that given by Niemelä (1998) but the Q value (4.1–4.7) shows the spores to be slightly wider and more uniform in Niemelä’s material.

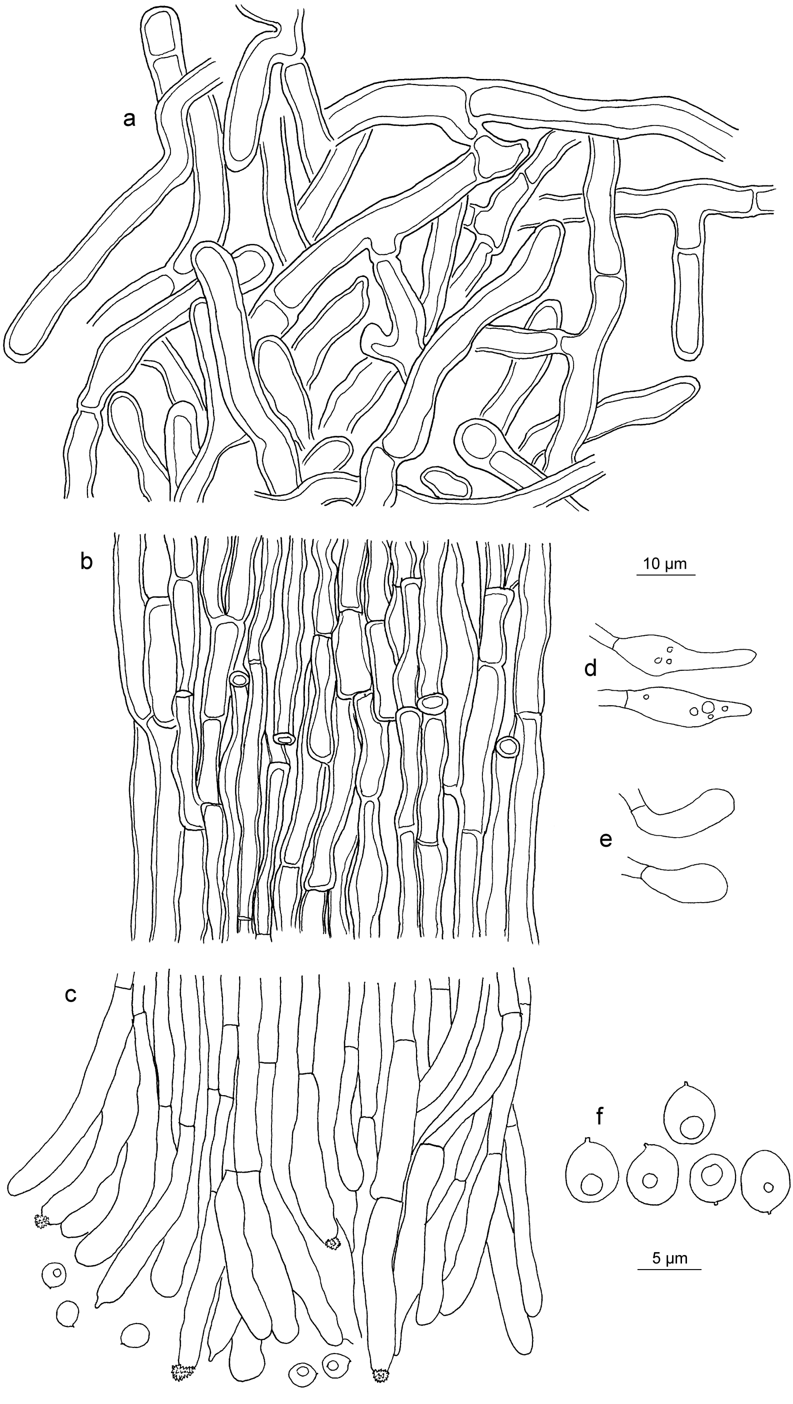

Fig. 7. *Rigidoporus crocatus* (from *Kotiranta 19848*). — **A**: Subicular hyphae. — **B**: Tramal hyphae. — **C**: Dissepimental hyphae and spores. — **D**: Cystidioles. — **E**: Basidioles. — **F**: Spores.

Skeletocutis lenis (P. Karst.) Niemelä

Nighneserginskyi area *Picea* (Stepanova-Kartavenko 1967

Skeletocutis nivea (Jungh.) Jean Keller

6 and Nighneserginskyi area *Populus*, *Sorbus*, *Tilia* (Stepanova-Kartavenko 1967)

****Skeletocutis odora*** (Sacc.) Ginns

1 *Pinus* (NU 1985), **2** *Populus* (NU 1228), **4** *Abies* (HK 19849), **6** *Picea* (HK 11773), **7** *Picea* (NU 622, 673, 998)

Skeletocutis subincarnata (Peck) Jean Keller

6 and Achit and Nighneserginskyi areas *Abies*, *Picea*, *Pinus sibirica* (Stepanova-Kartavenko (1967)

Spongipellis delectans (Peck) Murrill

Nighneserginskyi area *Tilia*, *Ulmus* (Stepanova-Kartavenko 1967)

Spongipellis fissilis (Berk. & M.A. Curtis) Murrill

Nighneserginskyi area *Populus*, *Tilia* (Stepanova-Kartavenko 1967)

****Trametes gibbosa*** (Pers.) Fr.

1 *Populus* (NU 1027), **2** *Populus* (NU 1156), **3** *Acer* (VM 22515), *Populus* (HK 12653), **6** *Populus* (Stavishenko 2000)

****Trametes hirsuta*** (Wulfen : Fr.) Pilát

1 *Alnus* (HK 11744), *Betula* (NU 1028), *Padus* (HK 11747), **2** *Abies* (NU 1169), **3** *Acer* (VM 22529), *Caragana* (VM 22564), *Padus* (VM 22513, 22527, 225469), **4** *Alnus* (HK 19822), **6** *Alnus* (Mukhin & Ushakova 2001), **7** *Sorbus* (NU 694), deciduous wood (NU 744)

****Trametes ochracea*** (Pers.) Gilb. & Ryvarden

1 *Padus* (NU 1032), *Salix* (HK 19901), **2** *Populus* (HK 19660, NU 1196), **3** *Crataegus* (VM 22587), **5** *Populus* (NU 850), **6** *Betula* (HK 11810, 11816, Stavishenko 2000), *Picea*, *Populus*, *Salix* (Stavishenko 2000), **7** deciduous wood (NU 721)

****Trametes pubescens*** (Schumach. : Fr.) Pilát

1 *Betula* (HK 11027, NU 1029), deciduous wood (HK 11749), **3** *Padus* (VM 22537), **4** *Salix* (HK 19799), **6** *Alnus* (Mukhin & Ushakova 2001), **7** *Sorbus* (NU 752)

****Trametes suaveolens*** (Fr.) Fr.

1 *Salix* (NU 1031), **6** *Salix* (HK 11785)

Trametes velutina (Fr.) G. Cunningh.

4 *Padus* (HK 19804)

Basidiocarp pileate, annual, pure white, rapidly eaten by insects. Upper surface velutinous. Pores round or slightly angular, (3–)4–6/mm, dissepiments lacerate, pale yellow when dry. Spores cylindrical, often basally bent, (5–)5.5–6.5(–7) × 1.9–2.1(–2.3) μm, L = 6 μm, W = 2 μm, Q = 2.6–3.2, Q^* = 3, thin-walled, CB–, IKI– (*HK 19804*, n = 30, from spore print).

****Trametes versicolor*** (L. : Fr.) Pilát

1 *Betula* (HK 11007, 19853, NU 1030), *Populus* (HK 10983), *Salix* (HK sight), **2** *Populus* (HK 19723), **3** *Acer* (VM 22529), *Caragana* (VM 22564), *Padus* (VM 22513, 22527, 22546), **6** *Betula* (HK 11803), **7** *Abies* (NU 550), deciduous wood (NU 758)

****Trechispora mollusca*** (Pers. : Fr.) Liberta

2 *Abies* (HK 19708, 19713), *Populus* (NU 1207), **4** *Abies* (NU 176), **6** *Abies* (HK 11820), *Fomes*/*Betula* (HK 11809)

****Trichaptum abietinum*** (Pers. : Fr.) Ryvarden

3 *Pinus* (VM 22520), **4** *Abies* (NU 181), *Picea* (HK 19816), **5** *Picea* (NU 23, 40, 53, 71), **6** *Picea* (NU 88), **7** *Abies* (NU 565c), *Picea* (NU 779)

****Trichaptum fuscoviolaceum*** (Ehrenb.: Fr.) Ryvarden

1 *Pinus* (HK 11005, 11753, 19753, 19777, 19890, sight X 2, NU 1099), **2** *Abies* (HK 19737, sight, NU 1154), *Pinus* (HK 19698), **3** *Pinus* (VM 22570), **4** *Abies* (HK 19828, NU 112, 116b, 155, 164b), *Picea* (NU 110b, 129, 134d, 159a, 161d, 166, 179, 188b), **5** *Picea* (NU 7, 15, 28, 33, 35, 38, 50, 60, 64, 66), **6** *Abies* (HK 11793, NU 93), *Picea* (HK 11777, NU 84c, 91, 101a, 106), **7** *Abies* (NU 565b)

****Trichaptum pargamenum*** (Fr.) Cunningh.

1 *Betula* (HK 11743, 19885, sight, NU 1100), *Padus* (HK 19862), **3** *Betula* (VM 22539), **6** *Alnus* (Mukhin & Ushakova 2001), *Betula* (HK 11805), **7** *Betula* (NU 572, 701)

****Tyromyces chioneus*** (Fr. : Fr.) P. Karst.

1 *Betula* (NU 1093), **2** *Betula* (NU 1211, 1218), *Picea* (NU 1181), **3** *Acer* (VM 22563), **7** *Betula* (NU 769), deciduous wood (NU 724)

Conclusions

The data from literature (e.g., Stepanova-Kartavenko 1967) are not suitable for the analyses in the next chapter, and therefore the percentages counted are based on our own material. It consists of 127 polypore species and 838 observations.

The six most common species in our material were *Fomitopsis pinicola* (44 observations = 5.3% of all observations), *Trichaptum fuscoviolaceum* (44/5.3%), *Fomitopsis rosea* (37/4.4%), *Postia caesia* (33/3.9%), *Bjerkandera adusta* (25/3%) and *Gloeophyllum sepiarium* (24/2.9%) (altogether 207/24.7%). The commonness of *B. adusta* is explained by its frequency in the city of Ekaterinburg, where it occupied several deciduous host tree species. On the other hand, *F. rosea* grows mostly in primeval forests, which were well represented in our study areas.

Kotiranta *et al*. (2005) reported 139 polypore species to occur in the South Urals. Of them 101 (72.6%) occur also in the Central Urals. The main difference is in the lack of oak (*Quercus*) dependent species in the Central Urals. In the South Urals the most common species were *Trichaptum fuscoviolaceum*, *Fomes fomentarius*, *F. pinicola*, *Trametes hirsuta* and *T. versicolor*, two of which were very common also in the Central Urals. The forests studied in the Central Urals were older than those in the South Urals. It explains better the differences in the abundances, rather than different climatic conditions or differences in the distributions of the polypores (except for the oak-dwelling species).

Stepanova-Kartavenko (1967) reported 120 polypore species from the Central Urals. Of them 96 (59.6%) are the same as in our material. Stepanova-Kartavenko included 34 species which were not observed by us and in our material there is 31 species not mentioned by her. Many species in our list have been described only after the publishing of her book. On the other hand, her book is a result of a long-term research work and it includes several annual species which were not found by us.

The 161 species reported from the Central Urals is low if compared with e.g., that of Finland (230 species, Niemelä 2005). It must, however, be kept in mind that the history of polypore investigations in Finland and the Central Urals is quite different and the area is much smaller. South- and Central Urals cover around 800 km of the Ural Mountains and the width of the massif varies between 40 to 150 kilometers. Accordingly, the area is about 80 000 km^2 and much smaller, thus covering more narrow spectrum of habitats and biogeographic zones, than e.g., Finland, with the area of 337 000 km^2. A combined list of the South Urals (Kotiranta *et al*. 2005) and the list above results into a total of 185 species. According to this, our prediction is, that together these two areas harbor far over 200 species.

The most common pathogens, i.e. species which attack living trees, were *Fomitopsis pinicola*, *Heterobasidion parviporum* and *Fomes fomentarius*. Somewhat odd is the lack of *Heterobasidion annosum*, since pine forests are common, especially in the vicinity of the biological station (site no. 1). However, *H. annosum* was found by Stepanova-Kartavenko (1967) from several areas. Strange is also the small number of *Skeletocutis* species. Most probably they are much more numerous than indicated in this paper. However, we did not have the possibility to study the material of *S. subincarnata*, mentioned by Stepanova-Kartavenko. It most probably contains species like *S. biguttulata*, *S. brevispora*, *S. chrysella* and *S. papyracea*. Also the lack of *Haploporus odorus* is strange, since its most common host tree, *Salix caprea*, is not uncommon in the area. On the other hand, the occurrence of *Perenniporia medulla-panis* on

Abies and *Pinus* and *Phellinus contiguus* on *Alnus* and *Ulmus* is surprising.

The forests in Khomutovka (site no. 4) are badly polluted, but seems not to affect the polypore assemblages, since besides many common species, also many old-growth forest dwelling species were found there. The forests in Khomutovka area are old, but not in virgin state. Most probably due to the great amount of dead wood it harbors several species commonly found in old-growth forests like *Antrodia albobrunnea*, *Climacocystis borealis*, *Fomitopsis rosea*, *Onnia leporina*, *Postia guttulata*, *P. hibernica*, *Pycnoporellus fulgens*, *Rigidoporus crocatus* and *Skeletocutis odora*.

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