

Polypores from the Great Hinggan Mts., NE China

Yu-Cheng Dai^{*}, Hai-Sheng Yuan^{1,2}, Chang-Jun Yu³, Bao-Kai Cui^{1,2}, Yu-Lian Wei^{1,2}, and
Juan Li^{1,2}

¹Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang 110016, China.

²Graduate School, Chinese Academy of Sciences, Beijing 100039, China.

³Northeast Forestry University, Harbin 150040, China.

(Received June 21, 2004; Accepted November 3, 2004)

Abstract. 283 specimens of polypore fungi were collected in the Huzhong Nature Reserve and surrounding area of the Great Hinggan Mts. of northeastern China during August 2003, and 112 species were identified from these materials. A checklist of the polypores is given, and the host of each species is supplied. Most of the species are firstly reported in the study area. In addition, *Albatrellus syringae*, *Polyporus ulmi* and *Skeletocutis lilacina* are new to Chinese fungal flora, and a detailed description of the three species is given based on the studied materials.

Key words: Great Hinggan Mts., Northeastern China, polypores, taxonomy.

INTRODUCTION

The Great Hinggan Mts. area has the most important forest resources in China, and the biggest Chinese forest area lies there. During the last 50 years old-growth forests in Great Hinggan Mts. area have dramatically diminished because of intensive forestry. From the 90's of last century several forest or nature reserves were established in unmanaged areas or some secondary natural forests in China, and Huzhong Reserve is one of them.

Numerous wood-rotting fungi, especially polypore fungi have been published from northeastern China and Russian Far East (Bondartsev, 1961, 1962, 1963; Bondartsev and Lyubarsky, 1963, 1965; Dai, 1996, 1998, 2000; Dai and Niemelä, 2002; Lyubarsky, 1962, Núñez *et al.*, 2001; Parmasto, 1980, 1982; Núñez and Ryvarden, 2000, 2001). However, the poroid species of Aphyllophorales in the Great Hinggan Mts. area were poorly known, with only around 30 species recorded (Teng, 1963; Tai, 1979; He *et al.*, 1987; Xiang *et al.*, 1987; Lian, 1994). By the support of the Chinese Academy of Sciences, a project has been carrying out to investigate wood-

rotting fungi of China, and a field trip was made in Huzhong Nature Reserve and surrounding area of Great Hinggan Mts. This study is mainly on diversity and taxonomy of polypore fungi in this area.

MATERIALS AND METHODS

Huzhong Nature Reserve (51°18'-51°57' N, 122°42'-123°18' E) is situated in Heilongjiang Province, Northeast of China, and the materials were collected from six localities in the reserve and surrounding area: Xiushan, Huzhong, Bailushan, Cangshan, Huzhong Nat. Res. And Guli (Figs. 1, 2). The reserve is mostly virgin forest of *Larix gmelinii*, but natural forests of other trees are in the reserve area, too. The common angiosperm trees are *Alnus sibirica*, *Betula platyphylla*, *Chosenia arbutifolia*, *Corylus mandshurica*, *Populus davidiana*, *Quercus mongolica*, and several species in *Salix*.

The study is based on the collections by the authors from Huzhong Nature Reserve and surrounding area in the Great Hinggan Mts. in 2003. The specimens are mostly deposited at the herbarium of Institute of Applied Ecology, Chinese Academy of Sciences (IFP), and some duplicates of specimens are preserved at the

*Corresponding author. E-mail: yuchengd@yahoo.com

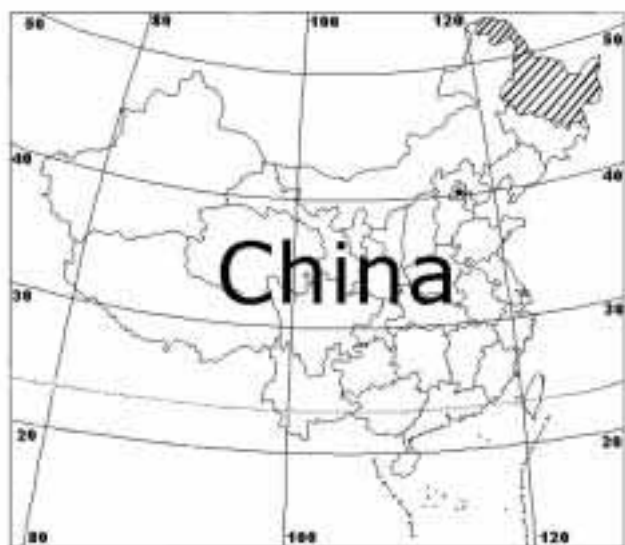


Fig.1. The situation of Heilongjiang Province (shaded) in China.



Fig. 2. The locations of the research area.

herbarium of Institute of Microbiology, Chinese Academy of Sciences (HMAS). For comparison, some materials from H (Helsinki, Finland) was studied to confirm our study.

The microscopic routine used in the study is as presented by Dai (1996). In the text the following abbreviations are used: L = mean spore length (arithmetical mean of all spores), W = mean spore width (arithmetical mean of all spores), Q = variation in the L/W ratios between the specimens studied (quotient of the mean spore length and the mean spore width), n = the number of spores (pores) measured from given number of specimens. In presenting the variation in the size

of spores (pores), 5% of the measurements were excluded from each end of the range, and are given in parentheses; IKI stands for Melzer's reagent and KOH for 5% potassium hydroxide, and CB is the abbreviation of Cotton Blue. CB+ means cyanophilous and CB- acyanophilous; IKI- means both inamyloid and indextrinoid.

RESULTS

Checklist. In the following an alphabetical list (according to genera) of polypores is given, and the authors of scientific names are according to the second edition of Authors of Fungal Names (<http://www.indexfungorum.org/AuthorsOfFungalNames.htm>). Substrate and collection numbers are supplied after the name of each polypore, and the hosts are listed alphabetically. Species printed in bold face are new to China.

- Albatrellus syringae* (Parmasto) Pouzar**, ground in forest of angiosperm, *Dai* 4674
- Amylocystis lapponica* (Romell) Singer, *Larix*, *Dai* 4771
- Anomoporia bombycina* (Fr.) Pouzar, *Larix*, *Dai* 4843
- Antrodia gossypina* (Speg.) Ryv., *Larix*, *Dai* 4640
- Antrodia heteromorpha* (Fr.: Fr.) Donk, *Larix*, *Dai* 4739, *Dai* 4768
- Antrodia serialis* (Fr.) Donk, *Larix*, *Dai* 4770
- Antrodia xantha* (Fr.: Fr.) Ryvardeen, *Betula*, *Dai* 4833a, *Dai* 4841, *Dai* 4865; *Chosenia*, *Dai* 4847; *Larix*, *Dai* 4636, *Dai* 4718, *Dai* 4853, *Dai* 4901
- Antrodiella semisupina* (Berk. & M.A. Curtis) Ryvardeen *sensu lato*, *Alnus*, *Dai* 4811
- Bjerkandera adusta* (Willd.: Fr.) P. Karst., *Chosenia*, *Dai* 4647, *Dai* 4838
- Bjerkandera fumosa* (Pers.: Fr.) P. Karst., *Betula*, *Dai* 4784
- Ceriporia excelsa* (S. Lundell) Parmasto, *Larix*, *Dai* 4748
- Ceriporiopsis aneirina* (Sommerf.: Fr.) Domański, *Chosenia*, *Dai* 4649; *Populus*, *Dai* 4738
- Ceriporiopsis mucida* (Pers.: Fr.) Gilb. & Ryvardeen, *Larix*, *Dai* 4728
- Cerrena unicolor* (L.: Fr.) Murrill, *Chosenia*, *Dai* 4652
- Coltricia perennis* (L.: Fr.) Murrill, ground in forest of gymnosperm, *Dai* 4828
- Daedalea dickinsii* Yasuda, *Quercus*, *Dai* 4890
- Daedaleopsis confragosa* (Bolton: Fr.) J. Schröt., *Chosenia*, *Dai* 4659; *Salix*

- Daedaleopsis sinensis* (Lloyd) Y.C. Dai, *Alnus*, Dai 4663
- Daedaleopsis tricolor* (Bull.: Mérat) Bondartsev & Singer, *Corylus*, Dai 4692
- Datronia mollis* (Sommerf.) Donk, *Alnus*, Dai 4800
- Datronia scutellata* (Schwein.) Gilb. & Ryvar den, *Alnus*, Dai 4783; *Corylus*, Dai 4654
- Dichomitus squalens* (P. Karst.) D.A. Reid, *Larix*, Dai 4624, Dai 4628, Dai 4752, Dai 4765, Dai 4790
- Diplomitoporus lindbladii* (Berk.) Gilb. & Ryvar den, *Larix*, Dai 4724, Dai 4760
- Fomes fomentarius* (L.: Fr.) Fr., *Betula*, Dai 4696
- Fomitiporia punctata* (P. Karst.) Murrill, *Alnus*, Dai 4792
- Fomitopsis cajanderi* (P. Karst.) Kotl. & Pouzar, gymnosperm, Dai 4713; *Larix*, Dai 4639, Dai 4755, Dai 4821
- Fomitopsis pinicola* (Sw.: Fr.) P. Karst., *Alnus*, Dai 4805; angiosperm, Dai 4695; *Larix*, Dai 4635
- Funalia cervina* (Schwein.: Fr.) Y.C. Dai, *Alnus*, Dai 4805; *Betula*, Dai 4701
- Funalia trogii* (Berk.) Bondartsev & Singer, angiosperm, Dai 4637; *Chosenia*, Dai 4646, Dai 4660, Dai 4837; *Larix*, Dai 4623
- Ganoderma lipsiense* (Batsch) G.F. Atk., *Betula*, Dai 4644
- Ganoderma tsugae* Murrill, *Larix*, Dai 4821a
- Gloeophyllum abietinum* (Bull.: Fr.) P. Karst., *Larix*, Dai 4630
- Gloeophyllum carbonarium* (Berk. & M.A. Curtis) Ryvar den, *Larix*, Dai 4714, Dai 4716
- Gloeophyllum odoratum* (Wulfen: Fr.) Imazeki, *Larix*, Dai 4897; *Quercus*, Dai 4887
- Gloeophyllum protractum* (Fr.) Imazeki, *Betula*, Dai 4699; *Larix*, Dai 4745
- Gloeophyllum sepiarium* (Wulfen: Fr.) P. Karst., *Larix*, Dai 4625
- Gloeophyllum trabeum* (Pers.: Fr.) Murrill, *Larix*, Dai 4620
- Gloeoporus dichrous* (Fr.: Fr.) Bres., *Populus*, Dai 4685; *Quercus*, Dai 4887, *Larix*, Dai 4632
- Gloeoporus taxicola* (Pers.: Fr.) Gilb. & Ryvar den, *Larix*, Dai 4740, Dai 4753
- Hapalopilus rutilans* (Pers.: Fr.) P. Karst., *Betula*, Dai 4892
- Hapalopilus salmonicolor* (Berk. & M.A. Curtis) Pouzar, *Larix*, Dai 4686
- Inocutis rheades* (Pers.) Fiasson & Niemelä, *Populus*, Dai 4673, Dai 4815
- Inonotus andersonii* (Wll. & Everh.) Černý, *Quercus*, Dai 4878
- Inonotus obliquus* (Pers.: Fr.) Pilát, *Betula*, Dai 4750
- Inonotus radiatus* (Sowerby: Fr.) P. Karst., *Alnus*, Dai 4675; *Corylus*, Dai 4677, Dai 4704
- Irpex lacteus* (Fr.: Fr.) Fr. *sensu lato*, *Alnus*, Dai 4657, Dai 4668
- Ischnoderma benzoinum* (Wahlenb.: Fr.) P. Karst., *Larix*, Dai 4743
- Ischnoderma resinosum* (Fr.) P. Karst., *Quercus*, Dai 4893
- Junghuhnia luteoalba* (P. Karst.) Ryvar den, *Chosenia*, Dai 4846
- Junghuhnia nitida* (Pers.: Fr.) Ryvar den, *Alnus*, Dai 4781; *Betula*, Dai 4859a; *Chosenia*, Dai 4651, Dai 4667, Dai 4860; *Populus*, Dai 4746
- Laetiporus sulphureus* (Bull.: Fr.) Murrill, *Larix*, Dai 4687
- Lenzites betulinus* (L.: Fr.) Fr., *Betula*, Dai 4622
- Oligoporus balsameus* (Peck) Gilb. & Ryvar den, *Larix*, Dai 4643
- Oligoporus obductus* (Berk.) Gilb. & Ryvar den, ground in forest of gymnosperm, Dai 4761, Dai 4866; *Larix*, Dai 4742, Dai 4756, Dai 4757, Dai 4796, Dai 4856, Dai 4861, Dai 4862; *Populus*, Dai 4819
- Oligoporus sericeomollis* (Romell) Bondartseva, *Betula*, Dai 4758; *Larix*, Dai 4631, Dai 4719, Dai 4736, Dai 4753a, Dai 4763, Dai 4769, Dai 4820, Dai 4822, Dai 4826, Dai 4835, Dai 4842, Dai 4844, Dai 4851, Dai 4854, Dai 4900, Dai 4902
- Onnia tomentosa* (Fr.) P. Karst., ground in forest of gymnosperm, Dai 4762, Dai 4735
- Oxyporus obducens* (Pers.: Fr.) Donk, *Populus*, Dai 4788, Dai 4839
- Parmastomyces mollissimus* (Maire) Pouzar, *Larix*, Dai 4817, Dai 4818, Dai 4829, Dai 4830
- Perenniporia tenuis* (Schwein.) Ryvar den, *Populus*, Dai 4793
- Phellinidium sulphurascens* (Pilát) Y.C. Dai, *Larix*, Dai 4689, Dai 4749, Dai 4849
- Phellinus ferreus* (Pers.) Bourdot & Galzin, *Alnus*, Dai 4859
- Phellinus gilvus* (Schwein.: Fr.) Pat., *Quercus*, Dai 4889
- Phellinus igniarius* (L.: Fr.) Quél. *sensu lato*, *Betula*, Dai 4816
- Phellinus laricis* (Jaczewski in Pilát) Pilát, *Larix*, Dai 4633, Dai 4737, Dai 4764, Dai 4855
- Phellinus lundellii* Niemelä, *Betula*, Dai 4666
- Phellinus nigrolimitatus* (Romell) Bourdot & Galzin, *Larix*, Dai 4734
- Phellinus tremulae* (Bondartsev) Bondartsev &

Borisov, *Populus*, Dai 4780
Physisporinus vitreus (Pers.: Fr.) P. Karst.,
Quercus, Dai 4870
Piptoporus betulinus (Bull.: Fr.) P. Karst., *Betula*,
 Dai 4682
Polyporus badius (Pers.: Gray) Schwein., *Populus*,
 Dai 4795
Polyporus ciliatus Fr.:Fr., *Alnus*, Dai 4656
Polyporus elegans Bull.: Fr., *Chosenia*, Dai 4672,
 Dai 4674, Dai 4857a; *Ulmus*, Dai 4863
Polyporus tubaeformis (P. Karst.) Ryvarden &
 Gilb., *Larix*, Dai 4694
***Polyporus ulmi* (Bondartsev & Ljub.) Vassilk.**,
Chosenia, Dai 4662
Polyporus varius Pers.: Fr., *Populus*, Dai 4785
Postia alni Niemelä & Vampola, *Alnus* 4786, Dai
 4824; *Betula*, Dai 4709; *Chosenia*, Dai 4665,
 Dai 4713a
Postia caesia (Schrad.: Fr.) P. Karst., *Larix*, Dai
 4634, Dai 4641, Dai 4741
Postia fragilis (Fr.: Fr.) Jülich, *Larix*, Dai 4763
Postia lactea (Fr.: Fr.) P. Karst., *Betula*, Dai 4794
Postia leucomallella (Murrill) Jülich, *Larix*, Dai
 4680, Dai 4688, Dai 4732
Postia stiptica (Pers.: Fr.) Jülich, *Larix*, Dai 4747
Postia cf. *subcaesia* (A. David) Jülich, *Alnus*, Dai
 4789; *Populus*, Dai 4898
Postia tephroleuca (Fr.) Jülich, *Larix*, Dai 4733
Protomerulius caryae (Schwein.) Ryvarden,
Betula, Dai 4799; *Quercus*, Dai 4867, Dai 4873,
 Dai 4876, Dai 4886
Pycnoporus cinnabarius (Jacq.: Fr.) P. Karst.,
Betula, Dai 4712, Dai 4857, Dai 4885, Dai 4896
Rigidoporus crocatus (Pat.) Ryvarden, *Betula*, Dai
 4836
Schizopora flavipora (Cooke) Ryvarden, *Betula*,
 Dai 4801, Dai 4877, Dai 4895; *Chosenia*, Dai
 4827; *Larix*, Dai 4629, Dai 4714a, Dai 4720;
Populus, Dai 4698, Dai 4703; *Quercus*, Dai
 4874, Dai 4883, Dai 4888
Schizopora paradoxa (Schrad.: Fr.) Donk,
Quercus, Dai 4871
Skeletocutis amorpha (Fr.: Fr.) Kotl. & Pouzar,
Larix, Dai 4679, Dai 4700
Skeletocutis carneogrisea A. David, *Larix*, Dai
 4684
Skeletocutis lenis (P. Karst.) Niemelä, *Larix*, Dai
 4787
***Skeletocutis lilacina* A. David & Jean Keller**,
Larix, Dai 4831
Skeletocutis nivea (Jungh.) Jean Keller, *Alnus*, Dai
 4697, Dai 4806; *Corylus*, Dai 4681
Skeletocutis ochroalba Niemelä, *Larix*, Dai 4754

Skeletocutis stellae (Pilát) Jean Keller, *Larix*, Dai
 4751
Skeletocutis vulgaris (Fr.) Niemelä & Y.C. Dai,
Larix, Dai 4691, Dai 4725
Spongipellis delectans (Peck) Murrill, *Quercus*,
 Dai 4869
Trametes conchifer (Schwein.: Fr.) Pilát,
Chosenia, Dai 4669
Trametes gibbosa (Pers.: Fr.) Fr., *Populus*, Dai
 4650
Trametes hirsuta (Wulfen: Fr.) Pilát, *Betula* 4676;
Chosenia, Dai 4658
Trametes ochracea (Pers.) Gilb. & Ryvarden,
Betula, Dai 4899; *Larix*, Dai 4823; *Populus*,
 Dai 4638
Trametes suaveolens (Fr.: Fr.) Fr., *Chosenia*, Dai
 4671
Trametes velutina (Fr.: Fr.) G. Cunn., *Alnus*, Dai
 4803
Trametes versicolor (L.: Fr.) Pilát, *Betula* 4621;
Larix, Dai 4766
Trechispora mollusca (Pers.: Fr.) Liberta, *Larix*,
 Dai 4845; *Populus*, Dai 4813
Trichaptum abietinum (Pers.: Fr.) Ryvarden, *Larix*,
 Dai 4627, Dai 4705
Trichaptum fuscoviolaceum (Ehrenb.: Fr.)
 Ryvarden, *Larix*, Dai 4626, Dai 4715, Dai 4722,
 Dai 4727
Trichaptum laricinum (P. Karst.) Ryvarden, *Larix*,
 Dai 4759
Trichaptum pargamenum (Fr.) G. Cunn., *Betula*,
 Dai 4711
Trichaptum polycystidiatum (Pilát) Y.C. Dai,
Quercus, Dai 4884
Tyromyces chioneus (Fr.) P. Karst., *Betula*, Dai
 4834; *Populus*, Dai 4710
Tyromyces kemetii (Bres.) Bondartsev & Singer,
Betula, Dai 4690, Dai 4881; *Populus*, Dai 4812

DESCRIPTION

Three species, *Albatrellus syringae*, *Polyporus ulmi* and *Skeletocutis lilacina* are new to Chinese fungal flora, and their illustrated description is given in the following.

Albatrellus syringae (Parmasto) Pouzar,
 Fol. Geobot. Phytotax. Bohem. 1: 358, 1966.
 (Figs. 3, 4)
Scutigera syringae Parmasto, Bot. Mat. Otdela
 Spor. Rast. Bot. Inst. Acad. Nauk SSR 15: 132,
 1962.

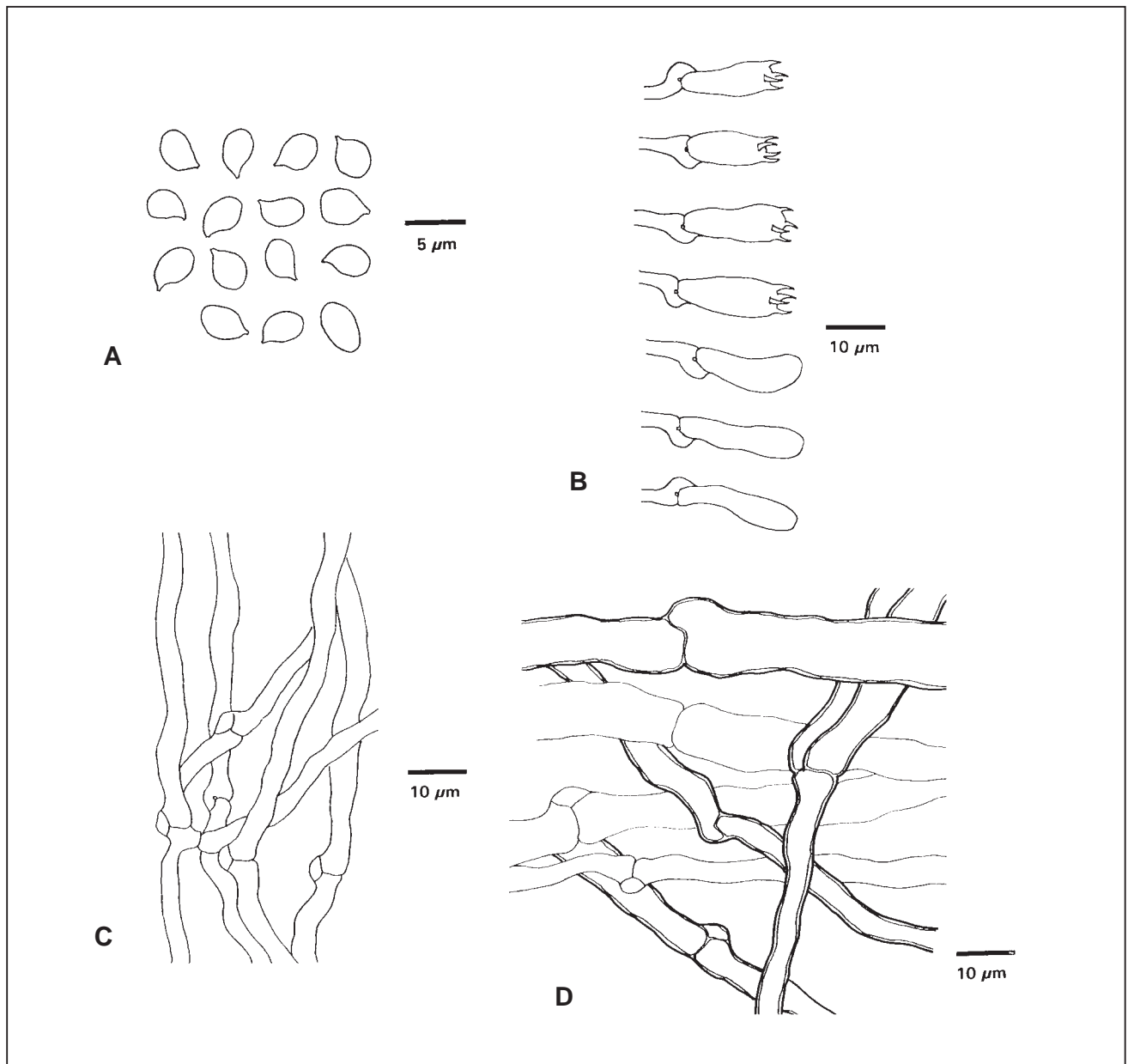


Fig. 3. Microscopical structures of *Albatrellus syringae* (Parmasto) Pouzar. A. Basidiospores. B. Basidia and basidioles. C. Hyphae from trama. D. Hyphae from context.



Fig. 4. *Albatrellus syringae*

Fruitbody. Basidiocarps annual, single, or several pilei fused to form more compound cluster, soft and watery when fresh, without odour or taste, becoming fragile and light in weight upon drying. Pilei more or less round, flat when juvenile, becoming depressed and infundibuliform with ages, up to 10 cm in diam., and 5 mm thick at center. Pileal surface yellowish brown, concentrically zonate, glabrous to silky mat, becoming dark yellowish brown and glossy when dry; margin acute and wavy, sometimes lobed, curved down when dry. Pore surface pale yellow to cream yellow when fresh, becoming dark brownish yellow; pores angular or irregular, 3-5

per mm; dissepiments thin, lacerate. Context cream yellow, soft and watery when fresh, becoming fragile to brittle upon drying, up to 3 mm thick; tube layer concolorous with pore surface; tubes brittle when dry, up to 2 mm long. Stipe connected to ground, up to 4 cm long and 0.8 cm in diam., watery and fleshy when fresh, becoming wrinkling and brittle upon drying; surface of stipe pale yellowish and mat, inside solid; pores decurrent on stipe.

Hyphal structure. Hyphal system monomitic; generative hyphae bearing with clamp connections, CB-, IKI-; tissues unchanged in KOH.

Context. Contextual hyphae hyaline, thin- to slightly thick-walled, frequently branched, bearing both clamp connections and simple septa, strongly flexuous, interwoven, mostly 5-8 μm in diam., often inflated, up to 15 μm in diam; gloeoplerous hyphae occasionally present, refractive in Melzer's reagent, flexuous, unbranched, 5-9 μm in diam; hyphae at stipe hyaline, thin- to slightly thick-walled, straight, occasionally branched, frequently simple septate, sometimes bearing clamp connections, parallel along the stipe, 4-11 μm in diam.

Tubes. Tramal hyphae hyaline, thin-walled, occasionally branched, frequently with clamp connections, more or less straight, loosely parallel along the tubes, 3-5 μm in diam. Cystidia and cystidioles absent; basidia clavate, thin-walled, with four sterigmata and a basal clamp connection, 18-26 \times 5-6.5 μm .

Spores. Basidiospores ellipsoid, slightly tapering towards the apiculus, hyaline, thin-walled, smooth, bearing a guttule, CB-, IKI-, (3.3-3.8-4.7(-5.0) \times (2.5-2.8-3.5(-3.8) μm , L = 4.24 μm , W = 3.15 μm , Q = 1.33-1.34 (n = 70/2).

Remarks. *Albatrellus syringae* is similar to *A. peckianus* (Cooke) Niemelä, but the latter species has smaller basidiospores, and the width of its basidiospores is less than 2.9 μm . In addition, hyphae of stem in *A. peckianus* are thick-walled, while all hyphae are thin-walled to slightly thick-walled in *A. syringae*.

Other specimens examined. *Albatrellus syringae*: **Finland.** Uusimaa, Nurmijärvi, Rajamäki, keskusta, 25.IX.1983 *Toivonen & Askola 1291* (H). Pohjois-Savo, Kuopio, town cemetery, on lawn, 3.VIII.1971 *Hakala* (H). *A. peckianus*: **Canada.** Quebec, Gatineau, Cantley, on buried hardwood, 22.VIII.1973 *Ginns 2322* (DAOM 143771). Ontario. Kanata, Goudbourne

Side Rd., on ground of *Acer* forest, 18.IX.1981 *Ginns 6362* (DAOM 180894).

Polyporus ulmi (Bondartsev & Ljub.) Vassilk., *Novosti Sist. Nizsh. Rast.* 1967: 246, 1967. (Fig. 5)

Piptoporus ulmi Bondartsev & Ljub., *Bot. Mater. Otd. Spor. Rast. Bot. Inst. Komarova Akad. Nauk S.S.S.R.* 14: 198, 1961.

Piptoporus chozeniae Vassilk., *Novosti Sist. Nizsh. Rast.* 1967: 244, 1967.

Fruitbody. Basidiocarps annual, centrally or laterally stipitate, solitary, fleshy and without odour or taste when fresh, becoming fragile, corky and light in weight upon drying. Pilei circular or fan-shaped, up to 8 cm diam., 5 cm thick at centre; margin sharp. Upper surface cream to pale yellowish cream when fresh, with abundant, small, yellowish brown, scale-like spots, becoming pale yellowish brown and wrinkling upon drying, rough. Poroid surface cream when fresh, becoming pale yellowish or yellowish brown when dry; pores angular, 1-2 per mm; dissepiments thin, lacerate. Context white and coriaceous when fresh, becoming cream and soft corky upon drying, up to 2.5 mm thick at centre; tube layer concolorous with pore surface, fragile when dry; tubes up to 2.5 mm long. Stipe cream when fresh, with black base, glabrous, up to 3 cm long, 5 mm diam; pores decurrent on stipe.

Hyphal structure. Hyphal system dimitic; generative hyphae with clamp connections; skeleto-binding hyphae fairly thick-walled to thick-walled with a distinct lumen or subsolid, in distal parts dendritically branched, branches tapering, IKI-, CB+; tissue unchanged in KOH.

Context. Generative hyphae frequent, hyaline, thin- to thick-walled, flexuous, 2.5-4 μm diam., sometimes inflated, up to 9 μm diam.; skeleto-binding hyphae thick-walled with a narrow lumen, flexuous, strongly interwoven, skeletal part 2.5-5.5 μm diam.

Tubes. Generative hyphae frequent, hyaline, thin-walled, frequently bearing clamp connections, occasionally branched, more or less subparallel along tubes or loosely interwoven, 2-4 μm diam.; skeleto-binding hyphae dominant, thick-walled with a narrow lumen, skeletal part 2.4-4.5 μm diam., binding hyphae interwoven and without orientation, 1.5-3 μm . Cystidia and cystidioles not seen; basidia clavate, with a basal clamp and four sterigmata, 21-35 \times 7-10 μm ; basidioles mostly

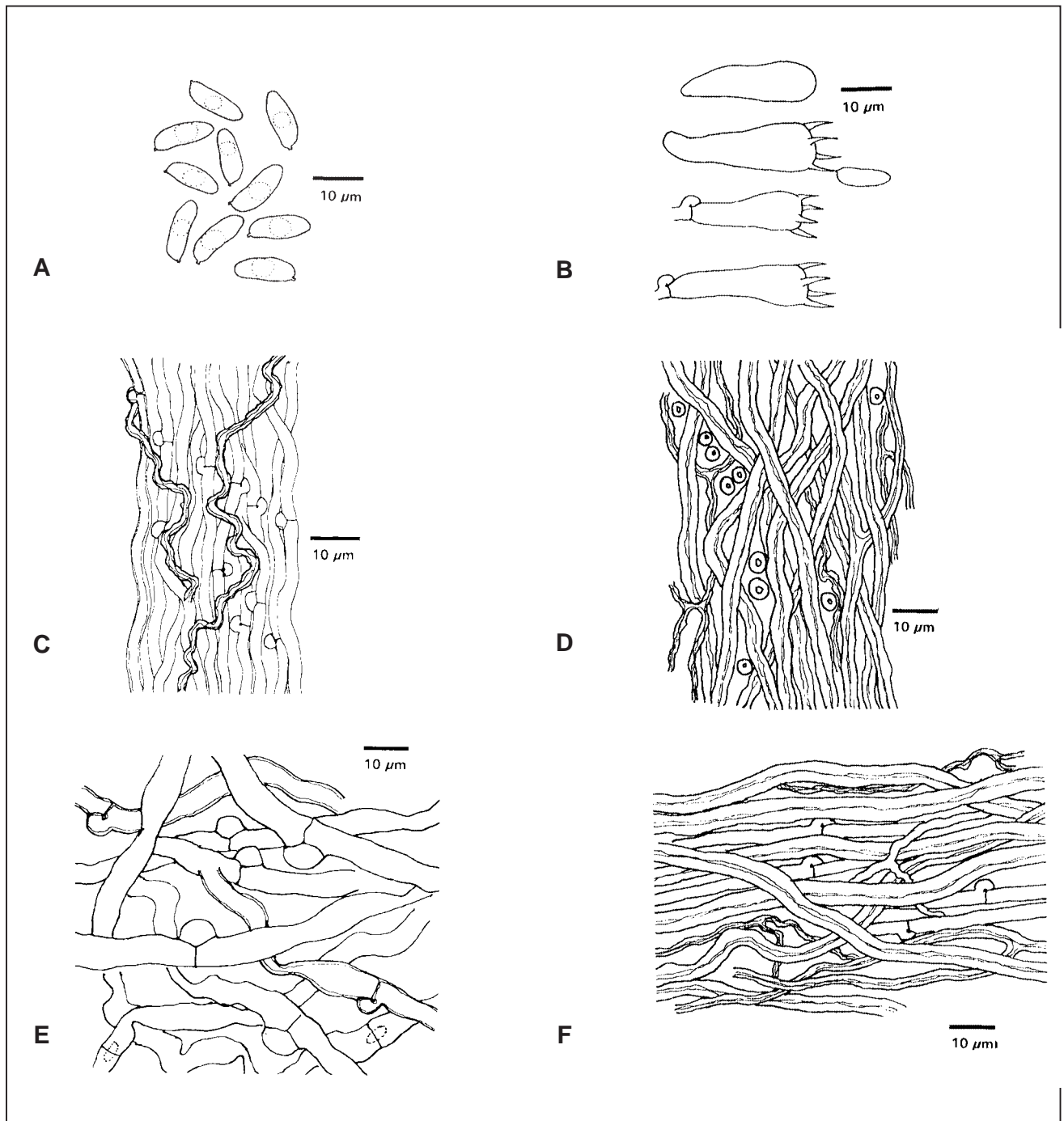


Fig. 5. Microscopical structures of *Polyporus ulmi* (Bondartsev & Ljub.) Vassilk. A. Basidiospores. B. Basidia and a basidiole. C. Tramal hyphae from juvenile basidiocarp. D. Tramal hyphae from mature basidiocarp. E. Contextual hyphae from juvenile basidiocarp. F. Contextual hyphae from mature basidiocarp.

clavate, slightly smaller than basidia.

Spores. Basidiospores cylindrical, hyaline, thin-walled, smooth, bearing one guttule, IKI-, CB-, $(10.2\text{--}10.3\text{--}12.9\text{--}13.5) \times (3.8\text{--}4\text{--}5\text{--}5.1) \mu\text{m}$, $L = 11.63 \mu\text{m}$, $W = 4.44 \mu\text{m}$, $Q = 2.53\text{--}2.72$ ($n=60/2$).

Remarks. This species was originally described from the Russian Far East as *Piptoporus ulmi* (Bondartsev 1961), and it was combined into

Polyporus by Vassilkov (1967). A detailed description of *Polyporus ulmi* (*P. chozeniae*) was published by Parmasto (1975), and more discussion on the species was made by Dai (1999). The upper surface has abundant, small, yellowish brown, scale-like spots, resembling *P. varius*. Núñez and Ryvardeen (1995) considered *P. chozeniae* to be a synonym of *P. varius*. According to our study, *P. varius* differs from *P. ulmi* by

having both smaller pores (5-9 per mm) and basidiospores ($7.3-9 \times 2.4-3 \mu\text{m}$).

Other specimens examined. Russia. Primorye Terr., on *Ulmus*, VIII.1945 *Vassiljeva* (LE 22548, holotype). Irkutsk Reg., Baikal, on *Chosenia*, 1989 *Zene* (H).

Skeletocutis lilacina A. David & Jean Keller, Mycol. Helvetica 1: 158, 1984. (Figs. 6, 7.)

Fruitbody. Basidiocarps annual, widely resupinate, sometimes effused-reflexed, soft corky to corticeous, with pleasant, bitter-sweet odour

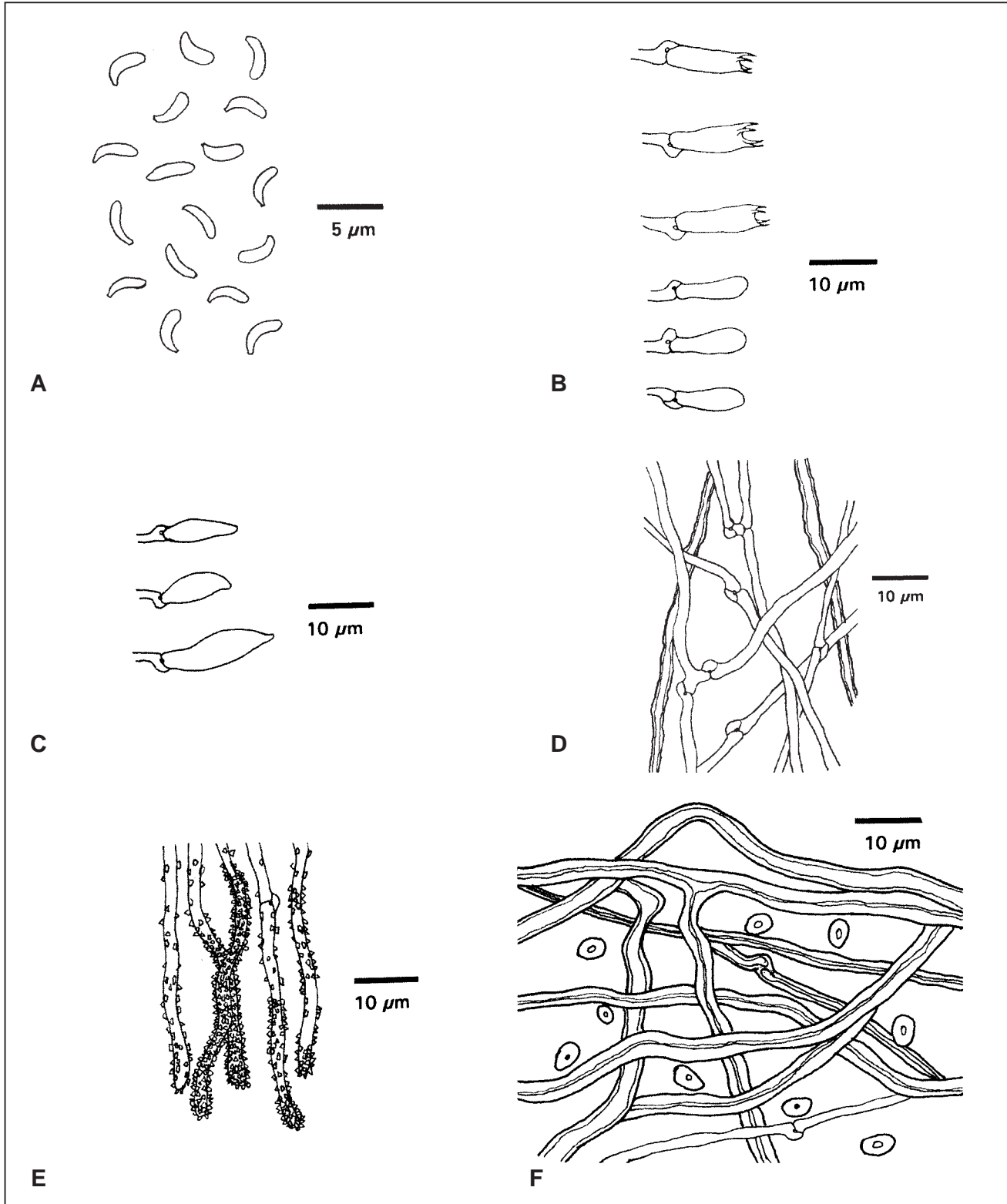


Fig. 6. Microscopical structures of *Skeletocutis lilacina* A. David & Jean Keller. A. Basidiospores. B. Basidia and basidioles. C. Cystidioles. D. Tramal hyphae. E. Hyphae from dissepimental edge. F. Contextual hyphae.



Fig. 7. *Skeletocutis lilacina*

when fresh, becoming hard corky upon drying. Pilei minute, fingernail-shaped, projecting up to 0.5 cm, 2 cm wide, 1 mm thick. Pileal surface greyish white, matted, azonate; margin thinning out, curving down when dry. Pore surface violaceous when fresh, becoming pale brown upon drying; sterile margin distinct, paler contrasting with pore surface; pores round to angular, 6-8 per mm ($n = 60/2$), dissepiments even to slightly lacerate. Subiculum gelatinous when fresh, becoming sordid straw-coloured and hard upon drying, very thin, ca. 0.3 mm thick. Tubes paler in contrast with pore surface, slightly constricting when dry, brittle, up to 0.7 mm long.

Hyphal structure. Hyphal system dimitic; generative hyphae bearing clamp connections; skeletal hyphae IKI-, CB-; tissues unchanged in KOH.

Subiculum. Generative hyphae infrequent, hyaline, thin- to thick-walled, unbranched, 2-2.5 μm diam.; skeletal hyphae dominant, thick-walled with a narrow lumen, flexuous, unbranched, strongly interwoven, 3-4 μm diam.

Tubes. Generative hyphae dominant, hyaline, thin- to thick-walled, frequently with clamp connections and branched, more or less parallel along tubes or loosely interwoven, 1.5-2.5 μm diam., hyphal tips at dissepimental edges with sparse encrustations; skeletal hyphae infrequent, thick-walled with a distinct lumen, 1.9-3 μm diam. Cystidioles frequent, fusoid, 9.5-17 \times 3.7-5 μm ; basidia clavate, with a basal clamp connection and four sterigmata, 11-14 \times 3.2-4.5 μm ; basidioles mostly clavate, slightly smaller than basidia.

Spores. Basidiospores cylindrical to allantoid, hyaline, thin-walled, smooth, bearing one or two guttule, IKI-, CB-, (3-)3.1-4(-4.2) \times 0.6-1 μm , $L = 3.56 \mu\text{m}$, $W = 0.91 \mu\text{m}$, $Q = 3.91$ ($n = 60/2$).

Remarks. *Skeletocutis lilacina* has bright pore

surface when fresh, and this is the most important character of the species. The colour may fade out with ages or dry, and then the species may be confused with *Trichaptum abietinum*, but the latter species has larger pores. In microscope *Trichaptum abietinum* has plenty of cystidia and bigger basidiospores. *Skeletocutis lilacina* is very rare in both Europe and North America, and it seems to be a rare species in China according to our investigation.

DISCUSSION

283 specimens were collected from the studied area, based on our collections, 112 species of polypores were found from Huzhong Nature Reserve and surrounding area of the Great Hinggan Mts. According to our previous studies in northeastern China, 161 polypore species were found in Fenglin Nature Reserve of the Lesser Hinggan Mts. (unpublished), and 213 species were recorded from Changbaishan Nature Reserve, Changbai Mts. (Dai 1996). Therefore the species is less rich in Great Hinggan Mts. than in both of the Lesser Hinggan Mts. and Changbai Mts. The mainly reason for this phenomena is the host tree species are rich in the Lesser Hinggan Mts. and Changbai Mts., e.g. six trees of gymnosperm and 16 tree genera of angiosperm are found in Changbai Mts., and five species of gymnosperm and 14 tree genera of angiosperm are found in the Lesser Hinggan Mts. While two coniferous trees and 7 genera of broad-leaved tree occur in Great Hinggan Mts.

Because the larch (*Larix gmelinii*) is the main tree in Huzhong Nature Reserve, and most of the forests in the reserve are almost pure forest of the tree. 54 species were found on wood of the larch (including two species related to the forest of larch). Broad-leaved trees occur mostly along the minor rivers, although such forests are the minor part in the reserve, 69 polypores were found on the wood of angiosperm.

ACKNOWLEDGEMENTS

Y.C. Dai and Y.L. Wei thank Dr. Tuomo Niemelä (H, Helsinki) for arranging the study facilities in the Botanical Museum of the University of Helsinki. The research was financed by Chinese Academy of Sciences (the Talent Program).

REFERENCES

- Bondartsev, A. 1961. Species nonnullae Polyporaceae curiosae Orientis Extremi. Bot. Mater. Otd. Spor. Rast. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 14: 198-206.
- Bondartsev, A. 1962. Polypori novi ex Oriente Extremo. Bot. Mater. Otd. Spor. Rast. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 15: 103-111.
- Bondartsev, A. 1963. Species pro URSS rariae et novae Polyporacearum. Bot Mater Otd Sporov Rast. 16:113-125.
- Bondartsev, A. and L.V. Lyubarsky. 1963. Genus novum et species novae Polyporacearum in Oriente Extremo inventae. Bot Mater Otd Sporov Rast. 16: 125-133.
- Bondartsev, A. and L.V. Lyubarsky. 1965. Species nonnullae Polyporacearum novae Orientis Extremi. Novosti Sist Nizsh Rast. 1965: 135-147.
- Dai, Y.C. 1996. Changbai wood-rotting fungi 7. A checklist of the polypores. Fungal Science 11: 79-105.
- Dai, Y.C. 1999. Changbai wood-rotting fungi 11. Species of *Polyporus sensu stricto*. Fungal Science 14: 67-77.
- Dai, Y.C. 2000. A checklist of polypores from Northeast China. Karstenia 40: 23-29.
- Dai, Y.C. 1998. Changbai wood-rotting fungi 9. Three new species and other species in *Rigidoporus*, *Skeletocutis* and *Wolfiporia* (Basidiomycota, Aphyllophorales). Ann Bot Fennici 35: 143-154.
- Dai, Y.C. and T. Niemelä. 2002. Changbai wood-rotting fungi 13. *Antrodia sensu lato*. Ann. Bot. Fennici 39: 257-265.
- He, B.Z., C.T. Xiang, and Y. Xue. 1987. Investigation on major forestry diseases of Tahe County. Acta Northeast Forestry University 15: 120-124.
- Lian, J.W. 1994. Edible fungi of Great Hinggan Mts. Edible Fungi of China. 17: 19-20.
- Lyubarsky, L.V. 1962. Polypori nonnulli rari ex Oriente Extremo. Bot Mater Otd Sporov Rast. 15: 111-125.
- Núñez, M., E. Parmasto, and L. Ryvardeen. 2001. New and interesting polypores from East Russia. Fungal Diversity 6: 107-144.
- Núñez, M. and L. Ryvardeen. 1995. *Polyporus* (Basidiomycotina) and related genera. Synopsis Fungorum 10: 1-85.
- Núñez, M. and L. Ryvardeen. 2000. East Asian polypores 1. Ganodermataceae and Hymenochaetaceae. Synopsis Fungorum 13: 1-168.
- Núñez, M. and L. Ryvardeen. 2001. East Asian polypores 2. Polyporaceae s. lato. Synopsis Fungorum 14: 170-522.
- Parmasto, E. 1975. On *Polyporus chozeniae* (Vassilkov) Parmasto *comb. nov.* and related species. Folia Crypt. Estonica 5: 33-40.
- Parmasto E. 1980. On *Auriporia* (Aphyllophorales: Polyporaceae). Mycotaxon 11: 173-176.
- Parmasto E. 1982. *Poriodontia*, a new poroid genus of the Hyphodontieae (Aphyllophorales: Corticiaceae). Mycotaxon 14: 103-106.
- Tai, F.L. 1979. Sylloge fungorum Sinicorum. Science Press, Beijing, 1527 pp. (in Chinese)
- Teng, S.Q. 1963. Fungi of China. Science Press, Beijing, 808 pp. (in Chinese)
- Vassilkov, L.N. 1967. Species nova familiae Polyporaceae in *Chozenia macrolepis* (Turcz.) Kom. Novosti Sist. Nizsh. Rast. 1967: 244—246.
- Xiang, C.T., B.Z He, and Y. Xue. 1987. Investigation on edible fungi of Tahe County. Acta Northeast Forestry University 15: 112-119.

中國東北大興安嶺的多孔菌

戴玉成¹ 袁海生^{1,2} 余長軍³ 崔寶凱^{1,2} 魏玉蓮^{1,2} 李娟^{1,2}

¹中國科學院沈陽應用生態研究所

²中國科學院研究生院

³東北林業大學森林資源與環境學院

2003年8月在中國東北大興安嶺地區呼中保護區及周遭採集木腐菌標本283號，經鑑定研究發現多孔菌112種，本文報導了這些多孔菌名錄，並根據採樣列出了每種的寄主，其中大多數種類為該地區首次報導。丁香地花 *Albatrellus syringae*，榆樹多孔菌 *Polyporus ulmi* 和紫孔千皮菌 *Skeletocutis lilacina* 為中國新紀錄種，根據中國的標本材料對這三種進行了詳細描述。

關鍵詞：大興安嶺，中國東北，分類，多孔菌。