

Macrofungal diversity associated with the scale-leaf juniper trees, *Juniperus excelsa* and *J. foetidissima*, distributed in Turkey

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Abstract: In this article, an attempt has been made to establish the qualitative composition of macromycetes in the communities of scale-leaf juniper, *Juniperus excelsa* M.Bieb. and *J. foetidissima* Willd., distributed in Turkey. A total of 127 species of macrofungi were registered, 2 belonging to Ascomycota and 125 to Basidiomycota. Of those, 69 species were collected in *Juniperus excelsa* stands, 23 in *J. foetidissima* stands, and 35 species in both juniper stands. The ecologic status for the fungal species is as follows: 30 lignicolous and 39 terricolous in *J. excelsa* stands, 19 lignicolous and 4 terricolous in *J. foetidissima*, and 31 lignicolous and 4 terricolous in both stands. For Turkey, 23 taxa were new, and 5 of them were new at genus level. The new genera were *Pyrenopeziza* Fuckel, *Amyloathelia* Hjortstam & Ryvarden, *Byssosporia* M.J.Larsen & Zak, *Globulicium* Hjortstam, and *Subulicium* Hjortstam & Ryvarden.

Key words: Macrofungal diversity, *Juniperus*, new records, Turkey

Türkiye’de yayılış gösteren pulsu yapraklı ardıç ağaçları, *Juniperus excelsa* ve *J. foetidissima*, birliğindeki makrofungal çeşitlilik

Özet: Bu makalede Türkiye’de yetişen pulsu yapraklı ardıç ağaçları, *Juniperus excelsa* M.Bieb. ve *J. foetidissima* Willd., topluluklarındaki makromantarların kalitatif kompozisyonunu çıkarmak için bir çalışma yapılmıştır. Ascomycota (2) ve Basidiomycota’ya (125) ait toplam 127 makrofungus belirlenmiştir. 69 tür *Juniperus excelsa* topluluğundan, 23 tür *J. foetidissima* topluluğundan ve 35 tür her iki ardıç topluluğundan toplanmıştır. Mantar türlerinin ekolojik durumları şu şekildedir: *J. excelsa* topluluğunda 30 lignikoloz ve 39 terrikoloz, *J. foetidissima* topluluğunda 19 lignikoloz ve 4 terrikoloz, her iki toplulukta 31 lignikoloz ve 4 terrikoloz türdür. 23 takson Türkiye için yenidir ve bunların 5’i cins seviyesinde yenidir. Yeni cinsler *Pyrenopeziza* Fuckel, *Amyloathelia* Hjortstam & Ryvarden, *Byssosporia* M.J.Larsen & Zak, *Globulicium* Hjortstam ve *Subulicium* Hjortstam & Ryvarden’dir.

Anahtar sözcükler: Makrofungal çeşitlilik, *Juniperus*, yeni kayıtlar, Türkiye

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Introduction

The investigation into macromycetes was carried out on 2 juniper species (*Juniperus excelsa* M.Bieb. and *J. foetidissima* Willd.). The Greek or Crimean juniper (*J. excelsa*) occurs in the hills and mountains of the eastern Mediterranean basin, the Black Sea, and several mountain ranges around the southern end of the Caspian Sea. Its altitudinal range is from 500 to 2300 m. It does not occur in regions below 500 m in Turkey, and it is especially common in Anatolia. It forms the tree-limit in several mountain ranges. It grows mainly on stony, rocky calcareous or noncalcareous slopes. *J. foetidissima* is a medium-high tree from western Asia and from the southern part of the Balkan Peninsula. It spreads from Transcaucasia, Syria, and Asia Minor, all the way to the Greek and Macedonian mountains (Davis, 1965; Carus, 2004).

Both juniper trees may form pure or open forests; they may also grow with other mixed conifers such as *Cedrus libani* A.Rich., *Abies cilicica* (Antoine & Kotschy) Carriere subsp. *cilicica*, *A. cilicica* (Antoine & Kotschy) Carriere subsp. *isaurica* Coode & Cullen, *Pinus nigra* J.F.Arnold subsp. *nigra* var. *caramanica* (Loudon) Businsky, *Phyllirea latifolia* L., *Pinus brutia* Ten., *Juniperus drupacea* Labill., *J. communis* L., *J. oxycedrus* L., *Quercus coccifera* L., *Q. frainetto* Ten., and *Q. infectoria* Olivier, or they may be part of oak-scrub communities in secondary vegetation but not in the Mediterranean maquis. In general, today in Turkey there are 78.583 ha of healthy high juniper forest, 1155.570 ha of disturbed high juniper forest, and, in total, 1234.162 ha of *J. excelsa* and *J. foetidissima* forest, while before there were 3,000,000 ha (Carus, 2004; Doğan and Karadelev, 2006a).

The first macrofungi data from both juniper species in Turkey were provided by Selik (1973), who published *Antrodia juniperina* (Murrill) Niemelä & Ryvarde (as *Daedalea juniperina*) and *Pyrofomes demidoffii* (Lév.) Kotl. & Pouzar (as *Fomes juniperinus*), both on *Juniperus excelsa* from the area of Adana (Çamalan). Later, Işiloğlu and Watling (1992) reported on *Pyrofomes demidoffii* from the area of Mersin (Erdemli) on *Juniperus* sp. in a mixed conifer forest. Further additions from juniper forests were made by Doğan and Karadelev (2006a, 2006b), Doğan et al. (2007), and Doğan and Karadelev (2009).

This paper provides information on the diversity of macrofungi in association with 2 juniper species (*Juniperus excelsa* and *J. foetidissima*) in Turkey. The samples were collected on tree parts, wood remnants, decaying wood, etc., or from soil in juniper stands. This research is of particular significance in view of the fact that in the past in Europe, the aforementioned species have been thoroughly studied only in Macedonia (Karadelev, 2000, 2001). Hence, this is the first in-depth study of macrofungi growing in scale-leaf juniper associations in Turkey.

Materials and methods

The research was conducted from 2002 through 2005, within the framework of a bilateral project entitled “Macromycetes biodiversity in juniper forest (*Juniperus excelsa*, *J. foetidissima*) in the Republic of Turkey and the Republic of Macedonia, and their comparison,” mainly in spring and autumn. Research was undertaken in 34 localities in Turkey at altitudes of 500-1800 m.

The identification of fungi was done using a microscope and reagents (Melzer’s reagent, 5% KOH, cotton blue, sulphovanillin, etc.). The determination of the microscopic characters of the species was achieved using the Leica Digital Screening System in the mycological laboratory. The relevant specimens were preserved in the existing mycocollection at the Selçuk University Mushroom and Application Centre (Konya).

The specimens were identified by referring to the following sources: Bondartsev (1971), Breitenbach and Kränzlin (1984-2000), Eriksson and Ryvarde (1973, 1975, 1976, 1978), Eriksson (1994), Eriksson et al. (1981, 1984), Gilbertson (1974), Gilbertson and Ryvarde (1986, 1987), Hjortstam et al. (1987, 1988), Horak (2005), Jülich (1984), Langer (1994), Moser (1983), Robich (2007), and Ryvarde and Gilbertson (1993). The new records for Turkey were checked with the relevant literature (Doğan et al., 2005; Solak et al., 2007; Sesli & Denchev, 2010).

Taxa, family, and author citations were listed according to Cannon and Kirk (2007), Kirk et al. (2008), and Index Fungorum (www.speciesfungorum.org, accessed 2010). Family and species names are listed in alphabetical order in the text.

Studied localities

Field research was done regarding macrofungi in juniper stands in the western, southern, and central parts of Turkey, at most of the localities where its associations are best developed.

The study areas were selected as the best developed locations for juniper stands in Turkey (Figure 1), including Adana, Amasya, Ankara, Antalya, Balıkesir, Eskişehir, Kahramanmaraş, Karaman, Konya, Kütahya, Mersin, and Muğla provinces.

Localities (in alphabetical order):

1. Adana: Pozantı, Fındıklı, Elma Sekisi district, 1700 m, 3 Nov. 2004, *J. excelsa* is dominant; in certain parts of the forest it is mixed with *J. foetidissima*, *J. drupacea*, *Abies cilicica* subsp. *cilicica*, and *Cedrus libani*.
2. Adana: Pozantı, Fındıklı, Tosman district, 1400 m, 3 Nov. 2004, *J. excelsa* and *J. foetidissima* stands are mixed with *J. drupacea*, *J. oxycedrus*, *C. libani*, and *P. nigra*.
3. Adana: Aladağ, Meydan plateau, 1200 m, 4 Nov. 2004, *J. excelsa* is dominant; in certain parts of the forest, it is mixed with *J. foetidissima*, *J. drupacea*, *J. oxycedrus*, *A. cilicica* subsp. *cilicica*, and *C. libani*.
4. Amasya: Akdağ, Aydınlık village, 1000 m, 18 May 2003, in natural juniper stand in cemetery, pure *J. excelsa* and *J. foetidissima* stands.
5. Amasya: Akdağ, Durucasu village, 1100 m, 18 May 2003, pure *J. excelsa* stand; in certain parts of the forest, it is mixed with *J. foetidissima*. Due to lack of dead wood, only 2 specimens were recorded from here.
6. Amasya: Göynücek, Alan village, 1250 m, 19 May 2003, in natural juniper stand in cemetery, pure *J. excelsa* and *J. foetidissima* stands. The forest was young and in healthy condition; hence, we collected very little material.
7. Amasya: Sarımeşe, Ardiçdüzü district, 800 m, 19 May 2003, mixed *J. excelsa* and *J. foetidissima* stands.
8. Ankara: Beypazarı, Tepeli district, 1100 m, 11 May 2005, pure *J. foetidissima* forest.
9. Ankara: Nallıhan, Hoşbebe picnic area, 1350 m, 12 May 2005, in natural juniper stand, pure *J. foetidissima* stand in *P. nigra* forest.
10. Ankara: Nallıhan, Karageyiş Mountain, Bakacak district, 1350 m, 12 May 2005, pure *J. foetidissima* forest.
11. Antalya: Akseki, Yarpuz, 1300 m, 2 Nov. 2003, pure *J. foetidissima* forest.
12. Antalya: Çaltılar, 1225 m, 11 Nov. 2005, mixed *J. foetidissima* and *J. excelsa* stands.
13. Antalya: Elmalı, Avlan, Radyolink road, 1400 m, 4 May 2004, *J. excelsa* stand in *C. libani* forest.
14. Antalya: Elmalı, Çıglıkara forest, Sevindik district, 1400 m, 3 May 2004, pure *J. excelsa* stand in *C. libani* and *Q. coccifera* forest.
15. Antalya: Korkuteli, Aşağı Karaman village, 1650 m, 2 May 2004, *J. excelsa* is dominant and mixed with *J. foetidissima*, *J. communis*, and *P. nigra*.
16. Antalya: Köprülü Kanyon National Park, Dutluca and Ballıbucağ districts, 900 m, 15 March 2003, 20 Nov. 2003, 23 Apr. 2005, pure *J. excelsa* forest.
17. Antalya: Termessos National Park, 700 m, 16 March 2003, in mixed *J. foetidissima* and *J. excelsa* stands.
18. Balıkesir: Dursunbey, 550 m, 7 Nov. 2003, *J. foetidissima* is dominant and mixed with *J. excelsa*, *Q. infectoria*, *J. oxycedrus*, and *P. latifolia*.
19. Balıkesir: Gölcük, Geyik Tepeleri district, 950 m, 7 Nov. 2003, *J. foetidissima* is dominant and mixed with *Q. cerris*, *J. oxycedrus*, *Acer* sp., *P. nigra*, and *P. latifolia*.
20. Balıkesir: Kazdağı, Ağlayan Çam district, 850 m, 6 Nov. 2003, *J. foetidissima* is dominant and mixed with *P. latifolia*, *J. oxycedrus*, *P. brutia*, *Q. frainetto*, and *Q. coccifera*.
21. Eskişehir: Mihalıccık, leaving Dinek Road, 1100 m, 13 May 2005, *J. foetidissima* and *J. excelsa* stands. Juniper stands were much less populated and young; therefore, there was not enough material.

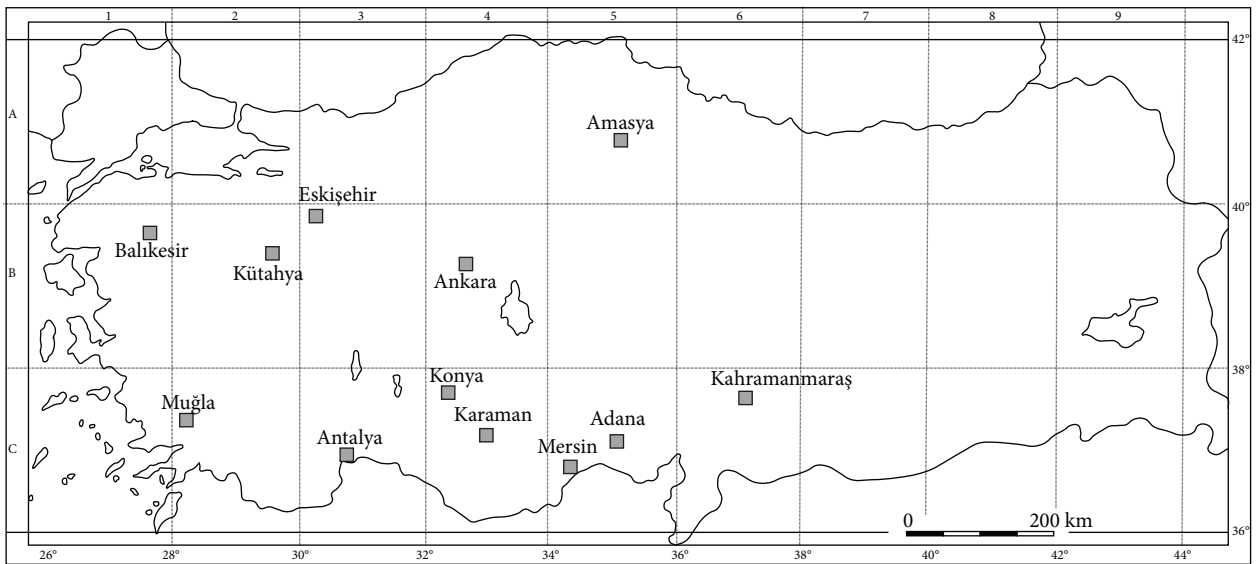


Figure 1. The studied localities in Turkey.

22. Eskişehir: Mihallıccık, on the way to Sarıyar Dam, 550 m, 13 May 2005, pure *J. excelsa* stand.
23. Kahramanmaraş: Andırın, Elmadağ, Karlık district, 1450 m, 5 Nov. 2004, *J. foetidissima* is mixed with *C. libani* and *P. nigra*. There were very few *J. foetidissima* trees at this locality; hence, we could not find enough material.
24. Kahramanmaraş: Andırın, Elmadağ, Mercimeklik district, 1250 m, 5 Nov. 2004, *J. excelsa* is dominant and mixed with *J. foetidissima*, *J. drupacea*, *A. cilicica* subsp. *cilicica*, and *C. libani*.
25. Kahramanmaraş: Göksun, by Saimbeyli Road, 10th km, 1500 m, 6 Nov. 2004, pure *J. foetidissima* stand. The forest was good and old, but it is very close to a village and there was no fallen material.
26. Kahramanmaraş: Göksun, 1000 m, 24 Apr. 2003, 6 Nov. 2004, pure *J. foetidissima* and *J. excelsa* forest.
27. Karaman: Ermenek, Damlaçalı district, 1650 m, 21 Oct. 2005, pure *J. excelsa* stand. There were not enough juniper trees to collect fungi samples.
28. Karaman: Sarıveliler, Civandere district, 1750 m, 8 May 2004, *J. excelsa* stand mixed with *J. oxycedrus* and *Q. cerris*. The forest was good and old, but it is very close to a village and there was not fallen material.
29. Konya: Seydişehir, Maden district, 1350 m, 2 Nov. 2003, mixed *J. foetidissima* and *J. excelsa* forest.
30. Kütahya: Muratdağı, Altıntaş district, 1100 m, 8 Nov. 2003, *J. foetidissima* is dominant and mixed with *J. excelsa*, *J. oxycedrus*, and *Q. cerris*.
31. Mersin: Arslanköy, Cocakdere district, 1450-1650 m, 5 Oct. 2003, 10 Oct. 2003, 13 May 2004, 11 June 2005, 7 Oct. 2005, *J. excelsa* is dominant and mixed with *J. foetidissima*, *C. libani*, *A. cilicica* subsp. *cilicica*, and *P. nigra*.
32. Mersin: Arslanköy, Kavaklıpınar, Yüksek Harman district, 1450 m, 6 June 2003, pure *J. excelsa* forest.
33. Muğla: Ardıçova, 1100 m, 14 Nov. 2005, pure *J. foetidissima* stand mixed with *J. excelsa* and *P. nigra*.
34. Muğla: Fethiye, Babadağ, 1200 m, 5 May 2003, 3 Nov. 2003, 12 Nov. 2005, *J.*

foetidissima is dominant and mixed with *J. excelsa*, *A. cilicica* subsp. *isaurica*, *P. nigra*, *P. latifolia*, *J. oxycedrus*, and *Q. coccifera*.

Abbreviations:

HD: Collection number of Hasan Hüseyin Doğan

*: New record at the species level

** : New record at the genus level

[]: Number of locality

Results

The identified species are listed in alphabetic order of family names. Macroscopic and microscopic images of the new records are given in Figures 2-7.

Ascomycota

Dermateaceae

1. ***Pyrenopeziza petiolaris* Masee; on branch of *J. excelsa*, [30], HD 1619 (Figure 2).
2. *Tapesia fusca* (Pers.) Fuckel; on bark of *J. foetidissima*, [30], HD 1604.

Basidiomycota

Agaricaceae

3. *Agaricus bitorquis* (Quél.) Sacc.; in grass in *J. excelsa* stand, [32], HD 2053.
4. *Agaricus bresadolanus* Bohus; in grass in *J. excelsa* stand, [32], HD 1325.
5. *Agaricus campestris* L. var. *campestris*; in grass in *J. excelsa* stand, [32], HD 2052.
6. *Agaricus luteomaculatus* (F.H.Møller) F.H.Møller; in grass in *J. excelsa* stand, [31], HD 2088.
7. *Agaricus osecanus* Pilát; in grass in *J. excelsa* stand, [32], HD 1324.
8. *Agaricus subfloccosus* (J.E.Lange) Hlaváček; in grass in *J. excelsa* stand, [12], HD 2161.
9. *Agaricus xantholepis* (F.H.Møller) F.H.Møller; in grass in *J. excelsa* stand, [12], HD 2156.
10. *Bovista nigrescens* Pers.; in grass in *J. excelsa* stand, [12], HD 2145.

11. *Bovista plumbea* Pers.; in grass in *J. excelsa* stand, [32], HD 1321.
12. *Calvatia gigantea* (Batsch) Lloyd; in grass in *J. excelsa* stand, [32], HD 1834.
13. *Crucibulum laeve* (Huds.) Kambly; on rotten wood of *J. foetidissima*, [32], HD 1875.
14. *Lepiota erminea* (Fr.) Gillet; in grass in *J. excelsa* stand, [12], HD 2152; [32], HD 1320.
15. *Lycoperdon molle* Pers.; in grass in *J. excelsa* stand, [12], HD 2146; on soil in *J. foetidissima* stand, [33], HD 2225.
16. *Lycoperdon umbrinum* Pers.; in grass in *J. excelsa* stand, [12], HD 2144.
17. *Macrolepiota excoriata* (Schaeff.) Wasser; in grass in *J. excelsa* stand, [3], HD 1916.
18. *Macrolepiota heimii* (Locq.) Bon; in grass in *J. excelsa* stand, [12], HD 2158; [29], HD 1483.
19. *Tulostoma fimbriatum* Fr.; in grass in *J. excelsa* stand, [31], HD 1446.
20. *Tulostoma squamosum* Pers.; in grass in *J. excelsa* stand, [12], HD 2155.

Amylocorticiaceae

21. ***Amyloathelia amylacea* (Bourdot & Galzin) Hjortstam & Ryvarden; on rotten wood of *J. foetidissima*, [8], HD 2014; [20], HD 1560 (Figure 2).

Amylostereaceae

22. *Amylostereum laevigatum* (Fr.) Boidin; on fallen branch of *J. excelsa*, [31], HD 1451.

Atheliaceae

23. *Amphinema byssoides* (Pers.) J.Erikss.; on rotten wood of *J. foetidissima* [19], HD 1582; [29], HD 1511.
24. *Athelia decipiens* (Höhn. & Litsch.) J.Erikss.; on rotten wood of *J. excelsa*, [13], HD 1703, 1705; [14], HD 1663, 1675, 1677, 1686, 1694; [30], on rotten wood of *J. foetidissima*, HD 1628.

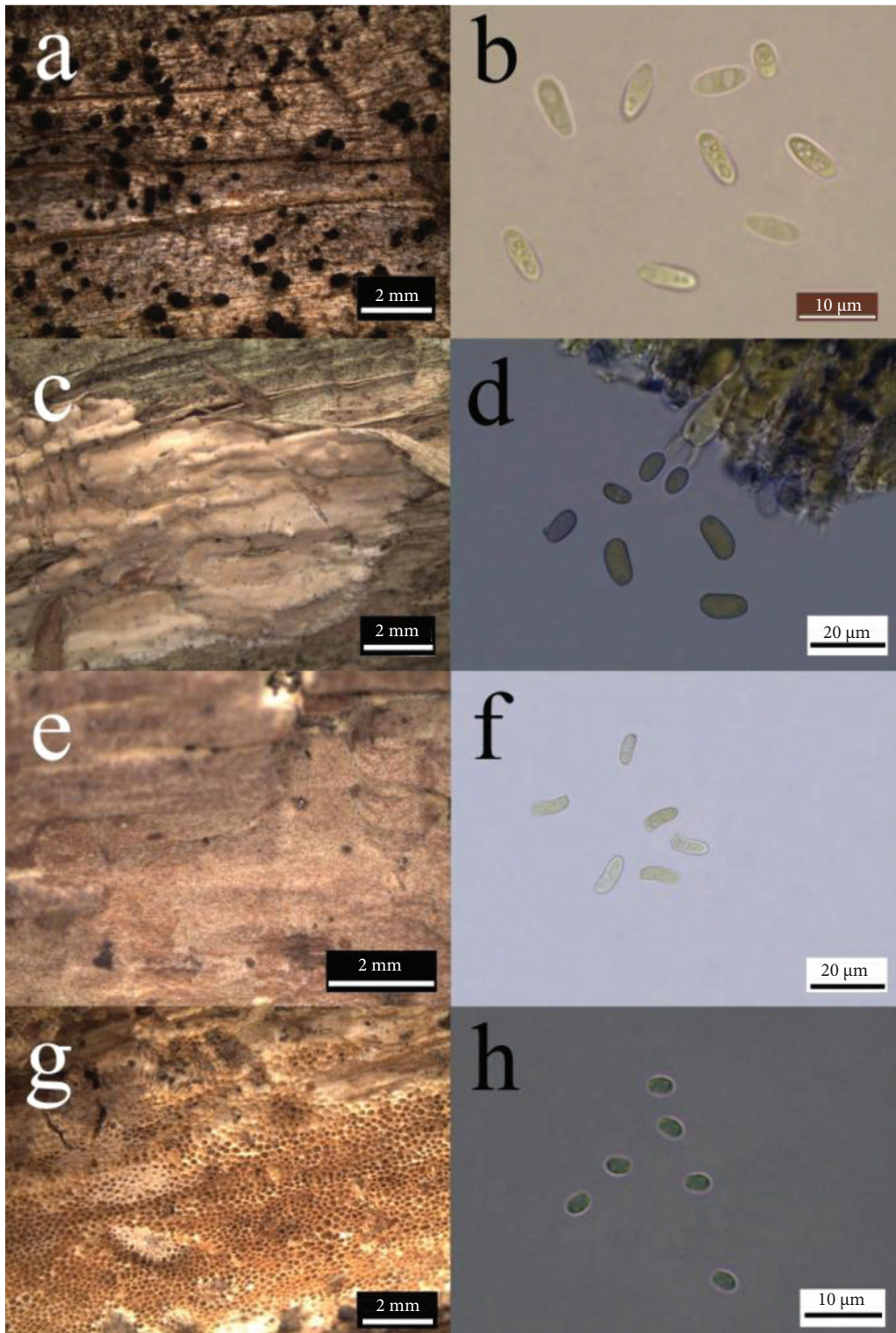


Figure 2. a) Ascocarps and b) ascospores of *Pyrenopeziza petiolaris*, c) basidiocarp and d) basidiospores of *Amyloathelia amylacea*, e) basidiocarp and f) basidiospores of *Athelia fibulata*, g) basidiocarp and h) basidiospores of *Byssoporia terrestris*.

25. **Athelia fibulata* M.P.Christ.; on rotten wood of *J. excelsa*, [15], HD 1647 (Figure 2).
26. *Athelia neuhoffii* (Bres.) Donk; on rotten wood of *J. foetidissima*, [19], HD 1600.
27. ***Byssoporia terrestris* (DC.) M.J.Larsen & Zak; on rotten wood of *J. excelsa*, [31], HD 1479 (Figures 2).

Bolbitiaceae

28. *Conocybe rickenii* (Jul.Schäff.) Kühner; in grass in *J. excelsa* stand, [32], HD 1317.
29. *Coprinarius remotus* (Schaeff.) Quél. var. *guttulatus* (Bres.) Quél.; in grass in *J. excelsa* stand, [32], HD 1316.

Botryobasidiaceae

30. *Botryobasidium subcoronatum* (Höhn. & Litsch.) Donk; on rotten wood of *J. excelsa*, [2], HD 1874; on rotten wood of *J. foetidissima*, [26], HD 1977.
31. *Botryohypochnus isabellinus* (Fr.) J.Erikss.; on rotten wood of *J. excelsa*, [13], HD 1710.

Coniophoraceae

32. *Coniophora arida* (Fr.) P.Karst.; on rotten wood of *J. excelsa*, [31], HD 1774.

Corticiaceae

33. **Laeticorticium polygonioides* (P.Karst.) Donk; on rotten wood of *J. foetidissima*, [19], HD 1595-b (Figure 3).

Dacrymycetaceae

34. *Dacrymyces stillatus* Nees; on fallen branch of *J. excelsa*, [16], HD 1997; [22], HD 2043; [26], HD 1277, 1278; [29], HD 1498, HD 1509; [33], HD 2216; on fallen branch of *J. foetidissima*, [20], HD 1559; [21], HD 2044; [29], HD 1510; [30], HD 1615.
35. *Dacrymyces variisporus* McNabb; on fallen branch of *J. foetidissima*, [19], HD 1568.

Fomitopsidaceae

36. *Antrodia juniperina* (Murrill) Niemelä & Ryvarde; on living tree of *J. excelsa*, [2], HD 1882; [3], HD 1917; [8], HD 2012; [12], HD 2164; [14], HD 1668; [15], HD 1648; [18],

HD 1566; [28], HD 1724; [31], HD 1467; [32], HD 1323; [34], HD 1530; on living branch of *J. excelsa*, [16], HD 1253, 1263; [24], HD 1961; on stump of *J. excelsa*, [4], HD 1300; [7], HD 1305; [26], HD 1274; on living tree of *J. foetidissima*, [9], HD 2031; [11], HD 1503; [20], HD 1551; [25], HD 1983; [30], HD 1603; [33], HD 2232; [34], HD 2184; on stump of *J. foetidissima*, [19], HD 1571; on rotten wood of *J. foetidissima*, [34], HD 1288.

37. *Dacryobolus sudans* (Alb. & Schwein.) Fr.; on rotten wood of *J. excelsa*, [3], HD 1943; on rotten wood of *J. foetidissima*, [34], HD 1528.

38. **Postia simani* (Pilát) Jülich; on rotten wood of *J. excelsa*, [29], HD 1481 (Figure 3).

Geastraceae

39. *Geastrum corollinum* (Batsch) Hollós; on soil in *J. foetidissima* stand, [12], HD 2150.
40. *Geastrum coronatum* Pers.; on soil in *J. excelsa* stand, [2], HD 1906; [16], HD 1252.
41. *Geastrum fornicatum* (Huds.) Hook.; on soil in *J. foetidissima* stand, [12], HD 2149.
42. *Geastrum pectinatum* Pers.; on soil in *J. excelsa* stand, [2], HD 1903; [34], HD 2180.
43. *Geastrum quadrifidum* Pers.; on soil in *J. excelsa* stand, [7], HD 1309.
44. *Geastrum rufescens* Pers.; on soil in *J. foetidissima* stand, [12], HD 2148; on soil in *J. excelsa* stand, [13], HD 1720.
45. *Geastrum saccatum* Fr.; on soil in *J. excelsa* stand, [3], HD 1930.
46. *Geastrum schmidelii* Vittad.; on soil in *J. excelsa* stand, [12], HD 2147; [18], HD 1567.
47. *Myriostoma coliforme* (Dicks.) Corda; in grass in *J. excelsa* stand, [3], HD 1913; [31], HD 1991; on soil in *J. excelsa* stand, [14], HD 1678; on wood debris in *J. excelsa* stand, [16], HD 1992, 2001; in grass in *J. foetidissima* stand, [12], HD 2151.

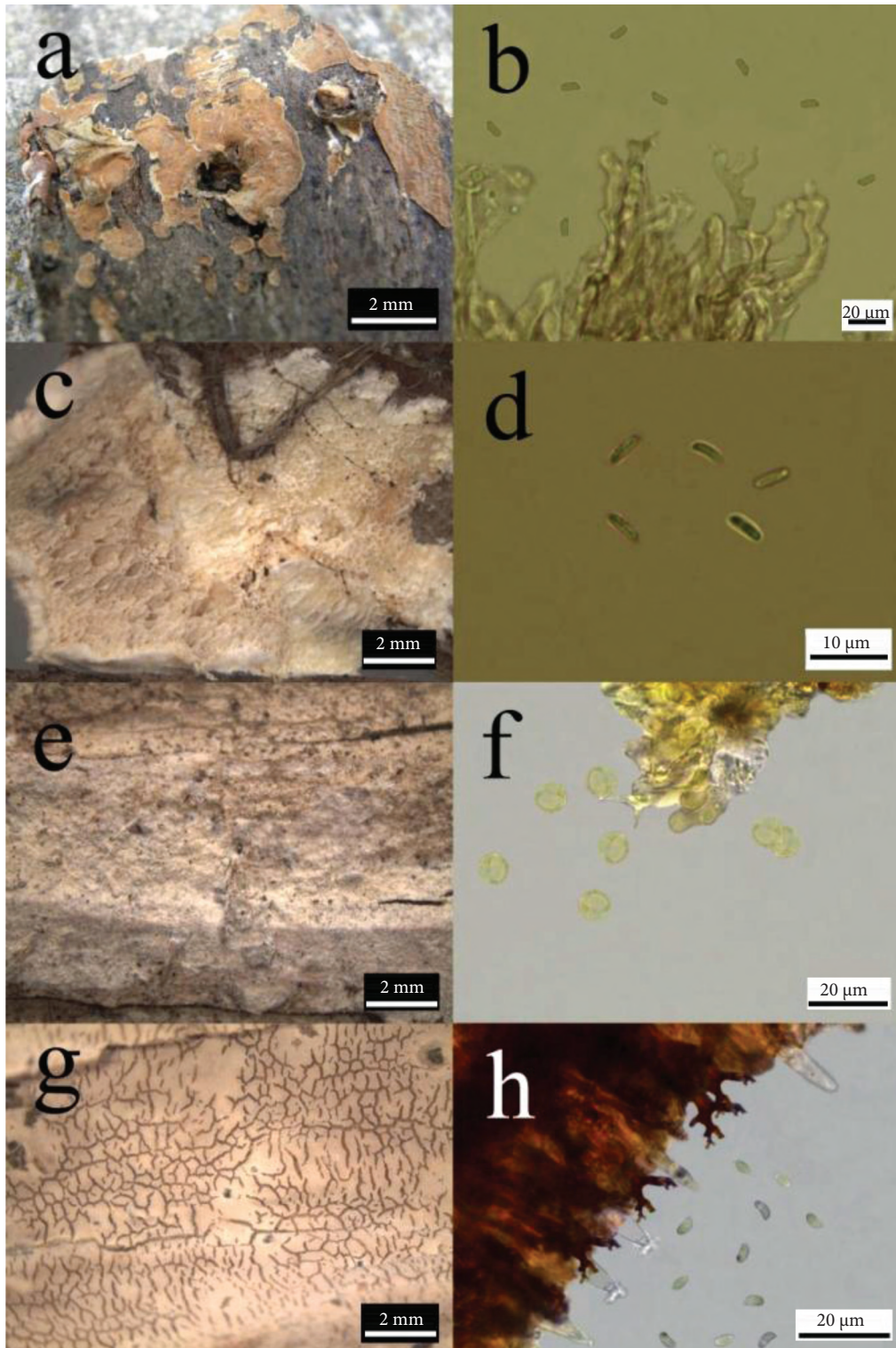


Figure 3. a) Basidiocarp and b) dendrohyphidia and basidiospores of *Laeticorticium polygonioides*, c) basidiocarp and d) basidiospores of *Postia simani*, e) basidiocarp and f) basidiospores of *Subulicium rallum*, g) basidiocarp and h) skeletal hyphae, cystidia, and basidiospores of *Scytinostroma galactinum*.

Gloeophyllaceae

48. **Gloeophyllum abietinum** (Bull.) P.Karst.; on fallen branch of *J. excelsa*, [3], HD 1927; [12], HD 2166; [16], HD 1993; on rotten wood of *J. excelsa*, [14], HD 1667; [24], HD 1962; on fallen branch of *J. foetidissima*, [19], HD 1599; [30], HD 1630; [34], HD 1516.

Gomphidiaceae

49. **Chroogomphus rutilus** (Schaeff.) O.K.Mill.; in *J. foetidissima* and *P. nigra* stand, [33], HD 2222.

Hydnodontaceae

50. **Litschauerella clematitis** (Bourdot & Galzin) J.Erikss. & Ryvarden; on rotten wood of *J. excelsa*, [2], HD 1881; on rotten wood of *J. foetidissima*, [3], HD 1951.
51. **Subulicystidium longisporum** (Pat.) Parmasto; on rotten wood of *J. excelsa*, [31], HD 1794.
52. **Trechispora fastidiosa** (Pers.) Libert; on rotten wood of *J. excelsa*, [31], HD 1453.

Hymenochaetaceae

53. **Hymenochaete fuliginosa** (Pers.) Lév.; on living tree of *J. excelsa*, [2], HD 1879; [30], HD 1621; [34], on rotten wood *J. excelsa*, HD 1289; on rotten wood of *J. foetidissima*, [11], HD 1502; [31], HD 1475, HD 2101; [34], HD 1517; on living tree of *J. foetidissima*, [19], HD 1569; [20], HD 1555; [30], HD 1612.
54. **Phellinus torulosus** (Pers.) Bourdot & Galzin; at the base of living *J. excelsa*, [3], HD 1912; [4], HD 1301; [7], HD 1304; [30], HD 1623; [31], HD 1449; at the base of living *J. foetidissima*, [20], HD 1553; [30], HD 1607.
55. **Phellinus sulphurascens** Pilát; on stump of *J. excelsa*, [13], HD 1713; on stump of *J. foetidissima*, [27], HD 2103.

Incertae sedis

56. **Peniophorella praetermissa** (P.Karst.) K.H.Larss.; on rotten wood of *J. foetidissima*, [30], HD 1635.

57. ****Subulicium rallum** (H.S.Jacks.) Jülich & Stalpers; on rotten wood of *J. excelsa*, [16], HD 2002 (Figure 3).

Inocybaceae

58. **Inocybe fuscomarginata** Kühner; in grass in *J. excelsa* stand, [32], HD 1365.
59. **Tubaria confragosa** (Fr.) Harmaja; on stump of *J. excelsa*, [34], HD 2179.

Lachnocladiaceae

60. **Asterostroma cervicolor** (Berk. & M.A.Curtis) Masee; on rotten wood of *J. excelsa*, [22], HD 2040; on rotten wood of *J. foetidissima*, [30], HD 1632.
61. **Dichostereum granulosum** (Pers.) Boidin & Lanq.; on rotten wood of *J. excelsa*, [31], HD 1469.
62. ***Scytinostroma galactinum** (Fr.) Donk; on rotten wood of *J. excelsa*, [4], HD 1303 (Figure 3).

Marasmiaceae

63. **Gymnopus dryophilus** (Bull.) Murrill; on stump of *J. foetidissima*, [34], HD 2181.

Meripilaceae

64. **Hydnopolyporus fimbriatus** (Fr.) D.A.Reid; on rotten wood of *J. excelsa*, [31], HD 1771.

Meruliaceae

65. ***Hyphoderma multicystidiatum** Ryvarden; on fallen branch of *J. foetidissima*, [19], HD 1586; on fallen branch of *J. excelsa*, [30], HD 1618 (Figure 4).
66. ***Hyphoderma obtusum** J.Erikss.; on rotten wood of *J. foetidissima*, [11], HD 1501; [19], HD 1584; on rotten wood of *J. excelsa*, [13], HD 1706; [29], HD 1491; [31], HD 1472, HD 2056 (Figure 4).
67. **Hyphoderma occidentale** (D.P.Rogers) Boidin & Gilles; on fallen branch of *J. excelsa*, [14], HD 1687.
68. ***Steccherinum litschaueri** (Bourdot & Galzin) J.Erikss.; on rotten branch of *J. foetidissima*, [26], HD 1979 (Figure 4).

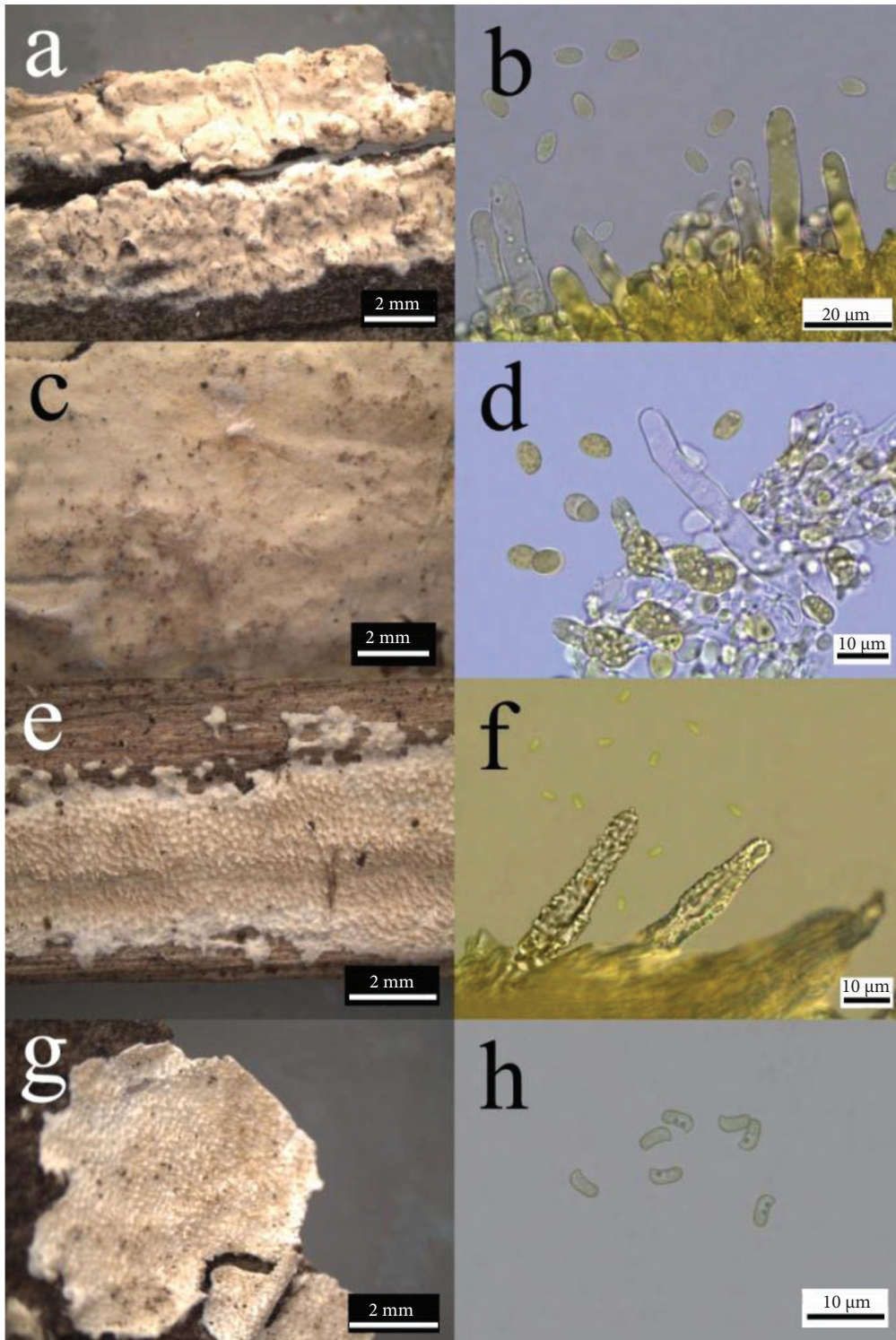


Figure 4. a) Basidiocarp and b) cystidia and basidiospores of *Hyphoderma multicystidiatum*, c) basidiocarp and d) cystidia and basidiospores of *H. obtusum*, e) basidiocarp and f) cystidia and basidiospores of *Steccherinum litschaueri*, g) basidiocarp and h) basidiospores of *Mycoacia aurea*.

69. **Mycoacia aurea* (Fr.) J.Erikss. & Ryvarden; on rotten wood of *J. foetidissima*, [26], HD 1978 (Figure 4).

Mycenaceae

70. *Mycena juniperina* Aronsen; on bark of *J. excelsa*, [16], HD 1249; [19], HD 1575; [26], HD 1272; on bark of *J. foetidissima*, [33], HD 2227; [34], HD 1290.
71. *Mycena renati* Quél.; on bark of *J. excelsa*, [34], HD 2182.
72. *Panellus mitis* (Pers.) Singer; on stump of *J. foetidissima*, [29], HD 1504.
73. *Xeromphalina campanella* (Batsch) Maire; on stump of *J. excelsa*, [34], HD 2186.

Peniophoraceae

74. **Peniophora junipericola* J.Erikss.; on bark of *J. excelsa*, [24], HD 1963; on bark of *J. foetidissima*, [3], HD 1952; [30], HD 1609, 1613; [34], HD 1523, 1548, 1631, 2189 (Figure 5).

Phanerochaetaceae

75. *Phanerochaete calotricha* (P.Karst.) J.Erikss. & Ryvarden; on rotten wood of *J. foetidissima*, [19], HD 1589; [34], HD 1544.
76. *Phanerochaete velutina* (DC.) Parmasto; on rotten wood of *J. excelsa*, [5], HD 1299; on fallen branch of *J. excelsa*, [14], HD 1662; on fallen branch of *J. foetidissima*, [20], HD 1561.

Pleurotaceae

77. *Pleurotus eryngii* (DC.) Quél.; under *Eryngium* sp. in *J. excelsa* stand, [12], HD 2153; under *Eryngium* sp. in *J. foetidissima* stand, [33], HD 2223.

Polyporaceae

78. **Erastiasalmonicolor* (Berk. & M.A.Curtis) Niemelä & Kinnunen; on rotten wood of *J. excelsa*, [4], HD 1302 (Figure 5).
79. *Polyporus arcularius* (Batsch) Fr.; on rotten branch of *J. excelsa*, [30], HD 1624.
80. *Pyrofomes demidoffii* (Lév.) Kotl. & Pouzar; on living tree of *J. excelsa*, [2], HD 1877; [7], HD 1310; [12], HD 2165; [15],

HD 1658; [28], HD 1721; [29], HD 1486; [34], HD 1296, HD 1515; on living tree of *J. foetidissima*, [2], HD 1284, [3], HD 1934, 1947, 1955; [8], HD 2011; [10], HD 2033; [17], HD 1262; [19], HD 1570; [20], HD 1552; [24], HD 1970; [25], HD 1984; [31], HD 1415; [33], HD 2231.

81. *Skeletocutis amorpha* (Fr.) Kotl. & Pouzar; on fallen branch of *J. foetidissima*, [34], HD 1549.
82. **Skeletocutis percandida* (Malençon & Bertault) Jean Keller; on rotten wood of *J. foetidissima*, [17], HD 1268 (Figure 5).
83. *Trichaptum fuscoviolaceum* (Ehrenb.) Ryvarden; on stump of *J. foetidissima*, [29], HD 1500.

Psathyrellaceae

84. *Parasola auricoma* (Pat.) Redhead, Vilgalys & Hopple; in grass in *J. excelsa* stand, [32], HD 1319.

Pterulaceae

85. ***Globulicium hiemale* (Laurila) Hjortstam; on rotten wood of *J. excelsa*, [3], HD 1940 (Figure 5).
86. *Radulomyces confluens* (Fr.) M.P.Christ.; on rotten wood of *J. excelsa*, [12], HD 2171; on rotten wood of *J. foetidissima*, [12], HD 2169.
87. **Radulomyces rickii* (Bres.) M.P.Christ.; on rotten wood of *J. excelsa*, [34], HD 1522, HD 1538; on rotten wood of *J. foetidissima*, [10], HD 2037; [29], HD 1505; [34], HD 1285, HD 1294 (Figure 6).

Schizophoraceae

88. **Hyphodontia alienata* (S.Lundell) J.Erikss.; on rotten wood of *J. excelsa*, [12], HD 2174 (Figure 6).
89. *Hyphodontia alutaria* (Burt) J.Erikss.; on rotten wood of *J. excelsa*, [13], HD 1700; [31], HD 1830; [19], on rotten wood of *J. foetidissima*, HD 1579, HD 1581.
90. *Hyphodontia arguta* (Fr.) J.Erikss.; on rotten wood of *J. excelsa*, [6], HD 1311; [14], HD 1668; [19], HD 1574; [27], HD 2102;

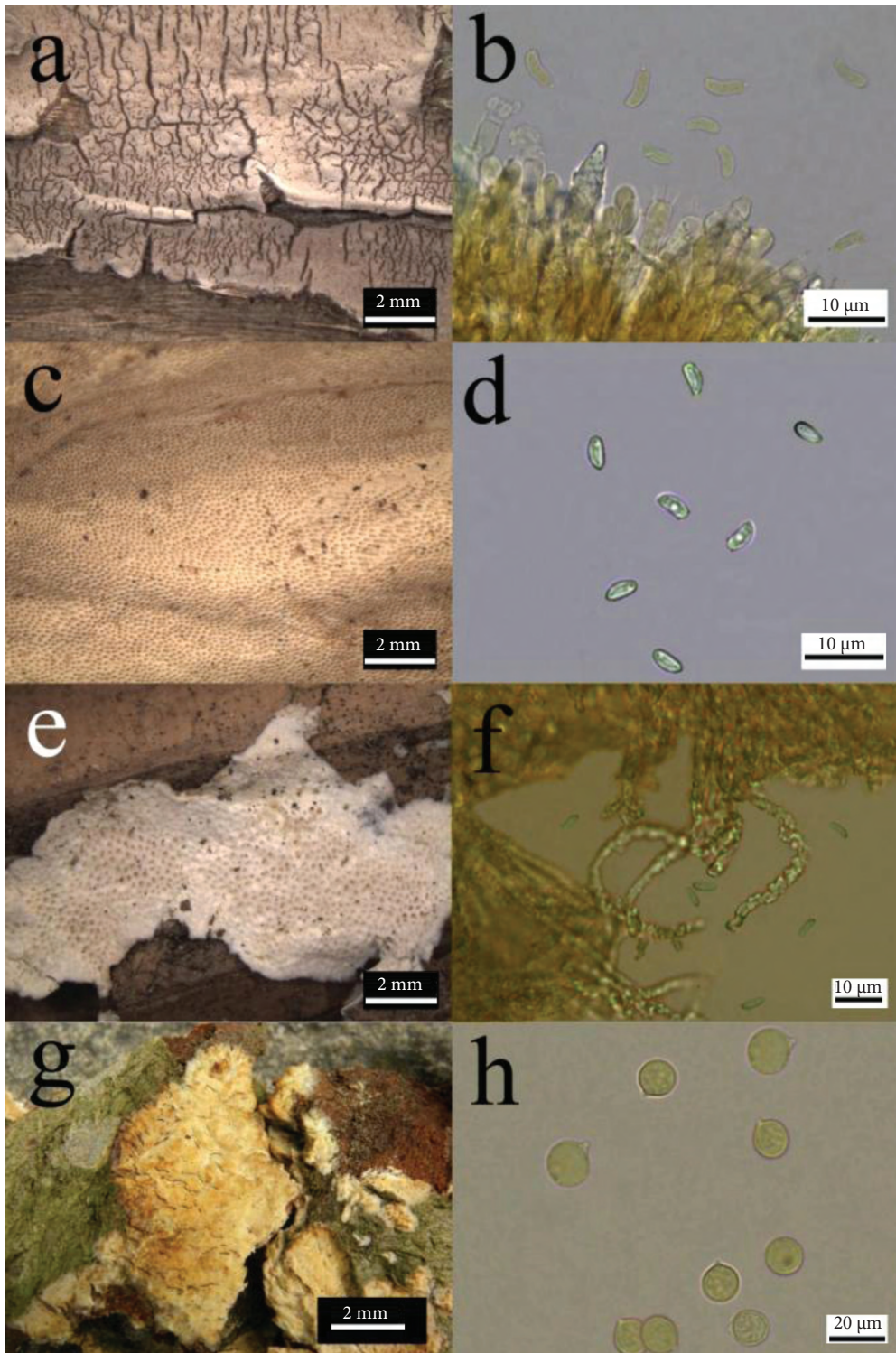


Figure 5. a) Basidiocarp and b) cystidia and basidiospores of *Peniophora junipericola*, c) basidiocarp and d) basidiospores of *Erastia salmonicolor*, e) basidiocarp and f) encrusted hyphal ends and basidiospores of *Skeletocutis percandida*, g) basidiocarp and h) basidiospores of *Globulicium hiemale*.

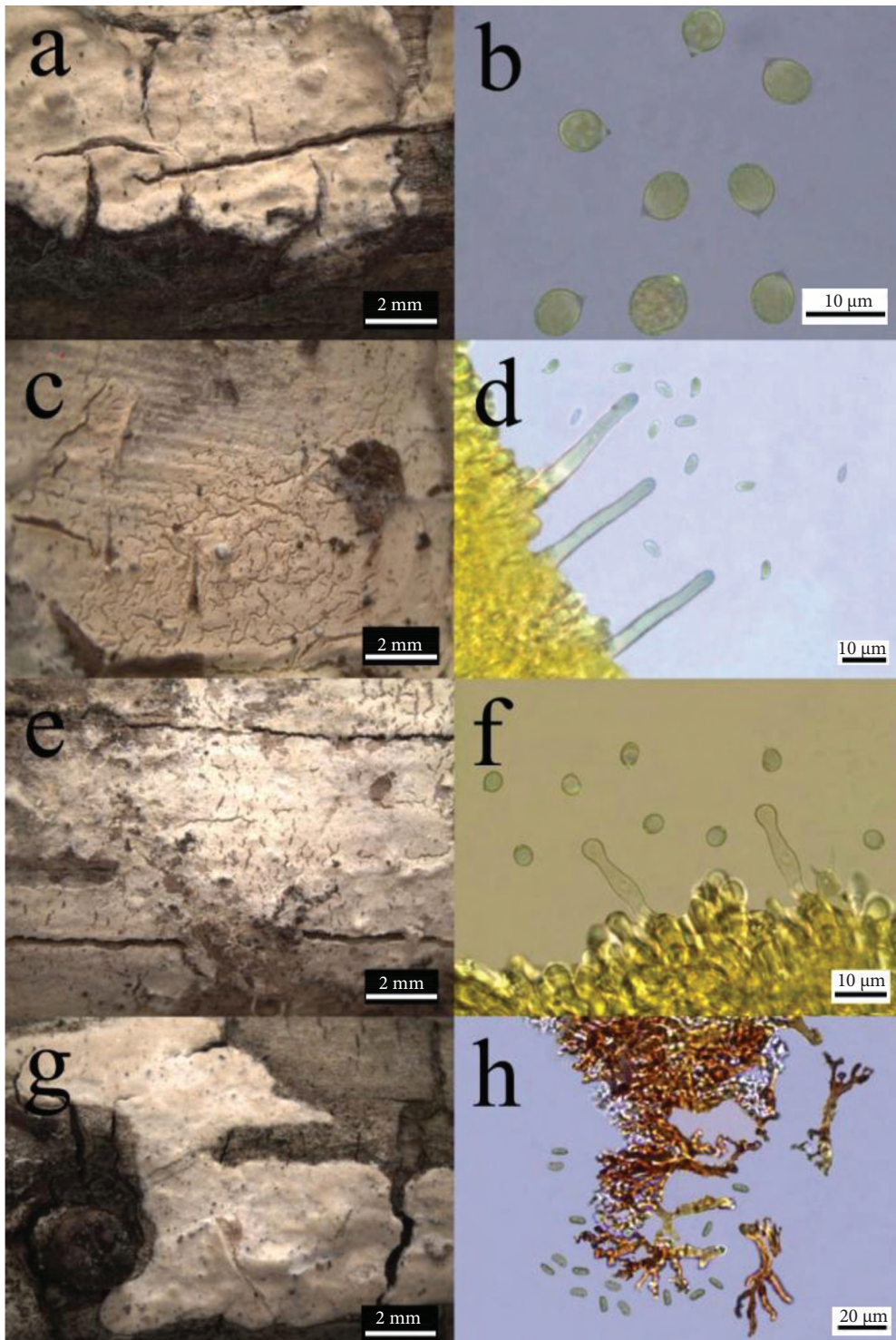


Figure 6. a) Basidiocarp and b) basidiospores of *Radulomyces rickii*, c) basidiocarp and d) cystidia and basidiospores of *Hyphodontia alienata*, e) basidiocarp and f) cystidia and basidiospores of *H. aspera*, g) basidiocarp and h) acanthohyphidia and basidiospores of *Aleurodiscus dextrinoideocerussatus*.

- [31], HD 1822; [34], HD 2185; on rotten wood of *J. foetidissima*, [19], HD 1573; [23], HD 1973; [30], HD 1606.
91. ***Hyphodontia aspera** (Fr.) J.Erikss.; on rotten wood of *J. excelsa*, [3], HD 1907, 1920, 1921; [31], HD 1478 (Figure 6).
92. **Hyphodontia cineracea** (Bourdot & Galzin) J.Erikss. & Hjortstam; on rotten wood of *J. excelsa*, [29], HD 1493.
93. **Hyphodontia juniperi** (Bourdot & Galzin) J.Erikss. & Hjortstam; on bark of living *J. excelsa*, [1], HD 1897; [2], 1942, HD 1950; [7], HD 1308; [12], HD 2168; [13], HD 1715; [14], HD 1684; [15], HD 1655; [16], HD 1247, HD 1255, HD 1258; [18], HD 1565; [24], HD 1956, 1957; [26], HD 1985; [29], HD 1490, HD 1508; [34] HD 1525; on bark of living *J. foetidissima*, [2], HD 1887, HD 1914; [9], HD 2029; [17], HD 1261; [19], HD 1572, HD 1594; [26], HD 1273, HD 1975; [29], HD 1489; [30], HD 1616, HD 1634; [34], HD 1292.
94. **Hyphodontia nespori** (Bres.) J.Erikss. & Hjortstam; on rotten wood of *J. foetidissima*, [34], HD 1529, HD 1636.
95. **Hyphodontia sambuci** (Pers.) J.Erikss.; on rotten wood of *J. excelsa*, [3], HD 1933; [34], on rotten wood of *J. foetidissima*, HD 1535.
96. **Hyphodontia subalutacea** (P.Karst.) J.Erikss.; on rotten wood of *J. excelsa*, [3], HD 1944; [31], HD 1456; [34], on rotten wood of *J. foetidissima*, HD 1536.
- Sebacinaceae**
97. **Sebacina grisea** (Pers.) Bres.; on rotten wood of *J. excelsa*, [2], HD 1878.
98. **Sebacina incrustans** (Pers.) Tul. & C.Tul.; on rotten wood of *J. excelsa*, [2], HD 1893.
- Stereaceae**
99. **Aleurodiscus cerussatus** (Bres.) Höhn. & Litsch.; on fallen branch of *J. excelsa*, [1], HD 1896; [2], HD 1883; [14], HD 1688; [15], HD 1642; [22], HD 2042; [31], HD 1829; [34], HD 1519; on fallen branch of *J. foetidissima*, [2], HD 1876; [26], HD 1976; [34], HD 1531.
100. ***Aleurodiscus dextrinoideocerussatus** Manjón, M.N.Blanco & G.Moreno; on fallen branch of *J. excelsa*, [1], HD 1898; [21], HD 2049; [31], HD 2055; on fallen branch of *J. foetidissima*, [10], HD 2035; [34], HD 2178 (Figure 6).
101. ***Gloeocystidiellum luridum** (Bres.) Boidin; on rotten wood of *J. excelsa*, [12], HD 2175; [31], HD 1828, HD 2058; [32], HD 2064, 2065; on rotten wood of *J. foetidissima*, [29], HD 1495 (Figure 7).
102. **Stereum hirsutum** (Willd.) Pers.; on stump of *J. excelsa*, [34], HD 2183.
103. **Stereum sanguinolentum** (Alb. & Schwein.) Fr.; on stump of *J. foetidissima*, [34], HD 1520.
- Strophariaceae**
104. **Agrocybe vervacti** (Fr.) Singer; in grass in *J. excelsa* stand, [32], HD 1314.
105. **Stropharia coronilla** (Bull.) Quél.; in grass in *J. excelsa*, [32], HD 1312.
106. **Stropharia semiglobata** (Batsch) Quél.; in grass in *J. excelsa*, [32], HD 1313.
- Suillaceae**
107. **Suillus luteus** (L.) Roussel; in *J. foetidissima* and *P. nigra* stand, [33], HD 2224.
- Thelephoraceae**
108. **Lenzitopsis oxycedri** Malençon & Bertault; on branch of living *J. foetidissima*, [17], HD 1250, 1256; [33], HD 2230; [34], HD 1291.
109. **Tomentella ferruginea** (Pers.) Pat.; on rotten wood of *J. excelsa*, [3], HD 1923, 1936.
- Tremellaceae**
110. **Tremella mesenterica** Schaeff.; on rotten branch of *J. excelsa*, [34], HD 1295.
- Tricholomataceae**
111. **Ampulloclitocybe clavipes** (Pers.) Redhead, Lutzoni, Moncalvo & Vilgalys; in grass in *J. excelsa* stand, [12], HD 2154.
112. ***Leucopaxillus lentus** (Sacc.) Courtec.; in grass in *J. excelsa* stand, [12], HD 2157 (Figure 7).

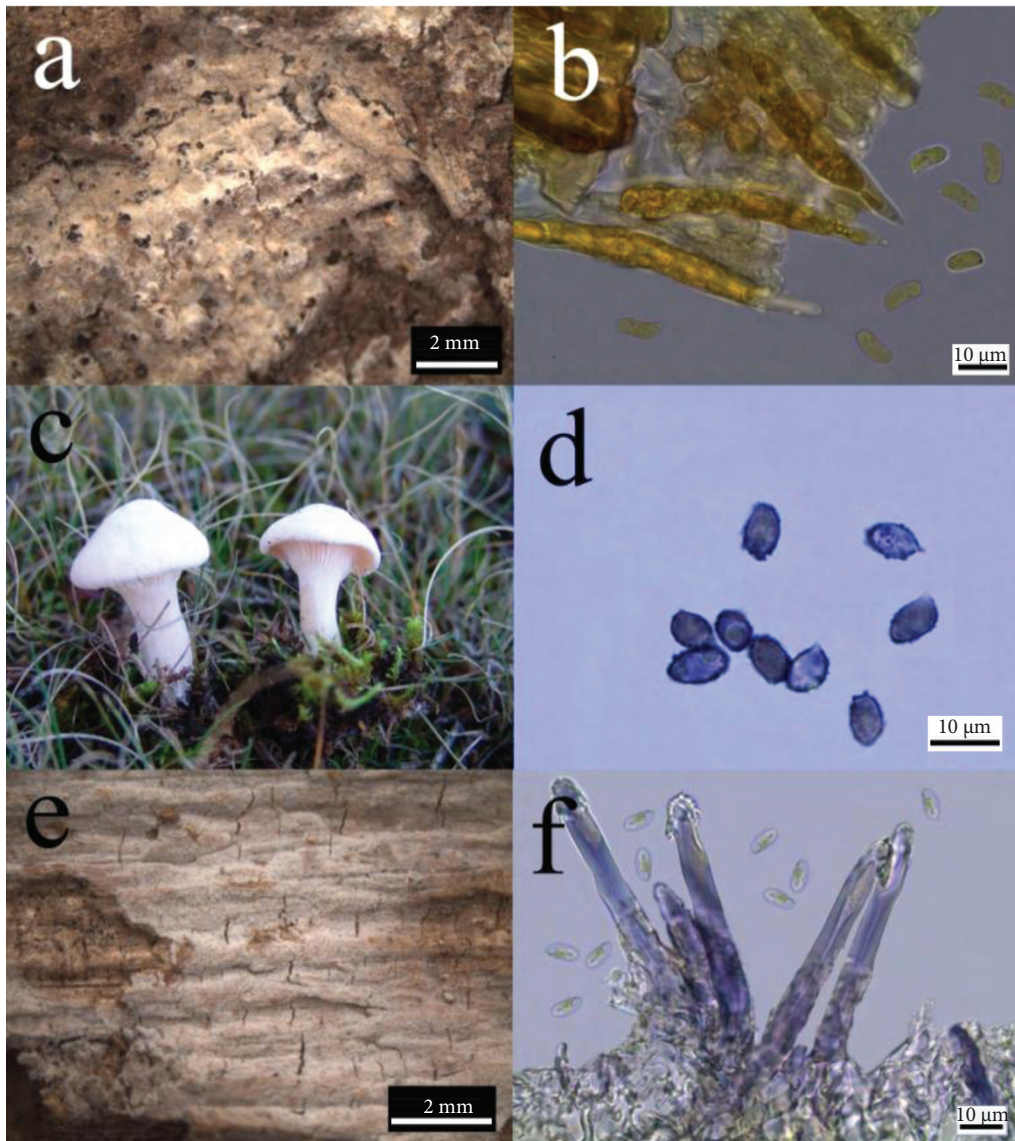


Figure 7. a) Basidiocarp and b) gloeocystidia and basidiospores of *Gloeocystidiellum luridum*, c) basidiocarp and d) basidiospores of *Leucopaxillus lentus*, e) basidiocarp and f) cystidia and basidiospores of *Tubulicrinis hamatus*.

113. **Clitocybe candicans** (Pers.) P.Kumm.; on mossy spots in *J. excelsa* forest, [12], HD 2163.
114. **Clitocybe candida** Bres.; in grass in *J. excelsa* stand, [32], HD 1326.
115. **Clitocybe odora** (Bull.) P.Kumm.; under *Q. coccifera* in *J. excelsa* forest, [12], HD 2162.
116. **Collybia cirrhata** (Schumach.) Quél.; on stump of *J. excelsa*, [32], HD 1315.
117. **Melanoleuca graminicola** (Velen.) Kühner & Maire; in grass in *J. excelsa* stand, [12], HD 2160.
118. **Melanoleuca humilis** (Pers.) Pat.; in grass in *J. excelsa* stand, [32], HD 1322.
119. **Tricholoma fracticum** (Britzelm.) Kreisel; in *P. nigra* stand in *J. excelsa* forest, [33], HD 2217.

120. *Tricholoma myomyces* (Pers.) J.E.Lange; in *P. nigra* stand in *J. excelsa* forest, [33], HD 2221.

Tubulicrinaceae

121. *Tubulicrinis calothrix* (Pat.) Donk; on rotten wood of *J. excelsa*, [2], HD 1888; on rotten branch of *J. excelsa*, [3], HD 1932, HD 1945; [15], HD 1639, HD 1656; [31], HD 1464, HD 2060; on rotten branch of *J. foetidissima*, [20], HD 1563; [29], HD 1503a.
122. *Tubulicrinis glebulosus* (Fr.) Donk; on rotten wood of *J. foetidissima*, [29], HD 1506; on rotten wood of *J. foetidissima*, [34], HD 1518.
123. **Tubulicrinis hamatus* (H.S.Jacks.) Donk; on rotten wood of *J. excelsa*, [31], HD 2062, 2063 (Figure 7).
124. *Tubulicrinis medius* (Bourdot & Galzin) Oberw.; on rotten wood of *J. excelsa*, [3], HD 1939; [31], HD 1751, HD 1825; on rotten wood of *J. foetidissima*, [19], HD 1593.
125. *Tubulicrinis sororius* (Bourdot & Galzin) Oberw.; on rotten wood of *J. foetidissima*, [19], HD 1595, 1598; on rotten wood of *J. foetidissima*, [30], HD 1626.
126. *Tubulicrinis subulatus* (Bourdot & Galzin) Donk; on rotten wood of *J. excelsa*, [2], HD 1873; [31], HD 1458, 1470, 1473, 1474, 1831, 2092; on rotten wood of *J. foetidissima*, [11], HD 1496; [19], HD 1590, 1601; [33], HD 2219.
127. *Tubulicrinis thermometrus* (G.Cunn.) M.P.Christ.; on rotten wood of *J. excelsa*, [3], HD 1935; on rotten wood of *J. foetidissima*, [11], HD 1497; [29], HD 1512.

Discussion and conclusion

The total number of recorded macrofungi is 127. These fungi belong to phyla Ascomycota (2), and Basidiomycota (125) and to 38 families, mainly to Agaricaceae (18), Tricholomataceae (10), Geastraceae

(9), Schizophoraceae (9), Tubulicrinaceae (7), Polyporaceae (6), and Atheliaceae, Meruliaceae, and Stereaceae (5 each), while the other 29 families each have fewer than 5 species.

Of the identified species, 1 taxon of Ascomycota and 22 taxa of Basidiomycota are new, and 5 are new genera records for Turkey. These new species are as follows: *Pyrenopeziza petiolaris* (Ascomycota), *Aleurodiscus dextrinoideocerussatus*, *Amyloathelia amyloacea*, *Athelia fibulata*, *Byssoporia terrestris*, *Erastia salmonicolor*, *Globulicium hiemale*, *Gloeocystidiellum luridum*, *Hyphoderma multicystidiatum*, *H. obtusum*, *Hyphodontia alienata*, *H. aspera*, *Laeticorticium polygonioides*, *Leucopaxillus lentus*, *Mycoacia aurea*, *Peniophora junipericola*, *Postia simani*, *Radulomyces rickii*, *Scytinostroma galactinum*, *Skeletocutis percandida*, *Steccherinum litschaueri*, *Subulicium rillum*, and *Tubulicrinis hamatus*.

The new genera are *Pyrenopeziza*, *Amyloathelia*, *Byssoporia*, *Globulicium*, and *Subulicium*.

According to sample abundance, the Antalya region comes first with 66 specimens, Mersin is second with 51 specimens, Muğla is third with 40, and Adana is fourth with 36. In these areas, juniper forests are in healthy condition, and most of the areas are protected. The best examples of protected areas are Antalya-Çiğlikara and Muğla-Babadağ. In these regions, juniper forests are very common and there are many old trees, along with fallen trunks, wood debris, and rotten wood debris. In these stands, the forest ecosystem offers favourable conditions for the growth of macrofungi.

In the Ankara, Amasya, and Kütahya regions, juniper stands are degraded and there are few healthy forests. While we visited these areas more often, we could not collect more material due to the fact that there were not cut trees, decaying wood, or any fallen wood remnants.

The number of species identified in *J. excelsa* stands was 69 (54%), in *J. foetidissima* stands 23 (18%), and in juniper stands (both species) 35 (28%). There were 47 terricolous species and 80 lignicolous species. The state of the lignicolous macromycete species, as far as substrates are concerned, was as follows: 30 species on *Juniperus excelsa*, 19 on *J. foetidissima*, and 31 species on both juniper substrates. The numbers of

the terricolous species according to substrates were as follows: 39 species on *Juniperus excelsa*, 4 species on *J. foetidissima*, and 4 species on both.

Three of the lignicolous species, *Antrodia juniperina*, *Pyrofomes demidoffii*, and *Phellinus torulosus*, are parasitic. *P. demidoffii* is a dangerous parasite on both juniper species and causes considerable damage in its associations. The rest of the species can be saprobes or parasites and grow on rotten branches and trunks or on living trees. A number of them, such as *Hyphodontia juniperi*, *Lenzitosia oxycedri*, and *Mycena juniperina*, grow on the bark of living trees, whereas *Peniophora* species grow on dry branches of living trees.

The most frequent species were as follows: *Hyphodontia juniperi* (30), *Antrodia juniperina* (26), *Pyrofomes demidoffii* (21), *Tubulicrinis subulatus* (11), *Dacrymyces stillatus* (11), *Aleurodiscus cerussatus* (10), *Hyphodontia arguta* (9), *Hymenochaete fuliginosa* (9), *Tubulicrinis calothrix* (9), *Athelia decipiens* (8), *Gloeophyllum abietinum* (8), *Peniophora junipericola* (8), *Phellinus torulosus* (7), *Gloeocystidiellum luridum* (6), *Hyphoderma obtusum* (6), *Radulomyces rickii* (6), *Aleurodiscus dextrinoideocerussatus* (5), and *Mycena juniperina* (5). These species were found on most of the juniper hosts and at the majority of studied localities during almost every visit.

Somewhat less common, rare, or only found once or twice were the following: *Amphinema byssoides*, *Amylostereum laevigatum*, *Athelia fibulata*, *A. neuhoffii*, *Botryobasidium subcoronatum*, *Botryohypochnus isabellinus*, *Byssoporia terrestris*, *Coniophora arida*, *Dacryobolus sudans*, *Dichostereum granulorum*, *Erastiasalmonicolor*, *Globulicium hiemale*, *Hydnopolyporus fimbriatus*, *Hyphoderma occidentale*, *Hyphodontia alienata*, *Laeticorticium polygonioides*, *Mycoacia aurea*, *Peniophorella praetermissa*, *Phellinus sulphurascens*, *Postia simani*, *Pyrenopeziza petiolaris*, *Radulomyces confluens*, *Scytinostroma galactinum*, *Sebacina grisea*, *S. incrustans*, *Skeletocutis amorpha*, *S. percardida*, *Steccherinum litschaueri*, *Subulicium rillum*, *Subulicystidium longisporum*, *Tapesia fusca*, *Tomentella ferruginea*, *Trechispora fastidiosa*, and *Tubulicrinis hamatus*.

Particularly interesting were *Antrodia juniperina*, *Pyrofomes demidoffii*, *Lenzitosia oxycedri*, and

Mycena juniperina. Their distribution and hosts are discussed below.

Antrodia juniperina is known in eastern Africa (Ethiopia, Kenya, and Tanzania) as a parasite and saprobe on old trunks of *Juniperus procera* (Niemelä & Ryvarden, 1975). In the USA, it grows on *Juniperus deppeana*, *J. monosperma*, *J. osteosperma*, and *J. virginiana* (Gilbertson & Ryvarden, 1986). In Europe, it is known in Spain, growing on *Juniperus thurifera* (Garcia-Manjon & Moreno, 1981), and in Bulgaria (Ryvarden & Gilbertson, 1993) and Macedonia on *J. excelsa* (Karadelev, 1995). This species is common and it was found at almost all of the observed localities. It grows as a saprobe, rarely as a parasite, on old trunks of *J. excelsa* (Doğan & Karadelev, 2006a).

Lenzitosia oxycedri causes white rot in *Juniperus* spp. It has unknown cultural characteristics and sexuality (Ryvarden & Gilbertson, 1993). According to the available literature, this is a very rare species, known only from one locality in Morocco and one in Guadalajara province in Spain. The species is apparently restricted to juniper and is known from *J. oxycedrus* and *J. thurifera* (Garcia-Manjon & Moreno, 1981). Bernicchia (2000) also reported this species from Italy, growing as a saprobe on *J. oxycedrus*. Doğan et al. (2007) studied the ecology and distribution of this species in Turkey.

Mycena juniperina is a member of the section *Supinae* Konrad & Maubl., which consists of 7 species in Europe. *M. juniperina* can be distinguished from the other members of this section by the colour of the pileus and its growth on juniper. Its microscopic features display a resemblance to the widely distributed European species *M. meliigena* and *M. pseudocorticola*. Among the differences between these 2 species and *M. juniperina*, the following could be noted: both of them grow exclusively on the bark of deciduous trees, while *M. juniperina* grows on coniferous trees; in addition, both their stipes and pilei are different in colour. Another species, *M. cupressina*, recently described from Italy (Antonín & Maas Geesteranus, 1998) has a similar ochraceous-coloured basidioma, but differs from *M. juniperina* by the smooth hyphae of the stipitipellis and by its habitat, *Cupressus sempervirens*. Doğan and Karadelev (2006b) studied the ecology and distribution of this species in Turkey.

P. sulphurascens causes a yellowish laminated rot of the roots in Douglas-fir (*P. menziesii*) and other conifers in North America and in Siberia, from where it was originally described on *Abies* sp. The fungus penetrates the root through intact bark, where it produces a thin layer of cream to dark yellow mycelium covering the outer bark of infected roots. Older infected trees may live in a slowly declining state for many years, whereas trees that are 10-15 years old will usually decay within 3 or 4 years. The infected area advances by about 30 cm each year (Lim et al., 2005). According to the known distribution data, this is a very rare species in Europe, where it is known only from the Ural Mountains in Russia, and the species is also widespread further to the east and southeast and into North America (Ryvarden & Gilbertson, 1993). Kotiranta et al. (2005) announced that the westernmost growth location of *P. sulphurascens* is the south Urals. Doğan and Karadelev (2009) published data on the distribution of this species in Turkey.

P. demidoffii is a dangerous parasite on various *Juniperus* spp. in eastern Africa (Ryvarden & Johansen, 1980), and it is also common on species of this genus in North America (Gilbertson & Ryvarden, 1987). Bondartsev (1971) mentioned it found in the Caucasus, Uzbekistan, Siberia, and Crimea, mostly on *Juniperus* spp., but also on *Cupressus* and *Pinus*. He considered it to be a subtropical species. Ryvarden (1991) compiled a map of the world distribution of *P. demidoffii*. It also occurs in Bulgaria on *Juniperus excelsa* (Ryvarden & Gilbertson, 1993). It causes extensive damage in juniper associations. Detailed data on the distribution of this species in Turkey has been provided by Doğan and Karadelev (2006a).

Some of the species, such as *Amylostereum laevigatum*, *Antrodia juniperina*, *Hyphodontia*

juniperi, *Lenzitopsis oxycedri*, *Mycena juniperina*, *Peniophora junipericola*, *Phellinus sulphurascens*, and *Pyrofomes demidoffii*, grow predominantly or exclusively on various species of the genus *Juniperus*. *H. juniperi* also occurs on deciduous woods. Some of these species, such as *A. juniperina* and *P. demidoffii*, occur only on scale-leaf juniper species.

Some other species, such as *Amyloathelia amyloacea*, *Asterostroma cervicolor*, *Dacryobolus sudans*, *Erastia salmonicolor*, *Gloeophyllum abietinum*, *Hymenochaete fuliginosa*, *Panellus mitis*, *Peniophora junipericola*, and *Stereum sanguinolentum*, are typical of conifers (*Abies*, *Pinus*, and *Picea*), while species such as *Polyporus arcularius* and *Stereum hirsutum* usually grow on deciduous wood.

Another interesting species is *Myriostoma coliforme*. The first data were given in Turkey by Asan et al. (2002). Apparently, this species is very rare, and it must be included in the list of threatened species. However, in the course of our research, it was found 6 times, in Adana, Antalya, and Mersin. This species generally grows on chalky soil in pure *J. excelsa* or *J. foetidissima* stands.

With this study, we added some important data and new species to the Turkish mycobiota, and we explained the fungal diversity for the special habitat of *J. excelsa* and *J. foetidissima*.

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