

한국산 참나무 목재부후균의 조사목록

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A Checklist of Decay Fungi Associated with Oak Trees in Korea

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(Received June 10, 2008. Accepted September 19, 2008)

ABSTRACT: Six species of oak are commonly found in Korean forests growing together with evergreen pines. Korean oak forests have recently been attacked by ambrosial fungi of the genus *Raffaelea* and by many other fungal species that are vectored by the beetle *Platypus koryoensis*. We investigated a full list of the diverse decay fungi as a first step to better understand the association between these fungi and oak trees, as well as considering effective management methods for oak forests in Korea. Through examination of specimens deposited in the Seoul National University Fungus Collection (SFC) and the National Institute of Biological Resources (NIBR), 523 decay fungi (104 species) associated with oak trees were identified and a full list is provided.

KEYWORDS : Decay fungi, NIBR, Oak trees, SFC

Oak trees are common in Korean forests in association with evergreen pines. Six species of oak occur in Korea: *Quercus aliena* (oriental white oak), *Q. acutissima*, *Q. serrata* (Konara oak), *Q. mongolica*, *Q. dentata*, and *Q. variabilis* (oriental oak, cork oak; Lee and Cho, 1981). Because the wood of oaks is very strong and hard, oak trees have been used to make furniture, flooring, and timberframe buildings (Kim, 1994). Acorns are also used for making flour, coffee, and a jelly called Muk.

Oak trees are very resistant to insect and fungal attacks because of their high tannin content (Faeth, 1985). However, many oak trees in Korea have been killed by ambrosial fungi of the genus *Raffaelea*, which are vectored by the beetle *Platypus koryoensis* (Hong *et al.*, 2006). Oak dieback has been recorded in Korea since 2004, and the number of infected trees has increased every year. Among *Quercus* species, *Q. mongolica* is more susceptible than the other species (Hong *et al.*, 2006). The oak dieback epidemic in Japan started in the late 1980s, probably because of a warmer climate that has allowed the beetle to extend its distribution to more northerly latitudes and higher altitudes (Kamata *et al.*, 2002; Esaki *et al.*, 2004). Therefore, we

consider that global warming is responsible for the present oak dieback epidemic in Korea.

For effective management of oak forests, it is necessary to investigate symbiotic ectomycorrhizal and decay fungi as well as pathogenic fungi associated with oak trees. Ectomycorrhizal fungi link tree root systems through a common mycorrhizal network that transfers carbon and nutrients among trees (Finnlay and Read, 1985; Simard *et al.*, 1997). Wood-decay fungi play a key role in maintaining the dynamic and ever-changing nature of forests, although they are often described as harmful organisms that cause economic losses of wood. For example, decay fungi make older trees more susceptible to windthrow through heartwood decay, but this permits the growth of young and vigorous trees. Partially decayed wood residues from brown-rot fungi are an important component in forests and increase the water-holding capacity and improve other physical and chemical soil characteristics essential for establishment and growth of many tree species (Alexopoulos *et al.*, 1996; Gilbertson, 1980).

Previously, some decay fungi were reported from Korean oak trees (Jung, 1992, 1994, 1995, 1996a, b; Lee, 2006; Lee and Jung, 2006; Lee *et al.*, 2002, 2004; Lim, 2001; Lim and Jung, 1999, 2001; Lim *et al.*, 1999, 2000). However, there is no complete list of oak decay fungi found in

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Korea. Here, we report a list of diverse decay fungi as a first step to better understanding the association of these fungi and oak trees in Korea.

Materials and Methods

The decay fungi were collected between 1990 and 2007. Samples were brought to the laboratory and completely dried over mild heat for several days. All the specimens were identified by macromorphological and microscopic examination. The measurements and drawings of microscopic structures were made from slide preparations mounted in 3% KOH and stained with aqueous phloxine (Largent *et al.*, 1977). Dried specimens were deposited in the Seoul National University Fungus Collection (SFC) and the National Institute of Biological Resources (NIBR).

For general fungal taxonomy and identification, the Donkian concept (Donk, 1964) was adopted for Aphyllophorales. Identification of polypores followed Gilbertson and Ryvarden (1986, 1987), Ryvarden and Gilbertson (1993, 1994), and Ryvarden and Johansen (1980). Identification of corticioid fungi used the classification systems of Eriksson (1958), Eriksson and Ryvarden (1973, 1975, 1976), Eriksson *et al.* (1978, 1981, 1984), Parmasto (1968), and Lim (2001). To conform to the latest scientific and Korean names, the CABI Bioscience Database of Fungal Names (<http://www.indexfungorum.org/Names/Names.asp>) and Lee and Jung (2005), respectively, were consulted.

Results and Discussion

In total, 523 decay fungi deposited in SFC (268 specimens) and NIBR (255 specimens) were investigated, and 104 species from 62 genera were finally identified. The fungal flora on oak trees generally had high species diversity. Most were polyporoid and corticioid fungi; 298 specimens (56.8%) of 59 species (56.2%) were polypores, and 176 specimens (33.6%) of 35 species (34.3%) were corticioid fungi. Although many of decay fungi belonging to the polypores play an important role in the deterioration of various wood products (Scheffer *et al.*, 1984), Kim *et al.* (2005) suggested that the corticioid fungi might also play a role in decaying wood. Our results are similar to those of Kim *et al.* (2005). The dominant fungi were *Trametes versicolor* (39 specimens), *Stereum peculiare* (38), *Lenzites betulina* (24), *Schizopora paradoxa* (24), *Inonotus xeranticus* (18), *Panellus stipticus* (18), *Phlebia chrysocreas* (18), *Cerrena consors* (17), *Hyphoderma*

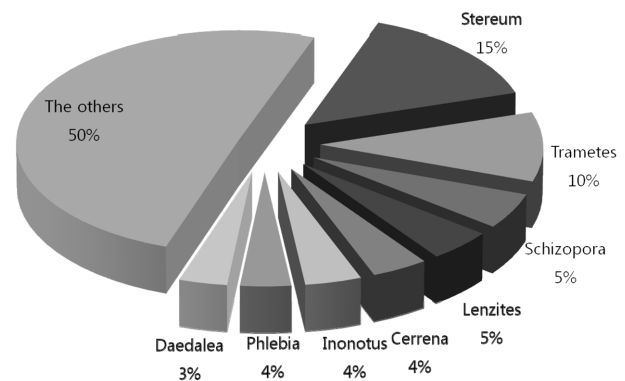


Fig. 1. Common decay fungi collected from Korean oak trees.

setigerum (17), *Daedalea dickinsii* (16), *Hydnochaete tabacinoides* (16), *Stereum subtomentosum* (16), *Stereum hirsutum* (15), *Daedaleopsis tricolor* (12), *Trichaptum biforme* (12), *Phellinus gilvus* (10), and *Schizophyllum commune* (10) (Fig. 1).

Decay fungi cause white and brown rot in oak trees. We found that 485 specimens (92.6%) representing 94 species were white rot fungi and only 38 specimens (7.3%) from 10 species were brown rot fungi. The majority of brown rot fungi were polypores from nine species; *Antrodia albida*, *A. heteromorpha*, *A. malicola*, *A. serialis*, *Daedalea dickinsii*, *D. quercina*, *Laetiporus sulphureus*, *Oligoporus tephroleucus*, and *Piptoporus betulinus*. In the Agaricales, *Lentinula edodes* is known to cause brown rot (Gilbertson, 1980; Gilbertson and Ryvarden, 1986).

A specific relationship between decay fungi and *Quercus* species was not found. Most decay fungi fruit on fallen or decayed wood of various oak tree species. However, interspecific hybridization is quite common among oaks, and white oaks often have weak internal barriers to hybridization (Arnold, 1997; Williams *et al.*, 2001).

Our primary objective was to investigate the diversity of wood-rotting fungi that participated in the decay of Korean oak trees. Although this study did not deal with the wood-rotting mechanism of the fungal species, it provides important information for the effective management of oak trees, in addition to further study of the decay process.

List of decay fungi associated with oak trees in Korea

The list is arranged alphabetically by the scientific name. 'Ibid' represents the same place cited for the species listed immediately above.

1. *Abortiporus biennis* (Bull.) Singer 적갈색유관버섯

Specimen examined: on dead fallen twig of *Quercus* sp., Mt.

Bangtae, Inje-gun, Gangwon Province (NIBRFG0000000983); on *Q. variabilis*, Mt. Jiri, Hamyang-gun, Gyeongnam Province (SFC 011114-15); on dead fallen twig of *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (SFC 981015-31)

2. *Abundisporus fuscopurpureus* (Pers.) Ryvarden 자색 구멍버섯

Specimen examined: on dead trunk of *Quercus* sp., Mt. Juheul, Mungyeong-si, Gyeongbuk Province (SFC 961111-22); *Ibid*, Gangchon, Chuncheon-si, Gangwon Province (SFC 000922-17); *Ibid*, *Ibid* (SFC 000922-22); on fallen twig of *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (SFC 991003-21); on dead trunk of *Quercus* sp., *Ibid* (SFC 991109-28)

3. *Antrodia albida* (Fr.) Donk 주름구멍버섯

Specimen examined: on dead trunk of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001829)

4. *Antrodia heteromorpha* (Fr.) Donk 그물주름구멍버섯

Specimen examined: on dead *Quercus* sp., Mt. Bukhan, Yangju-si, Gyeonggi Province (SFC 971008-07); on dead fallen twig of *Q. variabilis*, Mt. Chilgap, Cheongyang-gun, Chungnam Province (SFC 980508-B17); on dead fallen twig of *Q. serrata*, Bukgok-ri, Myeongho-myeon, Bonghwa-gun, Gyeongbuk Province (SFC 991219-07); on *Q. variabilis*, *Ibid* (NIBRFG0000001681); on dead branch of *Quercus* sp., Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 950211-22); on dead trunk of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001835)

5. *Antrodia malicola* (Berk. & M.A. Curtis) Donk 사과 주름구멍버섯

Specimen examined: on dead *Quercus* sp., Mt. Jiri, Hamyang-gun, Gyeongnam Province (SFC 011114-21); *Ibid*, Mt. Gaya, Hapcheon-gun, Gyeongnam Province (NIBRFG0000000939); *Ibid*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001617); on dead fallen twig of *Q. serrata*, *Ibid* (SFC 991003-23); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (SFC 021011-21)

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

Specimen examined: on stump of dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000075)

7. *Athelia fibulata* M.P. Christ. 조각부후고약버섯

Specimen examined: on *Quercus* sp., Mt. Songni,

Boeun-gun, Chungbuk Province (NIBRFG0000001864)

8. *Athelia neuhoffii* (Bres.) Donk 큰부후고약버섯

Specimen examined: on stump of broken *Quercus* sp., Mt. Gwanak, Gwacheon-si, Gyeonggi Province (SFC 900927-01)

9. *Bjerkandera adusta* (Willd.) P. Karst. 줄버섯

Specimen examined: on stump of broken *Quercus* sp., Mt. Bukhan, Seongbuk-gu, Seoul (SFC 980527-07); on dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020928-01); on fallen twig of *Quercus* sp. *Ibid* (SFC 021011-23); on fallen twig of *Q. serrata*, *Ibid* (SFC 970111-02)

10. *Bjerkandera fumosa* (Pers.) P. Karst. 흰둘레줄버섯

Specimen examined: on fallen twig of *Q. aliena*, Mt. Cheonggye, Gapyeong-gun, Gyeonggi Province (NIBRFG0000001235); on *Q. variabilis*, Mt. Hwangjang, Mungyeong-si, Gyeongbuk Province (SFC 010221-25); on stump of dead *Quercus* sp., Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 950211-03)

11. *Botryohypochnus isabellinus* (Fr.) J. Erikss. 옹단고약버섯

Specimen examined: on shiitake mushroom logs (= *Quercus* sp.), Isl. Bogil, Wando-gun, Jeonnam Province (SFC 960807-5A)

12. *Ceriporia purpurea* (Fr.) Komarova 분홍그물구멍버섯

Specimen examined: on fallen twig of *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001641)

13. *Ceriporiopsis gilvescens* (Bres.) Domański 밀구멍버섯

Specimen examined: on dead *Q. variabilis*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020417-18); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001761)

14. *Cerrena consors* (Berk.) K.S. Ko & H.S. Jung 송곳니털구름버섯

Specimen examined: on fallen twig of *Q. variabilis*, Bonghwa-gun, Gyeongbuk Province (SFC 991219-14); on trunk of *Quercus* sp., Mt. Duryun, Haenam-gun, Jeonnam Province (SFC 030301-01); on fallen twig of *Quercus* sp., Mt. Geomdan, Hanam-si, Gyeonggi Province (SFC 991127-

12); on dead *Q. variabilis*, Mt. Gaji, Ulju-gun, Ulsan (NIBRFG0000002046); on fallen twig of *Q. variabilis*, Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-01); on fallen twig of *Q. aliena*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001570); on trunk of *Quercus* sp., *Ibid* (NIBRFG0000001571); on dead *Q. variabilis*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001859); on stump of *Q. variabilis*, *Ibid* (NIBRFG0000001863); on dead *Q. serrata*, *Ibid* (SFC 020620-08); on fallen twig of *Q. aliena*, *Ibid*, (NIBRFG0000000046); on branch of dead *Quercus* sp., *Ibid* (SFC 020927-68); on stump of *Q. aliena*, *Ibid* (NIBRFG0000000127); on dead *Q. variabilis*, *Ibid* (NIBRFG0000000181); on trunk of *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (SFC 900905-62); on branch of dead *Quercus* sp., Mt. Aengja, Gwangju-gun, Gyeonggi Province (SFC 960413-20); on dead *Quercus* sp., Ondal Resort, Danyang-gun, Chungbuk Province (SFC 010407-06)

15. *Cerrena unicolor* (Bull.) Murrill 털구름버섯

Specimen examined: on dead branch of *Q. serrata*, Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 950211-13); on fallen twig of *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001653); on dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001844); on fallen trunk of *Quercus* sp., Mt. Juheul, Mungyeong-si, Gyeongbuk Province (SFC 961111-20)

16. *Chondrostereum purpureum* (Pers.) Pouzar 자색꽃구름버섯

Specimen examined: on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000104); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000137); *Ibid*, *Ibid* (SFC 021107-12)

17. *Coltriciella dependens* (Berk. & M.A. Curtis) Murrill 별집겨우살이버섯

Specimen examined: on stump of dead *Q. variabilis*, Mt. Jiri, Namwon-si, Jeonbuk Province (SFC 050526-01)

18. *Cylindrobasidium evolvens* (Fr.) Jülich 담자고약버섯

Specimen examined: on dead trunk of *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001800); *Ibid*, *Ibid* (NIBRFG0000000058)

19. *Daedalea dickinsii* Yasuda 등갈색미로버섯

Specimen examined: on stump of dead *Quercus* sp., Mt.

Gunamu, Gapyeong-gun, Gyeonggi Province (SFC 960420-24); on branch of dead *Q. serrata*, Isl. Bogil, Wando-gun, Jeonnam Province (SFC 960806-34); on the logs of the *Quercus* sp., Mt. Duwi, Jeongseon-gun, Gangwon Province (NIBRFG0000001916); on dead *Quercus* sp., Mt. Gaya, Hapcheon-gun, Gyeongnam Province (SFC 020118-29); on stump of *Quercus* sp., Gangchon, Chuncheon-si, Gangwon Province (NIBRFG0000001965); on dead *Quercus* sp., Mt. Gyeryong, Gongju-si, Chungnam (SFC 011222-19); *Ibid*, Gwangreung arboretum, Pocheon-si, Gyeonggi Province (SFC 960611-08); on stump of *Q. aliena*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001632); on fallen twig of *Quercus* sp., Namhae-gun, Gyeongnam Province (SFC 050609-41); *Ibid*, Mt. Sobaek, Danyang-gun, Chungbuk Province (SFC 940702-16); *Ibid*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001834); on trunk of *Q. variabilis*, *Ibid* (NIBRFG0000001807); *Ibid*, *Ibid* (NIBRFG0000001798); on stump of *Quercus* sp., *Ibid* (SFC 021010-13); *Ibid*, *Ibid* (SFC 970111-01); on trunk of dead *Q. aliena*, *Ibid* (SFC 970111-10)

20. *Daedalea quercina* (L.) Pers. 미로버섯

Specimen examined: on fallen dead *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001540); on stump of dead *Quercus* sp., *Ibid* (NIBRFG0000001539)

21. *Daedaleopsis styrcina* (Henn. & Shirai) Imazeki 때죽도장버섯

Specimen examined: on stump of *Quercus* sp., Mt. Sobaek, Danyang-gun, Chungbuk Province (SFC 960706-10)

22. *Daedaleopsis tricolor* (Bull.) Bondartsev & Singer 삼색도장버섯

Specimen examined: on branch of dead *Quercus* sp., Mt. Chiak, Wonju-si, Gangwon Province (SFC 961028-01); *Ibid*, *Ibid* (SFC 971215-01); on bark of dead *Q. variabilis*, Mt. Chilgap, Cheongyang-gun, Chungnam Province (SFC 980508-A15); on dead *Quercus* sp., Mt. Gaji, Ulju-gun, Ulsan (NIBRFG0000002042); *Ibid*, Mt. Gaya, Hapcheon-gun, Gyeongnam Province (SFC 020118-22); on dead *Q. aliena*, Mt. Jiri, Hadong-gun, Gyeongnam Province (NIBRFG0000002765); on fallen twig of *Q. aliena*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001647); on fallen twig of *Q. serrata*, *Ibid* (NIBRFG0000001542); on fallen twig of *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001756); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000000172);

on dead *Q. serrata*, Uljin-gun, Ulsan (NIBRFG0000000944); on the logs of the *Quercus* sp., Jangheung, Yangju-si, Gyeonggi Province (SFC 980801-03)

23. *Datronia mollis* (Sommerf.) Donk 미로구멍버섯
Specimen examined: on bark of dead *Quercus* sp., Mt. Gyeryong, Gongju-si, Chungnam Province (NIBRFG0000000624); *Ibid*, *Ibid* (SFC 950211-17); on bark of dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000184)

24. *Diplomitoporus crustulinus* (Bres.) Domański 초이증구멍버섯
Specimen examined: on stump of broken *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG00000001860)

25. *Fomes fomentarius* (L.) J.J. Kickx 말굽버섯
Specimen examined: on dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020417-26)

26. *Ganoderma applanatum* (Pers.) Pat. 잔나비불로초
Specimen examined: on broken branch of *Quercus* sp., Mt. Myeongji, Gapyeong-gun, Gyeonggi Province (SFC 960921-09); on dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020418-20); *Ibid*, *Ibid* (SFC 020514-19)

27. *Ganoderma lucidum* (Curtis) P. Karst. 불로초(=영지)
Specimen examined: on dead roots of *Quercus* sp., Mt. Gwanak, Gwacheon-si, Gyeonggi Province (SFC 900922-13); on stump of *Quercus* sp. Namhae-gun, Gyeongnam Province (SFC 050609-06); *Ibid*, Isl. Seokmo, Ganghwa-gun, Incheon (SFC 010517-10)

28. *Gloeoporus dichrous* (Fr.) Bres. 겹푸른구멍장이버섯
Specimen examined: on bark of *Q. aliena*, Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-11)

29. *Hericium erinaceus* (Bull.) Pers. 노루궁뎅이
Specimen examined: on dead branch of *Q. aliena*, Mt. Jiri, Sancheong-gun, Gyeongnam Province (SFC 980531-24)

30. *Hydnochaete tabacinoides* (Yasuda) Imazeki 갓소나무껍질버섯
Specimen examined: on bark of *Q. serrata*, Isl. Seokmo, Ganghwa-gun, Incheon (SFC 990116-3); on bark of dead *Q. aliena*, Mt. Jiri, Sancheong-gun, Gyeongnam Province (SFC 980531-09); *Ibid*, *Ibid* (SFC 980531-14); on dead *Q.*

variabilis, Myeongho-myeon, Bonghwa-gun, Gyeongbuk Province (SFC 991219-17); on fallen twig of *Q. aliena*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001592); *Ibid*, *Ibid* (NIBRFG0000001649); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000001667); *Ibid*, *Ibid* (SFC 990911-44); *Ibid*, Mt. Palbong, Hongcheon-gun, Gangwon Province (SFC 010628-13); on dead *Quercus* sp., Isl. Seokmo, Ganghwa-gun, Incheon (SFC 010517-06); *Ibid*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020515-06); on branch of *Q. aliena*, *Ibid* (NIBRFG0000000023); *Ibid*, *Ibid* (NIBRFG0000000045); *Ibid*, *Ibid* (NIBRFG0000000102); on dead *Q. aliena*, *Ibid* (NIBRFG0000000177)

31. *Hymenochaete cinnamomea* (Pers.) Bres. 적황색소나무비늘버섯
Specimen examined: on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000082)

32. *Hymenochaete intricata* (Lloyd) S. Ito 기와소나무비늘버섯
Specimen examined: on fallen twig of *Quercus* sp., Mt. Bongcheon, Ganghwa-gun, Incheon (NIBRFG00000002829); *Ibid*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001625); *Ibid*, Mt. Weolak, Chungju-si, Chungbuk Province (NIBRFG0000001056)

33. *Hymenochaete yasudai* Imazeki 무늬소나무비늘버섯
Specimen examined: on dead *Quercus* sp., Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-28)

34. *Hyphoderma setigerum* (Fr.) Donk 목재고약버섯
Specimen examined: on fallen twig of *Quercus* sp., Mt. Gwanak, Gwacheon-si, Gyeonggi Province (NIBRFG00000002440); on dead branch of *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (SFC 900913-54); *Ibid*, *Ibid* (SFC 900921-02); *Ibid*, Mt. Gwanak, Gwacheon-si, Gyeonggi Province (SFC 900927-14); on stump of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020416-03); *Ibid*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020418-14); on dead *Quercus* sp., *Ibid* (NIBRFG0000001793); *Ibid*, *Ibid*, (NIBRFG0000001777); on stump of *Q. aliena*, *Ibid* (NIBRFG0000000025); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000042); on fallen twig of *Quercus* sp., *Ibid* (SFC 021108-06); *Ibid*, *Ibid* (NIBRFG0000000159); *Ibid*, *Ibid* (SFC 021109-11); on branch of *Quercus* sp., *Ibid* (SFC 021109-19); on stump of *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (SFC 900905-03); on dead branch of

Quercus sp., *Ibid* (SFC 900905-54)

35. *Hyphodontia breviseta* (P. Karst.) J. Erikss. 흰돌기고약버섯

Specimen examined: on branch of dead *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (SFC 900913-06); *Ibid*, *Ibid* (SFC 900905-53); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000171)

36. *Hypochnicium punctulatum* (Cooke) J. Erikss. 백설후막고약버섯

Specimen examined: on branch of dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000062)

37. *Inonotus andersonii* (Ellis & Everh.) Nikol. 배착시루뎀버섯

Specimen examined: on bark of *Quercus* sp., Mt. Sobaek, Danyang-gun, Chungbuk Province (SFC 940702-05)

38. *Inonotus hispidus* (Bull.) P. Karst. 시루뎀버섯

Specimen examined: on stump of *Quercus* sp., Mt. Sobaek, Danyang-gun, Chungbuk Province (SFC 940702-10)

39. *Inonotus mikadoi* (Lloyd) Gilb. & Ryvarden 황갈색시루뎀버섯

Specimen examined: on dead *Quercus* sp., Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 011222-15)

40. *Inonotus xeranticus* (Berk.) Imazeki & Aoshima 금빛시루뎀버섯

Specimen examined: on fallen trunk of *Q. aliena*, Mt. Seolak, Inje-gun, Gangwon Province (SFC 971030-12); on broken trunk of *Q. aliena*, Mt. Bukhan, Seongbuk-gu, Seoul (NIBRFG0000002692); on stump of *Q. variabilis*, Mt. Chilgap, Cheongyang-gun, Chungnam Province (SFC 980508-B20); on dead *Q. variabilis*, Mt. Jiri, Hapcheon-gun, Gyeongnam Province (NIBRFG0000001482); on the logs of the *Quercus* sp. Mt. Duwi, Jeongseon-gun, Gangwon Province (NIBRFG0000001917); on stump of *Quercus* sp., Mt. Geomdan, Hanam-si, Gyeonggi Province (SFC 991127-08); *Ibid*, Mt. Gaya, Hapcheon-gun, Gyeongnam Province (NIBRFG0000000933); on stump of *Q. aliena*, Gangchon, Chuncheon-si, Gangwon Province (NIBRFG0000001953); on dead *Quercus* sp., Mt. Gyer-yong, Gongju-si, Chungnam Province (SFC 011222-13); *Ibid*, *Ibid* (NIBRFG0000000636); *Ibid*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (SFC990422-25); on dead *Q. aliena*, *Ibid* (NIBRFG0000001541); on dead

Quercus sp., Mt. Myeongji, Gapyeong-gun, Gyeonggi Province (SFC 960921-06); *Ibid*, Mt. Odae, Gangneung-si, Gangwon Province (SFC 000430-05); on stump of dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001845) on fallen dead *Q. aliena*, *Ibid* (NIBRFG0000001812); on stump of *Quercus* sp., *Ibid* (NIBRFG0000000084); on trunk of dead *Q. aliena*, *Ibid* (SFC 970111-13)

41. *Irpex lacteus* (Fr.) Fr. 기계충버섯

Specimen examined: on fallen twig of *Quercus* sp., Mt. Bukhan, Yangju-si, Gyeonggi Province (SFC 970926-12) on dead *Q. aliena*, Mt. Chiak, Wonju-si, Gangwon Province (NIBRFG0000002512); on dead *Quercus* sp., Gangchon, Chuncheon-si, Gangwon Province (SFC 011006-37); on stump of *Q. aliena*, Mt. Jiri, Hadong-gun, Gyeongnam Province (NIBRFG0000002766); on trunk of dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000064); on fallen twig of *Quercus* sp., Mt. Surak, Nowon-gu, Seoul (NIBRFG0000002048)

42. *Junghuhnia nitida* (Pers.) Ryvarden 좀살색구멍버섯

Specimen examined: on broken branch of *Quercus* sp., Mt. Aengja, Gwangju-gun, Gyeonggi Province (SFC 960413-13); on bark of *Q. variabilis*, Mt. Jiri, Hamyang-gun, Gyeongnam Province (SFC 011114-25)

43. *Laeticorticium roseocarneum* (Schwein.) Boidin 칠장미고약버섯

Specimen examined: on stump of *Quercus* sp. Mt. Soyo, Dongducheon-si, Gyeonggi Province (NIBRFG0000000681)

44. *Laeticorticium roseum* (Pers.) Donk 장미고약버섯

Specimen examined: on dead branch of *Quercus* sp., Mt. Cheonggye, Pocheon-si, Gyeonggi Province (NIBRFG0000001231)

45. *Laetiporus sulphureus* (Bull.) Murrill 덕다리버섯

Specimen examined: on dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020620-01); on dead *Q. aliena*, *Ibid* (SFC 020620-02); on *Q. variabilis*, *Ibid* (SFC 020620-19)

46. *Lentinula edodes* (Berk.) Pegler 표고

Specimen examined: on the logs of *Quercus* sp., Mt. Duwi, Jeongseon-gun, Gangwon Province (SFC 980630-05); on dead *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001637)

47. *Lenzites betulina* (L.) Fr. 조개껍질버섯

Specimen examined: on stump of *Quercus* sp., Mt. Aengja, Gwangju-gun, Gyeonggi Province (SFC 960413-06); on broken trunk of *Quercus* sp., Mt. Baeka, Hwasung-gun, Jeonnam Province (SFC 960524-13); on fallen twig of *Q. aliena*, Mt. Cheonggye, Pocheon-si, Gyeonggi Province (NIBRFG0000001234); on dead *Quercus* sp., Mt. Jiri, Hamyang-gun, Gyeongnam Province (NIBRFG0000001475); *Ibid*, Mt. Jiri, Sancheong-gun, Gyeongnam Province (NIBRFG0000001190); *Ibid*, Mt. Gaya, Hapcheon-gun, Gyeongnam Province (NIBRFG0000000925); *Ibid*, Mt. Hwanggang, Mungyeong-si, Gyeongbuk Province (SFC 010221-07); on broken branch of *Quercus* sp., Mt. Juheul, Mungyeong-si, Gyeongbuk Province (SFC 961111-17); on dead *Q. variabilis*, Mt. Jiri, Hadong-gun, Gyeongnam Province (NIBRFG0000002774); on dead *Quercus* sp., *Ibid* (NIBRFG0000002770); on stump of *Quercus* sp., Mt. Gwanak, Gwacheon-si, Gyeonggi Province (SFC 900927-16); *Ibid*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (SFC 990911-36); on dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001797); *Ibid*, *Ibid* (NIBRFG0000001765); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000001727); stump of *Q. aliena*, *Ibid* (SFC 021107-10); on fallen twig of *Quercus* sp., *Ibid* (SFC 021109-29); on fallen trunk of *Quercus* sp., Mt. Soyo, Dongducheon-si, Gyeonggi Province (NIBRFG0000000691); *Ibid*, Mt. Sinseon, Goesan-gun, Chungbuk Province (SFC 960316-04); on stump of dead *Quercus* sp., *Ibid* (SFC 960316-14); on fallen trunk of *Quercus* sp., Mt. Yongmun, Yangpyeong-gun, Gyeonggi Province (SFC 960725-11); on dead *Quercus* sp., Mt. Gaji, Ulju-gun, Ulsan (SFC 020214-08); on dead *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001584); on stump of *Q. aliena*, *Ibid* (SFC 990326-26)

48. *Lopharia cinerascens* (Schwein.) G. Cunn. 재껍질버섯

Specimen examined: On fallen twig of *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001862)

49. *Lopharia mirabilis* (Berk. & Broome) Pat. 큰껍질버섯

Specimen examined: on fallen twig of *Q. serrata*, Mt. Jiri, Hadong-gun, Gyeongnam Province (SFC 040721-19)

50. *Loweoporus roseoalbus* (Jung.) Ryvarden 청장미구멍버섯

Specimen examined: on fallen twig of *Q. serrata*, Mt. Jiri, Hamyang-gun, Gyeongnam Province (NIBRFG0000000546); *Ibid*, *Ibid* (SFC 040923-22)

51. *Merulius tremellosus* Schrad. 아교버섯

Specimen examined: on fallen twig of *Q. aliena*, Mt. Cheonggye, Pocheon-si, Gyeonggi Province (NIBRFG0000001240)

52. *Microporus affinis* (Blume & T. Nees) Kuntze 부채메꽃버섯

Specimen examined: on dead *Quercus* sp., Mt. Jiri, Hadong-gun, Gyeongnam Province (NIBRFG0000002153); *Ibid*, *Ibid* (NIBRFG0000002154); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000001154); *Ibid*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001728)

53. *Microporus vernicipes* (Berk.) Kuntze 메꽃버섯부치

Specimen examined: on trunk of dead *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001655); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000001552)

54. *Mycoacia copelandii* (Pat.) Aoshima & H. Furuk. 긴송곳버섯

Specimen examined: on fallen twig of *Q. aliena*, Mt. Cheonggye, Pocheon-si, Gyeonggi Province (NIBRFG0000001233); on trunk of *Quercus* sp., Mt. Jiri, Namwon-gun, Jeonbuk Province (SFC 040921-118); on fallen twig of *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (SFC 981015-03); on trunk of *Quercus* sp., Mt. Surak, Nowon-gu, Seoul (SFC 960309-19)

55. *Oligoporus tephroleucus* (Fr.) Gilb. & Ryvarden 적색손등버섯

Specimen examined: on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000105)

56. *Panellus stipticus* (Bull.) P. Karst. 부채버섯

Specimen examined: on dead branch of *Quercus* sp., Mt. Aengja, Gwangju-gun, Gyeonggi Province (SFC 960413-24); on fallen twig of *Quercus* sp. Mt. Seolak, Inje-gun, Gangwon Province (SFC 971030-05); on dead *Quercus* sp., Mt. Daedun, Wanju-gun, Jeonbuk Province (SFC 960127-18); on bark of *Quercus* sp., Mt. Gunamu, Gapyeong-gun, Gyeonggi Province (SFC 960420-02); *Ibid*, Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-27); on broken trunk of *Quercus* sp., Mt. Juheul, Mungyeong-si, Gyeongbuk Province (SFC 961111-09); on fallen *Quercus* sp., Gwangreung arboretum, Pocheon-si, Gyeonggi Province (SFC 960611-06); on dead branch of *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province

(SFC 990911-37); *Ibid*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020515-22); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000066); on trunk of dead *Quercus* sp., *Ibid* (SFC 021010-11); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000000106); *Ibid*, *Ibid* (SFC 021108-05); *Ibid*, *Ibid* (SFC 021109-20); on stump of dead *Quercus* sp., Mt. Sinseon, Goesan-gun, Chungbuk Province (SFC 960316-13); on *Q. serrata*, Mt. Hwanggang, Mungyeong-si, Gyeongbuk Province (SFC 010221-11); on fallen twig of *Quercus* sp., Mt. Mani, Ganghwa-gun, Incheon (NIBRFG0000001088); on stump of *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001582)

57. *Peniophora incarnata* (Pers.) P. Karst. 오렌지겹질고약버섯

Specimen examined: on fallen twig of *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000000945); on bark of *Q. serrata*, Uljin-gun, Ulsan (SFC 990326-22)

58. *Peniophora quercina* (Pers.) Cooke 겹질고약버섯

Specimen examined: on bark of *Q. variabilis*, Isl. Seokmo, Ganghwa-gun, Incheon (NIBRFG0000002038); on dead branch of *Q. aliena*, Isl. Sangnakwol, Yeonggwang-gun, Jeonnam Province (SFC 890815-08); on bark of *Quercus* sp., Gangchon, Chuncheon-si, Gangwon Province (NIBRFG0000001940); on dead branch of *Q. aliena*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (SFC 990911-38); on bark of dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001773)

59. *Perenniporia medulla-panis* (Jacq.) Donk 흰구멍버섯

Specimen examined: on fallen trunk of *Quercus* sp., Mt. Bukhan, Yangju-si Gyeonggi Province (SFC 971008-20); on fallen twig of *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000072)

60. *Perenniporia subacida* (Peck) Donk 금빛흰구멍버섯

Specimen examined: on *Q. variabilis*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001786); on stump of *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (SFC 900720-02); *Ibid*, *Ibid* (SFC 900720-03)

61. *Perenniporia tephropora* (Mont.) Ryvarden 잿빛흰구멍버섯

Specimen examined: on trunk of *Q. aliena*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (SFC 990422-26)

62. *Phanerochaete chrysorhizon* (Torr.) Budington & Gilb 침유색고약버섯

Specimen examined: on fallen twig of *Q. aliena*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (SFC 990911-60)

63. *Phanerochaete chrysosporium* Burds. 무성유색고약버섯

Specimen examined: on fallen twig of *Q. variabilis*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020417-14)

64. *Phanerochaete sanguinea* (Fr.) Pouz., *Ceská Mykol.* 27(1): 26 (1973) 유혈유색고약버섯(신칭)

Basidiomes fully resupinate; hymenophore white or cream-colored, turning reddish with time, membranous, adnate. Hyphal system monomitic; generative hyphae simple-septate, 5~7 μ m thick, hyaline, regularly branching at nearly right angles, mostly simple-septate, sometimes with clamps; lamprocystidia easy to find, thin-walled to somewhat thick-walled, cylindrical or tapering, naked or with varying degree of incrustation, 40~49 $\times$ 5.1~8 μ m; basidia clavate, thin-walled, 23~25 $\times$ 4~6 μ m; basidiospores narrowly ellipsoid, hyaline, 5.5~6.2 $\times$ 2.5~3.0 μ m, non-amyloid, acyanophilous (Fig. 2).

Specimens examined: on fallen twig of *Quercus* sp. Gangchon, Chuncheon-si, Gangwon Province (SFC 000922-04).

Notes - This species is generally easily recognized due to its red color. Young specimens are wholly white and then resemble very much *P. sordida*, but old specimens are wholly red. Burdsall (1985) had treated this species as a synonym of *P. calotricha*. However, they may be separated by the size, shape and number of the cystidia, and the basidiospore. This species is placed in the *Phanerochaete* group within the polyporoid clade (Lim, 2001).

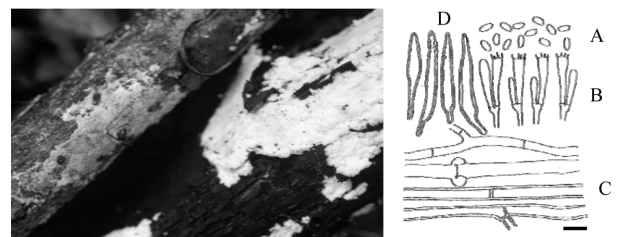


Fig. 2. Basidiome of *Phanerochaete sanguinea* and microscopic structure. a. basidiospores; b. basidia; c, generative hyphae; d. lamprocystidia. (scale bar = 10 μ m).

65. *Phanerochaete sordida* (P. Karst.) J. Erikss. & Ryvarden 유색고약버섯

Specimen examined: on dead *Quercus* sp., Mt. Mani, Ganghwa-gun, Incheon (NIBRFG0000001092); on fallen twig of *Quercus* sp., Mt. Bukhan, Gangbuk-gu, Seoul (SFC 980411-06); *Ibid*, Mt. Jiri, Sancheong-gun, Gyeongnam Province (SFC 980530-05); on fallen twig of *Q. serrata*, Mt. Jiri, Namwon-si, Jeonbuk Province (NIBRFG0000000544); on dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001796); on fallen twig of *Q. aliena*, *Ibid* (SFC 021109-17)

66. *Phanerochaete xerophila* Burds. 마른유색고약버섯

Specimen examined: on dead *Q. aliena*, Mt. Mani, Ganghwa-gun, Incheon (NIBRFG0000001005)

67. *Phellinus gilvus* (Schwein.) Pat. 마른진흙버섯

Specimen examined: on dead *Quercus* sp., Mt. Aengja, Gwangju-gun, Gyeonggi Province (SFC 960413-30); *Ibid*, Mt. Baeka, Hwasun-gun, Jeonnam Province (SFC 960524-10); *Ibid*, Mt. Bukhan, Gangbuk-gu, Seoul (NIBRFG0000002803); on fallen twig of *Q. aliena*, Mt. Cheonggye, Pocheon-si, Gyeonggi Province (NIBRFG0000001236); on the logs of *Quercus* sp., Mt. Duwi, Jeongseon-gun, Gangwon Province (NIBRFG0000001918); on base of *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (NIBRFG0000002449); on fallen twig of *Q. aliena*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001650); *Ibid*, *Ibid* (NIBRFG0000001551); on stump of *Quercus* sp., Mt. Mani, Ganghwa-gun, Incheon (SFC 051010-09); on dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (SFC 021123-14)

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

Specimen examined: on fallen twig of *Quercus* sp., Mt. Bangtae, Inje-gun, Gangwon Province (SFC 980722-35); on dead *Q. aliena*, Mt. Jiri, Sancheong-gun, Gyeongnam Province (NIBRFG0000001182); on dead *Quercus* sp., Mt. Woelak, Chungju-si, Chungbuk Province (NIBRFG0000001067)

69. *Phlebia chrysocreas* (Berk. & M.A. Curtis) Burds. 황금아교고약버섯

Specimen examined: on fallen twig of *Quercus* sp., Mt. Bukhan, Gangbuk-gu, Seoul (NIBRFG0000002801); on dead *Quercus* sp., Mt. Chiak, Wonju-si, Gangwon Province (SFC 971215-04); *Ibid*, Mt. Jiri, Hamyang-gun, Gyeongnam Province (NIBRFG0000001490); *Ibid*, Gangchon, Chuncheon-

si, Gangwon Province (NIBRFG0000001944); *Ibid*, Mt. Gaya, Hapcheon-gun, Gyeongnam Province (NIBRFG0000000929); on trunk of dead *Q. aliena*, Mt. Jiri, Hadong-gun, Gyeongnam Province (NIBRFG0000002767); on fallen twig of *Quercus* sp., Gangchon, Chuncheon-si, Gangwon Province (NIBRFG0000001954); on fallen twig of *Q. aliena*, Mt. Gwanak, Gwacheon-si, Gyeonggi Province (SFC 000606-09); on dead *Quercus* sp., Ondal Resort, Danyang-gun, Chungbuk Province (SFC 010407-10); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001783); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000038); *Ibid*, *Ibid* (NIBRFG0000000053); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000000081); *Ibid*, *Ibid* (NIBRFG0000000118); *Ibid*, *Ibid* (SFC 021012-35); *Ibid*, *Ibid* (NIBRFG0000000167); on dead *Q. aliena*, *Ibid* (NIBRFG0000000180); on dead *Q. serrata*, Mt. Hwanggang, Mungyeong-si, Gyeongbuk Province (SFC 010221-12)

70. *Phlebia rufa* (Pers.) M.P. Christ. 가는아교고약버섯

Specimen examined: on fallen trunk of *Q. aliena*, Mt. Bukhan, Seongbuk-gu, Seoul (NIBRFG0000002690)

71. *Piptoporus betulinus* (Bull.) P. Karst. 자작나무버섯

Specimen examined: on broken trunk of *Quercus* sp., Mt. Myeongji, Gapyeong-gun, Gyeonggi Province (SFC 960921-07)

72. *Plicaturopsis crispa* (Pers.) D.A. Reid 주름고약버섯

Specimen examined: on fallen twig of *Q. aliena*, Mt. Duryun, Haenam-gun, Jeonnam Province (SFC 030301-03); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000148)

73. *Polyporus arcularius* (Batsch) Fr. 쯤벌집구멍장이버섯

Specimen examined: on decayed *Quercus* sp., Gwangreung arboretum, Pocheon-si, Gyeonggi Province (SFC 960611-14)

74. *Polyporus brumalis* (Pers.) Fr. 겨울구멍장이버섯

Specimen examined: on stump of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000092); *Ibid*, *Ibid* (SFC 021010-30)

75. *Porodiscus pendulus* (Fr.) Murrill 그물코버섯

Specimen examined: on broken trunk of *Quercus* sp., Mt. Baeka, Hwasun-gun, Jeonnam Province (SFC 960524-15); on dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020417-09); on fallen twig of *Q.*

aliena, *Ibid* (SFC 020418-06); *Ibid*, *Ibid*, (SFC 021108-33); *Ibid*, Mt. Soyo, Dongducheon-si, Gyeonggi Province (NIBRFG0000000686); on dead *Q. variabilis*, Mt. Hwanggang, Mungyeong-si, Gyeongbuk Province (SFC 010221-19)

76. *Punctularia strigosozonata* (Schwein.) P.H.B. Talbot
털가는주름버섯

Specimen examined: on the base of *Quercus* sp., Mt. Sobaek, Yeongju-si, Gyeongbuk Province (SFC 900626-03); on fallen twig of *Q. aliena*, Mt. Cheonggye, Pocheon-si, Gyeonggi Province (SFC 000401-14); on fallen trunk of *Q. aliena*, Mt. Bukhan, Seonbuk-gu, Seoul (NIBRFG0000002693); on shiitake mushroom logs (= *Quercus* sp.), Mt. Duwi, Jeongseon-gun, Gangwon Province (NIBRFG0000001921)

77. *Pycnoporus cinnabarinus* (Jacq.) Fr. 간버섯

Specimen examined: on fallen twig of *Quercus* sp., Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 010705-23); *Ibid*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001843); on fallen twig of *Q. serrata*, *Ibid* (NIBRFG0000001808); on fallen twig of *Quercus* sp., *Ibid* (SFC 021010-38); on dead *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (NIBRFG0000002421)

78. *Pycnoporus coccineus* (Fr.) Bondartsev & Singer
진홍간버섯

Specimen examined: on fallen twig of *Quercus* sp., Mt. Jiri, Namwon-si, Jeonbuk Province (SFC 050526-20)

79. *Rigidoporus microporus* (Sw.) Overeem 각목버섯

Specimen examined: on bark of *Q. serrata*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001831); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000043); *Ibid*, *Ibid* (NIBRFG0000000183)

80. *Schizophyllum commune* Fr. 치마버섯

Specimen examined: on shiitake mushroom logs (= *Quercus* sp.), Mt. Duwi, Jeongseon-gun, Gangwon Province (NIBRFG0000001920); on fallen trunk of *Q. aliena*, Mt. Hwaak, Gapyeong-gun, Gyeonggi Province (SFC 960622-03); on the logs of *Quercus* sp., Mt. Juheul, Mungyeong-si, Gyeongbuk Province (SFC 961111-06); on fallen twig of *Q. aliena*, Gwangreung arboretum, Pocheon-si, Gyeonggi Province (SFC 960611-04); on dead *Quercus* sp., Nakwol-myeon, Yeonggwang-gun, Jeonnam Province (SFC 890816-18); on fallen twig of *Q. variabilis*,

Myeongho-myeon, Bonghwa-gun, Gyeongbuk Province (NIBRFG0000001684); on dead *Quercus* sp., Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-17); on fallen twig of *Quercus* sp., Namhae-gun, Gyeongnam Province (SFC 050609-36); on dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020514-01); on fallen twig of *Q. aliena*, *Ibid* (SFC 021107-02)

81. *Schizopora flavipora* (Berk. & M.A. Curtis ex Cooke) Ryvarden 크림곰구멍버섯

Specimen examined: on fallen twig of *Quercus* sp. Mt. Bukhan, Yangju-si, Gyeonggi Province (SFC 970926-04); *Ibid*, *Ibid*, (SFC 971008-17); on dead *Quercus* sp., Mt. Jiri, Hamyang-gun Gyeongnam Province (NIBRFG0000001498)

82. *Schizopora paradoxa* (Schr.) Donk 곰구멍버섯

Specimen examined: on trunk of dead *Q. aliena*, Mt. Bukhan, Gangbuk-gu, Seoul (NIBRFG0000002808); *Ibid*, *Ibid* (NIBRFG0000002691); *Ibid*, *Ibid* (NIBRFG0000002694); on fallen twig of *Quercus* sp. Mt. Chiak, Wonju-si, Gangwon Province (SFC 910715-51); on fallen twig of *Q. variabilis*, Mt. Chilgap, Cheongyang-gun, Chungnam Province (SFC 980508-B15); on fallen twig of *Q. aliena*, Mt. Duryun, Haenam-gun, Jeonnam Province (SFC 030301-06); *Ibid*, *Ibid* (SFC 030301-07); on trunk of dead *Q. aliena*, Mt. Mani, Ganghwa-gun, Incheon (SFC D051010-02); *Ibid*, *Ibid* (NIBRFG0000001102); on fallen twig of dead *Quercus* sp., Mt. Geomdan, Hanam-si, Gyeonggi Province (SFC 991127-14); on stump of dead *Quercus* sp., Mt. Gwanak, Gwanak-gu, Seoul (NIBRFG0000002460); *Ibid*, *Ibid* (NIBRFG0000002448); on dead *Quercus* sp., Mt. Gaya, Hapcheon-gun, Gyeongnam Province (NIBRFG0000000927); on fallen twig of *Q. variabilis*, Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-02); on dead *Q. serrata*, Mt. Jiri, Hamyang-gun, Gyeongnam Province (SFC 040923-23); *Ibid*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001794); on fallen twig of *Q. variabilis*, *Ibid* (NIBRFG0000001787); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000032); *ibid*, *ibid* (NIBRFG0000000067); *ibid*, *ibid* (NIBRFG0000000077); on stump of dead *Q. variabilis*, *Ibid* (NIBRFG0000000135); on fallen twig of *Quercus* sp., *Ibid* (SFC 021123-09); on branch of dead *Q. serrata*, *Ibid* (SR970111-11); on branch of dead *Quercus* sp., Mt. Sinseon, Goesan-gun, Chungbuk Province (SFC 960316-05)

83. *Sistotrema diademiferum* (Bourdot & Galzin) Donk
리본단지고약버섯

Specimen examined: on fallen twig of dead *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001668)

84. *Steccherinum laeticolor* (Berk. & M.A. Curtis) Banker 털바늘버섯

Specimen examined: on dead *Quercus* sp. Mt. Gyeryong, Gongju-si, Chungnam Province (NIBRFG0000000642)

85. *Steccherinum murashkinskyi* (Burt) Maas Geest 동심바늘버섯

Specimen examined: on dead *Q. variabilis*, Mt. Jiri, Hamyang-gun, Gyeongbuk Province (NIBRFG0000001495); on fallen twig of *Q. aliena*, *Ibid* (SFC 040921-12); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000115)

86. *Steccherinum ochraceum* (Pers.) Gray 바늘버섯

Specimen examined: on broken branch of *Quercus* sp. Mt. Gwanak, Gwanak-gu, Seoul (SFC 900921-04); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000157)

87. *Steccherinum rhois* (Schwein.) Hongo & Izawa 솔바늘버섯

Specimen examined: on trunk of *Q. variabilis*, Mt. Jiri, Hadong-gun, Gyeongnam Province (SFC 040722-23); on stump of dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000132); on fallen twig of *Quercus* sp., *Ibid* (SFC 021108-37); on the logs of the *Quercus* sp., Jangheung, Yangju-si, Gyeonggi Province (SFC 980801-01)

88. *Stereum complicatum* (Fr.) Fr. 복합꽃구름버섯

Specimen examined: on fallen twig of *Q. variabilis*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020927-13); *Ibid*, *Ibid* (NIBRFG0000001732); *Ibid*, *Ibid* (NIBRFG0000001733); on stump of *Q. aliena*, *Ibid* (SFC 021107-14)

89. *Stereum gausapatum* (Fr.) Fr. 흰테꽃구름버섯

Specimen examined: on fallen twig of *Q. serrata*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001547); on fallen twig of *Q. aliena* Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020418-17); on branch of dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000107); on dead *Q. serrata*, Mt. Weolak, Chungju-si, Chungbuk Province

(NIBRFG0000001065)

90. *Stereum hirsutum* (Willd.) Pers. 꽃구름버섯

Specimen examined: on broken branch of *Quercus* sp., Mt. Baeka, Hwasun-gun, Jeonnam Province (SFC 960524-12); on dead *Quercus* sp., Mt. Chiak, Wonju-si, Gangwon Province (SFC 971215-02); on fallen twig of *Q. serrata*, Mt. Chilgap, Cheongyang-gun, Chungnam Province (SFC 980508-A20); *Ibid*, *Ibid* (SFC 980508-A22); on dead *Quercus*, Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-18); on stump of *Q. variabilis*, Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (SFC 991120-04); *Ibid*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001815); *Ibid*, *Ibid* (SFC 020824-14); on dead *Q. variabilis*, *Ibid* (SFC 020926-01); on stump of *Q. aliena*, *Ibid* (NIBRFG0000001753); on branch of *Quercus* sp., *Ibid* (NIBRFG0000000130); on trunk of *Quercus* sp., *Ibid* (NIBRFG0000000078); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000000158); on dead *Quercus* sp., *Ibid* (NIBRFG0000000186); on bark of *Quercus* sp., Mt. Sinseon, Goesan-gun, Chungbuk Province (SFC 960316-03)

91. *Stereum peculiare* Parmasto, Boidin & Dinghra 겹질꽃구름버섯

Specimen examined: on fallen *Q. variabilis*, Myeongho-myeon, Bonghwa-gun, Gyeongbuk Province (NIBRFG0000001682); on dead *Quercus*, Gangchon, Chuncheon-si, Gangwon Province (NIBRFG0000001943); on fallen twig of *Quercus*, Mt. Mani, Ganghwa-gun, Incheon (NIBRFG0000001107); *ibid*, Mt. Geomdan, Hanam-si, Gyeonggi Province (SFC 991127-09); on dead *Quercus*, Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-10); on fallen twig of *Q. variabilis*, Mt. Jiri, Hadong-gun, Gyeongnam Province (NIBRFG0000002769); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000539); *Ibid*, *Ibid* (NIBRFG0000000543); on bark of *Quercus* sp., Gangchon, Chuncheon-si, Gangwon Province (NIBRFG0000001952); *Ibid*, Isl. Gyodong, Ganghwa-gun, Incheon (SFC 020307-04); on branch of *Quercus* sp., Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 011222-04); on fallen twig of *Quercus* sp., Mungyeongsaejae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001614); *Ibid*, *Ibid* (NIBRFG0000001666); *Ibid*, *Ibid* (NIBRFG0000001563); *Ibid*, Ondal Resort, Danyang-gun, Chungbuk Province (SFC 010407-11); on dead *Quercus* sp., Mt. Odae, Gangreung-si, Gangwon Province (SFC 000518-11); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001841); on

dead *Q. variabilis*, *Ibid* (NIBRFG0000001813); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000001802) on dead *Quercus* sp., *Ibid* (NIBRFG0000001851); on fallen twig of *Q. variabilis*, *Ibid* (NIBRFG0000001788); *Ibid*, *Ibid* (NIBRFG0000001775); *Ibid*, *Ibid* (NIBRFG0000001752); on branch of *Q. aliena*, *Ibid* (NIBRFG0000000024); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000044); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000000094); *Ibid*, *Ibid* (NIBRFG0000000101); *Ibid*, *Ibid* (NIBRFG0000000146); *Ibid*, *Ibid* (NIBRFG0000000170) on dead *Q. aliena*, *Ibid* (NIBRFG0000000182); on *Q. variabilis*, Mt. Hwangjang, Mugyeong-si, Gyeongbuk Province (SFC 010221-24); on dead *Quercus* sp., Mt. Chiak, Wonju-si, Gangwon Province (SFC 971215-03); on dead branch of *Quercus* sp., Mt. Baeka, Hwasun-gun, Jeonnam Province (SFC 960524-07); *Ibid*, Mt. Bongcheon, Ganghwa-gun, Incheon (NIBRFG0000002827); on fallen twig of *Quercus* sp., Mt. Chilgap, Cheongyang-gun, Chungnam Province (SFC 980508-B27); *Ibid*, Dosanseowon, Andong-si, Gyeongbuk Province (SFC 980119-05); on dead branch of *Quercus* sp., Mt. Suri, Gunpo-si, Gyeonggi Province (SFC 960518-05); on fallen twig of *Q. aliena*, Valley of Suta, Hongcheon-gun Gangwon Province (NIBRFG0000000822)

92. *Stereum submentosum* Pouzar 갈색털꽃구름버섯

Specimen examined: on fallen *Q. aliena*, Mt. Seolak, Inje-gun, Gangwon Province (SFC 971030-11); *Ibid*, Mt. Jiri, Sancheong-gun, Gyeongnam Province (SFC 980531-10); on broken *Quercus* sp., Mt. Gunamu, Gapyeong-gun, Gyeonggi Province (SFC 960420-26); *Ibid*, Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 950211-38); on fallen twig of *Quercus* sp., Gwangreung arboretum, Pocheon-si, Gyeonggi Province (SFC 960611-11); on broken branch of *Quercus* sp., Mt. Myeongji, Gapyeong-gun, Gyeonggi Province (SFC 960921-08); on dead *Quercus* sp., Mt. Myeongseong, Pocheon-si, Gyeonggi Province (SFC 960608-06); *Ibid*, Mt. Sobaek, Danyang-gun, Chungbuk Province (SFC 960706-23); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000083); on dead *Quercus* sp., *Ibid* (SFC 021010-12); on dead *Q. aliena*, *Ibid* (NIBRFG0000001855); *Ibid*, *Ibid* (NIBRFG0000001861); on branch of *Q. aliena*, *Ibid* (SFC 020826-22); on bark of *Q. variabilis*, Mt. Jiri, Hamyang-gun, Gyeongnam Province (NIBRFG0000001496); on dead *Q. serrata*, Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 011222-11); on *Q. variabilis*, Mt. Odae, Gangneung-si, Gangwon Province (SFC 000430-06)

93. *Trametes hirsuta* (Wulfen) Pilát 흰구름송편버섯 (= 흰구름버섯)

Specimen examined: on fallen twig of *Quercus*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 021012-12); on stump of *Q. serrata*, *Ibid* (NIBRFG0000001833); on dead *Quercus* sp., Yangyang-gun, Gangwon Province (NIBRFG0000002834); *Ibid*, Mt. Chiak, Wonju-si, Gangwon Province (NIBRFG0000002510); on fallen twig of *Quercus* sp., Mt. Jiri, Sancheong-gun, Gyeongnam Province (NIBRFG0000001194)

94. *Trametes suaveolens* (L.) Fr. 송편버섯

Specimen examined: on stump of *Quercus* sp., Mt. Seolak, Inje-gun, Gangwon Province (SFC 971030-13); on the log of *Quercus* sp., Mt. Jiri, Sancheong-gun, Gyeongnam Province (SFC 980531-49); on branch of *Quercus* sp., Iyeong, Goyang-si, Gyeonggi Province (SFC 980125-06); on stump of *Quercus* sp., Mt. Odae, Pyeongchang-gun, Gangwon Province (SFC 971011-09); *ibid*, *Ibid* (SFC 971011-10); on trunk of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (SFC 021012-13)

95. *Trametes trogii* Berk. 토끼송편버섯

Specimen examined: on broken trunk of *Quercus* sp., Mt. Baeka, Hwasun-gun, Jeonnam Province (SFC 960524-14); on stump of *Quercus* sp., Mt. Soyo, Dongducheon-si, Gyeonggi Province (NIBRFG0000000679); on the log of *Quercus* sp. Jangheung, Yangju-si, Gyeonggi Province (SFC 980801-04)

96. *Trametes versicolor* (L.) Lloyd 구름송편버섯 (= 구름버섯)

Specimen examined: on fallen twig of *Q. aliena*, Mungyeongsaekjae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001654); *Ibid*, *Ibid* (NIBRFG00000015490); on fallen dead *Quercus* sp., *Ibid* (NIBRFG0000001568); on dead *Quercus* sp., Ondal Resort, Danyang-gun, Chungbuk Province (SFC 010407-05); *Ibid*, Mt. Mani, Ganghwa-gun, Incheon (SFC 010316-16); on *Q. aliena*, Isl. Sangnakwol, Yeonggwang-gun, Jeonnam Province (SFC 890815-06); on stump of *Quercus* sp., Mt. Bukhan, Yangju-si, Gyeonggi Province (SFC 971008-19); *Ibid*, Mt. Chiak, Wonju-si, Gangwon Province (SFC 961028-09); on dead *Quercus* sp., *Ibid* (SFC 971215-05); on stump of *Quercus* sp., Mt. Myeongseong, Pocheon-si, Gyeonggi Province (SFC 960608-07); on dead *Quercus* sp., Mt. Sinseon, Goesan-gun, Chungbuk Province (SFC 960316-08);

on fallen trunk of *Quercus* sp., Mt. Soyo, Dongducheon-si, Gyeonggi Province (NIBRFG0000000690); on fallen twig of *Quercus* sp., Mt. Baeka, Hwasun-gun, Jeonnam Province (SFC 960524-05); on dead *Q. serrata*, Mt. Chilgap, Cheongyang-gun, Chungnam Province (SFC 980508-A10); on fallen twig of *Quercus* sp., Mt. Cheonggye, Pocheon-si, Gyeonggi Province (NIBRFG0000001238); on dead *Quercus* sp., Mt. Jiri, Sancheong-gun, Gyeongnam Province (NIBRFG0000001174); on shiitake mushroom logs (= *Quercus* sp.), Mt. Duwi, Jeongseon-gun, Gangwon Province (NIBRFG0000001922); on dead *Quercus* sp., Gangchon, Chuncheon-si, Gangwon Province (NIBRFG0000001960); *Ibid*, *Ibid* (NIBRFG0000001961); on trunk of *Quercus* sp., Mt. Mani, Ganghwa-gun, Incheon (NIBRFG0000001103); on dead *Quercus* sp., Mt. Geomdan, Hanam-si, Gyeonggi Province (SFC 991127-16); on fallen twig of *Q. variabilis*, Mt. Gaji, Ulju-gun, Ulsan (NIBRFG0000002043); *Ibid*, *Ibid* (NIBRFG0000001295); on fallen twig of *Quercus* sp., Mt. Gyoryong, Namwon-si, Jeonnam Province (NIBRFG0000002081); on dead *Quercus* sp., Mt. Gaya, Hapcheon-gun, Gyeongnam Province (NIBRFG0000000934); on stump of *Quercus* sp., Ilyeong, Goyang-si, Gyeonggi Province (SFC 980125-04); *Ibid*, Isl. Gyodong, Ganghwa-gun, Incheon (NIBRFG0000001002); on dead *Q. serrata*, Mt. Gyeryong, Gongju-si, Chungnam Province (SFC 950211-15); on dead *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001847); on *Q. variabilis*, *Ibid* (NIBRFG0000001849); on dead *Quercus* sp., *Ibid* (NIBRFG0000001852); on *Q. aliena*, *Ibid* (NIBRFG0000001853); *Ibid*, *Ibid* (NIBRFG0000001854); on stump of *Quercus* sp., *Ibid* (NIBRFG0000000123); *Ibid*, *Ibid* (SFC 021108-25); on dead *Quercus* sp., *Ibid* (NIBRFG0000000138); on fallen twig of *Quercus* sp., *Ibid* (NIBRFG0000000173); on *Q. aliena*, *Ibid* (NIBRFG0000000185); on the logs of the *Quercus* sp., Jangheung, Yangju-si, Gyeonggi Province (SFC 980801-02)

97. *Trechispora vaga* (Fr.) Liberta 황금미세고약버섯

Specimen examined: on fallen twig of *Q. serrata*, Mt. Hwangjang, Mungyeong-si, Gyeongbuk Province (SFC 010221-20)

98. *Trichaptum bifforme* (Fr.) Ryvarden 테웃솔버섯

Specimen examined: on bark of *Q. variabilis*, Mt. Jiri, Hamyang-gun, Gyeongnam Province (NIBRFG0000001480); on bark of *Q. aliena*, Mt. Jiri, Sancheong-gun, Gyeongnam Province (SFC 980531-16); on dead *Quercus* sp., Gangchon,

Chuncheon-si, Gangwon Province (NIBRFG0000001942); on trunk of *Q. aliena*, Mt. Mani, Ganghwa-gun, Incheon (NIBRFG0000001105); on dead *Q. variabilis*, *Ibid* (SFC 010316-19); on *Q. aliena*, Mt. Jiri, Hadong-gun, Gyeongnam Province (NIBRFG0000002764); on fallen twig of *Q. variabilis*, Mt. Jiri, Namwon-si, Jeonbuk Province (NIBRFG0000001162); *Ibid*, Mt. Odae, Gangneung-si, Gangwon Province (SFC 000518-09); on dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020405-05); on fallen *Q. variabilis*, *Ibid* (NIBRFG0000001816); *Ibid*, *Ibid* (NIBRFG0000001801); on fallen twig of *Q. aliena*, *Ibid* (NIBRFG0000000072)

99. *Trichaptum fuscoviolaceum* (Ehrenb.) Ryvarden 기와웃솔버섯

Specimen examined: on trunk of dead *Q. aliena*, Mt. Jiri, Sancheong-gun, Gyeongnam Province (SFC 980531-13); on dead *Q. variabilis*, Mt. Chilgap, Cheongyang-gun, Chungnam Province (SFC 980508-A14); *Ibid*, *Ibid* (SFC 980508-B24)

100. *Tyromyces chioneus* (Fr.) P. Karst. 개떡버섯

Specimen examined: on stump of *Q. aliena*, Mt. Bukhan, Gangbuk-gu, Seoul (NIBRFG0000002811)

101. *Tyromyces incarnatus* Imazeki 주황개떡버섯

Specimen examined: on *Quercus* sp., Mt. Jiri, Hamyang-gun, Gyeongnam Province (SFC 011114-31)

102. *Tyromyces sambuceus* (Lloyd) Imazeki 명아주개떡버섯

Specimen examined: on *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (SFC 020417-29)

103. *Vuilleminia comedens* (Nees) Maire 새재고약버섯

Specimen examined: on fallen twig of *Q. aliena*, Mt. Jiri, Hadong-gun, Gyeongnam Province (NIBRFG0000000542); *Ibid*, Mungyeongsaesae, Mungyeong-si, Gyeongbuk Province (NIBRFG0000001593); on fallen twig of *Quercus* sp., Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000000109); *Ibid*, *Ibid* (NIBRFG0000000116); *Ibid*, *Ibid* (NIBRFG0000000174)

104. *Xylobolus annosus* (Berk. & Broome) Boidin 큰귀북꽃구름버섯

Specimen examined: on dead *Q. aliena*, Mt. Songni, Boeun-gun, Chungbuk Province (NIBRFG0000001806); on stump of *Q. aliena*, *Ibid* (SFC 020418-13)

적 요

한반도에 자생하는 여섯 종의 참나무는 소나무와 함께 흔히 발견되는 수종들로, 이들은 딱정벌레인 *Platypus koryoensis*에 의해 매개되는 *Raffaelea*속의 균류뿐만 아니라 다른 많은 균류들에 의해 피해를 입고 있다. 다양한 목재부후균의 목록을 조사함으로써 참나무와 균류사이의 상호관계와 참나무수림을 효과적으로 관리하는 방법을 좀 더 깊이 이해하기 위한 초석이 될 것으로 사료된다. 본 연구에서는 서울대학교(Seoul National University Fungus Collection)와 국립생물자원관(NIBR)에 수장 중인 104종 523점의 목재부후균을 동정하여 전체조사목록을 제시하였다.

Acknowledgements

This work was supported by the Korean indigenous species research project from the National Institute of Biological Resources (NIBR), Ministry of Environment Republic of Korea.

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