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Macrofungi of Çameli District (Denizli-Turkey)

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Abstract: In this taxonomic study, macrofungi of Çameli (Denizli) were collected during the period 2000-2002. As a result of field and laboratory studies we report 80 taxa belonging to 27 families of *Ascomycetes* and *Basidiomycetes*.

Key Words: Çameli, fungal diversity, macrofungi, Turkey

Çameli Yöresinin (Denizli-Türkiye) Makrofungusları

Özet: Bu taksonomik çalışmada, 2000-2002 periyodunda Çameli (Denizli) yöresinin makrofungusları toplanmıştır. Arazi ve laboratuvar çalışmaları sonucu *Ascomycetes* ve *Basidiomycetes* sınıfından 27 familyaya ait 80 takson teşhis edilmiş ve burada rapor edilmiştir.

Anahtar Sözcükler: Çameli, fungal çeşitlilik, makrofunguslar, Türkiye

Introduction

Many taxonomic studies of the macrofungal mycota of Turkey have been carried out and many others remain in progress. Reports on macrofungi species collected and investigated between 1932 and 2004 were reviewed and, as a result, a total of 1600 species was established as the approximate number of documented macrofungi species for Turkey (Sesli & Denchev, 2005). These studies focused on the Mediterranean, Marmara, Black Sea, and the western regions of Turkey. Although there are many taxonomic studies from the Aegean region, there is no available information about the macrofungal diversity of the Çameli region. Therefore, Çameli was chosen as the research area for the present study.

Çameli is a district in the province of Denizli, bordered by Muğla to the south, Acıpayam to the north, Köyceğiz (Muğla) to the west, and Burdur to the east (Figure). The collection area, located in the Aegean region, has a Mediterranean-alpine climate. The investigated area is a

natural habitat to a number of trees and dominant forest plants include *Pinus nigra* J.F.Arnold, *Pinus brutia* Ten, *Cedrus libani* A.Rich, *Juniperus oxycedrus* L., and *Quercus coccifera* L. There are also *Populus alba* L. and *Salix triandra* L., which grow near the Kirazlıyayla and Dalaman streams.

The aim of the present study was to determine macrofungi species in the research area and, thus, to provide additional data on the macrofungal diversity of Turkey.

Materials and Methods

Field studies were carried out primarily in the spring and autumn, since during these seasons the climate conditions are most suitable for carpophore formation. Macrofungi specimens were removed from the ground with great care so as to not damage the base or other parts of the fruit bodies. Specimens were collected in

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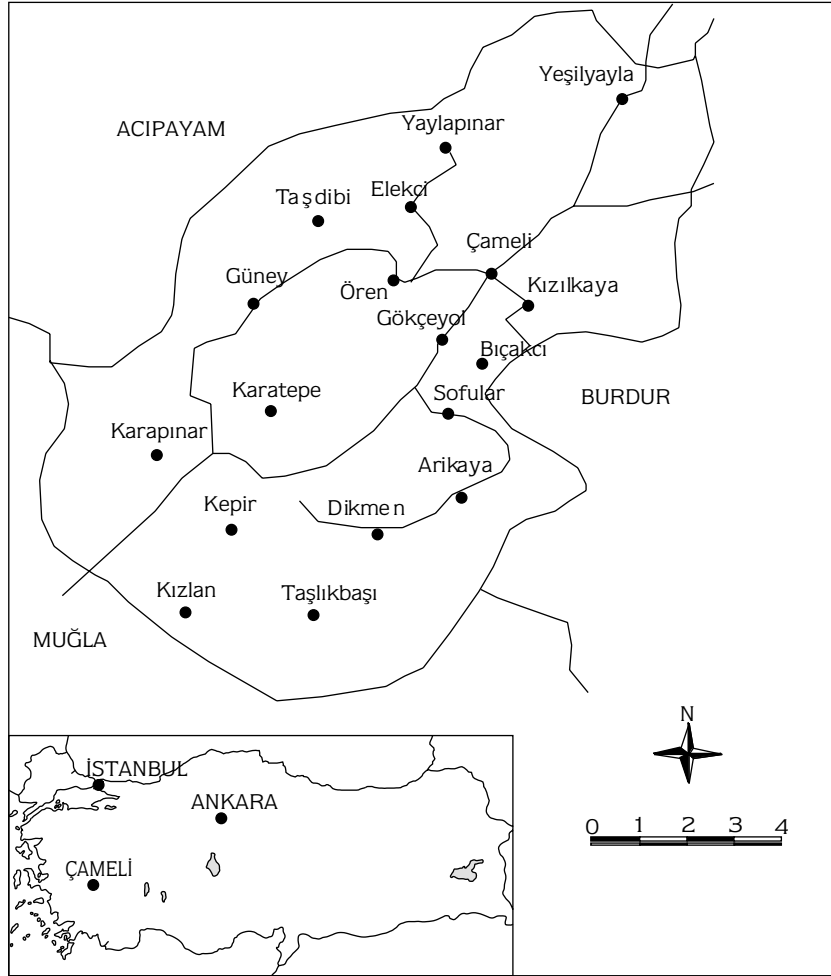


Figure. Collection areas.

separate wicker containers to avoid mixing. Basic features, such as colour, locality, and characteristics of habitat, were noted and photographed during the collection. In laboratory conditions morphological features and spore properties of dry and fresh macrofungi specimens were studied, and species were identified according to Phillips (1981), Watling (1982), Michael et al. (1983-1987), Moser (1983), Breitenbach & Kränzlin (1984-2000), Pegler (1987), Watling & Gregory (1987, 1989), Bresinsky & Besl (1990), Ellis & Ellis (1990), Grünert & Grünert (1984, 1991), Marchand, (1971, 1973, 1975, 1977, 1980, 1982, 1983, 1986), Moser (1983), Pacioni (1993), Gerhardt (1997), and Pace (1998). Taxa were arranged according to Kirk & Ansell (1992). After identification, the macrofungi samples were dried and kept in polythene bags containing 5 g of thymol crystals.

All materials were deposited in the Laboratory of Science Department, Pamukkale University, Education Faculty, Denizli.

Results

The species and families are listed in alphabetical order.

ASCOMYCETES

Discinaceae

1. *Gyromitra esculenta* (Pers.) Fr.

Elmalı village, on sandy soil, 09.iv.2001, *Kanlık* 211, 218.

Helvellaceae

2. *Helvella lacunosa* Afzel.

Bıçakçı village, 04.iv.2001, *Kanlık* 179. Dikmen Mountain, in meadows, 11.iv.2001, *Kanlık* 226; Karabelen Mountain, in meadows, 11.iv.2001, *Kanlık* 234.

3. *Helvella leucomelaena* (Pers.) Nannf.

Elmalı village, Kepir district, in pine forest, 18.iv.2001, *Kanlık* 256; Taşçılar village, in oak forest, 19.iv.2001, *Kanlık* 263.

4. *Helvella leucopus* Pers.

Bıçakçı village, on sandy soil near the road, 28.iii.2001, *Kanlık* 187; Kirazlıyayla village, in oak trees, 03.iv.2001, *Kanlık* 208.

Morchellaceae

5. *Morchella elata* Fr.

Elmalı village, Kepir district, in pine forest, 18.iv.2001, *Kanlık* 258; Taşçılar village, in pine forest, 19.iv.2001, *Kanlık* 265; Taşçılar village, in pine forest under *Cistus salvifolius*, 19.iv.2001, *Kanlık* 269.

6. *Morchella esculenta* (L.) Pers.

Bıçakçı village, in pine forest, 03.iv.2001, *Kanlık* 168; Bıçakçı village, Ören district, in pine forest under *C. salvifolius*, 04.iv.2001 *Kanlık* 181.

7. *Morchella vulgaris* (Pers.) Boud.

Sarıkavak village, in pine forest under *C. salvifolius*, 23.iv.2001, *Kanlık* 271; Karabayır village, in pine forest under *C. salvifolius*, 27.iv.2001, *Kanlık* 334.

Pezizaceae

8. *Peziza vesiculosa* Bull.

Elmalı village, Kepir district, Çakal Kırığı district, in pine forest, 26.iii.2001, *Kanlık* 152.

9. *Sarcosphaera coronaria* (Jacq.) J. Schröt.

Karabayır village, in oak forest, 27.iv.2001, *Kanlık* 337.

BASIDIOMYCETES

Agaricaceae

10. *Agaricus bisporus* (J.E. Lange) Pilát

Bıçakçı village, Kırkbudak district, in grass, 04.iv.2001, *Kanlık* 188; Arıkaya village, in grass, 24.iv.2001, *Kanlık* 281.

11. *Agaricus bitorquis* (Quél.) Sacc.

Arıkaya village, in grass, 05.vi.2001 *Kanlık* 465.

12. *Agaricus campestris* L.

Elmalı village, on manure, 16.v.2000 *Kanlık* 24; Bıçakçı village, Kırkbudak district, in grass, 04.iv.2001, *Kanlık* & *Türkoğlu* 192.

13. *Coprinus atramentarius* (Bull.) Fr.

Bıçakçı village, path side, 05.vi.2001, *Kanlık* 466.

14. *Coprinus comatus* (O.F. Müll.: Fr.) Pers.

Bıçakçı village, path side, 25.x.2000, *Kanlık* 47.

15. *Coprinus disseminatus* (Pers.) Gray

The bank of Dalaman Stream, on willow and poplar trunks, 23.iv.2001, *Kanlık* 275.

16. *Lepiota heimii* Locq.

Elmalı village, on poplar trunks, 17.x.2000, *Kanlık* 30.

17. *Leucoagaricus cinerascens* (Quél.) Bon & Boiffard

Dikmen Mountain, in mixed pine and oak forest, 10.iv.2002, *Kanlık* & *Türkoğlu* 485.

18. *Macrolepiota procera* (Scop.) Singer

Taşçılar village, in pine forest, 08.x.2001, *Kanlık* 371.

Albatrellaceae

19. *Albatrellus confluens* (Alb. & Schwein.) Kotl. & Pouzar

Near Dalaman stream, on poplar trees, 23.iv.2001, *Kanlık* & *Türkoğlu* 275.

Bolbitiaceae

20. *Agrocybe cylindracea* (DC.) Gillet

Elmalı village, on poplar trees, 29.iv.2001, *Kanlık* 219.

21. *Agrocybe praecox* (Pers.: Fr) Fayord

Elmalı village, on poplar trees, 05.vi.2001, *Kanlık* 467.

22. *Hebeloma eburneum* Malençon

Dikmen Mountain, in pine forest, 10.xi.2002, *Kanlık* & *Türkoğlu* 520.

23. *Hebeloma mesophaeum* (Pers.) Fr.

Dikmen Mountain, in pine forest, 10.xi.2002, *Kanlık* & *Türkoğlu* 521.

24. *Panaeolus campanulatus* (L.) Quél.

The bank of Dalaman Stream, on willow and poplar trunks, 23.iv.2001, *Kanlık* 277.

Boletaceae

25. *Boletus edulis* Bull.: Fr.

Bıçakçı village, Mumcu Marı district, in oak forest, 10.ix.2002, *Kanlık & Türkoğlu* 470.

26. *Boletus erythropus* Pers.

Gürsu village, Çıraoluk district, in pine forest, 15.x.2002, *Kanlık & Türkoğlu* 503.

27. *Boletus impolitus* Fr.

Bıçakçı village, Mumcu Marı district, in pine forest, 10.ix.2002, *Kanlık & Türkoğlu* 467.

28. *Boletus radicans* Pers.

Bıçakçı village, Mumcu Marı district, in pine forest, 10.ix.2002, *Kanlık & Türkoğlu* 468.

Cortinariaceae

29. *Gymnopilus penetrans* (Fr.) Murrill

Dikmen Mountain, in pine forest, 11.iv.2001, *Kanlık* 224.

30. *Inocybe geophylla* Sowerby : Fr.) P. Kumm.

Bıçakçı village, in grass, 05.iv.2001, *Kanlık & Türkoğlu* 204; Gürsu village, Tülüler plateau, in pine forest, 26.iv.2001, *Kanlık* 324.

31. *Inocybe rimosa* Britzelm.

Elmalı village, in grass, 10.iv.2001, *Kanlık* 215.

Ganodermataceae

32. *Ganoderma applanatum* (Pers.) Pat.

Karabayır village, on poplar, 27.iv.2002, *Kanlık & Türkoğlu* 465.

33. *Ganoderma lucidum* (Curtis) P. Karst.

Karabayır village, on poplar, 27.iv.2002, *Kanlık & Türkoğlu* 466.

Geastraceae

34. *Geastrum fimbriatum* Fr.

Gürsu village, Yaylacık district, in mixed pine and oak forest, 05.vi.2001, *Türkoğlu & Gezer* 462.

35. *Geastrum pectinatum* Pers.

Elmalı village, in pine forest, 05.vi.2002, *Kanlık & Türkoğlu* 491.

36. *Geastrum triplex* Jungh.

Gürsu village, Yaylacık district, in pine forest, 11.xi.2000, *Kanlık* 88; Kocadağ, in pine forest, 02.xii.2001, *Kanlık* 437.

Gomphidiaceae

37. *Chroogomphus rutilus* (Schaeff.) O.K. Mill.

Arıkaya village, Karaöz district, in pine forest, 24.iv.2001, *Kanlık* 293; Sofular village, Gedik Boğazı district, 25.iv. 2001, *Kanlık* 298.

Hapalopilaceae

38. *Bjerkandera adusta* (Willd.) P. Karst.

Sofular village, Küçük havdancık district, on *Fagus*, 25.iv.2001, *Kanlık* 309.

Hymenochaetaceae

39. *Phellinus pini* (Brot.) Bondartsev & Singer

Kızılağaç district, on *Prunus* sp., 25.iv.2002, *Kanlık & Türkoğlu* 468.

40. *Phellinus pomaceus* (Pers.) Maire

Kızılağaç district, on *Prunus* sp., 23.iii.2001, *Kanlık* 128; Bıçakçı village, Çeçey district, on *Prunus* sp., 04.iv.2001, *Kanlık & Türkoğlu* 87.

41. *Phellinus torulosus* (Pers.) Bourdot & Galzin

Arıkaya village, Karaöz district, on pine trunk, 10.ix.2002, *Kanlık & Türkoğlu* 481.

Lycoperdaceae

42. *Langermannia gigantea* (Batsch) Rostk.

Elmalı village, in pine forest, 05.vi.2002, *Kanlık & Türkoğlu* 498.

43. *Lycoperdon molle* Pers.

Elmalı village, in pine forest, 05.vi.2002, *Kanlık & Türkoğlu* 495.

44. *Lycoperdon perlatum* Pers.

Elmalı village, in pine forest, 05.vi.2002, *Kanlık & Türkoğlu* 493.

Nidulariaceae

45. *Cyathus olla* (Batsch) Pers.

Arıkaya village, Karaöz district, on pine trunk, 06.xi.2000, *Kanlık* 73.

Pleurotaceae

46. *Pleurotus eryngii* (DC.) Gillet

Bıçakçı village, in grass, 05.iv.2001, *Kanlık* 198; Elmalı village, on *Ferula* sp., 10.iv.2001, *Kanlık* 215.

47. *Pleurotus ostreatus* (Jacq.) P. Kumm.

Elmalı village, on willow trees, 21.iii.2001, *Kanlık* 122; Bıçakçı village, Gökteş district, 03.iv.2001, *Kanlık* 172.

Pluteaceae

48. *Amanita ovoidea* (Bull.) Link.

Sarıkavak village, on poplar trees, 23.iv.2001, *Kanlık* 278.

49. *Volvariella bombycina* (Schaeff.) Singer

Elmalı village, in pine forest, 04.x.2001, *Kanlık* 363.

Polyporaceae

50. *Fomes fomentarius* (L.) J.J.Kickx

Gürsu village, Çıraoluk district, on poplar trunk, 26.iv.2001, *Kanlık* 318.

51. *Laetiporus sulphureus* (Bull.) Murrill

Gürsu village, Çıraoluk district, on poplar trees, 11.xi.2000, *Kanlık* 81.

52. *Polyporus squamosus* (Huds.) Fr.

Sofular village, Küçük Havdancık district, on apple tree, 25.iv.2002, *Kanlık & Türkoğlu* 460.

53. *Trametes gibbosa* (Pres.) Fr.

Arıkaya village, Karaöz district, on pine tree, 05.vi.2001, *Türkoğlu & Gezer* 461.

54. *Trametes versicolor* (L.) Lloyd

Bıçakçı village, Küçük Ballık district, on willow trunks, 03.iv.2001, *Kanlık* 175.

Rhizopogonaceae

55. *Rhizopogon luteolus* Fr.

Elmalı village, in pine forest 05.vi.2002, *Kanlık & Türkoğlu* 463.

56. *Rhizopogon roseolus* (Corda) Th. Fr.

Elmalı village, in pine forest, 21.iii.2001, *Kanlık* 123; Elmalı village, Çakal Kırığı district, in pine forest, 26.iii.2001, *Kanlık* 154.

Russulaceae

57. *Lactarius deliciosus* (L.) Gray

Bıçakçı village, in pine forest, 25.x.2000, *Kanlık* 48; Karabayır village, in pine forest, 21.xi.2000, *Kanlık* 115; Elmalı village, in pine forest, 04.x.2001, *Kanlık* 365.

58. *Lactarius deterrimus* Gröger

Bıçakçı village, in pine forest, 25.x.2000, *Kanlık* 49; Karabayır village, in pine forest, 21.xi.2000, *Kanlık* 118.

59. *Russula delica* Fr.

Taşçılar village, in pine forest, 06.v.2000, *Kanlık* 469.

60. *Russula foetens* (Pers.) Pers.

Sofular village, in pine forest, 22.xi.2001, *Kanlık* 408.

61. *Russula vinosa* Lindblad

Taşçılar village, in pine forest, 08.x.2001, *Kanlık* 368.

Schizophyllaceae

62. *Schizophyllum commune* Fr.

Elmalı village, Kanlıçay district, on willow trees, 26.ix.2000, *Kanlık* 356.

Stereaceae

63. *Stereum hirsutum* (Willd.: Fr.) Gray

Gökçeyaka village, 07.xi.2000, *Kanlık* 77; Kocadağ, on stumps, 11.iv.2001, *Kanlık* 239.

64. *Stereum ocraceoflavum* (Schwein.) Fr.

Sofular village, Kara Kısıcık district, on stumps, 20.xi.2001, *Kanlık* 395.

Strophariaceae

65. *Hypholoma fasciculare* (Huds.) P. Kumm.

Elmalı village, in the graveyard, on poplar, 09.iv.2001, *Kanlık* 212.

66. *Stropharia coronilla* (Bull.: Fr.) Fr.

Elmalı village, Kepir district, in pine forest, 12.iv.2001, *Kanlık* 249.

Suillaceae

67. *Suillus bellinii* (Inzenga) Watling

Elmalı village, in pine forest, 12.x.2000, *Kanlık* 169; Gürsu village, Çıraoluk district, in pine forest, 01.xi.2000, *Kanlık* 83; Bıçakçı village, Mumcu Marı district, in pine forest, 14.x.2001, *Kanlık* 378.

68. *Suillus granulatus* (L.) O. Kuntze

Gürsu village, Çıraoluk district, in pine forest, 15.x.2002, *Kanlık & Türkoğlu* 500.

69. *Suillus luteus* (L.) Roussel

Gürsu village, Çıraoluk district, in pine forest, 15.x.2002, *Kanlık & Türkoğlu* 501.

Tricholomataceae

70. *Clitocybe costata* Kühner & Romagn.

Sofular village, on oak trees, 22.xi.2001, *Kanlık* 403.

71. *Clitocybe odora* (Bull.) P. Kumm.

Elmalı village, on oak trees, 12.x.2000, *Kanlık* 20.

72. *Laccaria laccata* (Scop.) Fr.

Sofular village, in pine forest, 30.x.2000, *Kanlık* 68.

73. *Lepista nuda* (Bull.) Cooke

Bıçakçı village, Ören district, in pine forest, 24.x.2000, *Kanlık* 42.

74. *Mycena strobilicola* J. Favre & Kühner

Bıçakçı village, Ören district, in black pine forest, 05.iv.2001, *Kanlık* & *Türkoğlu* 208.

75. *Tricholoma arvernense* Bon

Sofular village, Karakışık district, in pine forest, 30.x.2000, *Kanlık* 59.

76. *Tricholoma myomyces* (Pers.) J.E. Lange

Elmalı village, Çakal Kırığı district, in pine forest, 18.x.2000, *Kanlık* 34; Bıçakçı village, in pine forest, 24.x.2000, *Kanlık* 43.

77. *Tricholoma stans* (Fr.) Sacc.

Karabayır village, in pine forest, under cedar, 27.iv.2001, *Kanlık* 335.

78. *Tricholoma ustale* (Fr.: Fr.) Kumm.

Bıçakçı village, in pine forest, 05.vi.2001, *Türkoğlu* & *Gezer* 464.

79. *Xerula radicata* (Relhan) Dörfelt

Gürsu village, Tülüler plateau, in pine forest, 26.iv.2001, *Kanlık* 321.

Tulostomataceae

80. *Tulostoma brumale* Pers.

Dikmen Mountain, under pine, 11.v.2002, *Kanlık* & *Türkoğlu* 469.

Discussion and Conclusion

In this study, 80 taxa of macrofungi belonging to 27 families were identified and reported from the Çameli district in Turkey.

Among them, 9 species (11%) belong to *Ascomycetes* and 71 (89%) to *Basidiomycetes*. These figures are similar to those reported in earlier studies conducted in other areas. For instance, in the Mediterranean region of Turkey, macrofungi species consist of 7.5% *Ascomycota* and 92.5% *Basidiomycota* (Işıloğlu & Watling, 1992), 13% and 87% in İzmir province (Solak et al., 2000), 9% and 91% in the Antalya region (Gezer, 2000), and 13% and 87% in the Bekilli district (Köse et al., 2006). The distribution of the 80 species within families is as follows: *Tricholomataceae* 10, *Agaricaceae* 9, *Bolbitiaceae* 5, *Polyporaceae* 5, *Russulaceae* 5, *Boletaceae* 4, *Geastraceae* 3, *Cortinariaceae* 3, *Helvellaceae* 3, *Hymenochaetaceae* 3, *Lycoperdaceae* 3, *Morchellaceae* 3, *Suillaceae* 3, *Ganodermataceae* 2, *Pleurotaceae* 2, *Pluteaceae* 2, *Rhizopogonaceae* 2, *Stereaceae* 2, *Strophariaceae* 2, *Pezizaceae* 2, *Albatrellaceae* 1, *Tulostomataceae* 1, *Discinaceae* 1, *Gomphidiaceae* 1, *Hapalopilaceae* 1, *Nidulariaceae* 1, and *Schizophyllaceae* 1. The families richest in species are *Tricholomataceae* (12.5%) and *Agaricaceae* (11.3%).

In comparison to earlier studies carried out near our research area, there were some similarities in terms of species distribution through the regions (Işıloğlu & Watling, 1992; Solak et al., 1999; Gezer, 2000; Köse et al., 2006). This may have been due to the similarities in vegetation, climate, and flora.

Of the 80 macrofungi species, 16 area are eaten by the local population. The edible species and their local names are: *Morchella esculenta* (kuzu göbeği), *M. vulgaris* (kuzu göbeği), *M. elata* (kuzu göbeği), *Rhizopogon roseolus* (dolaman), *R. luteus* (dolaman), *Lactarius deliciosus* (çıntar), *L. deterrimus* (çıntar), *Pleurotus ostreatus* (yaprak mantarı), *P. eryngii* (diken mantarı), *Lepista nuda* (mor mantar), *Tricholoma myomyces* (karakız mantarı), *Macrolepiota procera* (dede mantarı), *Agaricus campestris* (beyaz mantar), *A. bisporus* (beyaz mantar), *A. bitorquis* (beyaz mantar), and *Russula delica* (beyaz çıntar). We documented 5 poisonous species: *Gyromitra esculenta*, *Hypholoma fasciculare*, *Inocybe rimosa*, *I. geophylla*, and *Tricholoma ustale*. There are no reports of death from mushroom poisoning in this area because the local population collect only well-known edible mushrooms.

Lignicolous macrofungi consist of 22 (28.8%) species in the area. *Schizophyllum commune*, in particular, is a

very common species. Gezer (2000) reported that these and other species suffered extensive damage in the study area, as well as in other localities in Turkey. *Fomes*, especially in beech forests in the Black Sea region, and *Polyporus*, on chestnut trees in Bolu province and the

Belgrad Forest in İstanbul, have suffered extensive damage.

This study on the macrofungal mycota of Çameli represents a significant contribution to the known data on the fungal diversity of Turkey.

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