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# MACROMYCETES OF MEDITERRANEAN TURKEY

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Eighty one species of larger fungi are recorded from Mediterranean Turkey, many of which are noted for the first time either for Turkey as a whole or the southern region. Notes on the distribution, where appropriate, are added especially for the most significant collections. All the major families of agarics are included in addition to some gasteromycetes, members of the Polyporales, and a few ascomycetes.

## INTRODUCTION

The phanerogamic flora of Turkey is very well documented (Boissier, 1869 & subseq.; Davis, 1965 & subseq.) and although some collections of larger fungi have been noted, little attention has been paid to those of the mediterranean areas of the country. This omission is redressed herein based on collections made by the senior author. A wide range of agarics have been examined and compared with herbarium material from continental Europe and, wherever possible, material from the British Isles. In addition a few prominent polypores and their allies, stomach fungi or gasteromycetes, and members of the Pezizales (Ascomycotina) were included in this study.

Most of the species recorded are of cosmopolitan distribution but there are certain taxa which indicate a southern element (e.g. *Amanita caesarea*, *A. ovoidea* and *Leccinum corsicum*) and others a mediterranean element (e.g. *Amanita codinae*). Surprisingly there are some northern European elements (e.g. *Sarcodon scabrosum*) which contrast with those with a more continental distribution e.g.(*Pyroformes demidoffi*). These ideas, however, are based on only limited knowledge and may require modification when more work is carried out on the larger fungi in the eastern Mediterranean Basin. Some of the fungi are undoubtedly tied to their mycorrhizal hosts, e.g. *S. bellinii* and *S. boudieri* with pines. In southern Turkey these species are found not with *Pinus halapensis*, as they are in the northern mediterranean, but with *P. brutia*. Indeed, several species are now recorded in association for the first time with *P. brutia*.

Amongst the saprophytic fungi there are also new host/fungus records but in the case of some taxa there appears to be even a switch of hosts, for example, *Mycena strobicola* on *Pinus* not on *Picea* and *Phellinus rimosus* on *Abies* and not on hardwood.

Some of the fungi recorded, although widespread, are apparently never common throughout Europe, e.g. *Pholiota astragalina*. In contrast, in southern Turkey *Astraeus hygrometricus* occurs in large troops whereas in certain western countries it is decreasing or is now extinct. The most exciting record, however, is of *Torrendia pulchella* the

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present record of which extends its distribution to the eastern end of the Mediterranean Basin.

Many of the fungi listed are edible, examples being *Macrolepiota* spp., *Pleurotus ostreatus*, *Lactarius deliciosus* and *Morchella conica*. Surprisingly the first is not eaten in Turkey but the native traditions will be discussed at length elsewhere by the senior author. There are several poisonings each year from eating larger fungi but because of our poor knowledge of the total flora it is at present impossible to indicate which fungi are associated with which poisoning. However, in two cases *Lepiota helveola* has been implicated (Isiloglu & Watling, 1991). In the records below there are certainly other toxic species, e.g. *Omphalotus olearius* and *Inocybe* spp., but more information is required on their involvement in cases of toxicity.

MAIN COLLECTING AREAS

Collections were made from over seventeen localities, all within the mediterranean parts of Turkey (southern Anatolia fide Davis, 1965; see Fig. 1). The vegetation of these localities is of mixed woodland predominantly with conifers, especially *Pinus brutia*. Four species of *Quercus* are dispersed in these communities; the pine and oaks along with *Abies cilicica*, *Salix alba* and *Populus alba* constitute the main ectomycorrhizal hosts. Other dominant plants are listed in Table 1 after Kayacik (1966).

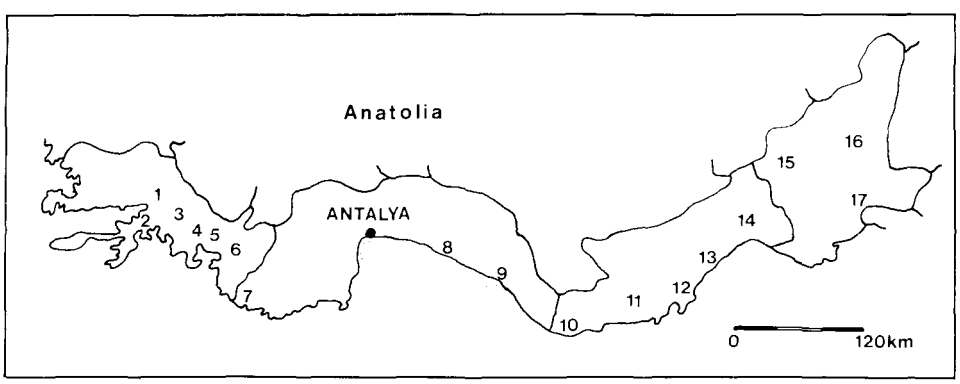


FIG. 1. Localities from which collections of larger fungi have been examined. 1, Ula; 2, Marmaris; 3, Köyceğiz; 4, Ortaca; 5, Dalaman; 6, Fethiye; 7, Kalkan; 8, Manavgat; 9, Alanya; 10, Anamur; 11, Gülnar; 12, Silifke; 13, Erdemli; 14, Tarsus; 15, Pozanti; 16, Kozan; 17, Ceyhan.

All the material was collected by the senior author between 1988 and 1990 and was the subject of a special study by him whilst in the laboratory of the Royal Botanic Garden Edinburgh.

The material is deposited in the Herbarium of Inönü University of Malatya with duplicates wherever possible in E. More detailed descriptions will appear in a doctorate thesis by the senior author.

## SPECIES LIST

The species are arranged in alphabetical order within families and follow where possible (Dennis, Orton & Hora (1960) and colours follow the Colour Identification Chart

accompanying the *British Fungus Flora: Agarics and Boleti* (Henderson, Orton & Watling, 1969). Where there are recent changes in classification and for non-British taxa Moser (1983) has been consulted.

TABLE 1. Dominant plants of the study area

| | | |
|---|---|---|
| Abies cilicica | Quercus ilex | Paliurus spina-christii |
| Cedrus libani | Liquidambar orientalis | Arbutus unedo |
| Pinus brutia | Ulmus campestris | Erica arborea |
| Cupressus sempervirens | Laurus nobilis | E. verticillata |
| Salix alba | Crataegus monogyna | Styrax officinalis |
| Populus alba | Ceratonia siliqua | Nerium oleander |
| Quercus libani | Myrtus communis | Olea europaea |
| Q. coccifera | Pistacia terebinthus | |
| Q. cedrorum | P. lentiscus | |

## BASIDIOMYCOTINA
## Hymenomycetes

AGARICALES

Agaricaceae

**1. *Agaricus bisporus*** (Lange) Singer

$C_3$, Alanya-Manavgat roadside 25km, in pasture, 26 xii 1988, *Işiloğlu* 1140.

*A. bisporus* is a wild relative of the cultivated mushroom, one of our most familiar agarics. It has recently been recorded by Gezer (1988) from Eskisehir.

**2. *Agaricus campestris*** (L.) Fr.

$C_5$, Tarsus, Namrun Yaylasi, 29 x 1988, *Işiloğlu* 1051; Gülnar, 12 xii 1988, *Işiloğlu* 1110. $C_3$, Kalkan, 26 xii 1988, *Işiloğlu* 1142. $C_2$, Marmaris, 28 xi 1990, *Işiloğlu* 1283.

The common field mushroom is characterized by broadly ellipsoid basidiospores (7.2-9.6 x 4.8-6.4µm), pink gills and fertile gill-margin. It is widespread in Turkey; Oder (1978) records it from Giresun; Isiloglu (1987) from Malatya; Gezer (1988) from Eskisehir; and Solak (1990) from Bursa.

**3. *Agaricus cupreobrunneus*** (Schaeff. & Steer) Möller

$C_4$, Erdemli, in the picnic area, near the beach, 23 xi 1990, *Işiloğlu* 1185. $C_2$, Ula, in pasture, 28 xi 1990, *Işiloğlu* 1255.

This agaric is recognized by the purple-brown, concentrically scaly pileus and fertile gill-margin. It is a widespread European species of hill pastures and lowland grassland. Although not unexpected, this is the first record for Turkey.

Amanitaceae

**4. *Amanita caesarea*** (Scop.: Fr.) Pers.

$C_4$, Anamur, in pine forest, 20 xi 1988, *Işiloğlu* 1081.

This member of the genus (sect. *Vaginatae*) has a rather southern distribution in Europe. It is recorded from N Africa, and from Turkey by Karamanóglu & Öder (1973) and by Sümer (1987). It agrees in all ways with European collections. This taxon is recorded from N America (Jenkins, 1986) but there is still controversy and speculation as to the relationship of these collections, those from Europe, and *A. hemibapha* (Berk. & Br.)

Sacc. from SE Asia. Our collection differs from *A. hemibapha* in the distinctive orange to reddish fibrillose scaly zones on the stipe.

**5. *Amanita codinae*** (R. Maire) Singer
C4, Erdemli, in open woodland of pine forest, 16 x 1988, *Işiloğlu* 1025; loc. cit., 23 xi 1990, *Işiloğlu* 1177.
This member of subg. *Lepidella* is known from W Spain, Morocco and S France (Bas, 1969), and now for the first time from Turkey. The present record considerably extends the geographical distribution; the habitats of this species throughout its range are all apparently similar.

**6. *A. ovoidea*** (Bull.: Fr.) Quélet
C4, Erdemli, in pine forest, 7 x 1988, *Işiloğlu* 1061. C5, Kozan, amongst fallen needles under *Pinus brutia* in conifer woodland; 17 x 1988, *Işiloğlu* 1121. C4, Silifke-Gülnar roadside, 26 x 1990, *Işiloğlu* 1207.
This taxon, although generally rare throughout its range is southern in distribution in Europe. It appears to favour calcareous soils. It is a large, fleshy, edible agaric of pine-forests and is found widely in Kozan and Erdemli from October to December. It can be confused with the toxic *Amanita verna* (Bull.: Fr.) Pers. ex Vitt. which differs in the round spores (7–8μm) and always pure white, not ochraceous pileus, gills, stipe and volva, and more delicate habit. It would appear to be not uncommon in S Turkey, and is also known from N Turkey (Öder 1986).

The present collections show some variability in the colour of the volva which needs further investigation. *Işiloğlu* 1061 had a white volva in contrast to *Işiloğlu* 1121 and 1207 which exhibited yellowish brown colours.

Boletaceae
**7. *Leccinum corsicum*** (Roll.) Singer
C4, Erdemli, in mixed forest, with *Quercus* sp., 18 xii 1988, *Işiloğlu* 1123.
This is a member of a southern group of boletes in the genus *Leccinum*. It and several relatives are known from the Mediterranean Basin, from Spain to Italy and N Africa to Israel, and are generally associated with *Quercus*. As well as honey yellowish tubes, pores and scabrosities on the stipe, *L. corsicum* is particularly distinguished by the chestnut red-brown pileus. This is the first record from Turkey.

**8. *Suillus bellinii*** (Inz.) Watl.
C4, Silifke, Sehitlik Ormani, in pine forest, 19 xii 1990, *Işiloğlu* 1132.
This is closely related to the next species and is known from Italy, Greece etc. It has been recorded from Manisa by Gücin & Öner (1982), by Gücin (1983, 1987) from Elazig and Malatya, and by Solak (1990) from Bursa.

**9. *Suillus boudieri*** (Quélet) Watl.
C4, Gülnar, in pine forest, under *Pinus brutia*, 20 xi 1988, *Işiloğlu* 1085.

This species is widespread in southern areas of Europe and has been documented in full by Watling (1968) where the species is distinguished from *S. bellinii*. This record constitutes the first for Turkey.

Coprinaceae

**10. *Coprinus atramentarius*** (Bull.: Fr.) Fr.

$C_5$, Pozanti, in poplar plantation, under *Populus* sp., 23 xi 1990, *Işiloğlu* 1179.

This record is based on a photograph of a single collection which shows the clustered habit, large size and typical obtuse pileus; the stipe base possesses a volvate ridge. This species is very common throughout the world and records include many for Turkey: by Öder (1978) from Giresun, Trabzon and Samsun; by Gücin (1983, 1987) from Elazig and Malatya; and by Gezer, (1988) from Eskísehir.

**11. *Coprinus galericuliformis*** Losa ex Watl.

$C_4$, Silifke, Göksu River side, 26 xi 1990, *Işiloğlu* 1198.

This member of subg. *Pseudocoprinus* is characterized by a clustered habit correlated with the strongly lentiform basidiospores of the *C. plicatilis* group. Although rare, it is known from temperate N America and Europe; this record is apparently the first for Turkey although the species, true distribution is not fully known because of confusion with *C. plicatilis* (Curt.: Fr.) Fr.

**12. *Coprinus ovatus*** (Schaeffer: Fr.) Fr.

$C_2$, Ortaca, on clayish soil, bed of dried up stream, 7 x 1990, *Işiloğlu* 1153.

Moreno *et al.* (1990) have demonstrated the differences between *C. ovatus* and *C. comatus* with which it has probably been confused, although *C. comatus* when grown in culture shows the development of a rooting base this is never as prominent as in *C. ovatus*. In addition, the basidiospores are apparently larger in size (11–15 x 7–10μm as opposed to 10–14 x 6–8μm). This species has not been recorded from Turkey before, but it may well have been mistaken for *C. comatus* which has been reported on several occasions.

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

$C_4$, Kozan, in open places of mixed forest, 6 xi 1988, *Işiloğlu* 1065; Ula, 28 xi 1990, *Işiloğlu* 1266.

No voucher material is available but this agaric is so distinctive that the record which constitutes the first for Turkey, is accepted on the basis of a colour transparency based on *Işiloğlu* 1065. In addition, this species has been collected several hundred kilometeres further west in Ula. Basidiomes of this attractive agaric develop in deep leaf-litter in mixed forests in autumn; this contrasts to collections from the British Isles where the fungus characterizes beech-woods.

**14. *Lacrymaria lacrymabunda*** (Bull.: Fr.) Pat.

$C_2$, Ula, in open woodland, amongst grass, on rich soil, 2 xii 1990, *Işiloğlu* 1294.

This is a widely distributed agaric usually found in disturbed soils often around habitation, on tracks in woods, plantations, fields etc. It is known from most major areas

of the world but this is surprisingly the first record for S Turkey. Some authors, e.g. Smith (1972) and Singer (1986), place the species in *Psathyrella*.

*L. lacrymabunda* is easily recognized in the field by its large, fibrillose-woolly pileus and its almost black gills with white margins that exude a colourless liquid when fresh. It is recorded from Istanbul by Selik & Sümer (1982).

**15. *Panaeolus foenisecii*** (Pers.: Fr.) Schröter
C4, Anamur, amongst grass, 25 xi 1990, *Işiloğlu* 1194.
It is recorded for many areas of the world and previously noted for Turkey by Öner (1972 as *Psilocybe*); although this second record is from a more southerly locality; it might be expected in other localities in the country. It has been placed in *Panaeolina* mainly because of the ornamental basidiospores and dark brownish spore-print; Smith (1972) transferred it to *Psathyrella*. This agaric has been considered hallucinogenic in some areas of the temperate world (Watling 1982).

**15a.** A photograph very probably representing *Panaeolus campanulatus* (L.: Fr.) Quélet was taken of material from S Turkey. Further material is required to authenticate the record.

**16. *Psathyrella gracilis*** (Fr.) Quélet
C2, Ula, forest roadside, 2 xii 1990, *Işiloğlu* 1309.
This is a common and widespread taxon throughout Europe and N America where it is found in grassy areas, in parkland etc. It belongs to section *Psathyrella* and differs from *P. microrhiza* (Lasch) Singer in the colour of the gill trama; brown in *P. gracilis* and hyaline in *P. microrhiza*. We have not found this species to be previously reported from Turkey.

**17. *Psathyrella*** sp.
C2, Ula, forest roadside, 2 xii 1990, *Işiloğlu* 1286.
This species of *Psathyrella* (in section *Psathyra*) has been recorded in the same area as *P. gracilis* growing in the same kind of habitat but differs in the smaller spores (8–8.5 x 5–5.5μm), the utriform cheilocystidia and absence of pleurocystidia. A photograph taken in Mersin (Silifke, near Göksu River, 26 xi 1990) is what can only be *Psathyrella candolleana* s. lato. This is a widespread species in Europe and later collections will no doubt confirm its presence in S Turkey.

Cortinariaceae
**18. *Cortinarius*** aff. ***subvalidus*** R. Henry
C4, Erdemli, in mixed conifer forest, under *Cedrus* sp. 18 xii 1988, *Işiloğlu* 1119.
This is a member of the *C. subtriumphans* group which has been fully documented for Britain by Orton (1960). Moser (1960) includes it in his key to *Phlegmacium* and his accompanying figures agree in all ways as far as can be ascertained. This is one of the more conspicuous members of the genus which, as elsewhere, has many members in Turkey. They are not included as part of this study although undoubtedly many, when identified, will be new records for the country.

**19. *Hebeloma sinapizans*** (Paulet: Fr.) Gillet
C4, Silifke, in pine forest, under *Pinus brutia*, caespitose in large groups, 19 xii 1988, *Işiloğlu* 1134.
This large, fleshy *Hebeloma* occurred in huge groups in the humus-rich soil of a pine forest. In continental Europe it occurs under conifers and frondose trees and might be expected to be more widely distributed in Turkey. Apparently this record constitutes the first for Turkey.

**20. *Inocybe geophylla*** (Sow.: Fr.) Kummer var. ***lilacina*** Gillet
C2, roadside between Ula and Mugla, in pine forest, 28 xi 1990, *Işiloğlu* 1272; Ula, Kestane Dági 2 xii 1990, *Işiloğlu* 1327.
This common species occurs in two colour forms possibly of equal frequency in Europe. However, as yet only the violaceous form has been found in the study area; var. *geophylla* has been recorded by Öner (1972). The colour intensity of the violaceous variety is quite variable and partly age dependent. It is a widely distributed agaric in temperate N America and Europe. This record of var. *lilacina* constitutes the first for Turkey.

**21. *Inocybe patouillardii*** Bres.
C4, Erdemli, in open area of pine forest, 12 xi 1988, *Işiloğlu* 1067.
Kuyper (1986) considers that the correct name for this species is *I. erubescens* Blytt. It is a well-known toxic agaric although there are few extensively documented cases even in Europe where it is widespread but never common (Bresinsky & Besl, 1985). It is also known from N America (Ammirati et al., 1985). This is the first record for Turkey.

**22. *Pholiota astragalina*** (Fr.) Singer
C4, Anamur-Antalya, roadside in pine forest, 13 xi 1988, *Işiloğlu* 1072.
This differs in the field from other common species of *Pholiota* in its flame-orange to pinkish orange pileus and rather bitter taste. Although this is the first record from Turkey, it is apparently widespread in Europe and N America.

**23. *Pholiota carbonaria*** A. H. Smith
C4, Erdemli, in burnt pine forest, 18 xi 1988, *Işiloğlu* 1074; Silifke, on ash in burnt mixed conifer forest, 18 xii 1988, *Işiloğlu* 1116.
This species usually grows in sparse clusters and can be distinguished from *P. astragalina* by its habitat requirements. *P. carbonaria* is always found on burnt ground and this is the first record from Turkey. The epithet '*carbonaria*' has often been used for a very common European species formerly placed in the genus *Flammula*. This is in fact *P. highlandensis* Peck which differs in its paler pileus and lack of reddish tawny to orange veil; this species should also be looked out for in the forests of the area.

Gomphidiaceae
**24. *Chroogomphus rutilus*** (Fr.) Miller
C5, between Adana and Kozan, pine forest, 6 xi 1988, *Işiloğlu* 1064. C2, between Dalaman and Fethiye, pine forest, 27 xi 1988, *Işiloğlu* 1142.

This lamellate bolete is widespread in the boreal forests of Europe, N America and Asia. It is noted by Miller (1964) from Japan and Asia Minor. It is apparently found with a variety of conifers and is not confined to growing with *Pinus* spp.; so far in Turkey it is associated with *Pinus brutia*, a 2-needled pine. These present records expand the distribution of this species in Turkey, as it is recorded elsewhere under the synonym *Gomphidius viscidus* (L.:Fr.) Fr. *Chroogomphus* differs from *Gomphidius* in the coloured gills and flesh, the latter turning blue-black in Melzer's reagent. It has been recorded by Gücin & Öner (1982) from Manisa and by Solak (1990) from Bursa.

Hygrophoraceae

**25. *Hygrophorus chrysodon*** (Batsch) Fr.

$C_4$, Silifke-Gülnar roadside 15km, pine forest, 18 xii 1990, *Işiloğlu* 1114.

This is a very distinct species with yellowish granules on the stipe, contrasting with the paler background colour. It is widespread in north temperate areas in native conifer woods and is known from several localities in Turkey: Bolu, by Watling & Gregory (1977); Artvin and Sinop, by Öder (1978); and Manisa, by Gücin & Öner (1982).

Lepiotaceae

**26. *Lepiota helveola*** Bres.

$C_5$, Kozan, in pasture, 5 xi 1988, *Işiloğlu* 1058. $C_6$, Ceyhan, in pasture 6 xi 1988, *Işiloğlu* 1059.

This fungus has been fully documented by the authors (Işiloğlu & Watling, 1991). It is one of Turkey's most poisonous mushrooms and has caused several fatalities. It had previously been recorded from E Turkey by Gücin (1986), but this is the first record from the southern area. It is also recorded from Israel by Binyamini (1975).

**27. *Leucoagaricus leucothites*** (Vitt.) Wasser

Syn.: *Agaricus leucothites* Vitt., Funghi Mangerecci: 310 (1835)
*Lepiota leucothites* (Vitt.) P.D. Orton in Tran. Brit. Mycol. Soc. 43:177 (1960).

$C_5$, Tarsus, in open woodland, 29 x 1988, *Işiloğlu* 1033. $C_4$, Anamur 10 xii 1988, *Işiloğlu* 1109. $C_2$, Ula 2 xii 1990, *Işiloğlu* 1321.

These collections agreed with the above taxon as outlined by Orton in Dennis, Orton & Hora (1960) although there is much confusion in the taxonomy and nomenclature of this fungus. *L. leucothites* has been adopted here for a fairly widespread agaric called by many *Lepiota pudica* (= *Leucoagaricus pudicus* (Bull.: Quélet) Bon). In our restricted sense the unchanging flesh, or at most slightly brownish on handling, characterizes the species. It would appear that in Europe and N America it is more frequent in areas of warmer climate. These records constitute the first for Turkey.

**28. *Macrolepiota mastoidea*** (Fr.) Singer

$C_4$, Erdemli, in open place, in pine forest, 16 x 1988, *Işiloğlu* 1027; Erdemli, 18 xii 1988, *Işiloğlu* 1120

Also known from elsewhere in the world, *M. mastoidea* is relatively widespread in Europe where it is found in open woods or woodland margins. It occurs in similar places

in pine woods in Turkey and often occurs in fairly large numbers, especially from October to December. This record constitutes the first for Turkey.

**29. *Macrolepiota procera*** (Scop.:Fr.) Singer
$C_5$, Tarsus, 30 x 1988, *Işiloğlu* 1057. $C_4$, Anamur-Antalya, roadside, 27 xii 1988, *Işiloğlu* 1103. $C_2$, Ula-Köycegiz, roadside, 28 xi 1990, *Işiloğlu* 1337.
This very large parasol agaric is a widespread, cosmopolitan species throughout the major regions of the world, including S Turkey. Its distinguising features of are: regularly concentric scales on the pileus, double ring, bulbous, adder-like ornamented stipe, and large (15–20 x 10–12μm), dextrinoid basidiospores which have an enormous germ-pore. It has been reported from several provinces: Watling & Gregory (1977) from Bolu; Öder (1978) from Artvin and Sinop; Gücin (1987) from Malatya; Solak (1990) from Bursa; Asan & Gücin (1990) from Istiranca Daglari. These records extend its distribution in Turkey.

Paxillaceae
**30. *Omphalotus olearius*** (DC.: Fr.) Singer
$C_5$, Tarsus, Namrun Yaylasi, on *Pistacia lentiscus*, 29 x 1988, *Işiloğlu* 1050; Kozan, on *P. lentiscus* and *Olea europaea*, 6 xi 1988, *Işiloğlu* 1062. $C_4$, Erdemli, on *Ceratonia siliqua* and *Arbutus unedo*, 12 xi 1988, *Işiloğlu* 1066; Anamur–Antalya, roadside on *O. europaea*, 20 xi 1988, *Işiloğlu* 1075.
*O. olearius* is easily recognized in the field by its bright orange basidiomes and lignicolous habitat. In Turkey it grows in tufts on the stumps of a wide variety of hosts.

Gücin & Öner (1972) record it from Manisa, Gücin (1983) from Elazig, and Solak (1990) more recently from Bursa. It is also recorded from Israel by Binyamini (1975).

Following recent trends based on chemical evidence *O. olearius* is here placed within Paxillaceae. There are still some authors who prefer to emphasise its relationships with the Tricholomataceae where it may be sought in many popular texts. A more extreme treatment is to place this species and its relatives in its own family – Omphalotaceae.

Pleurotaceae
**31. *Lentinus tigrinus*** (Bull.: Fr.) Fr.
$C_6$, Ceyhan, on stumps of *Salix* sp., 31 iii 1988, *Işiloğlu* 1023.
This rather common, lignicolous species is recorded by Pilát (1933) and Kotlaba (1976) from Ankara. It is widespread in Europe and extends into the Indian subcontinent, into Africa and asiatic USSR; it is also known from N America.

**32. *Pleurotus ostreatus*** (Jacq. ex Fr.) Kummer
$C_2$, Ula, on *Pyrus malus*, 2 xii 1990, *Işiloğlu* 1332; Ula-Mugla, roadside on *Populus* sp, 3 xii 1990, *Işiloğlu* 1338.
This widespread lignicolous agaric commonly called the Oyster mushroom, has been recorded several times from Turkey: Pilát (1933) from Ilgaz Daglari, Öner (1972) from Izmir; Öder (1978, 1988) from Samsun and Konya; Gücin (1983, 1987) from Elazig and Malatya; Işiloğlu (1987) from Malatya; Gezer (1988) from Eskisehir; and Solak (1990) from Bursa. *P. ostreatus* is edible and closely related to *P. nebrodensis* Inz. which occurs

on umbelliferous plants. It too is edible and good material of this taxon has been examined from E Turkey (*Işiloğlu*, 1987).

Pluteaceae

**33. *Volvariella speciosa*** (Fr.: Fr.) Singer

$C_6$, Ceyhan, near the Ceyhan River, on straw, 18 xii 1988, *Işiloğlu* 1124. $C_2$, Ula, forest roadside, 28 xi 1990, *Işiloğlu* 1290.

This is a typical fungus of urban rubbish heaps, roadsides and fields, growing on soil rich in humus especially where straw has been incorporated. It is easily recognized by the robust habit, pale viscid pileus and relatively large (12.5–16.5 x 8–10μm) basidiospores. It has been recorded by: Gücin & Öner (1982) from Manisa; Gücin (1983) from Elazig; and Solak (1990) from Bursa – and was therefore expected in southern Turkey. It is also recorded from Israel by Binyamini (1975).

Russulaceae

**34. *Lactarius deliciosus*** (Fr.) S.F. Gray

$C_4$, Erdemli, in pine forest, under *Pinus brutia* amongst pine needles, in groups, 12 xi 1988, *Işiloğlu* 1068. $C_2$, Ula, Gökova Köyü, in pine forest, 27 xi 1988, *Işiloğlu* 1102.

This is a characteristic and widespread inhabitant of the pine forests of Europe and N America, where it is collected with its close relatives in great quantities for food. It is recognized by the flesh commencing orange and turning greenish after several hours but it never becomes wine-coloured when old. The stipe is characteristically scrobiculate. *L. deliciosus* grows profusely from October to January in Turkish pine forests, and it is collected and sold for culinary use throughout northern, southern and western provinces. It has been recorded several times from Turkey: Öner (1972) from Izmir; Öder (1972, 1976, 1978, 1980, 1982) from Bolu, Sinop-Artvin and Kastamonu; Karamanoglu & Öder (1973) from Bursa; Asan & Gücin (1990) from Istiranca Daglari; and Solak (1990) from Bursa. Binyamini (1975) records it from Israel.

Many collections of *Russula* have been found but at present, with lack of extensive field notes and spore-prints, delimitation is difficult. The following taxa, however, have been recognized in the flora.

**35. *Russula delica*** Fr.

$C_4$, Anamur, pine forest, amongst pine needles, in groups, 20 xi 1988, *Işiloğlu* 1084. $C_2$ Ula, Kestane Dagi, 2 xii 1990, *Işiloğlu* 1306.

This widespread agaric can be easily overlooked as it sometimes fruits under the duff or becomes only partly exposed. It is characterized by the white basidiomes which becoming slightly smudged with rust-colour and lacking any blue-green colouration at the stipe-apex. The basidiospores (8.5–11.5 x 6.5–8μm) have a low wart-like ornamentation. It is known from Giresun, Artvin and Samsun (Öder, 1978); from Bolu (Öder, 1972), from Elazig and Malatya (Gücin, 1983, 1987); and from Bursa (Solak, 1990). It is also known from Israel (Binyamini, 1975).

**36. *Russula ochroleuca*** (Pers.) Fr.

$C_2$, Ula, Kestane Dagi, pine forest 2 xii 1990, *Işiloğlu* 1316.

This very common agaric of N America and Europe is found in both deciduous and mixed forests. It is characterized by the dull yellow pileus, very pale cream-coloured gills and white stipe which in age takes on a slight hint of grey. This is the second record from Turkey, previously being known only from Erzurum (Altan, Gücin & Babaç, 1986).

**37. *Russula sanguinea*** Bull.: Fr.
$C_5$, Tarsus, Namrun Yaylasi, pine forest, 29 x 1988, *Işiloğlu* 1030.
This is a species of European pine-woods well delimited by the subdecurrent gills, the red pileus which becomes spotted with ochraceous yellow, and the intensely hot taste. The spore-print is pale cream (C) following Henderson, Orton, Watling (1969). This is the first record from Turkey, although it might have been previously expected.

**38. *Russula xerampelina*** Schaeffer: Fr.
$C_2$, Ula, Kestane Dagi, pine forest, 2 xii 1990, *Işiloğlu* 1258.
This is the true *R. xerampelina*, previously called *R. erythropus* Peltereau. It is characterized by the blood-red pileus and red tinges on the stipe. The spore-print is richly coloured (G–H). *R. xerampelina* had previously been known only from Bolu and Ankara (Watling & Gregory, 1977).

**39. *Russula obscura*** Rommel
$C_2$, Ula, Kestane Dagi, pine forest, 2 xii 1990, *Işiloğlu* 1256.
This agaric is known from the pine woods of Europe and has also been called *R. vinosa* Lindbl. Both names express various characters of the fungus, such as wine-coloured pileus and the blackening flesh. This is the first record of it from this part of the Mediterranean.

Strophariaceae
**40. *Psilocybe pratensis*** P.D. Orton
$C_2$, Ula, Kestane Dagi, amongst grass, 2 xii 1990, *Işiloğlu* 1302.
This agrees with the original description (Orton, 1969) although the habitat is slightly different. In both cases, however, the soil was highly mineral and nutrient rich. As the species has only recently been described its distribution in the world is as yet unknown; Guzmán (1983) in his monograph knew the present species only from Great Britain. It is recognized within this group of small *Psilocybe* spp., once referred to as *Deconica*, by its large basidiospores. This record constitutes the first for Turkey.

**41. *Stropharia aeruginosa*** (Curtis ex Fr.) Quélet
$C_2$, Ula, pine forest, 28 xi 1990, *Işiloğlu* 1240; Ula, Kestane Dagi, 2 xii 1990, *Işiloğlu* 1293.
This very beautiful agaric was growing amongst grass in pine forests. *S. aeruginosa* is a widespread species in both Europe and N America although it has been confused with *S. caerulea* Kreisel. The latter differs in possessing cheilocystidia some of which have yellow-staining amorphous contents in alkali solutions. *S. aeruginosa* has been recorded by Lohwag (1964) from Istanbul.

Tricholomataceae

**42. *Armillaria mellea*** (Fr.) Kummer

$C_4$, Alanya, in banana orchard, on *Ulmus* sp. stump, 26 xii 1988, *Işiloğlu* 1139. $C_2$, Ula, on *Morus alba* stump, 3 xii 1990, *Işiloğlu* 1335.

This is a member of a most complex group of agarics commonly referred to as the 'Honey fungus'. It has been found in large groups on or around stumps and can be easily recognized by its honey-coloured to brown pileus, the collar-like annulus, the long cylindric stem and the pale cream-coloured, slightly decurrent gills. It is a root pathogen and one of the commonest causes of death of trees and shrubs (Watling, Kile & Burdsall, 1991). *A. mellea* is recorded from: Ilgaz Daglari by Pilát (1933, as *Clitocybe mellea*); Bolu by Watling & Gregory (1977); Sinop and Artvin by Öder (1978); and Istiranca Daglari by Asan & Gücin (1990).

**43. *Clitocybe*** aff. ***radicellata*** Gillet

$C_4$, Erdemli, in *Pinus brutia* forest, 16 x 1988, *Işiloğlu* 1029.

*C. radicellata* is characterized by its vernal nature, preference for spruce woods, concolorous gills, pileus and stipe and basidiospores 5–6.5(–7) x 2.5–4μm. The present collection, although close, differs in a number of characters that the authors consider to be significant. The spores of *Işiloğlu* 1029 are larger (7–7.5 x 4–4.5μm) than typical *C. radicellata* which occurs in temperate to boreal conifer forests.

**44. *Cystoderma amianthium*** (Scop.) Fayod

$C_2$, Ula, Kestane Dagi, under pine trees, on calcareous soil, 2 xii 1990, *Işiloğlu* 1297.

This widespread, common and very beautiful agaric is easily recognized by its ochre-brown, umbonate pileus with wrinkled-folded surface, concolorous annulate stipe and small (4–5.5 x 3–4μm), distinctly amyloid basidiospores. In addition, the pileipellis contains numerous oidia. Surprisingly, this is the first record of *C. amianthium* from Turkey.

**45. *Hohenbuehelia rickenii*** (Kühner) P. D. Orton

$C_2$, Dalaman, near the Dalaman River, on roots of *Pinus brutia*, 11 i 1988, *Işiloğlu* 1005.

This species is a member of the *H. geogenia–petaloides* group, which has only recently been delimited. *H. rickenii* is characterized in this group by the longer, slightly broader basidiospores than either *H. geogenia* (DC.: Fr.) Singer and *H. petaloides* (Bull.: Fr.) Schulzer and its preference for coniferous woody debris. It has not previously been reported from Turkey.

**46. *Laccaria laccata*** (Scop.: Fr.) Berk. & Br.

$C_2$, Ula-Mugla roadside 3km, amongst grass, 28 xi 1990, *Işiloğlu* 1285.

*L. laccata* is a very common, widespread, attractive agaric with pinkish brown colouration of the pileus, stipe and gills; the last are thick and often dusted with white basidiospores. It is known from all major areas of the world. This taxon is recorded from: Izmir by Öner (1982); Elazig by Gücin (1983); Malatya by Işiloğlu (1987); and Bursa by Solak (1990). It is also known from Israel (Binyamini, 1975).

**47. *Lepista saeva*** (Fr.) P. D. Orton

$C_2$, Ortaca, in open places of pine forest, 2 iii 1988, *Işiloğlu* 1010.

This agaric is probably better known as *Tricholoma personatum* (Fr.) Gillet, under which epithet it occurs in books on edible and poisonous fungi, and is easily recognized by the violaceous blue stipe contrasting with the brown pileus. In some parts of western Europe it is known from grassland communities but as here, in other areas of the Mediterranean and N Temperate zone it is as at home in woodland. Apparently, this record constitutes the first for Turkey.

**48. *Lepista sordida*** (Fr.) Singer

$C_4$, Erdemli, in pine forest, 16 x 1988, *Işiloğlu* 1028.

This species differs from *Lepista saeva* in the hygrophanous pileus. It is widespread in Europe and is recorded from Israel by Binyamini (1975).

*L. sordida* has previously been recorded from Istanbul as *Tricholoma sordidum* (Fr.) Kummer by Selik & Sümer (1982).

**49. *Marasmius androsaceus*** (L: Fr.) Fr.

$C_2$, Ula, Kestane Dagi, on *Quercus* sp. leaves and on pine needles, 2 xii 1990, *Işiloğlu* 1297.

*M. androsaceus* occurs throughout Europe and N America where it grows in large numbers on leafy debris, twigs and fallen pine needles. It is a widespread species although surprisingly this record constitutes only the second for Turkey, having previously been recorded from Bolu by Sümer (1982).

**50. *Mycena epipterygia*** (Scop.: Fr.) S.F. Gray

$C_2$, Ula-Mugla roadside 5km., pine forest, 28 xi 1990, *Işiloğlu* 1225.

This is a very widespread agaric ranging from cold deserts and montane areas to boreal and deciduous woodland; it also occurs in many forms which have often been given distinct status. The present collection was of the more typical form with grey pileus contrasting with the lemon-yellow, glutinous stipe. Surprisingly this is the first record from Turkey.

**51. *Mycena*** cf. ***strobilicola*** Favre & Kühner

$C_5$, Tarsus, Namrun Yaylasi, in *Pinus brutia* forest on pine cone, 29 x 1988, *Işiloğlu* 1036. $C_2$, Ula, Kestane Dagi, on pine cone, 2 xii 1990, *Işiloğlu* 1239.

This collection keys out to *Mycena strobicola* in the general texts, although it differs markedly in its late fruiting and growth on cones of *Pinus brutia*. There is some confusion between authors on the basidiospore measurements, some embracing our own spore sizes (e.g. Moser, 1983 and Kühner, 1938–7–11.5 x 3.7–5.2µm) although generally it would be taken to have shorter spores 6–8.8 x 3.8–5µm (Gulden, 1966) and 7.2–9.6 x 3.6–5.8µm (Geesteranus, 1988). The two collections from quite separate localities but on the same substrate and at the same time of year but in different years indicate that this may be an independent taxon.

**52. *Tricholoma batschii*** Gulden

$C_5$, Tarsus, Namrun Yaylasi, in pine forest, 29 x 1988, *Işiloğlu* 1047. $C_2$, Köycegiz, in pine forest, under *Erica arborea*, 11 i 1988, *Işiloğlu* 1002. $C_4$, Anamur, in pine forest, under *Erica verticillata* Forsk, 10 xii 1988, *Işiloğlu* 1110.

This member of the *T. caligatum-robustum* group has been confused with *T. robustum* by Ricken (1915), hence the necessity for Gulden to erect a new species (Gulden, 1969). It differs from *T. robustum* especially in the lack of a membranous ring, and can be recognized by its reddish brown pileus, involute pileus margin and the presence of a distinct white or brownish zone at the stipe-apex. These records constitute the first for Turkey. It has also been found in Israel (Binyamini, 1975).

**53. *Tricholoma caligatum*** (Viv.) Ricken

$C_4$, Silifke, Sehitlik Ormani, 19 xii 1988, *Işiloğlu* 1126.

This is a very handsome agaric with a strong odour of *Narcissus*, variously described as the blossom of pear (*Pyrus*) or white thorn (*Crataegus*). It occurs from the northern boreal forests to the Mediterranean coniferous forests. This is the first record from southern Turkey having previously been recorded from the western province at Manisa by Gücin & Öner (1982).

**54. *Tricholoma terreum*** (Schff.: Fr.) Kummer

$C_2$, Ula, Kestane Dagi, in pine forest, 2 xii 1990, *Işiloğlu* 1328.

*T. terreum* is recognized by the smoke grey, umbonate pileus contrasting with the white gills with concolorous edge and hyaline, ellipsoid basidiospores (6–8 x 4–5m). It is widespread in Europe and N America and has been recorded from Israel (Binyamini 1975). In Turkey, Gücin & Öner (1982) record it from Manisa, Gücin (1987) from Malatya, and Solak (1990) more recently from Bursa.

APHYLLOPHORALES

Bankeraceae

**55. *Sarcodon scabrosus*** (Fr.) Karsten

$C_4$, Silifke, Sehitlik Ormani, in pine forest, 19 xii 1988, *Işiloğlu* 1128.

This differs from *S. imbricatum* (L.: Fr.) Karsten in the bluish green stipe base and the small basidiospores that also have rather more numerous angular tubercules. This is the first record of this attractive hydnaceous fungus for Turkey. According to Geesteranus & Nannfeldt (1969) recent records include collections from Yugoslavia and Italy.

Hymenochaetaceae

**56. *Pyrofomes demidoffii*** (Lév.) Kotl. & Pouzar

$C_4$, Erdemli, Yayla Yolu, in mixed conifer forest, on *Juniperus* sp., 25 iii 1988, *Işiloğlu* 1021.

This very distinctive species is widespread in western and southern areas of N America, but not in Canada and rarely east of the Mississippi River. It is also known on *Juniperus* in E Africa, Pakistan and eastern Europe; the present collection is the first record for Turkey and the Mediterranean Basin. It usually grows on *Juniperus* although rare records exist on *Pinus* in Siberia and *Cupressus* in the Crimea (Bondartsev, 1953).

**57. *Phellinus pini*** (Thoe: Fr.) Pilát
$C_2$, Köycegiz, in pine forest, on *Pinus brutia* 28 ii 1988, *Işiloğlu* 1009.
This is a widespread polypore of north temperate areas on various coniferous tree species and is circumglobal. It is also known from Africa, Mongolia, USSR, India and particularly Pakistan; this present record confirms its occurrence in Turkey. It is undoubtedly an important forest pathogen causing a white pocket rot but is rarely recorded on hardwood trees. *P. pini* has been recorded from Manisa by Gücin & Öner (1972) and by Solak (1990) from Bursa.

**58. *Phellinus*** aff. **rimosus** (Berk.) Pilát
$C_4$, Erdemli, Yayla Yolu, in mixed forest, on *Abies* sp. 25 iii 1988, *Işiloğlu* 1020.
*P. rimosus* is in the centre of a complex of closely related taxa which are widespread in the tropics and subtropics on a variety of hardwoods; one of us (RW) knows it from West Central Africa. In the USSR it is also known from Soviet Central Asia, Caucasus, Armenia and the Crimea. *P. rimosus* s. str. (Larsen, & Cobb-Poulle, 1990) is recorded from New Caledonia, Tasmania, Mexico, Puerto Rico and Tunisia. Our collection differs markedly in the host viz. *Abies*, and further field work is necessary to clarify its taxonomic status.

Polyporaceae
**59. *Trametes versicolor*** (Fr.) Pilát.
$C_6$, Ceyhan, in orange orchard, on *Cupressus*, 23 ii 1988, *Işiloğlu* 1007.
This is one of our most common, widespread polypores not only in Europe but world-wide. It occurs generally on hardwoods but can be found on conifers, particularly softwood window frames. It is frequently recorded as *Polystictus* and *Coriolus*. The present authors follow Ryvarden (1978). There are several records of *T. versicolor* from Turkey: Öner (1972) from Izmir; Kotlaba (1976) from Iskenderun; and Niemela & Uotila (1977) from Istanbul, Bolu and Izmit: Gücin (1983 and 1987) from Elazig and Malatya; Gezer (1988) from Eskisehir; Asan & Gücin (1990) from Istiranca Daglari.

**60. *Bjerkandera adusta*** (Fr.) Karsten
$C_4$, Erdemli, in pine forest, on *Pinus* sp., 2 i 1988, *Işiloğlu* 1003.
This is a common, fairly widespread polypore generally found growing on hardwoods, although it is not infrequently collected on coniferous timbers. It is northern and circumglobal (Gilbertson & Ryvarden 1986) although Bondartsev (1971) indicates it is almost everywhere on the globe. It has previously been recorded from Bursa by Solak (1990) and from Istiranca Daglari by Asan & Gücin (1990).

Stereaceae
**61. *Stereum hirsutum*** (Willd.: Fr.) S.F. Gray
$C_6$, Ceyhan in mixed forest, on *Quercus* sp. 2 iv 1988, *Işiloğlu* 1024.
*S. hirsutum* is an extremely common resupinate fungus in Europe on dead wood of hardwood trees and shrubs; it is less frequently found on coniferous timbers. Surprisingly the present collection is only the third record for Turkey. It has been recorded from Iskenderun by Kotlaba (1976) and by Gücin (1987) from Malatya.

'Gasteromycetes'

HYMENOGASTRALES

Rhizopogonaceae

**62. *Rhizopogon luteolus*** Fr.

C5, Tarsus, Namrun Yaylasi, in open places of pine forest, 29 x 1988, *Işiloğlu* 1055; between Ula and Mugla, in pine nursery, 28 xi 1990, *Işiloğlu* 1267.

This false truffle is widespread in Europe and has a worldwide distribution undoubtedly having been introduced to many areas of the Southern Hemisphere and Africa. It often occurs in huge numbers and is always associated with *Pinus* spp. *R. luteolus* differs from both *R. roseolus* and *R. rubescens* (Tul.) Tul. in not becoming reddish or wine-coloured or changes, if any are insignificant. It has a more strongly gelatinized trama and smaller basidiospores. Pilát (1937) records the taxon from Ilgaz Daglari and Öder (1978) from Sînop-Artvin.

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

C4, Erdemli, in pine forest 12 xi 1988, *Işiloğlu* 1069; Ula-Çiçekli roadside, in pine forest 28 xi 1990, *Işiloğlu* 1218.

This species, also found with *Pinus* spp., characteristically becomes pinkish or reddish on handling. In Europe its distribution is not well documented because of confusion with *R. rubescens* which is said to differ in its basidiomes yellowing with age and in having narrower basidiospores. It is recorded from many localities in Turkey, although we do not know whether this refers to this fungus in the strict sense or as a complex including *R. rubescens*. It is recorded by: Gücin & Öner (1982) from Manisa; Altan, Gücin & Babaç (1986) from Erzurum; by Gezer (1988) from Eskiseher; and Solak (1990) from Bursa.

LYCOPERDALES

Geastraceae

**64. *Geastrum pectinatum*** Pers.

C4, Erdemli, in pine forest, 2 i 1988, *Işiloğlu* 1001.

This earthstar is widespread in Western Europe, the Baltic States and Scandinavia (Sunhede 1989). It is frequently found in coniferous woods although in the British Isles it is known from hardwood stands. It is also noted from N America, S Africa, Central and Northern Asia and for Turkey where it was recorded primarily only from Anatolia (Gezer, 1988).

Lycoperdaceae

**65. *Bovista plumbea*** Pers.

C5, Tarsus, Namrun Yaylasi, pine forest, 29 x 1988, *Işiloğlu* 1049.

This puffball is common and widespread, occuring in grassy areas both within and outside forests, and from sea-level to higher altitudes. Kreisel (1967) records it from N America, New Zealand, and from Europe where it is very well known, ranging east to Turkey-Iraq and Central USSR. It has been recorded several times from Turkey: Pilát (1937) from Ilgaz Daglari; Watling & Gregory (1977) from Ankara; Gücin & Öner

(1982) from Manisa; Gücin (1983, 1987 from Elazig and Malatya; Altan, Gücin & Babaç (1986) from Erzurum; *Işiloğlu* (1987) from Malatya; Solak (1990) from Bursa.

**66. *Bovista polymorpha*** (Vitt.) Kreisel
C4, Erdemli, in open place of pine forest, 12 xi 1988, *Işiloğlu* 1070.
This puffball is also widespread in grassy areas in and outside forests. It is mapped by Kreisel (1967) as extending in its range from the British Isles in the west to Kazakhstan in the east. It cuts across Turkey but the present record will extend this to the southernmost localities.

**67. *Lycoperdon atropurpureum*** Vitt.
C4, Tarsus, Namrun Yaylasi, 29 x 1988, *Işiloğlu* 1056.
This species is rare in Northern Europe, becoming more frequent southwards where it is a characteristic member of the oakwood communities in mediterranean and submediterranean areas (Demoulin, 1983). It has been reported by Watling & Gregory (1977) from Istanbul as *L. molle* var. *atropurpureum* and by Altan, Gücin & Babaç (1986) from Erzurum.

**68. *Lycoperdon molle*** Pers.
C5, Tarsus Namrun Yaylasi, 29 x 1988, *Işiloğlu* 1031.
This puffball is more widespread than *L. atropurpureum* and has been recorded several times from Turkey: Karamanoglu & Öder (1973) from Bursa; Öder (1978) from Ordu, Giresun, Rize and Trabzon; Gücin & Öner (1982) from Manisa; Gücin (1983) from Elazig, Işiloğlu (1987) from Malatya; Asan & Gücin (1990) from Istiranca Daglari. It is also known from many areas of Europe, North Africa and N. America. This puffball which occurs in coniferous woods, does not appear to be as thermophilic as *L. atropurpureum.*

**69. *Lycoperdon perlatum*** Pers.
C4, Erdemli, 20 x 1988, *Işiloğlu* 1086; Anamur, 25 xi 1990, *Işiloğlu* 1186.
This is an extremely common, widespread and rather variable puffball. It occurs in woodlands from sea-level to montane areas in all the major areas of the world. In Turkey it has been recorded by: Öder (1972) from Bolu; Öner (1972) from Istanbul; Watling & Gregory (1977) from Bolu; Gücin (1983, 1987) from Elazig & Malatya; and Solak (1990) from Bursa.

NIDULARIALES
Nidulariaceae
**70. *Cyathus olla*** (Batsch) Pers.
C5, Tarsus Namrun Yaylasi, on pine branches, 29 x 1988, *Işiloğlu* 1042. C2, Ula, Kestane Dagi, on pine needles, 2 xii 1990, *Işiloğlu* 1315.
*C. olla* is a particulary common 'birds nest fungus' in Europe and N America, although apparently not in the far north; it ranges southwards into S Africa, S America and Australia. It is recorded from Iran (Brodie, 1975) and the present collections confirm its presence in the Turkish flora. It is already known from Anatolia (Gezer, 1988).

SCLERODERMATALES

Astreaceae

**71. *Astraeus hygrometricus*** (Pers.) Morgan

$C_5$, Tarsus, Namrun Yaylasi, 29 x 1988, *Isiloglu* 1048. $C_4$, Anamur, pine forest, 25 xi 1990, *Işiloğlu* 1184.

This rather taxonomically isolated fungus is widespread but can never be considered common in W Europe, and indeed has recently become extinct in certain areas. It is, however, known from several areas of Africa, Eastern Asia and Asia Minor in addition to N America where it ranges from the southern to the northern states. It appears to be a well established member of the Turkish fungus flora (Gücin, 1983).

Sclerodermataceae

**72. *Pisolithus arhizus*** Raz.

$C_4$, Silifke-Mut roadside 18km, pine forest, 26 xi 1990, *Işiloğlu* 1204.

*P. arhizus* is reported for the first time from Turkey. It is characterized by its epigeous, club-shaped or pear-shaped basidiomes, thick-walled peridioles and globose, spiny, cinnamon-brown spores (8–10μm). This fungus is frequently referred to in forestry and some mycological texts as *P. tinctorius* (Mich.: Pers.) Coker & Couch. It is widely distributed in the world ranging from Australasia and India to Africa and Europe, even extending, although rarely, to Britain, and in North and South Americas.

'Agaricoid Gasteromycetes'

Torrendiaceae

**73. *Torrendia pulchella*** Bres.

$C_2$, Ula, Akarca mevkii, margin of harvested wheat field, 2 xii 1990, *Işiloğlu* 1313.

This is a rare and rather extraordinary fungus related to *Amanita* (Amanitaceae). It was previously known from Portugal, Spain, maritime France and N Africa. A full description and discussion is published elsewhere (Watling & Işiloğlu, 1991).

ASCOMYCOTINA

'Discomycetes'

PEZIZALES

Helvellaceae

**74. *Helvella crispa*** Fr.

$C_4$, Erdemli, in mixed forest, 18 xii 1988, *Işiloğlu* 1117.

*H. crispa* is a widespread fungus known from the northernmost parts of Europe, including Iceland, Czechoslovakia, Austria etc. It would appear to be less common in the Mediterranean Basin although this may be because of lack of collecting. The present material indicates that it is more widely distributed in this area than first thought as Gücin & Öner (1982) also record it from Manisa. Elsewhere it is found in N America, Asia as far as Japan, and in the eastern Soviet Republics.

**75. *Helvella leucopus*** Pers.

$C_6$, Ceyhan, near Ceyhan River, in *Salix* plantation, 24 iii 1988, *Işiloğlu* 1012.

Although generally having the same distribution as *H. crispa* it is not common, nor as well known. It might be slightly more thermophilic and as a consequence is known from several records in the Mediterranean area including eastern parts; the present record extends the distribution even further south. The fact that the present collection was made in a willow plantation this may indicate that the fungus has been introduced from outwith the area. *H. leucopus* is recorded from Elazig and Malatya by Gücin (1983, 1987), from Malatya by Işiloğlu (1987), and from Bursa by Solak (1990).

Morchellaceae

**76. *Morchella conica*** Pers.

C4, Erdemli, Yayla yolu, in mixed forest, 25 iii 1988, *Işiloğlu* 1013.

This well-known comestible fungus is eagerly sought as food by local people in the study area, in addition to western and northern provinces of Turkey. It has a wide distribution from N America, China, India and Central Asia to N Africa and the Canary Islands; it is common and widespread in Europe where it frequents disturbed soils. There are many records although strangely this is the first published record for southern Turkey where it is widespread.

**77. *Verpa conica*** (O. Müller) Swartz

C6, Ceyhan, near the Ceyhan River, in *Salix* plantation, with *Helvella leucopus*, 24 iii 1988, *Işiloğlu* 1011.

This morel is characterized by its smooth or slightly furrowed cap which is pendulous from the apex of a cylindric stalk. It is not uncommon and widely distributed in Northern Europe; this is the first record from Turkey. *V. conica* is considered by some authorities to be the same as *V. digitaliformis* Pers. and, if so, its distribution ranges from Europe, including Iceland, to N Africa and N America; it also occurs in Japan.

Pezizaceae

**78. *Peziza badioconfusa*** Korf

C4, Erdemli, pine forest, 25 iii 1988, *Işiloğlu* 1014.

This cup-fungus is frequently confused with the common *P. badia* Pers. from which it differs in the non-reticulate, warted ascospores. The habitat appears to be similar although now that the two can be critically distinguished more fieldwork is required for both. Records for both are available for Turkey.

**79. *Peziza*** aff. **repanda** Pers.

C6, Ceyhan, 23 ii 1988, *Işiloğlu* 1006.

This collection differs from *P. repanda* as generally defined by the slightly larger but narrower ascospores, 16–18 x 7–9μm (as opposed to 15–16 x 9–10μm). *P. repanda* is a widespread cup-fungus being recorded from the Canary Islands, Central Asia, Iran, India, Korea, Australia, N America and Greenland; in addition to Europe.

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