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NEW RECORDS IN KARAMAN PROVINCE FOR MACROFUNGI FLORA OF TURKEY

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ABSTRACT

The macrofungi specimens were collected from different localities of Karaman region in 1998-2001, during autumn and spring. After field and laboratory studies, 16 species belonging to 10 genus (*Armillaria, Collybia, Cystoderma, Lyophyllum, Macrocystidia, Mycena, Omphalina, Tricholoma, Oudemansiella* and *Xeromphalina*) in *Tricholomataceae* were identified as new records for the macrofungi flora of Turkey. Sort descriptions and distributions are presented along with photographs of the basidiocarps and spores.

Keywords: Macrofungi, New Records, *Tricholomataceae,* Karaman, Turkey.

KARAMAN YÖRESİNDEN TÜRKİYE MAKROFUNGUS FLORASI İÇİN YENİ KAYITLAR

ÖZET

1998-2001 yıllarının özellikle ilkbahar ve sonbahar aylarında Karaman yöresinde farklı lokalitelerden makrofungus örnekleri toplanmıştır. Arazi ve laboratuvar çalışmaları sonucu, *Tricholomataceae*'den 10 cins'e (*Armillaria, Collybia, Cystoderma, Lyophyllum, Macrocystidia, Mycena, Omphalina, Tricholoma, Oudemansiella* ve *Xeromphalina*) ait 16 tür Türkiye makrofungus florası için yeni kayıt olarak belirlenmiştir. Belirlenen türlerin kısa deskripsiyonları ve yayılışı ile bazidyokarp ve sporların fotoğrafları verilmiştir.

Anahtar Kelimeler: Makrofunguslar, Yeni Kayıtlar, *Tricholomataceae,* Karaman, Türkiye.

INTRODUCTION

In this study, the previous studies carried out in Turkey [1] have revised then 16 new species have been recorded and in this way, they have been added to the macrofungi flora of Turkey.

The Karaman region covers 9.393 km^2 (figure 1). The city is surrounded by Konya in the north and northwest, Mersin in the southeast, Antalya in the southwest. The climate of Karaman is warm and rainless in the Summer while cold and rainy in the Autumn. The climate of Karaman is terrestrial type [2].

Dominant forest plants in the region are *Pinus brutia* Ten, *Pinus nigra* J.F.Arnold. subsp. *nigra* var. *caramanica* (J.F.Loudon) Rehder, *Cedrus libani* A.Rich., *Abies cilicica* (Ant.& Kotschy) Carr. subsp. *isaurica* Coode & Cullen., *Juniperus excelsa* M.Bieb., *J. foetidissima* Willd., *Quercus cerris* L. var. *cerris, Q. ithaburensis* Decne subsp. *macrolepis* (Kotschy) Hedge & Yalt., *Q. coccifera* L.. However *Populus* L. sp., *Salix* L. sp., *Tamarix* L. sp. grows near the stream and river [3-5].

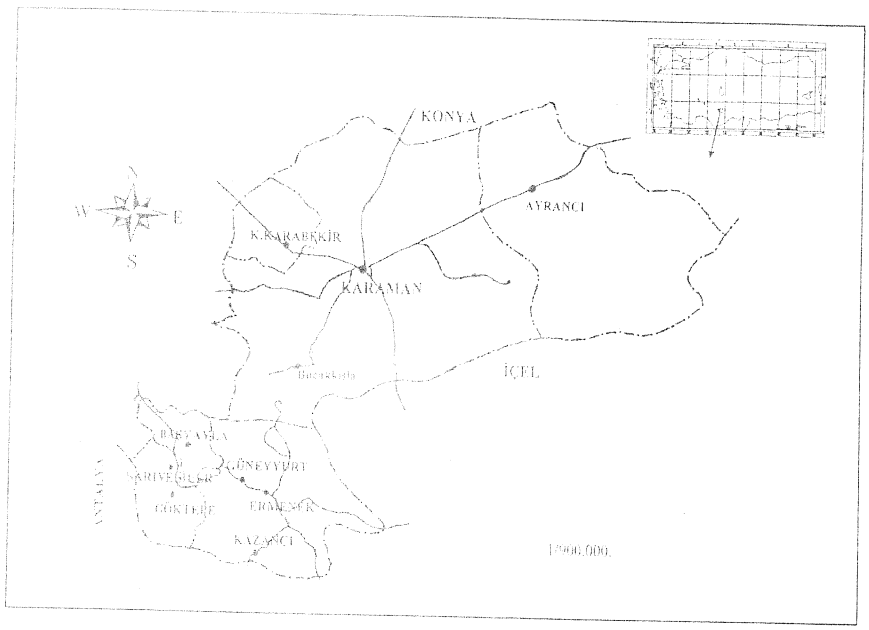

Figure 1. The map of Karaman region.

MATERIALS AND METHODS

The field study has been chiefly carried out in the autumn and spring, since the climatic conditions during these periods are most suitable for carphophore formation.

Macrofungi specimens were removed from the ground with great care to avoid damage to the base and other parts (stipe, hymenium etc.). Soil was removed using a soft brush. Specimens were placed in separate wicker containers to avoid mixing. Colour, locality and characteristics of habitat etc. were noted during the collection. Then photography of specimens were taken. In the laboratory, morphological features, the spore properties of dry and fresh macrofungi specimens were studied and they were identified using identification literature [6-22]. After macrofungi specimens were identified and dried, they were preserved in polythene bags containing 5 gr thymol crystals.

Macrofungi specimens are kept at Selçuk University, Fungarium of Mushroom Application and Research Centre, in Konya.

RESULTS

Tricholomataceae

1. **Armillaria cepistipes Velen.**

Macroscopic and microscopic features

Pileus 4-15 cm, hemispherical to convex at first, then plane to infundibiliform, margin incurved when young (figure 2), hazelnut-brown to red-brown with a darker centre when moist, centre ochre brown when dry, with fibrillose remains of the veil hanging from margin. Lamellae whitish, spotting red brown, decurrent. Stipe 4-10 x 0.5-1.5 cm, cylindric-conic, with a bulbous base, with a fugacious annular zone consisting of whitish to yellowish fibrils, surface white.

Spores broadly elliptic, 7-9 x 5-6.5 μ (figure 3), smooth, hyaline.

Karaman; Pınarbaşı village entrance, near the stream under Poplar tree, 1250 m, 24.11.2000, Doğan 1032.

2. **Collybia distorta** (Fr.) Quél.

Macroscopic and microscopic features

Pileus 3-8 cm, conic-campanulate, later convex to expanded and plane, with an obtuse umbo, surface smooth (figure 4), reddish-brown when moist, ochre-brown when dry. Lamellae whitish to whitish yellow, broadly adnate. Stipe 4-10 x 0.5-1 cm, cylindric, white to cream coloured, red-brownish in age.

Spores subglobose, 3.5-4.5 x 3-4.5 µ (figure 5), smooth, hyaline.
Sarıveliler, mixed oak forest, 1450 m, 15.05.2000, Doğan 620, Sarıveliler; Civandere, mixed oak forest, 1550 m, 02.06.2000, Doğan 863.

3. **Cystoderma ambrosii** (Bres.) Sm. & Sing.
Macroscopic and microscopic features
Pileus 2.5-4 cm, hemispherical to hemispherical-conical, then convex to plano convex (figure 6), surface densely covered with whitish coloured pyramidal fibrillose squamules and causing it to appear granular squamules on a concolorous background, turning brown when old. Lamellae white, somewhat yellowish toward the margin, browning when mature, broadly adnate. Stipe 2-3.5 x 0.2-0.4 cm, cylindrical, surface smooth above the floccose annular zone, with light ocherish flocci below.
Spores elliptical, 3.5-5 x 2.5-3 µ (figure 7), hyaline, smooth.
Bucakkışla; Bayır village, Tozlu district, black pine forest, 1550 m, 10.06.2000, Doğan 879.

4. **Lyophyllum fumatofoetens** (Secr.) J. Schäff.
Syn: *Lyophyllum leucophaetum* (Karst.) Karst.
Clitocybe gangraenosa (Fr.) Sacc.
Clitocybe leucophaeta Karst.
Macroscopic and microscopic features
Pileus 4-8 cm, conic campanulate, then turning convex to plane with a depressed centre or an obtuse umbo (figure 8), surface finely radially tomentose, dingy white to grey brownish-beige brownish. Lamellae whitish, then beige to brownish, turning blue when pressed. Stipe 5-7 x 0.1-1 cm, cylindric, surface with brown longitudinally fibrils on ochre background.
Spores cylindric to cylindric-elliptic 6-7.5 x 3-4 µ (figure 9), finely verrucose, hyaline.
Ermenek; Damlaçalı district, Cedar forest, 1750 m, 01.06.2000, Doğan 842.

5. **Lyophyllum infumatum** (Bres.) Kühn.
Macroscopic and microscopic features
Pileus 5-7 cm, hemispherical, with obtuse umbo in centre, often shield shaped (figure 10), whitish, soon turning to dark brown and innately fibrous. Lamellae white, then turning grey, blue when pressed, decurrent tooth. Stipe 5-7 x 1-1.5 cm, cylindric, sometimes tinner toward the base, white at first, turning to brown when age.
Spores rhombic shaped 10-12 x 6-8 µ (figure 11), hyaline.
Başyayla; Katranlı plateau, Cedar forest, 1700 m, 05.12.1998, Doğan 59, Ermenek; Damlaçalı district, Cedar forest, 1750 m, 13.11.1999, Doğan

294, 01.06.2000, Doğan 827, Bucakkışla; İhsaniye village, Köprücek district, black pine forest, 1700 m, 10.06.2000, Doğan 897.

6. **Lyophyllum semitale** (Fr.) Kühn.
Syn: *Clitocybe semitalis* (Fr.) Quél.
Macroscopic and microscopic features
Pileus 3-5 cm, hemispherical-convex, surface smooth (figure 12), dull, beige brown when moist, grey-beige when dry. Lamellae cream, turning blue when pressed, blackening after several hours, broadly adnate. Stipe 4-7 x 1-1.5 cm, cylindric, somewhat thickened toward the base or slightly fusiform, white, longitudinally fibrillose, later dingy ocherish, blackening in age.
Spores narrowly elliptic, 6.5-8.5 x 3-4.5 µ (figure 13), smooth, hyaline.
Başyayla ; Katranlı plateau, Cedar forest, 1700 m, 29.10.2000, Doğan 1004.

7. **Macrocystidia cucumis** (Pers.: Fr.) Joss.
Syn: *Naucoria cucumis* (Pers.: Fr.) Kumm.
Macroscopic and microscopic features
Pileus 2-6 cm, conic campanulate, turning plane and umbonate from centre, surface smooth (figure 14), somewhat velutinous, red-brown to almost black brown when moist, light ochre when dry, margin ochre to yellow and translucent-striate. Lamellae whitish, ochre to ochre reddish, adnexed. Stipe 4-8 x 0.2-0.5 cm, cylindric, dark red-brown to black brown, apex usually paler, tough and cartilaginous, the whole length finely velutinous.
Spores elliptic, 7-9 x 3.5-4.5 µ (figure 15), smooth, light reddish. Pleuro and cheliocystidia lanceolate.
Bucakkışla; İhsaniye village, Şekerpınarı district, Black pine forest, 1550 m, 31.05.2000, Doğan 814, Ermenek; Damlaçalı district, Cedar forest, 1750 m, 11.06.2000, Doğan 926.

8. **Mycena amicta** (Fr.) Quél.
Syn: *Mycena calorhiza* Bres.
Mycena vesitta Vel.
Macroscopic and microscopic features
Pileus 0.5-2 cm, campanulate-hemispherical, later conic-campanulate (figure 16), finely white-tomentose under a hand lens, centre grey yellowish, increasingly cream-white toward the margin, translucent striate to the margin. Lamellae whitish-greyish, decurrent. Stipe 4-6 x 0.05-0.1 cm, cylindric, apex often cream, whitish, grey to brownish-grey below, whole length finely whitish-pubescent.
Spores elliptic, 6-10 x 3.5-5 µ (figure 17), smooth, hyaline.

Ermenek; Damlaçalı district, Cedar forest, 1750 m, 01.06.2000, Doğan 831.

9. **Mycena hiemalis** (Osbeck: Fr.) Quél.
Syn: *Mycena flocculentipes* Huijsman
Macroscopic and microscopic features
Pileus 0.5-1 cm, conic-campanulate, with a small umbo, surface smooth (figure 18), translucent striate, centre grey brown, darker toward the centre, paler to almost white toward the margin. Stipe 0.5-2.5 x 0.05-0.1 cm, cylindric, smooth, translucent striate, white.
Spores broadly elliptic, 6.5-8 x 5-6 µ (figure 19), smooth, hyaline.
Bucakkışla; near Göksu bridge, on poplar tree remnants, 450 m, 19.05.2000, Doğan 643, 27.10.2000, Doğan 970.

10. **Mycena xantholeuca** Kühn.
Macroscopic and microscopic features
Pileus 0.5-3 cm, cylindric, turning campanulate (figure 20), whitish cream, then yellowish-beige with a whitish margin, faintly striate. Lamellae white at first, then cream coloured with a pink tinge, finely adnexed. Stipe 3-8 x 0.1-0.4 cm, cylindric, translucent white, white-powdered toward the base, base whitish-strigose and somewhat thickened, fragile, hollow.
Spores elliptic-dacryoid, 7-9.5 x 3.5-5 µ (figure 21), smooth, hyaline.
Bucakkışla; İhsaniye village, Şekerpınarı district, on Poplar tree remnants, 1650 m, 19.05.2000, Doğan 675.

11. **Omphalina obscurata** Reid
Macroscopic and microscopic features
Stipe 2-4 cm, margin inrolled, centre slightly depressed to umblicate, beige brown-soil brown-dark brown, surface smooth (figure 22). Lamellae cream brownish, fragile, decurrent. Stipe 3-5 x 0.5-1 cm, cylindrical, surface smooth, soil brown-dark brown, slightly whitish-powdered.
Spores elliptical, 8-13 x 5-7 µ (figure 23), hyaline, smooth.
Başyayla; Katranlı plateau, on grass in Cedar forest, 1700 m, 05.12.1998, Doğan 53, 65.

12. **Oudemansiella hygrophoroides** Sing. & Clç.
Macroscopic and microscopic features
Pileus 3-5 cm, hemispherical, surface smooth, radially furrowed (figure 24), whitish, later beige grey to grey. Lamellae cream white, yellowish-white when mature, adnexed. Stipe 3-5 x 0.5-1 cm, cylindric, bulbous up to 1-2 cm at the base, grey and surface depressed fibrous.
Spores elliptic, 14.5-20 x 8-11 µ (figure 25), hyaline, smooth.
Sarıveliler; Civandere, Kumluçukur district, Cedar forest, 1750 m,

02.06.2000, Doğan 867.

13. **Tricholoma apium** J. Schff.
Syn: *Tricholoma luteovirens* (Alb. & Schw.: Fr.) Rick.
Tricholoma helviodor Pill. & Svrcek
Macroscopic and microscopic features
Pileus 4-8 cm, convex-expanded and undulating, surface dull, finely tomentose (figure 26), whole surface white when young, then turning ochre-brown to olive brownish darker toward the centre. Lamellae cream-white to yellowish white, adnate. Stipe 4-7 x 1-2 cm, cylindric to conic, tapered toward the base, surface whitish.
Spores subglobose, 4.5-6 x 4-5.5 µ (figure 27), smooth, hyaline.
Başyayla; Katranlı plateau, Cedar forest, 1700 m, 29.10.2000, Doğan 1001, 26.11.2000, Doğan 1066.

14. **Tricholoma myomyces** (Pers.: Fr.) Lge.
Macroscopic and microscopic features
Pileus 3-6 cm, hemispherical-conic, with obtuse umbo (figure 28), surface with grey coloured fibrous woolly on grey-beige, grey-lead coloured background. Veil remnant hung in the pileus edge. Lamellae whitish, turning grey, decurrent tooth. Stipe 3-6 x 0.5-1 cm, cylindrical, longitudinally fibrillose, with transient cortina, white.
Spores broadly elliptic, 5.5-8 x 4-5 µ (figure 29), hyaline.
Bucakkışla; İhsaniye village, Köprücek district, Black pine forest, 1750 m, 19.05.2000, Doğan 656.

15. **Tricholoma radotinense** Pilat & Charvat
Macroscopic and microscopic features
Pileus 5-10 cm, hemispherical, then expanded and plane, centre depressed and margin involute, surface smooth (figure 30), white when young, then turning ocherish-pink, pink or pinkish brown spotted on a white background. Lamellae cream, then turning reddish yellow, decurrent tooth. Stipe 4-6 x 1.5-2 cm, cylindrical, tapered toward the base, surface fibrillose, cream white, turning yellowish pink-brownish pink when mature.
Spores elliptic, 4.5-6 x 3.5-4.5 µ (figure 31), hyaline, smooth.
Sarıveliler; Civandere village, Kumluçukur district, Cedar forest, 1700 m, 22.11.1998, Doğan 39,45, Başyayla; Katranlı plateau, Cedar forest, 1700 m, 05.12.1998, Doğan 49, 30.10.1999, Doğan 227, Ermenek; Damlaçalı district, Cedar forest, 1750 m, 06.11.1999, Doğan 255.

16. **Xeromphalina caulicinalis** (With. : Fr.) Kühn. & Mre.
Syn: *Marasmius fulvobulbilosus* R. & Fr.

Macroscopic and microscopic features

Pileus 1-2.5 cm, hemispherical, expanded to plane, with an obtuse umbo in the centre, surface smooth (figure 32), shiny, dark lemon yellow in the centre, increasingly light lemon coloured in the margin. Lamellae lemon-sulphur yellow, often heavily cross-veined, decurrent. Stipe 4-8 x 0.1-0.2 cm, cylindric, tapered toward the base, yellow toward the apex, reddish brown-blackish brown toward the base, surface with dark brown tomentose.

Spores elliptic-cylindric, 5.5-6 x 2.5-3 μ (figure 33), smooth, hyaline.

Bucakkışla; İhsaniye village, Kerimpınarı distrcit, on Poplar trunks, 1650 m, 25.11.2000, Doğan 1047.

Acknowledgements

This investigation was supported by Selçuk University Research Council (FEF: 99/074). Thanks to their aids.

Figure 2. Basidiocarps of *Armillaria cepistipes* (1/ 1 life size).

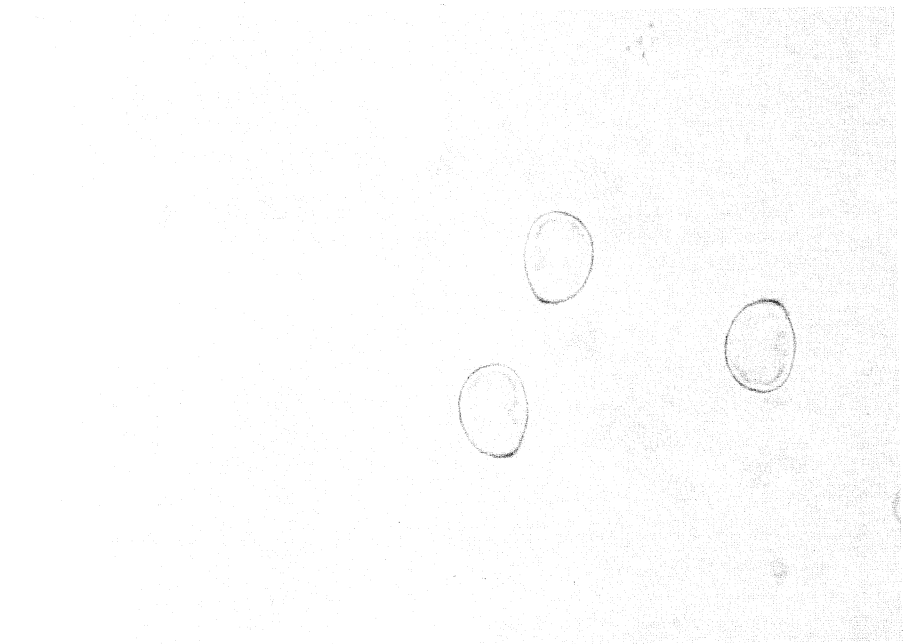

Figure 3. Basidiospores of *Armillaria cepistipes* (10 x 100).

Figure 4. Basidiocarps of *C. distorta* (1/ 2 life size).

Figure 5. Basidiospores of *C. distorta*.

Figure 6. Basidiocarps of *Cystoderma ambrosii* (1/ 1 life size).

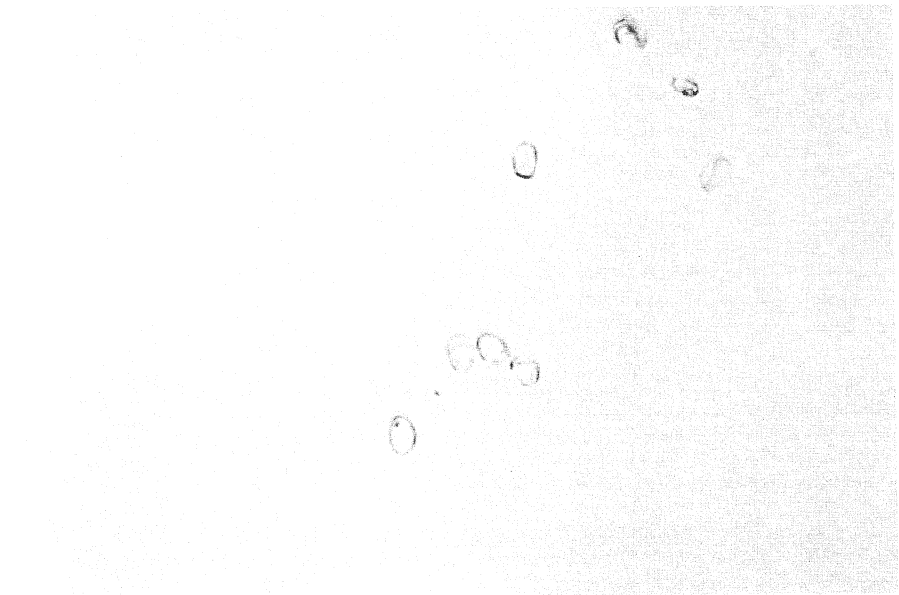

Figure 7. Basidiospores of *Cystoderma ambrosii* (10 x 40).

Figure 8. Basidiocarps of *Lyophyllum fumatofoetens* (1/ 1 life size).

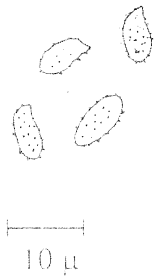

Figure 9. Basidiospores of *Lyophyllum fumatofoetens*

Figure 10. Basidiocarps of *L. infumatum* (1/ 1 life size).

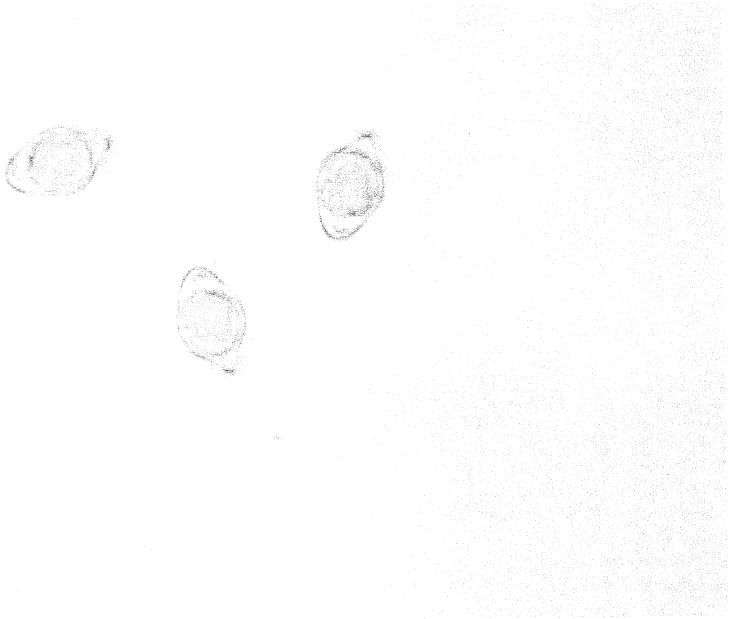

Figure 11. Basidiospores of *L. infumatum* (10 x 100).

Figure 12. Basidiocarps of *L. semitale* (1/ 1 life size).

Figure 13. Basidiospores of *L. semitale*.

Figure 14. Basidiocarps of *Macrocystidia cucumis* (1/2 life size).

Figure 15. Basidiospores of *Macrocystidia cucumis* (10 x 100).

Figure 16. Basidiocarps of *M. amicta* (1/ 1 life size).

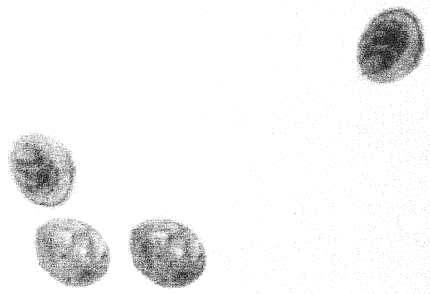

Figure 17. Basidiospores of *M. amicta* (10 x 100).

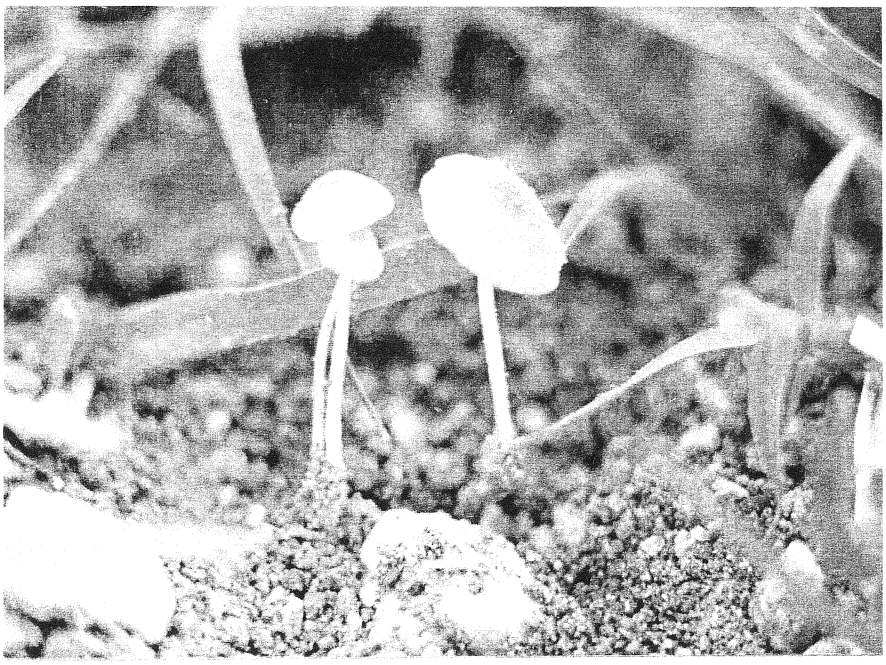

Figure 18. Basidiocarps of *M. hiemalis* (1 x 2 life size).

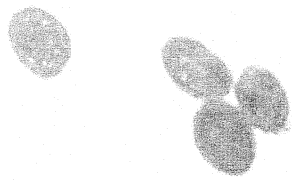

Figure 19. Basidiospores of *M. hiemalis* (10 x 100).

Figure 20. Basidiocarps of *M. xantholeuca* (1/ 1 life size).

Figure 21. Basidiospores of *M. xantholeuca* (10 x 100).

Figure 22. Basidiocarps of *Omphalina obscurata* (1/2 life size).

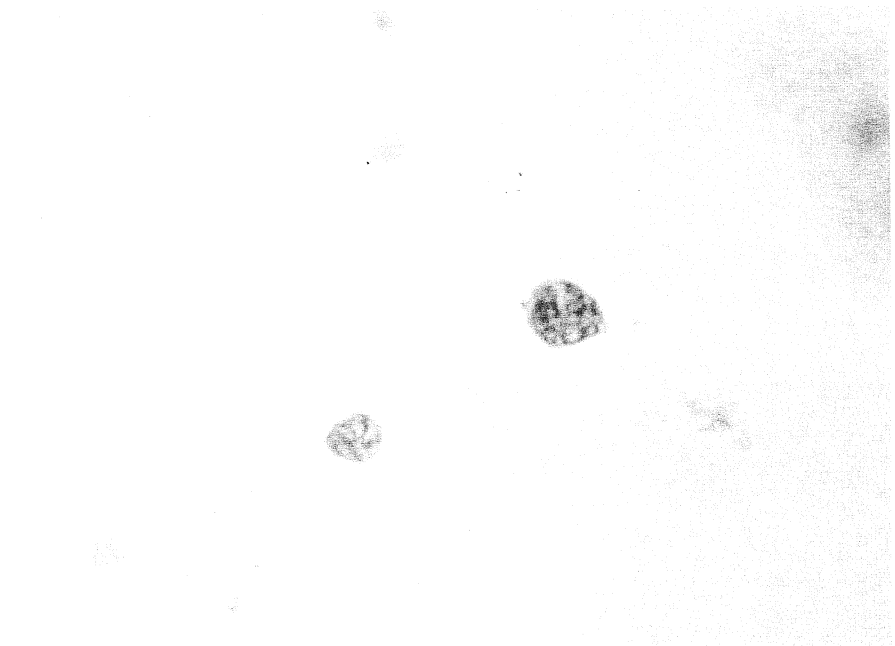

Figure 23. Basidiospores of *Omphalina obscurata* (10 x 100).

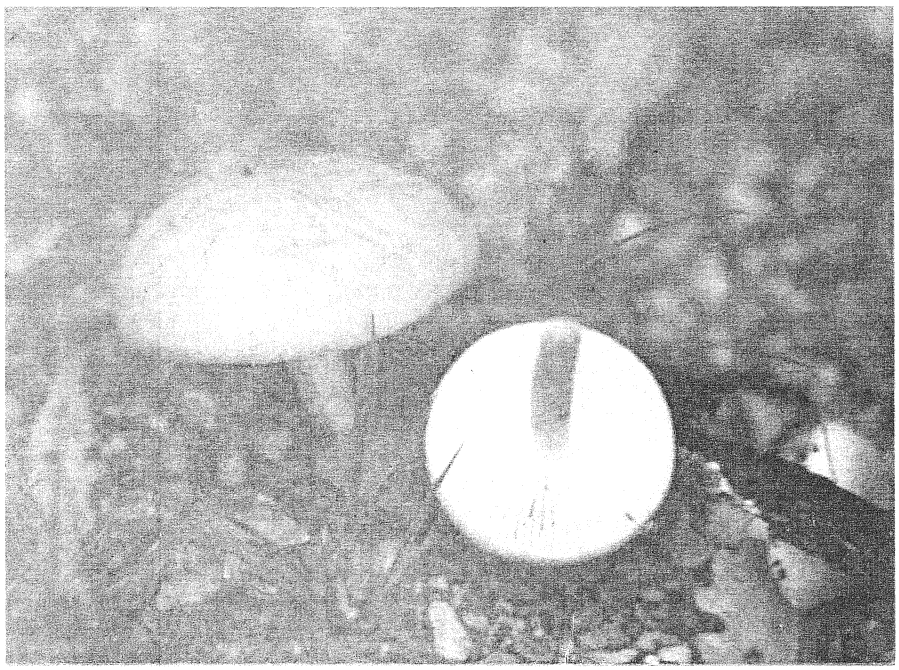

Figure 24. Basidiocarps of *Oudemansiella hygrophoroides* (1/ 1 life size).

Figure 25. Basidiospores of *Oudemansiella hygrophoroides* (10 x 100).

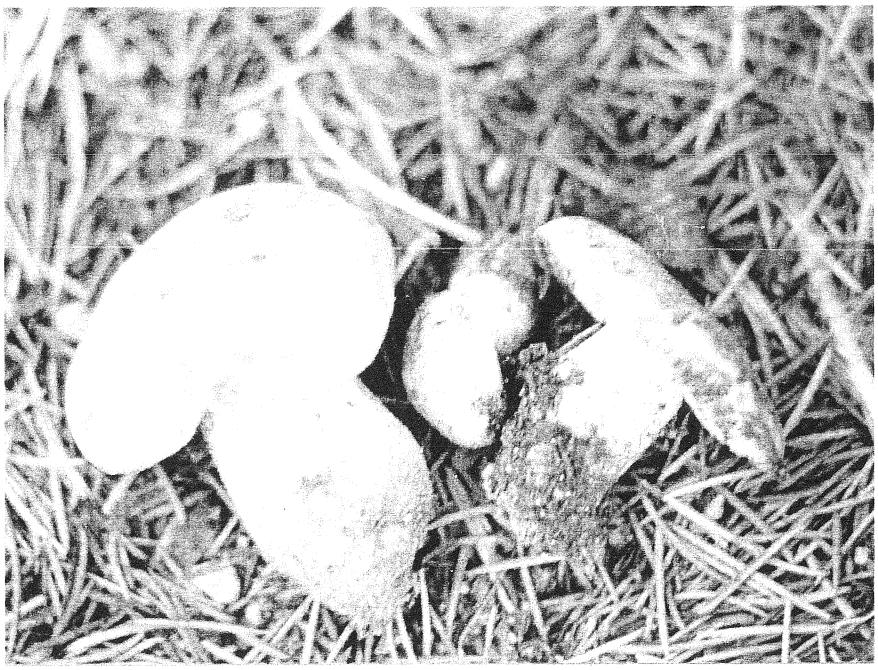

Figure 26. Basidiocarps of *T. apium* (1/ 2 life size).

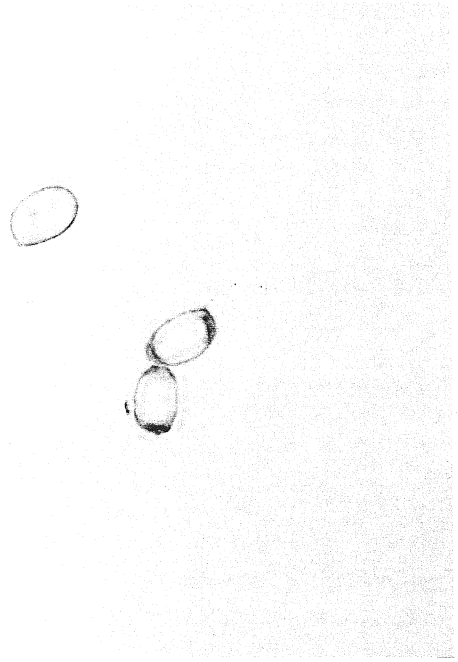

Figure 27. Basidiospores of *T. apium* (10 x 100).

Figure 28. Basidiocarps of *T. myomyces* (1/ 1 life size).

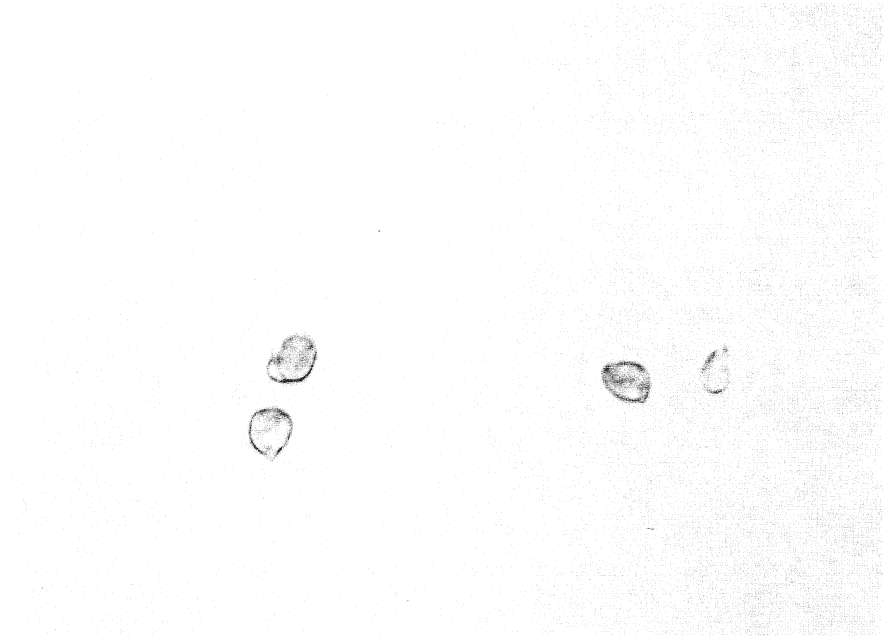

Figure 29. Basidiospores of *T. myomyces* (10 x 100).

Figure 30. Basidiocarps of *T. radotinense* (1/ 2 life size).

Figure 31. Basidiospores of *T. radotinense* (10 x 100).

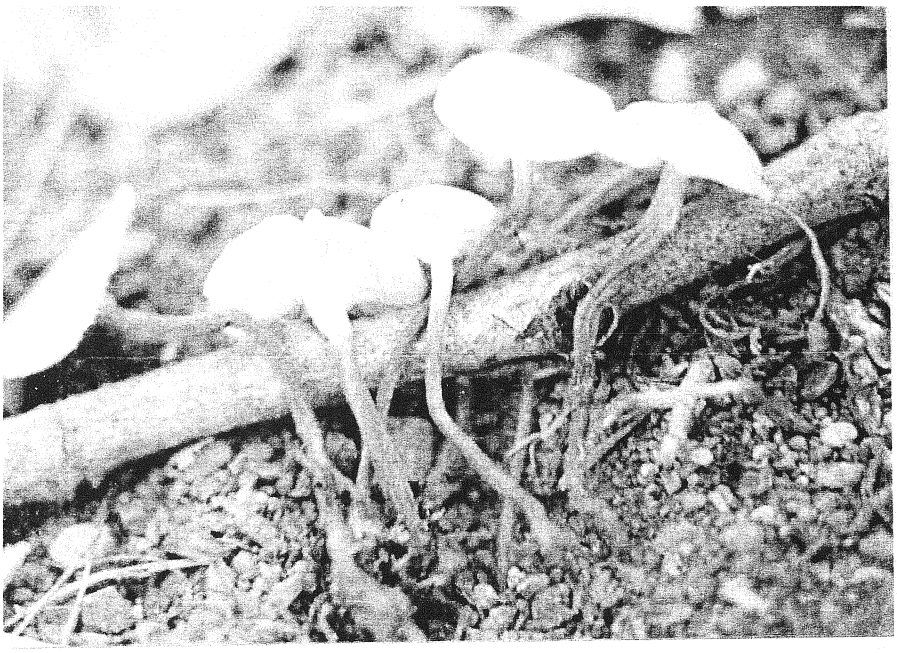

Figure 32. Basidiocarps of *Xeromphalina caulicinalis* (1/ 1 life size).

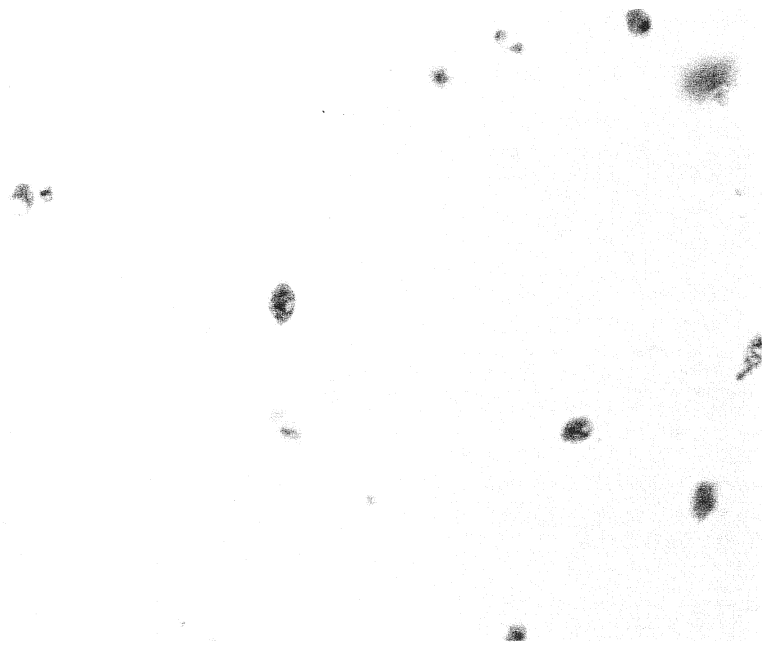

Figure 33. Basidiospores of *Xeromphalina caulicinalis* (10 x 100).

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