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New records of morels from Turkey

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Abstract— Numerous field trips in Muğla Province during 2000 and 2002 revealed four *Morchella* taxa new to Turkey. *Morchella elatoides* var. *elegans*, *M. hortensis*, *M. pseudoviridis*, and *M. purpurascens* var. *ionoviridis* are described and illustrated.

Key words— taxonomy, Turkish fungi, macromycetes

Introduction

Many species of *Morchella* are exported to foreign countries from Turkey, in particular France, Sweden, Germany, England, Belgium, Netherland and the United States. As a result, morels from the Aegean, Mediterranean and Marmara regions contribute significantly to the Turkish economy. In Muğla Province ecological factors, such as a mild, rainy regime on the coastal and cooler interior regions particularly foster *Morchella* diversity (Fig. 1). In Muğla morels can be collected from February to May in sunny places in pine forests, especially in burned areas, clearings, or on woody debris such as bark chips, sawdust, or wood chippings. Morels are but also found in gardens, lawns and parks.

Many studies on macromycota have been done in Turkey (Mat 2000, Solak et al. 2001, 2002). Clearly many mushrooms growing in different parts of Turkey have not yet been determined. About 300 articles published between 1932 and 2004 have been examined. About 1400 macrofungus species have thus far been reported from Turkey. Among these, 22 *Morchella* taxa have been recorded.

This study adds four new *Morchella* taxa to the Turkish Macromycota, increasing the known taxa from 22 to 26.

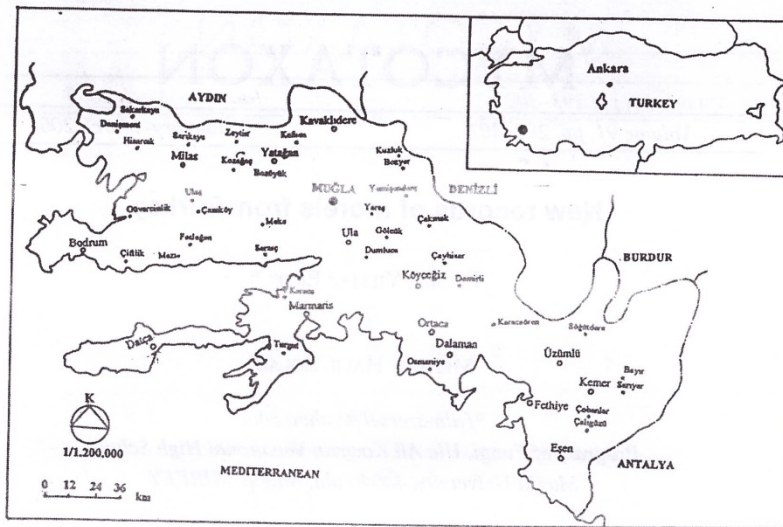


FIGURE 1. Muğla Province, the study area.

Materials and Methods

Specimens were collected during field trips in Muğla Province between 2000 and 2002. The morphological and ecological characteristics of the macrofungi were recorded. The morphs were first photographed in their natural habitats and then brought to the laboratory. Spore prints were taken and fresh ascospores were photographed. Dried specimens were numbered, placed in locked bags, and frozen at low temperatures for a week to protect against internal and external parasites.

The specimens were identified using macroscopic and microscopic features, using references by Marchand (1973), Breitenbach & Kranzlin (1984), and Jacquetant (1984). All specimens collected are now curated at the fungarium of Muğla University.

Taxonomic Descriptions

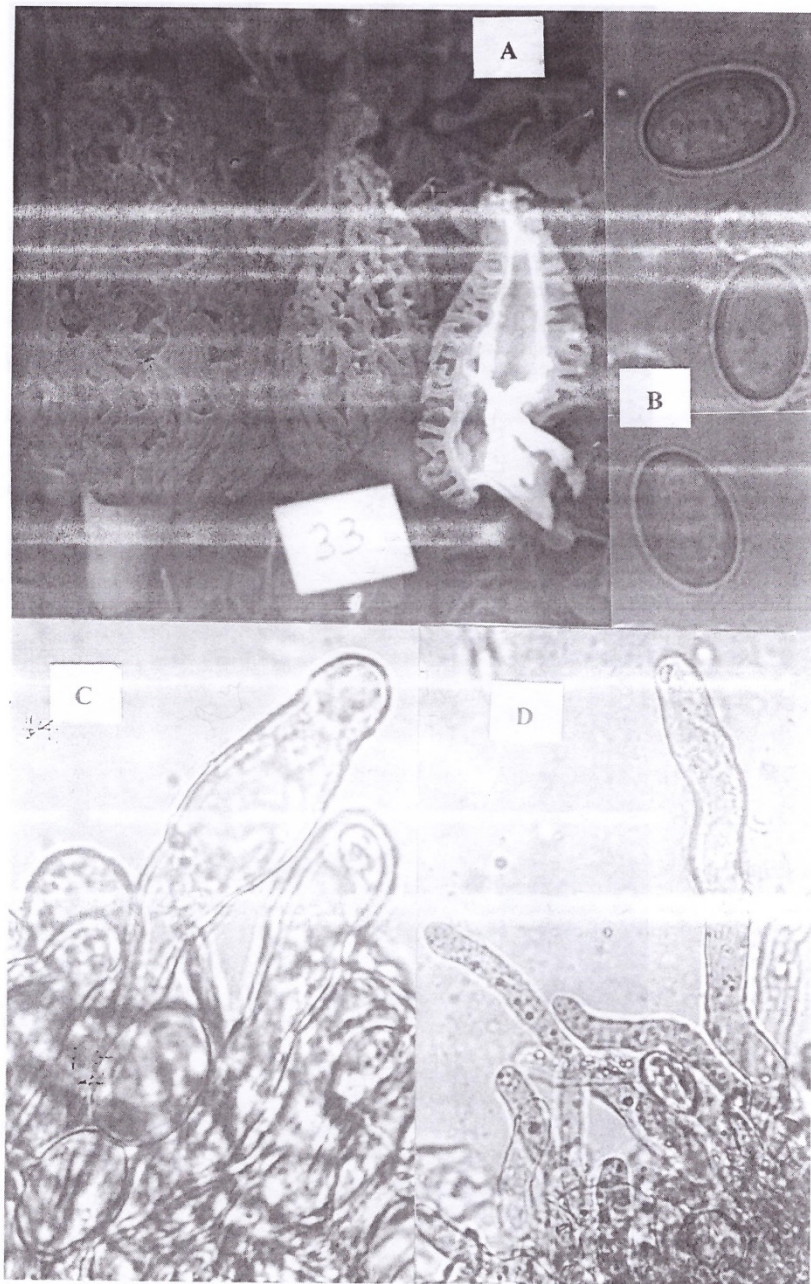
Morchella elatoides Jacquet. var. *elegans* Jacquet.

Figure 2

Cap 40-50 x 20-25 mm, cylindrical, thin and tall, breakable; longitudinal ribs yellowish, sometimes dark yellow, usually with 10 ribs, narrow at edges. Alveolae irregular and dimension variable. **Stalk** 20 x 10 mm, shorter than cap, cylindrical; surface white to

FIGURE 2 *Morchella elatoides* var. *elegans*. **Top left.** Fruiting body *in situ*. **Top right.** Ascospores (x400). **Middle.** Paraphyses (left x400; right x200). **Bottom:** Cystidia (x200).





ochraceous, wrinkled at base, furfuraceous; hollow. Margin of cap passing directly into the stalk without a sharp bend.

Spores 22.5 x 11-12.5 μ , elliptical, smooth. **Asci** eight-spored. **Paraphyses** cylindrical, septate and forked, tips with clavate thickenings. **Cystidia** rather regular, clavate.

Habitat under *Pinus* and *Quercus* and open places in the forest.

Distribution Muğla, Yaras Village, 17.04.2001, FY., S., 6; Yemisendere Village, 17.04.2001, FY., S., 63.

M. hortensis Boud.

FIGURE 3-4

Cap 45-60 x 30-35 mm, ovoid, rarely cylindrical, light brown to grey; ribs thick, frequently, whitish, usually 20-30 irregular longitudinal ribs, alveolae darker than ribs. **Stalk** 25-35 x 10-15 mm, always shorter than cap, cylindrical, broadened toward the base; white to cream, surface wavy, hairy, hollow. Margin of cap sharply bent inward and attached to stalk. **Flesh** whitish, thin.

Spores 22-23 x 15-16 μ , elliptical, hyaline. **Paraphyses** cylindrical, branched, thickened at the tips. **Cystidia** regular, broad clavate.

Habitat near the pathway outside the forest.

Distribution Muğla, Ula, Golcuk Village, 11.04.2001, FY., S., 31,33,35.

M. pseudoviridis Jacquet.

FIGURES 4-6

Cap 40-60 mm, irregularly spherical to oval, ribs thin and irregular; light golden yellow. alveolae large, irregular, deep, grey to light brown. **Stalk** 20-30 x 15 mm, cylindrical, thickened toward the base; white; surface smooth to slightly wrinkled, hollow.

Spores 20-22.5 x 10-12.5 μ , elliptical, smooth, sometimes with small droplets. **Asci** eight spored, turning reddish in Melzer's Reagent. **Paraphyses** cylindrical and septate. **Cystidia** irregular.

Habitat in broadleaved forest.

Distribution Muğla, Milas, Sakarkaya Village, 10.04.2001, FY., S., 42.

M. purpurascens (Kromb. ex Boud.) Jacquet. var. *ionoviridis* Jacquet.

FIGURE 6-7

Cap 40-60 x 25-35 mm, conic, longitudinal ribs thick, distance between ribs narrow, alveolae small; purplish. **Stalk** 15-25 x 10 mm, small, thick, white to pale grey. Margin of cap is sharply bent inward and attached to stalk.

FIGURE 3. *Morchella hortensis*. A. Fruiting body in situ. B. Ascospores ($\times 400$) C-D. Paraphyses (C: $\times 400$, D: $\times 200$).

Spores 23-25 x 14-15 μ , narrow elliptical to ovoid. **Asci** eight spored. **Paraphyses** clavate shaped. **Cystidia** long, bulky and regular.

Habitat in coniferous forest.

Distribution Muğla, Dalaman, Osmaniye Village, 15.04.2001, FY., S., 81.

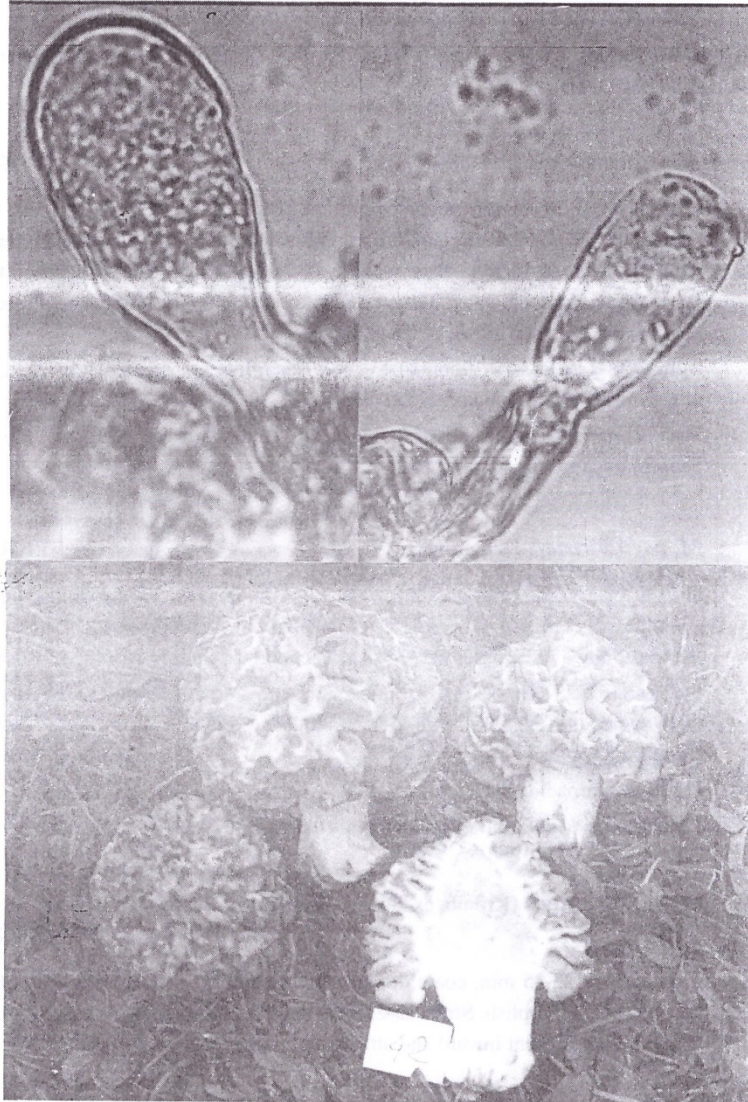


FIGURE 4. **Top:** *Morchella hortensis*. Cystidia ($\times 400$) **Bottom:** *Morchella pseudoviridis*. Fruiting body ($\times 0.75$).

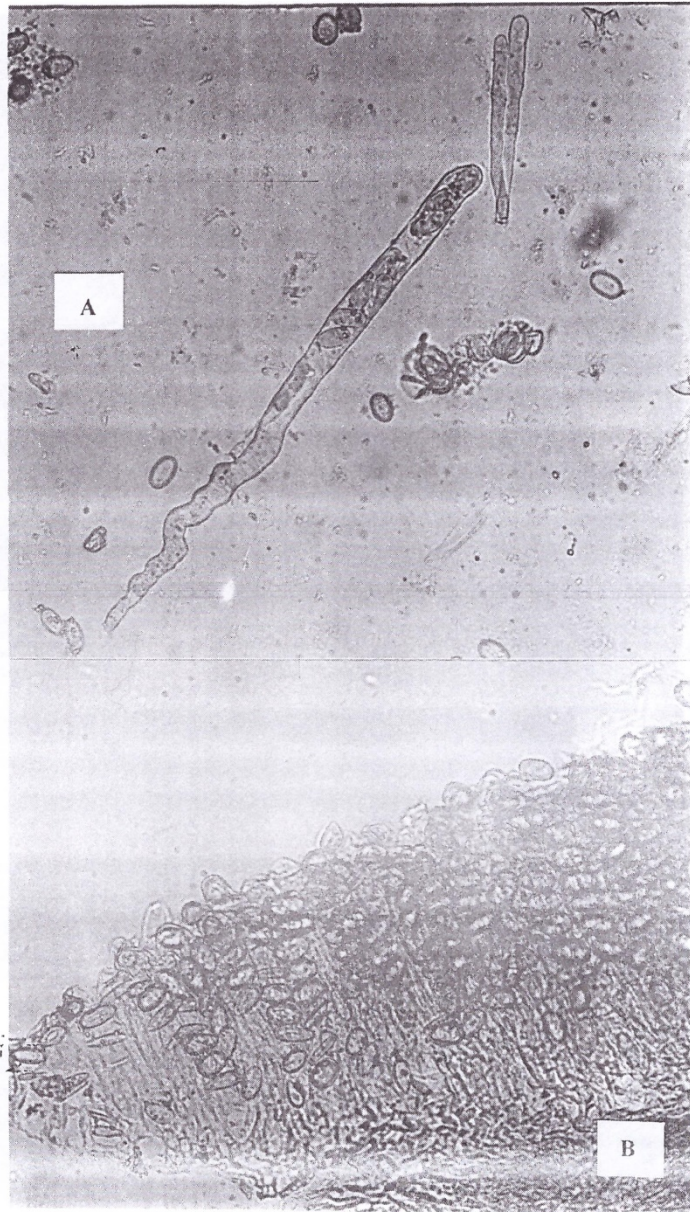


FIGURE 5. *Morchella pseudoviridis*. A. Ascus with paraphyses ($\times 100$). B. Hymenium ($\times 100$).

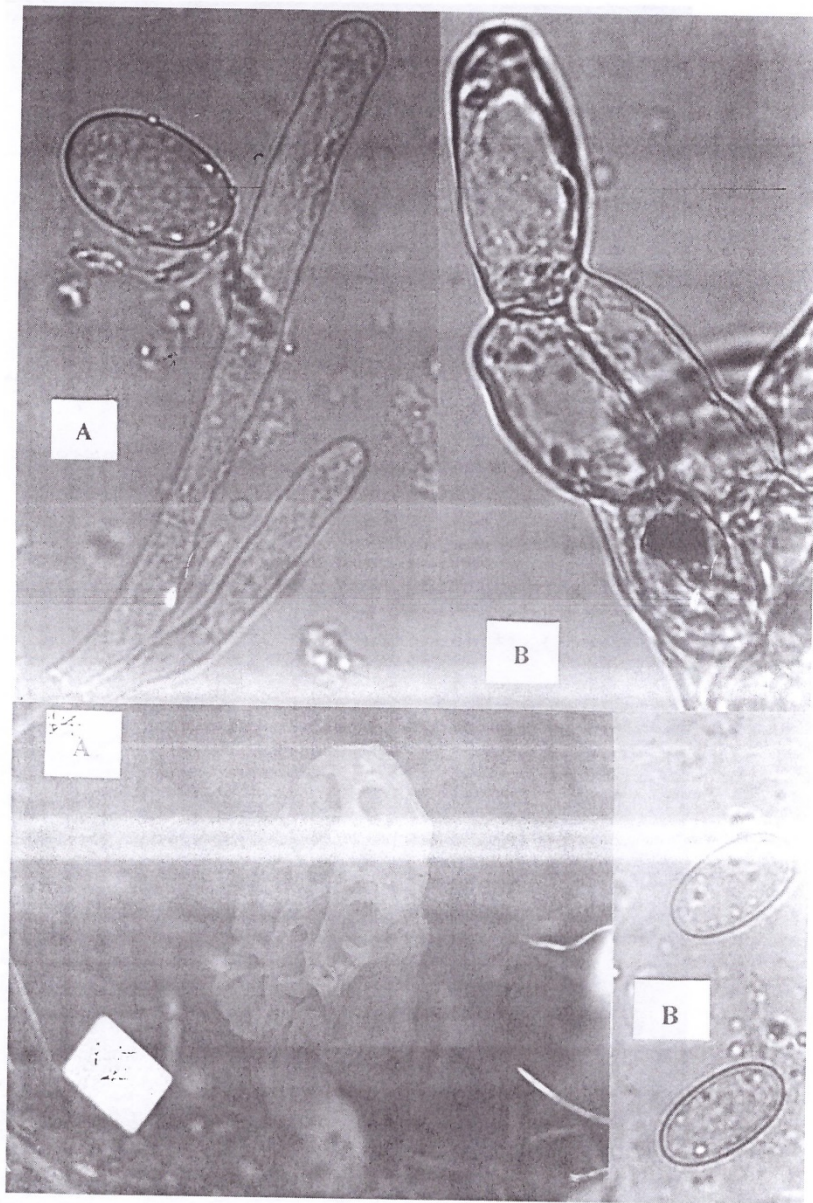


FIGURE 6. Top. *Morchella pseudoviridis*. A. Paraphyses ($\times 400$). B. Cystidia ($\times 400$).
 Bottom. *Morchella purpurascens* var. *ionoviridis*. A. Fruiting body in situ ($\times 1$).
 B. Ascospores ($\times 400$).

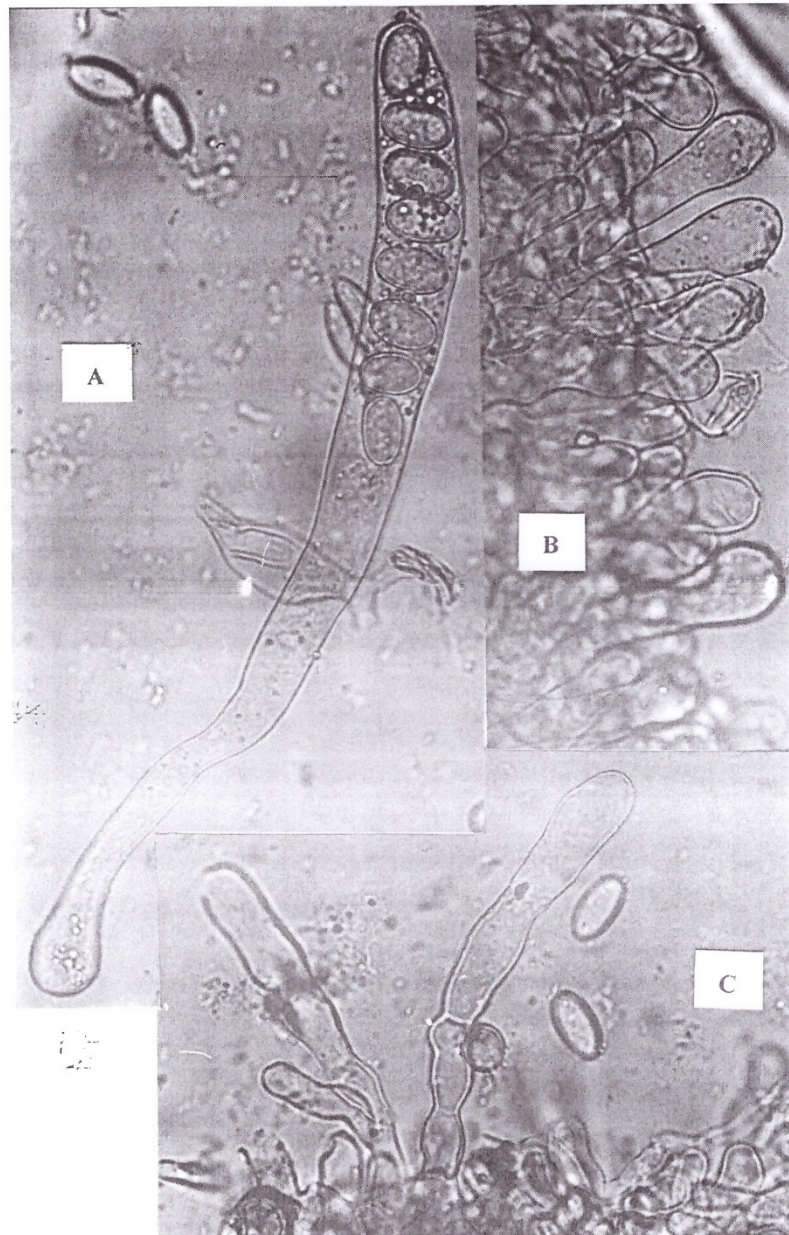


FIGURE 7. *Morchella purpurascens* var. *ionoviridis*. A. Ascospores ($\times 200$). B. Cystidia ($\times 200$). C. Paraphyses ($\times 200$)

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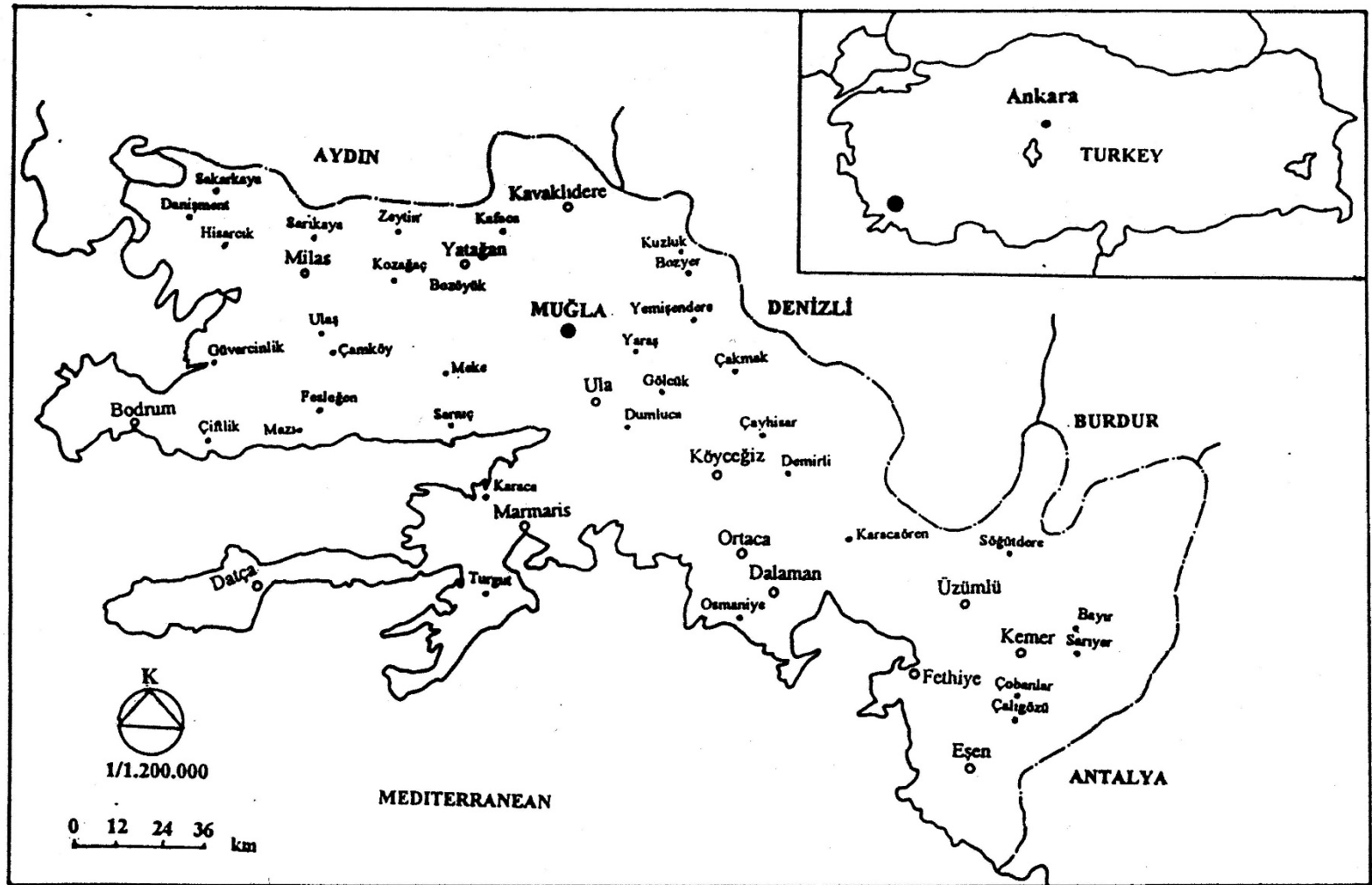


FIGURE 1. The study area

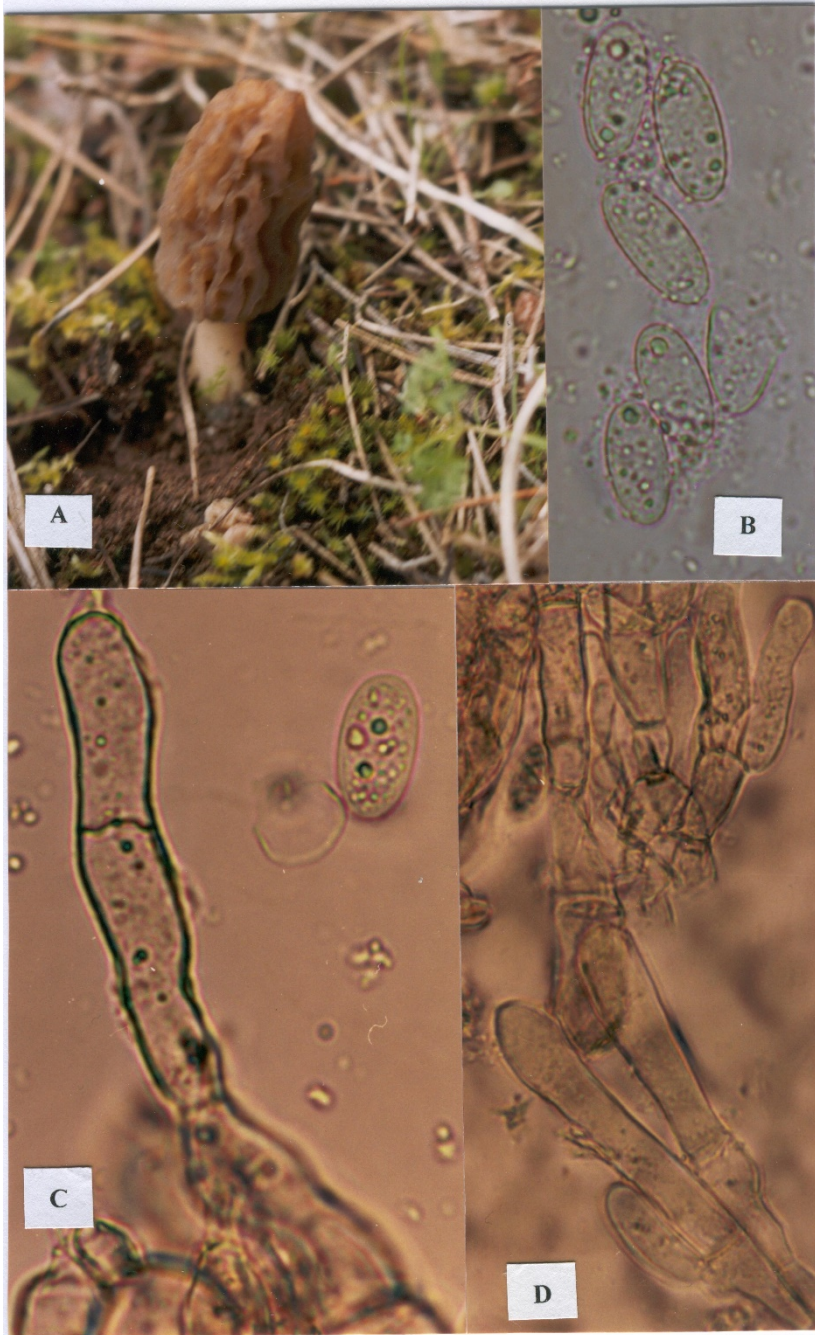


FIGURE 2: *M. elatoides* var. *elegans* **A** : Fruiting body (Life size)
B : Spores (X400) **C** : Paraphyse (X400) **D** : Paraphyses (X200)

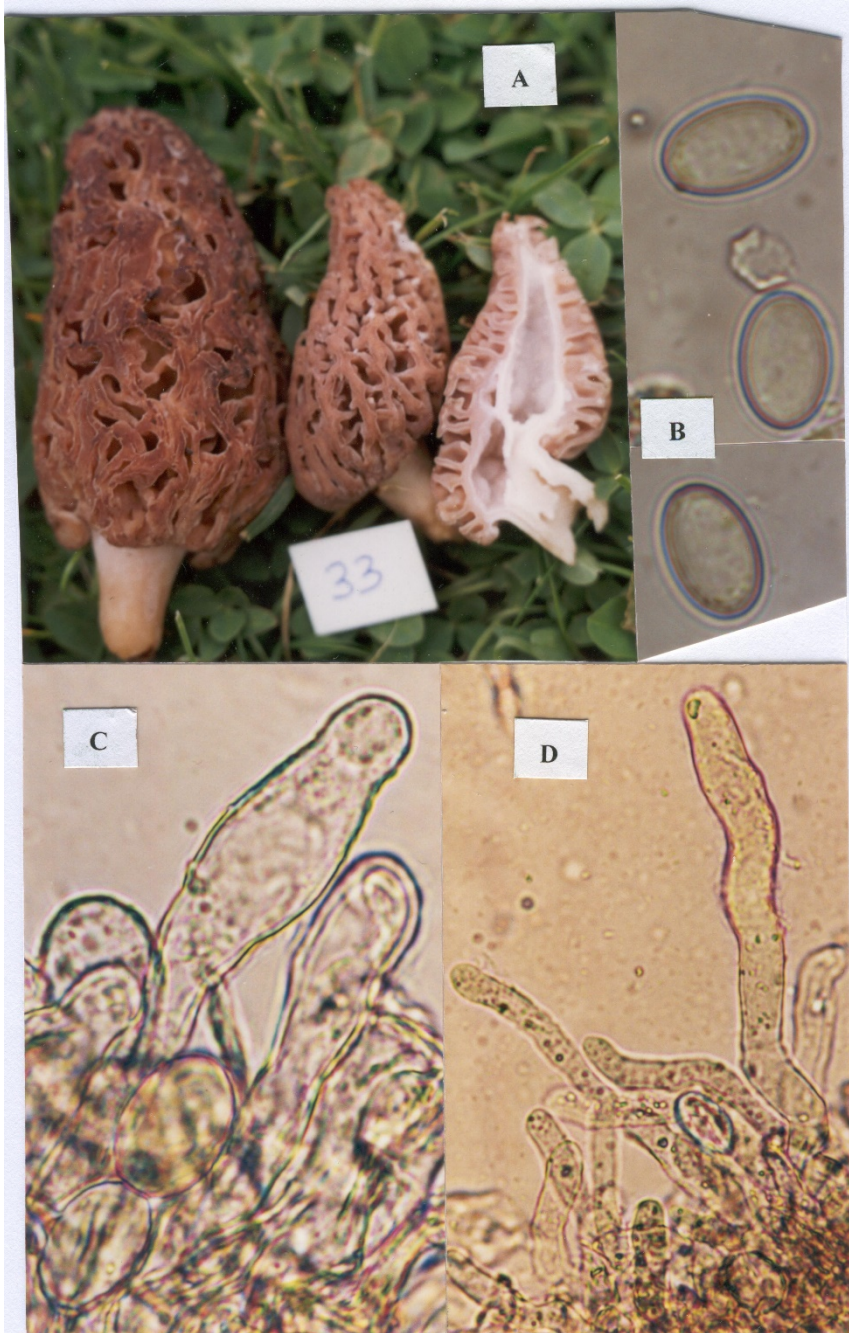


FIGURE 4: *M. hortensis* **A** : Fruiting body (Life size) **B** : Spores (X400)
C : Paraphyses (X400) **D** : Paraphyses (X200)

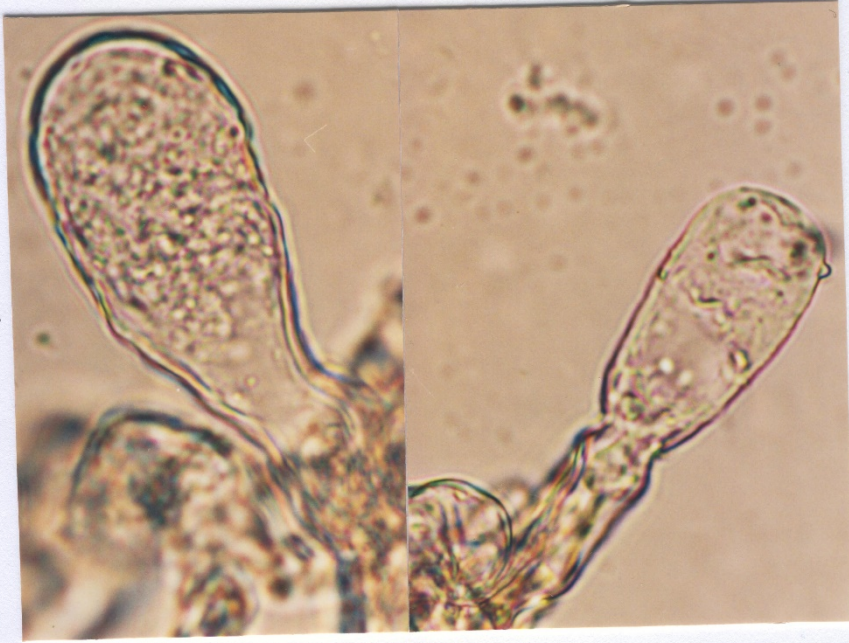


FIGURE 5: *M. hortensis*, Cystidia (X400)



FIGURE 6: *M. pseudoviridis*, Fruiting body (Life size $\frac{3}{4}$)

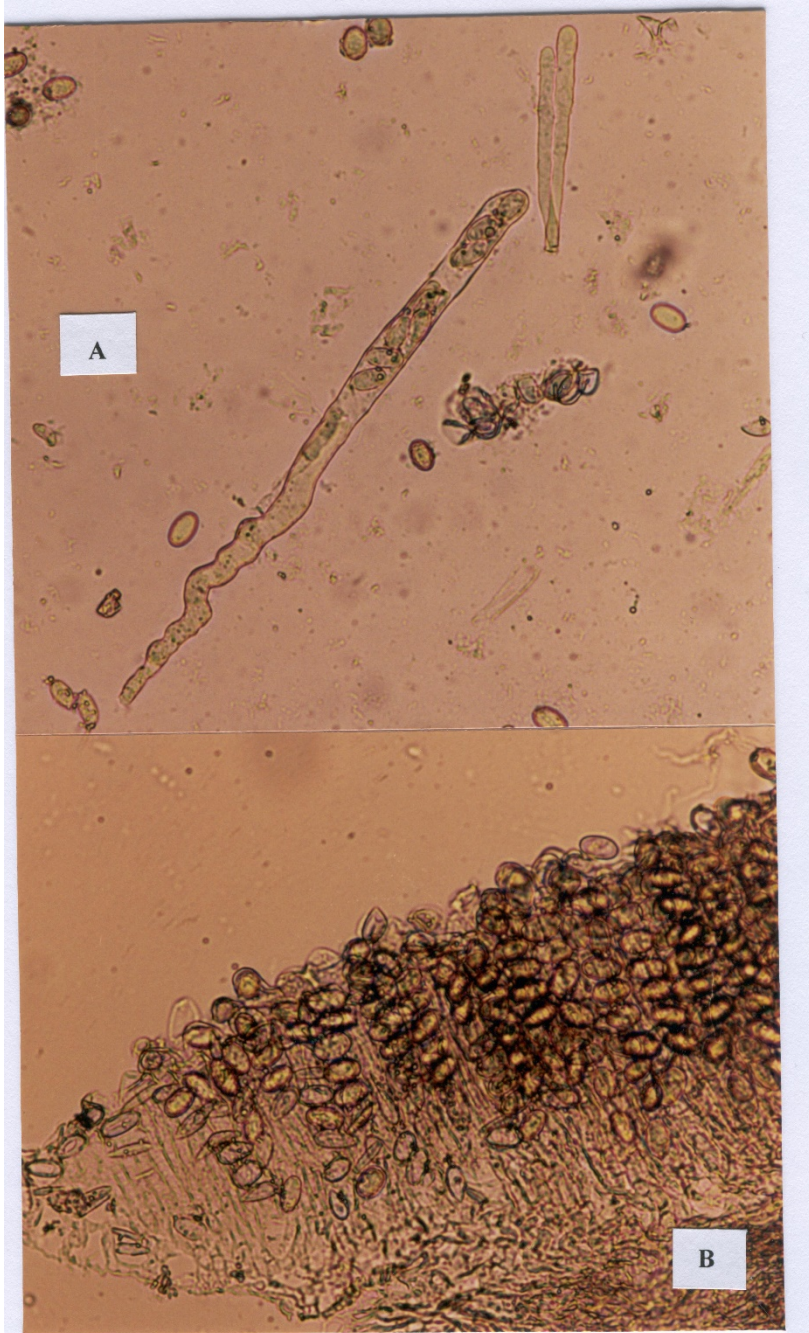


FIGURE 7: *M. pseudoviridis* **A :** Ascus (X100) **B :** Hymenium (X100)



FIGURE 8: *M. pseudoviridis* **A** : Paraphyses (X400) **B** : Cystidia (X400)



FIGURE 9: *M. purpurascens* var. *ionoviridis* **A** : Fruiting body (Life size)
B : Spores (X 400)

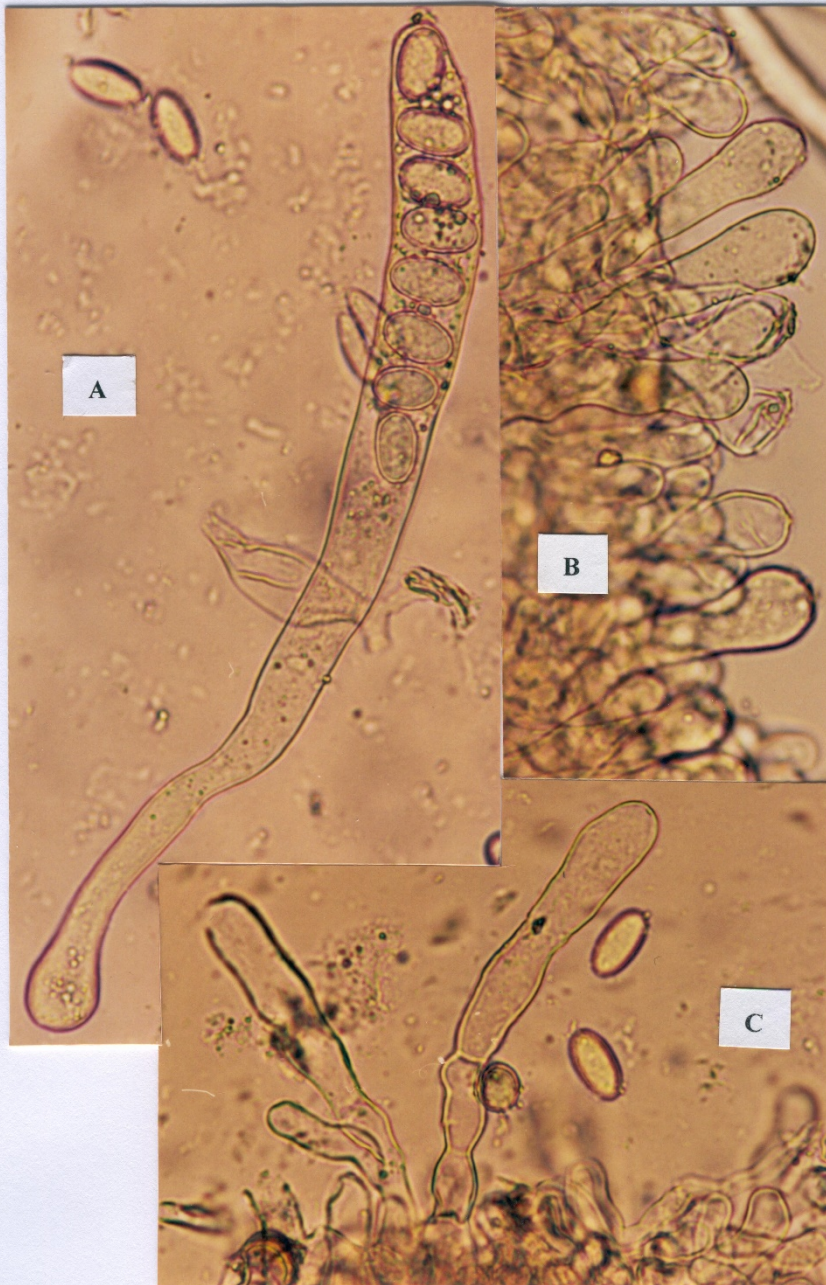


FIGURE 10: *M. purpurascens* var. *ionoviridis* **A** : Ascus (X200)
B : Cystidia (X200) **C** : Paraphyses (X200)