

## Some Rare Myxomycetes from Malta

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### Abstract

In the present paper, eight rare or new taxa of myxomycetes from Malta are described and their main representative morphological characteristics are illustrated by SEM micrographs. Among these are *Craterium rubronodum* and *Tubifera microsperma*, both new records for the Mediterranean Region and *Arcyria major*, *Comatricha laxa* and *Stemonitopsis hyperopta*, new records for Malta. Concise information on the physical, climatic and ecological conditions in the Maltese Islands is also given.

### Resumen

En el presente trabajo se describen indicando los caracteres morfológicos más importantes, e ilustran con fotografías con MEB, 8 táxones de myxomycetes procedentes de Malta. *Craterium rubronodum* y *Tubifera microsperma* son nuevas citas para la Región Mediterránea y *Arcyria major*, *Comatricha laxa* y *Stemonitopsis hyperopta* son nuevos registros para Malta. Se aporta una breve información acerca de las condiciones físicas, climáticas y ecológicas de las Islas de Malta.

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## Introduction

The Maltese Islands are situated in the centre of the Mediterranean, c. 93 kilometres south of Sicily. They include three main islands: Malta, Gozo and Commino with a total surface area of 318 square kilometres, flanked by even smaller islets. Their geological structure consists of tertiary, calcareous, sedimentary rocks, topped by scattered quaternary alluvial deposits.

The climate of the Maltese Islands is hot and dry in summer and mild and wet in winter. The annual rainfall, mostly in short heavy showers, averages c. 500 mm but is extremely variable. However, the temperature and relative humidity are more stable. Taken over a thirty-year period the average daily maximum and minimum temperature for January, the coldest month is 18.6°/4.5° C and for July, the hottest month, 35.9°/18.2° C (The Year Book 1984). The relative humidity is high, mostly between 60% and 80% with little seasonal variation.

There are archaeological indications that as early as about 5000 BC the islands were already inhabited by relatively advanced settlers, who brought with them domestic animals and cultivated the land (HASLAM et al. 1977). Because of this and subsequent continuous human interference the primitive evergreen forests dominated by holm oak (*Quercus ilex*) and aleppo pine (*Pinus halepensis*) gradually disappeared.

At present the natural vegetation is mainly garigue. In fact wild tree-cover occupies less than 1% of the total area of the islands, mostly in Malta. The commonest tree is the carob (*Ceratonia siliqua*), which can be seen practically everywhere in scattered single specimens or as the dominant tree of maquis communities on rocky valley slopes. Four small stands of holm oak (*Quercus ilex*) are believed to be the only surviving traces of the ancient evergreen forests, besides two small clumps of the old Sandarac gum tree (*Tetraclinis articulata*), which in Europe only occurs in Malta and in a small locality in southern Spain. Other tree species of native or doubtful origine, which may have become extinct and reintroduced in recent or historic time, include: aleppo pine (*Pinus halepensis*), olive (*Olea europaea*),

ash (*Fraxinus angustifolia*), laurel (*Laurus nobilis*) and tamarisk (*Tamarix africana*). In some valleys, in the vicinity of a few natural springs still survive a few native elms (*Ulmus canescens*), white poplars (*Populus alba*), and mediterranean willows (*Salix pedicellata*). A naturalised old introduction is the prickly pear (*Opuntia ficus-indica*), a native of tropical America, and a relatively recent introduction is the tree of heaven (*Ailanthus altissima*), a native of China. Recent attempts at afforestation which included *Eucalyptus* and *Acacia* spp. from Australia were strongly criticised by local conservationists.

On the decaying leaf-litter, twigs and stumps of some of these wooded habitats, specimens belonging to 71 species of myxomycetes have been recently collected (BRIFFA 1998). Among these are *Craterium rubronodum* and *Tubifera microsperma*, both new records for the Mediterranean Region, *Comatricha anomala*, *Didymium quitense* and *Enteridium splendens* var. *juratum*. New records for Malta are *Arcyria major*, *Comatricha laxa* and *Stemonitopsis hyperopta*.

## Material and Methods

The examined specimens were collected from various localities in Malta by A. BONNICI and one of us (MB), and are deposited at the private BRIFFA Herbarium in Malta (MB). Duplicates from the same collections of *Craterium rubronodum* and *Tubifera microsperma* are also deposited in the Herbarium of the Departamento de Biología Vegetal, Universidad de Alcalá, Madrid, Spain (AH). Studies and photographs of spores and capillitium by scanning electron microscopy (SEM) were made with a Zeiss-DSM 950 microscope. The material was prepared by using the critical point method.

In the following list, the name of each species described is followed by the Herbarium reference number of the respective examined specimen together with its collection data.

## Annotated List of Examined Species

***Arcyria major* (G. LISTER) ING, Trans. Brit. Mycol. Soc. 50: 556. 1967 (Figs 1-2)**

**Material studied:** MB1244, Loc. Ballut tal-Imgiebah, Malta, 4-02-1999, on dead branch of *Quercus ilex*.

This specimen is characterized by the short-stalked, crowded, reddish-brown sporocarps, 2.5-3 mm long; the tubular, elastic, very expanded capillitium, decorated with rings and half rings, slightly attached to the calyculus; the globose spores 7-8 µm in diam., very minutely warted with groups of larger warts, pale by transmitted light. On SEM the spores have small irregularly dispersed verrucae together with a few groups of larger ones and the ornamentation of the capillitium is made up of half rings and crests.

This species is a new record for Malta.

***Comatricha anomala* RAMMELOO, Bull. Jard. Bot. Natl. Belg. 46: 237. 1976 (Fig. 3)**

**Material studied:** MB1183, Loc. Ballut tal-Wardiya, Malta, 27-08-1997, on dead wood of *Quercus ilex*.

This specimen is easily recognisable by its characteristic spore ornamentation with warts and small reticulate areas. In the Mediterranean region, this species had only been recorded from Spain (MORENO et al. 1992) and Portugal (LADO 1994b).

***C. laxa* ROSTAF., Sluzowce Monogr.: 201. 1874**

**Material studied:** MB1188a, Loc. Wied Babu, Malta, 29-09-1997, on dead wood of *Ceratonia siliqua*.

This taxon is characterized by its small size, the spherical to nearly spherical sporocarps; the capillitium forming a net, rarely without main branches, with free ends at the apex; and spores, 10-11 µm diam. with a strong ornamentation, which is visibly baculate under SEM

(CASTILLO et al. 1997). This species is a new record for Malta.

***Craterium rubronudum* G. LISTER, Trans. Brit. Mycol. Soc. 5: 74. 1915 (Figs 4-6, 19)**

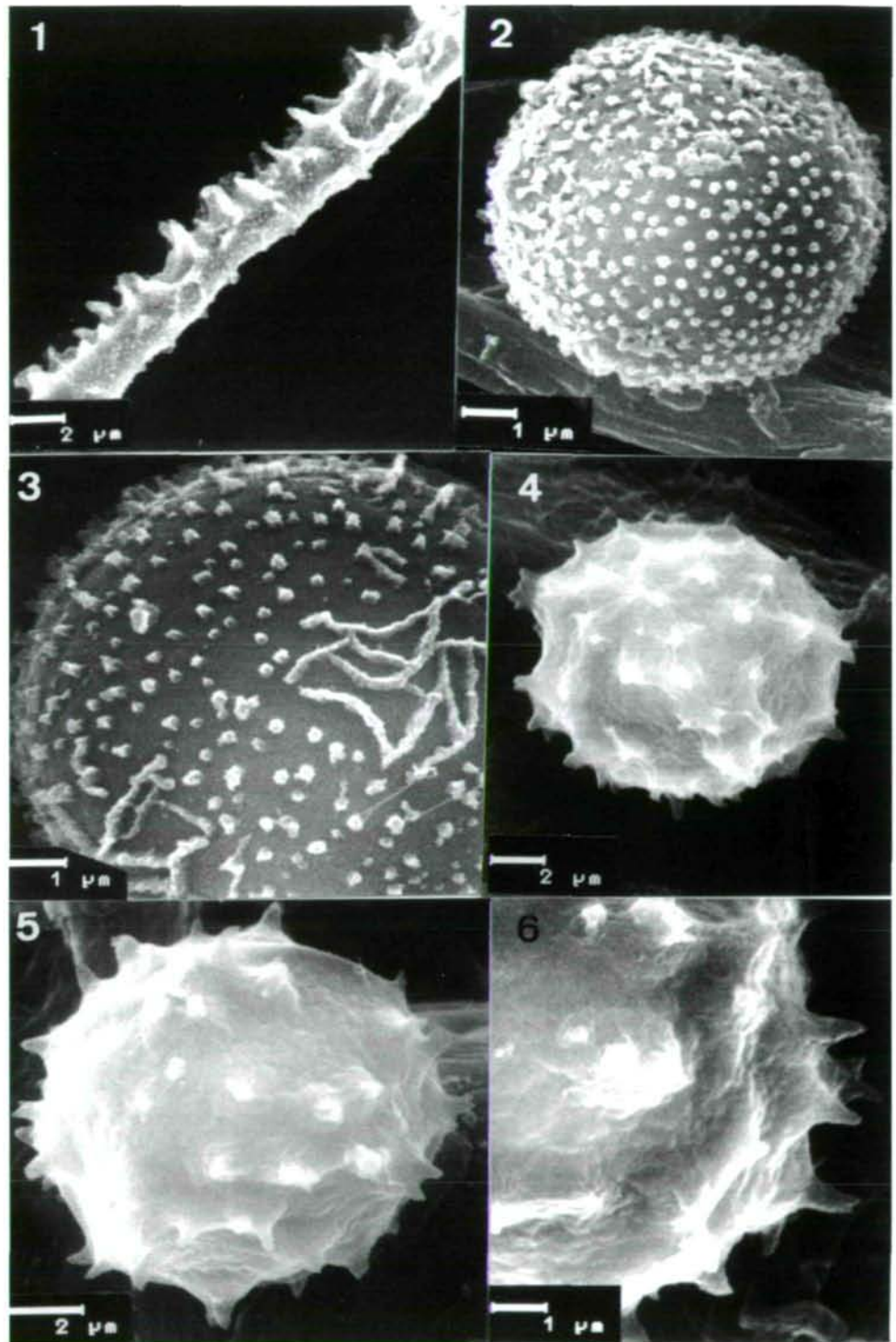
**Material studied:** MB1206 (Duplo in AH25503), Loc. Ballut tal-Imgiebah, Malta, 21-11-1997, on leaf-litter and twigs of *Quercus ilex*.

This specimen, a new record for the Mediterranean region, was reported by BRIFFA (1998). It is characterized by the gregarious sessile or short-stalked cup-shaped sporocarp, 0.6-0.8 mm long; the smooth, grey peridium, with a dark red-brown base; the flat, pinkish-grey, cartilaginous lid with petaloid dehiscence; the capillitium consisting of irregular pink nodes (yellow by transmitted light) connected by hyaline threads; the globose or subglobose spores, 10-12 µm in diam. with scattered long spines (1 µm diam.), black in mass and dark brown by transmitted light. The spore ornamentation is described by LISTER (1925) as: "marked with scattered spines whose bases may be connected so as to form a broken reticulation", but on SEM the ornamentation which consists of scattered long spines with wide bases, show no sign of reticulation on the spore surface.



**Fig. 19: Photograph of *Craterium rubronudum* (MB1206; dia. G. MORENO).**

Figs 1-6: Scanning electron micrographs.  
1-2: Capillitium and spore of *Arcyria major*. 3: Detail of the spore ornamentation of *Comatricha anomala*. 4-6: Spores of *Craterium rubronudum*.





***Didymium quitense* (PAT.) TORREND,  
Brotéria, Sér. Bot. 7: 90. 1908  
(Fig. 7)**

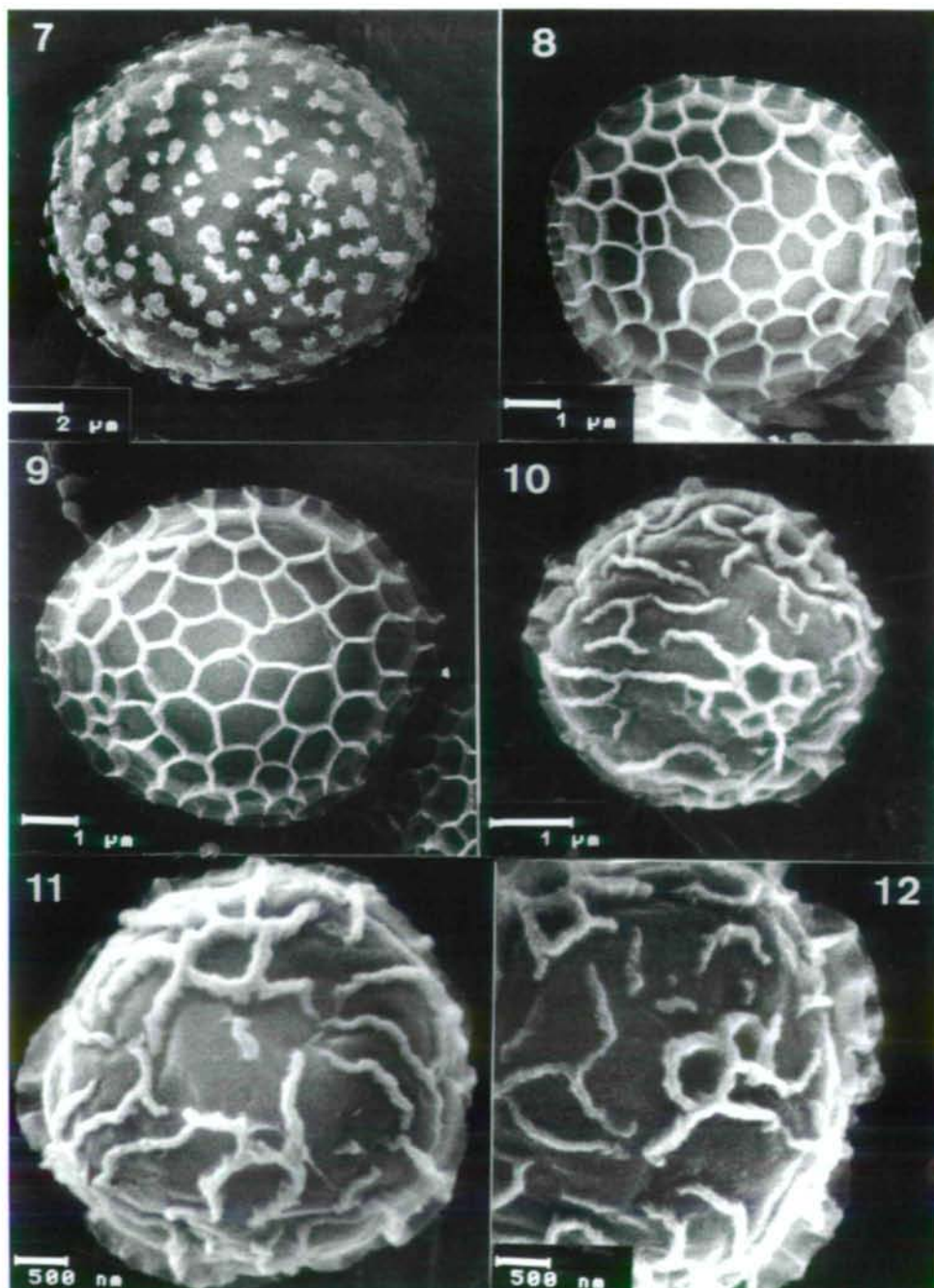
Material studied: MB1251, Loc. Maqluba, Malta, 9-2-1999, on leaf litter under *Ceratonia siliqua*.

This specimen belongs to the group of *Didymium* species with pulvinate sporocarps having a peridium covered with a smooth, eggshell-like crust consisting of compacted

lime crystals. However, it is easily identifiable by the larger spores of 14-15  $\mu\text{m}$  diam. The spore on SEM is ornamented with pila. In the Mediterranean Region this species had only been recorded from Spain and Turkey (LADO 1994a).

***Enteridium splendens* var. *juranum*  
(MEYL.) HÄRK., Karstenia 19: 5. 1979  
(Figs 8-9)**

Material studied: MB1113, Loc. Ballut tal-



Figs 7-12: Scanning electron micrographs of spores.  
7: *Didymium quitense*.  
8-9: *Enteridium splendens* var. *juranum*.  
10-12: *Stemonitopsis hyperopta*.

Ingiebah, Malta, 24-10-1996, on dead branch of *Ceratonia siliqua*.

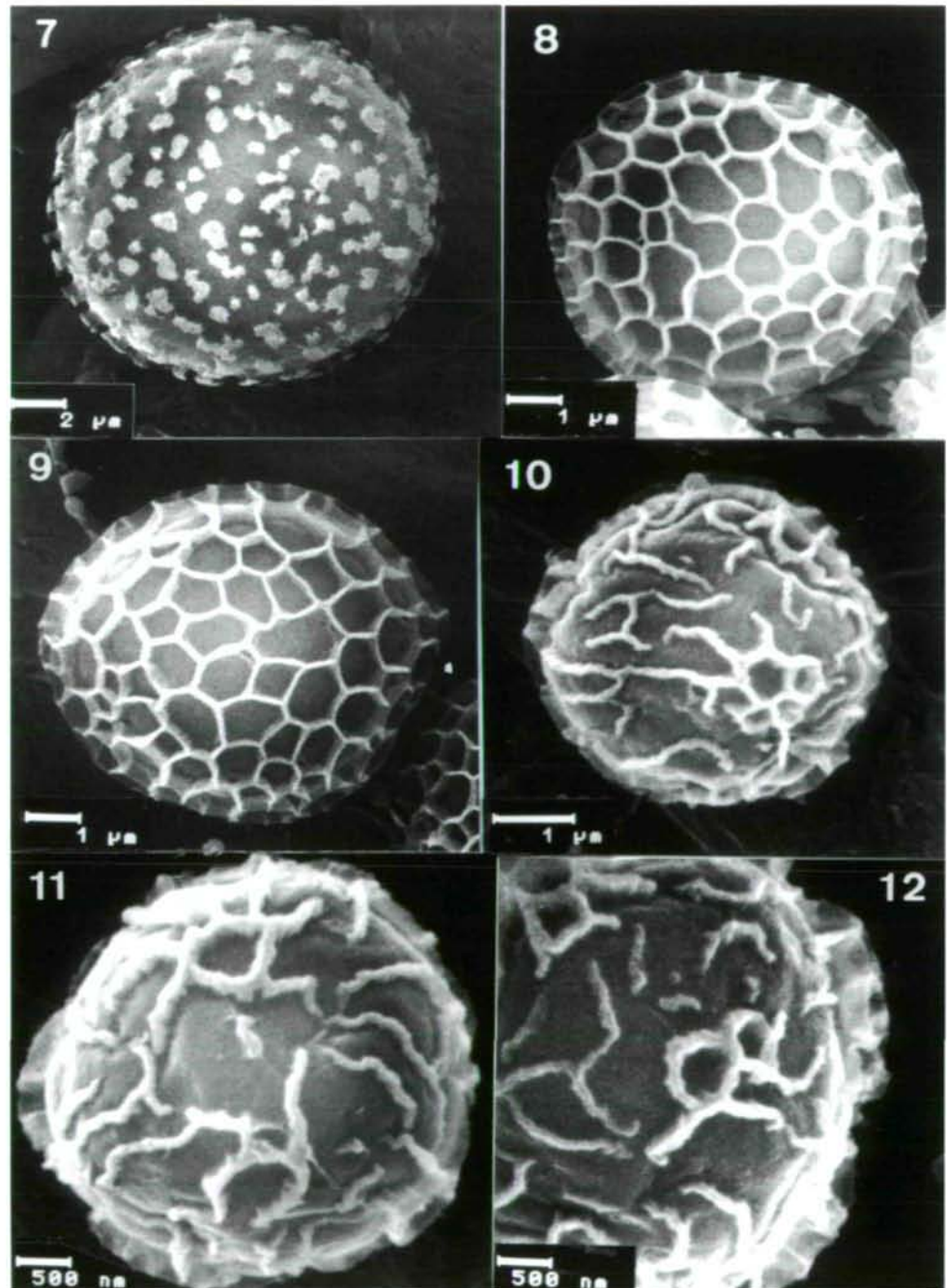
This taxon is characterized by the aethalia with a membranous, partially fugacious peridium and the pseudocapillitium formed of flaccid and perforated plates. On SEM the spore ornamentation is visibly reticulate. In the Mediterranean Region, this taxon had only been recorded from Spain and France (LADO 1994a).

***Stemonitopsis hyperopta* (MEYL.)  
NANN.-BREMEK., Nederl. Myxomyceten  
206. 1974 (Figs 10-12)**

Material studied: MB1231, Loc. Wied Qirda, Malta, 12-02-1998, on dead wood of *Ceratonia siliqua*.

The examined specimen is characterized by its tufted stipitate, cylindrical, lilac-brown sporocarps, 2-2.2 mm tall; the fibrous black stalks, 0.5 mm long; the columella reaching

Figs 13-18: Scanning electron micrographs of *Tubifera microsperma*.  
13-16: Spores. 17-18: Inner surface of the peridium.





near the apex of the sporocarp; the red-brown capillitium; the internal net with flexuous threads; and the globose spores of 5-6  $\mu\text{m}$  diam. with a fine reticulum, lilac brown in mass and pale brown in transmitted light. On SEM the spore ornamentation is shown with an incomplete reticulate of low ridges and bands. This is a new record for Malta.

***Tubifera microsperma* (BERK. & M.A. CURTIS.) G.W. MARTIN, Mycologia 39: 461. 1947 (Figs 13-18, 20)**

**Material studied:** MB1194 (duplo in AH25502), Loc. Buskett, Malta, 28-10-1997, on decaying stump of *Ceratonia siliqua*.

This specimen, a new record for the Mediterranean region, was reported by BRIFFA (1998). Its characteristics according to NELSON & SCHEETZ (1982) are here illustrated by SEM microphotography. *Tubifera microsperma* is characterized by its cylindrical sessile pinkish-brown sporocarps united in a pseudoaethalium, the reticulate spores, and the inner surface of the peridium which is densely covered by rimmed craters. *T. ferruginosa* (BATSCH) J. F. GMELIN, is very close to *T. microsperma* but the former species is stipitate and the inner surface of the peridium is smooth.



**Fig. 20: Photograph in situ of *Tubifera microsperma* (MB1194; dia. M. BRIFFA).**

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