

Some myxomycetes from the Baix Empordà region, Catalonia, Spain

JAN BOSSELAERS*

Dochterland, R. novarumlaan 2, B-2340 Beerse, Belgium

During a collecting trip in July–August 2002 and a few additional visits to the Baix Empordà region, province of Gerona, Catalonia, Spain, 26 species of myxomycetes were found. Two species, *Stemonaria fuscoidea* Nann.-Brem. et Y. Yamam. and *Stemonitopsis subcaespitosa* (Peck) Nann.-Brem., have not been recorded in Spain before. The species collected are listed and a number of the more interesting species are illustrated and discussed in more detail.

Key words: myxomycetes, *Stemonaria fuscoidea*, *Stemonitopsis subcaespitosa*, Catalonia, Gerona, Spain.

Introduction

The myxomycetes of the Mediterranean region are very diverse and still incompletely known (LADO 1993, 1994). Although the Iberian peninsula is one of the best studied Mediterranean regions in this respect (ALMEIDA 1987; ILLANA *et al.* 1990; LADO 1991, 1994; LADO and PANDO 1997), further studies of the myxomycetes of Spain continue to hold the promise of interesting discoveries. In the summer of 2002, the author made a collecting trip to the Baix Empordà region in the province of Gerona, Catalonia, Spain, and collected myxomycetes on several locations.

The typical summer climate of the Baix Empordà region is dry and warm, with a monthly average of 250–280 h of sunlight, 9–14 sunny days as compared to 4–6 rainy days and an average temperature of 22–23 °C in July and August (ANONYMOUS 2003). However, in July and August 2002 the local climate was unusually moist, with a regular alteration of rainy and sunny days. Combined with warm temperatures, this created an ideal climate for myxomycete fructification. As a result, a few interesting species were found, two of them new for Spain. The collections, together with a few additional finds, are described below.

* Corresponding address: Fax: +32 14 615896. E-mail: hortipes@dochterland.org

Materials and Methods

Specimens were examined and drawn using a Euromex MIC 465 binocular microscope equipped with an eyepiece grid and a Wild M-12 compound microscope with a drawing tube. Photographs were made with a Nikon Eclipse E600 microscope equipped with a Nikon DXM1200 digital camera. Photographs were treated using the programmes Eclipse Net 1.16.2 for Nikon cameras and Adobe Photoshop 5.0. The colour of specimens was estimated by comparison with colour charts according to the Revised Munsell Colour System (OYAMA and TAKEHARA 1970). Microscope slide preparations were enclosed in a medium composed of 100 g chloral hydrate, 10 g glycerol and 2g polyvinyl alcohol (100% hydrolysed, average MW 14,000, Aldrich 18,933-2) in 25 g distilled water. Cover glasses were sealed with transparent nail varnish. Latitude, longitude and altitude above sea level of collection localities were obtained from the NAVSTAR Global Positioning System, using a Garmin GPS-12 satellite receiver.

The following abbreviations of collections are used in the text:

- AH Herbarium Universidad Alcalá de Henares, Alcalá de Henares, Spain
- BR Herbarium National Botanic Gardens, Meise, Belgium
- CJB Personal collection Jan Bosselaers
- Hooff Personal collection J.P.M. van Hooff
- Lado Personal collection Carlos Lado
- M Herbarium Botanische Staatssammlung, München, Germany
- NB Personal collection N.E. Nannenga-Bremekamp (curated in BR)
- Now Personal collection Wolfgang Nowotny
- PAN Herbarium Panjab University, Chandigarh, Punjab, India
- YY Personal collection Yukinori Yamamoto

Results and Discussion

During a collecting trip in July – August 2002 and a few additional visits to the Baix Empordà region, province of Gerona, Catalonia, Spain, 26 species of myxomycetes were found. Two species, *Stemonaria fuscoides* Nann.-Brem. et Y. Yamam. and *Stemonitopsis subcaespitosa* (Peck) Nann.-Brem., have not previously been recorded for Spain. The species collected are listed and a number of the more interesting species are illustrated and discussed in more detail.

Amaurochaete atra (Alb. & Schwein.) Rostaf., Sluzowce Monogr. 211. 1874.

Material examined: Spain, Catalonia, prov. Gerona: Fitor, elev. 230 m, N 41° 54' 53.8" E 3° 5' 25.3", in hills on fallen pine trunk in mixed wood with cork oak and pine, 6 August 2002, Jan Bosselaers leg., CJB MY-106.

This taxon has been reported from the Province of Gerona before (LADO 1991).

Arcyria incarnata (Pers. ex J. F. Gmelin) Pers., Observ. Mycol. 1: 58. 1796.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 9 August 2002, Jan Bosselaers leg., CJB MY-116; same locality, elev. 36 m, N 41° 52' 6.0" E 3° 9' 39.0", 18 April 2003, Jan Bosselaers leg., CJB MY-202, CJB MY-203;

Romanya De La Selva, elev. 396 m, N 41° 52' 6.6" E 2° 58' 44.3", near hilltop on fallen branch in wood with cork oak and juniper, 3 August 2002, Jan Bosselaers leg., CJB MY-105; Fitor, on fallen branch in mixed wood, 3 December 2002, Hans Henderickx leg., CJB MY-181.

The specimens from CJB MY-105 and CJB MY-203 are somewhat aberrant by the brown colour of their capillitium (Munsell 5YR 5/6 yellowish red to 7.5YR 5/6 strong brown), but clearly belong to *Arcyria incarnata* by their 6–8 µm spores and their sub-globose to cylindrical, barely attached capillitium with tubes 3–5 µm in diameter, decorated with warts and sharp ridges, half rings and rings. *Arcyria incarnata* has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Arcyria obvelata (Oeder) Onsberg, Mycologia 70: 1286. 1979.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 7 August 2002, Jan Bosselaers leg., CJB MY-115.

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Arcyria pomiformis (Leers) Rostaf., Sluzowce Monogr. 271. 1875.

Material examined: Spain, Catalonia, prov. Gerona: La Bisbal d'Empordà, elev. 62 m, N 41° 56' 12.2" E 3° 1' 46.5", on fallen branch in dry river bed, 5 August 2002, Jan Bosselaers leg., CJB MY-109.

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) before.

Badhamia foliicola Lister, J. Bot. 35: 209. 1897.

Material examined: Spain, Catalonia, prov. Gerona: La Bisbal d'Empordà, elev. 102 m, N 41° 54' 38.3" E 3° 1' 48.5", on fruiting body of *Auricularia auricula-judae* (L.) Schroet. on fallen branch in cork oak wood near hilltop, 5 August 2002, Jan Bosselaers leg., CJB MY-108.

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Ceratiomyxa fruticulosa (Müller) T. Macbride, N. Amer. Slime-Moulds 18. 1899

Material examined: Spain, Catalonia, prov. Gerona: Romanya De La Selva, elev. 396 m, N 41° 52' 6.6" E 2° 58' 44.3", near hilltop on fallen decorticated branch in wood with cork oak and juniper, 3 August 2002, Jan Bosselaers leg., CJB MY-103.

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Comatricha laxa Rostaf., Sluzowce Monogr. 201. 1874.

Material examined: Spain, Catalonia, prov. Gerona: La Bisbal d'Empordà, elev. 62 m, N 41° 56' 12.2" E 3° 1' 46.5", on fallen branch in dry river bed, 5 August 2002, Jan Bosselaers leg., CJB MY-110.

Description: Six isolated stalked sporocarps, 0.8–1 mm tall (Fig. 1A). Sporocarp ovoid to globose, brown (Munsell 7.5YR 4/4), 0.4–0.5 mm high and 0.3–0.4 mm wide. Stalk blackish brown and fibrous, widening at the base, 0.4–0.5 mm long. Hypothallus isodiametric, up to 1 mm diameter, shiny, brown near stalk base, colourless and translucent near periphery. Peridium not observed. Columella black and opaque under transmitted light, splitting in 3–5 branches 1/5 below tip of sporocarp (Fig. 1A-B). Lateral branches of capillitium arising along columella. Capillitium forming a loose internal net with 2–3 meshes between columella and periphery. No real surface net present, but capillitium threads interconnected at the surface into wide meshes with many short, pointed free ends (Fig. 1B). Spores in mass brown, lilac-brown in transmitted light, 8–10 µm diameter, finely but prominently warted.

The specimens can be attributed to *Comatricha laxa* based on their small size, globose sporocarps, netted capillitium with many free ends at the periphery and warted spores with a diameter of 8–10 µm (CASTILLO et al. 1997).

Comatricha laxa has been reported from Spain before (ILLANA et al. 1990, LADO 1991), but not yet from the Province of Gerona.

Comatricha nigra (Pers. ex J. F. Gmelin) J. Schröt., Krypt.-Fl. Schlesien 3(1): 118. 1885.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 9 August 2002, Jan Bosselaers leg., CJB MY-119; Palamós, Cap Gros, elev. 80 m, N 41° 51' 5" E 3° 8' 37" near coast on dead pine trunk in *Pinus pinea* wood, 14 April 2003, Jan Bosselaers leg., CJB MY-206.

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Cribraria cancellata (Batsch) Nann.-Brem., Nederl. Myxomyceten 92. 1974.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Cap Gros, elev. 50 m, near coast on dead pine trunk in *Pinus pinea* wood, 16 July 1998, Jan Bosselaers leg., CJB MY-57, part of material in BR and Hooff).

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) before.

Cribraria microcarpa (Schrad.) Pers., Syn. Meth. Fung. 190. 1801.

Material examined: Spain, Catalonia, prov. Gerona: Mont Ras, elev. 65 m, N 41° 54' 22" E 3° 7' 34", on fallen dead branch in small stream in cork oak wood, 17 April 2003, Jan Bosselaers leg., CJB MY-208.

About twenty isolated sporocarps were found on a piece of dead wood, associated with *Trichia varia*. *Cribraria microcarpa* has been reported from Spain before (ILLANA et al. 1990, LADO 1991), but not yet from the Province of Gerona.

Enerthenema papillatum (Pers.) Rostaf., Sluzowce Monogr. Suppl. 28. 1876.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 7 August 2002, Jan Bosselaers leg., CJB MY-138.

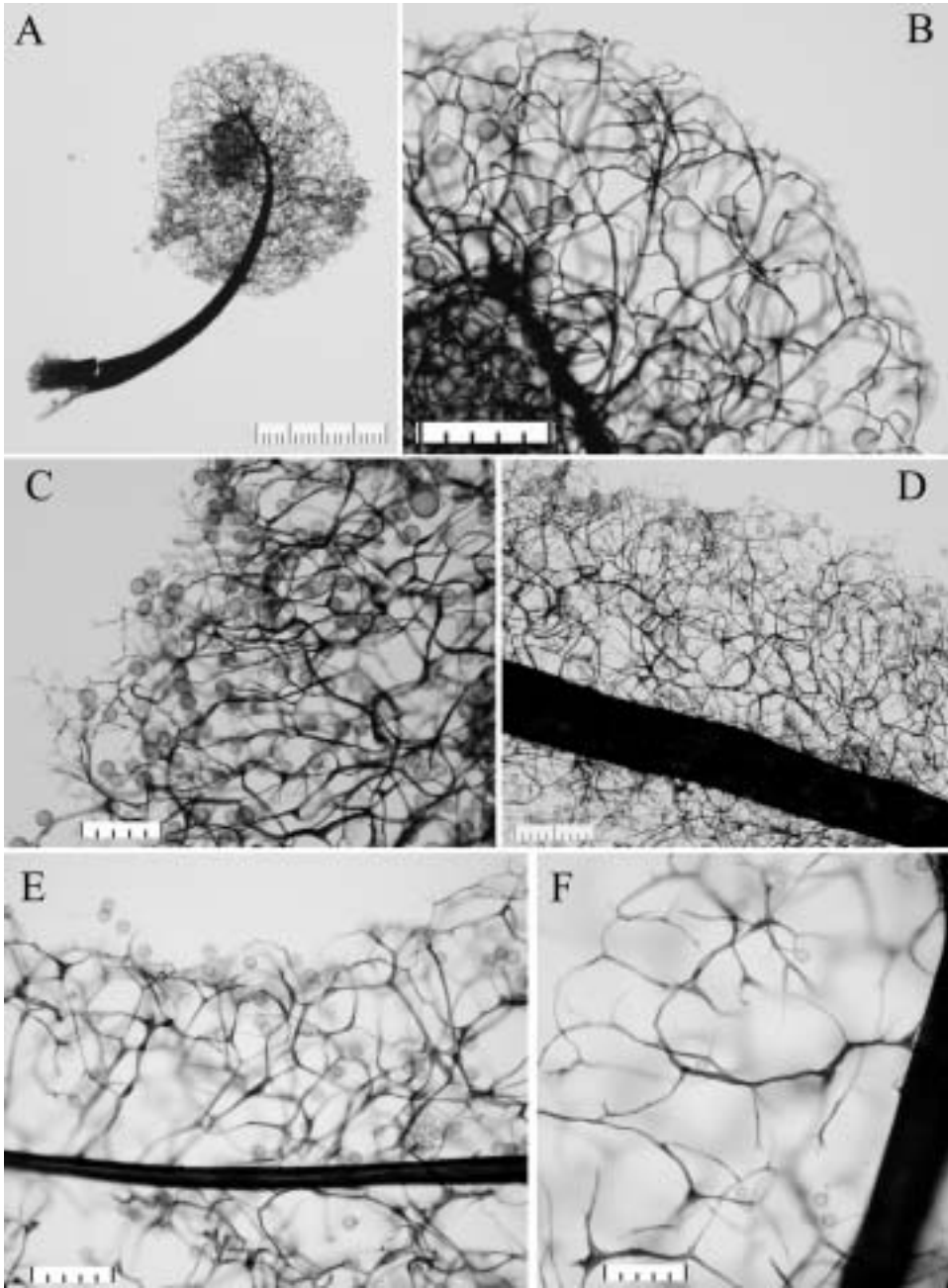


Fig. 1. A-B – *Comatricha laxa* (CJB MY-110). C-F - *Stemonaria fuscooides*. C-D – CJB MY-113. E – YY412 = BR065221-37 (*typus*). F – Now 20 = BR067757-51. A – sporocarp. B – capillitium: details of surface. C – capillitium, details of surface net. D – capillitium, details of internal net. E – capillitium. F – capillitium, details of expansions and bulbous thickenings. Scale bars: one scale division denotes 10 μ m.

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) before.

Enteridium lycoperdon (Bull.) M.L. Farr, Taxon 25: 514. 1976.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Cap Gros, elev. 48 m, N 41° 51' 7.8" E 3° 8' 35.2", near coast on fallen dead pine trunk in *Pinus pinea* wood, 30 July 2002, Jan Bosselaers leg., CJB MY-120; Fitor, elev. 230 m, N 41° 54' 53.8" E 3° 5' 25.3", in hills on pine stump in mixed wood with cork oak and pine, 6 August 2002, Jan Bosselaers leg., CJB MY-140.

Discussion: This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Enteridium splendens (Morgan) T. Macbride, N. Amer. Slime-Moulds 151. 1899 var. *juratum* (Meylan) Härkönen, Kartsenia 19: 5. 1979.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 7 August 2002, Jan Bosselaers leg., CJB MY-125; same data, 9 August 2002, Jan Bosselaers leg., CJB MY-124.

This taxon has been reported from the Province of Gerona (LADO 1991) before.

Fuligo septica (L.) Wigg., Prim. Fl. Holsat. 112. 1780 var. *septica*.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Cap Gros, elev. 48 m, N 41° 51' 7.8" E 3° 8' 35.2", near coast on fallen dead pine trunks in *Pinus pinea* wood, 30 July 2002, Jan Bosselaers leg., CJB MY-89, CJB MY-94.

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Hemitrichia calyculata (Speg.) Farr, Mycologia 66: 887. 1974.

Material examined: Spain, Catalonia, prov. Gerona: Mont Ras, elev. 63 m, N 41° 54' 26.1" E 3° 7' 37.2", on fallen dead tree trunk near small stream in cork oak wood, 2 August 2002, Jan Bosselaers leg., CJB MY-95; same locality, 17 April 2003, Jan Bosselaers leg., CJB MY-210.

The specimens can be attributed to *Hemitrichia calyculata* based on the slender stalk which is clearly differentiated from the rather shallow calyculus covering about half of the sporotheca (FARR 1981, LADO and PANDO 1997). *Hemitrichia calyculata* has been reported from Spain before (ILLANA et al. 1990, LADO 1991), but not yet from the Province of Gerona.

Lycogala epidendrum (L.) Fr., Syst. Mycol. 3: 80. 1829.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Cap Gros, elev. 48 m, N 41° 51' 7.8" E 3° 8' 35.2", near coast on fallen dead pine trunk in *Pinus pinea* wood, 30 July 2002, Jan Bosselaers leg., CJB MY-93; same data, 31 July 2002, Jan Bosselaers leg., CJB MY-83; Romanya De La Selva, elev. 396 m, N 41° 52' 6.6" E 2° 58' 44.3", near hilltop on

fallen branch in wood with cork oak and juniper, 3 August 2002, Jan Bosselaers leg., CJB MY-104.

This taxon has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Physarum cfr. *viride* (Bull.) Pers., Ann. Bot. (Usteri) 15: 6. 1795.

Material examined: Spain, Catalonia, prov. Gerona: Mont Ras, on dead wood, 30 October 2002, Hans Henderickx leg., CJB MY-173, part of material in BR and Lado.

Other material examined: *Physarum flavicomum*, Spain, prov. Cáceres, Arroyo de la Luz, on burned wood of *Quercus suber*, 24 December 1989, Equipo micológico de Alcalá de Henares leg., AH12340, = BR005308-70 = M3106.

Description: Gregarious, stalked, nodding sporocarps, 0.9–1.6 mm tall. Sporocarps globose, 0.3–0.5 mm diameter, all dehisced in this somewhat worn collection, revealing the yellow (Munsell 4Y 8/8) capillitium when spores are blown out. Stalk slender and tapering, grooved and twisted, orange (Munsell 7.5YR 6/8), devoid of lime and transparent in transmitted light. Hypothallus small, discoid, orange. Peridium reduced to a disk at the base of sporocarp in this collection, yellow (Munsell 2.5Y 8/8), sparsely encrusted with lime to limeless and iridescent. Capillitium dense, radiating from base of sporocarp, branching and reticulate, expanded at junctions and with yellow, spindle-shaped or irregular lime nodes. Spores blackish-brown (Munsell 2.5Y 3/1) in mass, violet-brown in transmitted light, ovoid to globose, minutely warted, 8–10 µm diameter.

Although CJB MY-173 resembles *Physarum viride* in some respects, the collection also has several characteristics reminiscent of *Physarum flavicomum* Berk.: limeless, orange stalks, a peridium which is only sparsely incrustated with lime and a reticulate capillitium with expanded junctions. However, after seeing the specimens, Lado (pers. comm.) considers them to represent somewhat anomalous material of *Physarum viride* because tropical collections of *Physarum flavicomum* have longer, thinner and paler stalks and thinner, more reticulate capillitium threads with fewer lime nodes. *Physarum flavicomum* has been cited from Portugal (LADO 1991), but no specimens could be found in support of this claim. A few Spanish collections have been deposited as *Physarum flavicomum*, but Lado considers these identifications erroneous (pers. comm., LADO 1994). When comparing CJB MY-173 with one of the Spanish collections reported as *Physarum flavicomum* (AH12340, »sobre maderá de *Quercus suber* quemada«), a striking similarity can be noted.

Physarum viride has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) before.

Stemonaria fuscoidea Nann.-Brem. et Y. Yamam., Proc. Kon. Ned. Akad. Wet. 87: 460. 1984.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 7 August 2002, Jan Bosselaers leg., CJB MY-113. Austria, 16 September 1978, Wolfgang Nowotny leg., Now20 = NB14891, = BR067757-51. Japan, Kochi prefecture, Motoyamacho, Reihoku High School premises, 21 June 1979, Yukinori Yamamoto leg., YY412, = NB13004, = BR065221-37 (holotypus).

Description: Sporocarps densely tufted, on a common hypothallus, 1–2 mm tall, with short stalks (Fig. 2C). Sporocarp dull brown (Munsell 7.5YR 5/3), cylindrical, rounded at base and apex, 0.9–1.7 mm long and 0.4–0.5 mm wide. Stalk broad and stout, dark red-brown in transmitted light, hollow, 0.1–0.3 mm long. Hypothallus continuous, membranaceous, shiny. Peridium not observed. Columella broad (Figs. 1D, 2A-B), dark red-brown in transmitted light, hollow, with a blunt end, reaching tip of sporocarp. Capillitium yellow-brown in transmitted light, forming an internal net with 3–4 meshes between columella and periphery (Figs. 1D, 2A-B), with wide translucent expansions at junctions and with dark bulbous thickenings along branches (Figs. 1C, 2A). Capillitium finely

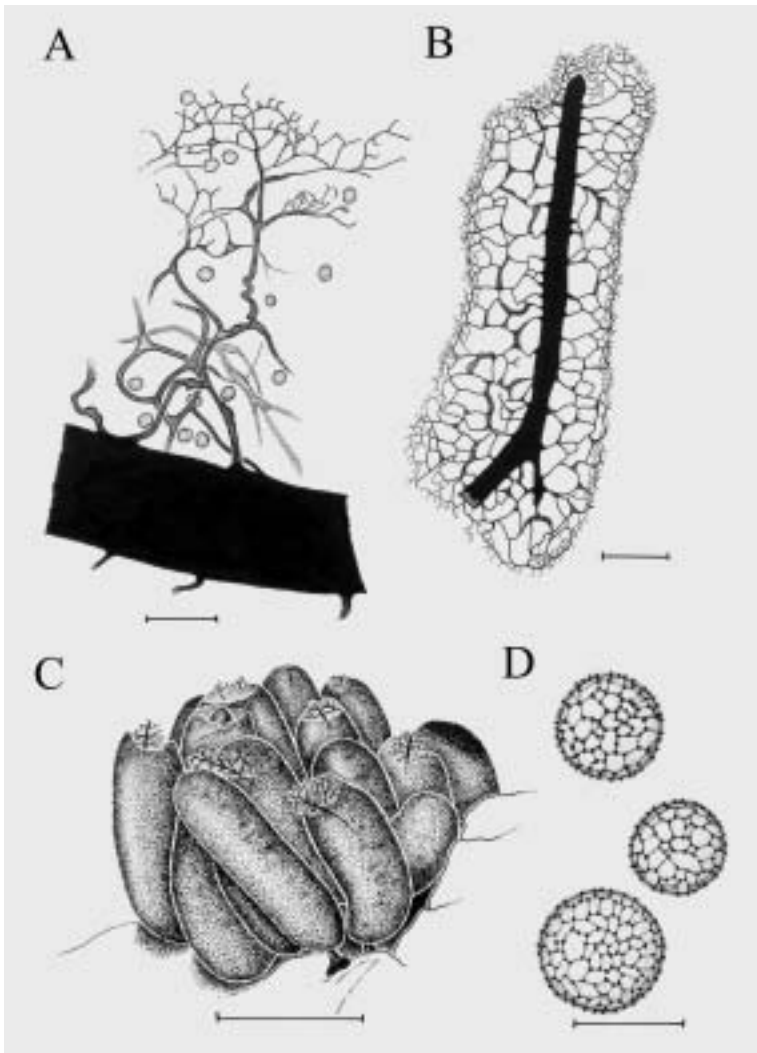


Fig. 2. *Stemonaria fuscooides* (CJB MY-113). A – detail of capillitium. B – sporocarp with spores blown out. C – habitus. D – spores. Scale bars: A – 50 μ m; B – 200 μ m; C – 1 mm; D – 10 μ m.

branched and anastomosed towards periphery, but not forming a surface net. Many outward pointing spines with a length of 3–10 µm near the surface (Figs. 1C, 2A). Spores globose, pale yellow-brown in transmitted light, 8–10 µm diameter, with fine reticulation of irregularly sized meshes, consisting of rows of thin spinules. Meshes number 6–9 across the diameter of spores (Fig. 2D).

The specimens can be attributed to *Stemonaria fuscoidea* based on the small, erect sporocarps with short, hollow stalks, the membranous and bulbous expansions of the capillitium, the absence of a capillitium surface net and the globose, reticulated spores with a diameter of 8–10 µm (NANNENGA-BREMEKAMP et al. 1984). A few of the smaller sporocarps in CJB MY-113 seem not to have matured normally and have compacted, blackened tips (Fig. 2C, extreme right). The specimens differ from the type (YY412, Fig. 1E) by their smaller size, very short stalks and broad columella. However, they are very similar to collection Now20 from Austria (Fig. 1F), which was identified as *Stemonaria fuscoidea* by Nannenga-Bremekamp (NEUBERT et al. 2000).

This is the first report of *Stemonaria fuscoidea* from Spain. The species has been reported from Japan (NANNENGA-BREMEKAMP et al. 1984), from Austria and from Germany (NEUBERT et al. 2000).

Stemonitis axifera (Bull.) T. Macbr., N. Amer. Slime-Moulds 120. 1899.

Material examined: Spain, Catalonia, prov. Gerona: Romanya De La Selva, elev. 396 m, N 41° 52' 6.6" E 2° 58' 44.3", near hilltop on fallen branch in wood with cork oak and juniper, 3 August 2002, Jan Bosselaers leg., CJB MY-102.

Stemonitis axifera has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Stemonitis flavogenita (Bull.) E. Jahn, Verh. Bot. Vereins Prov. Brandenburg 45: 165. 1903.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 9 August 2002, Jan Bosselaers leg., CJB MY-117 (= Hooff 6523).

Stemonitis flavogenita has been reported from Spain before (ILLANA et al. 1990, LADO 1991), but not yet from the Province of Gerona.

Stemonitis fusca Roth, Bot. Mag. (Römer and Usteri) 1(2): 26. 1788.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Cap Gros, elev. 60 m, near coast on dead pine trunk in *Pinus pinea* wood, 21 July 2001, Jan Bosselaers leg., CJB MY-159; same data, elev. 48 m, N 41° 51' 7.8" E 3° 8' 35.2", near coast on fallen dead pine trunk, 30 July 2002, Jan Bosselaers leg., CJB MY-88, CJB MY-91, CJB MY-92; same data, near coast on dead pine stump in *Pinus pinea* wood, 31 July 2002, Jan Bosselaers leg., CJB MY-86; same locality, elev. 80 m, N 41° 51' 5" E 3° 8' 37", on dead branch among grass in *Pinus pinea* wood near coast, 14 April 2003, Jan Bosselaers leg., CJB MY-207; Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branches in mixed wood with cork oak and pine, 9 August 2002, Jan Bosselaers leg., CJB MY-136 (= Hooff 6524); same locality, on fallen branch, 18 April 2003, Jan Bosselaers leg., CJB MY-201; Mont Ras, elev. 63 m, N 41° 54' 26.1" E 3° 7' 37.2", on fallen dead tree trunk near small stream in cork oak wood, 2 August 2002, Jan Bosselaers leg., CJB MY-100, CJB MY-101.

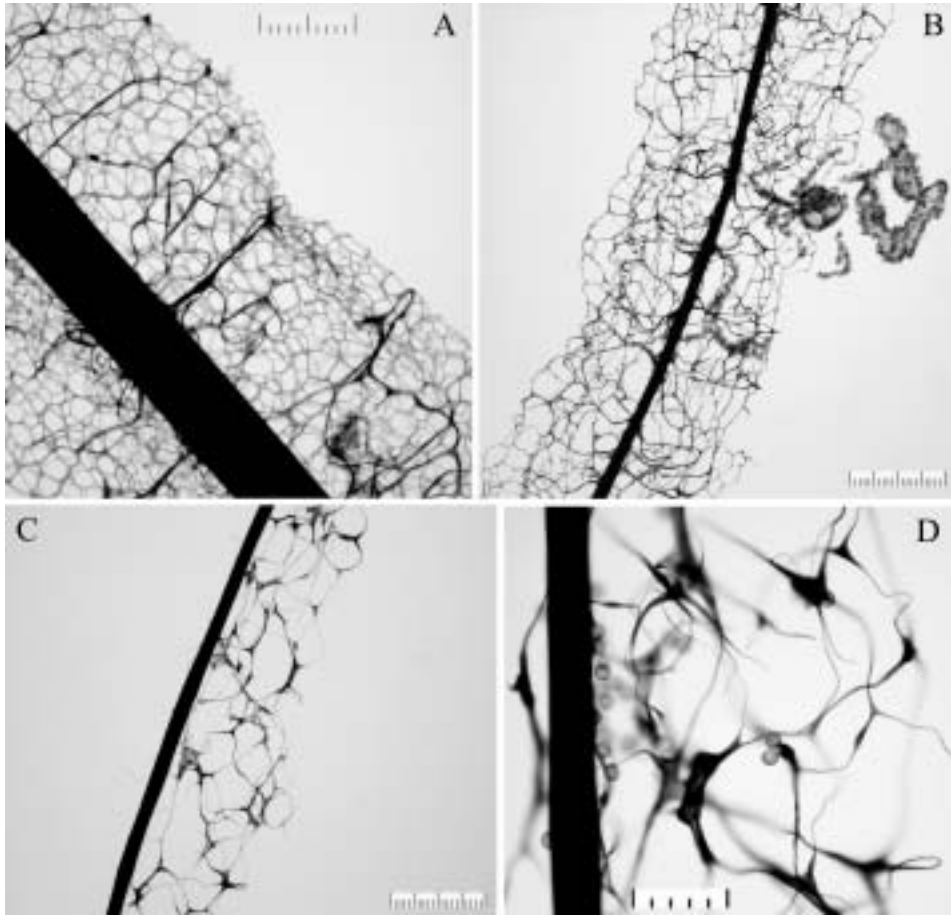


Fig. 3. A-B: *Stemonitis splendens*. C-D – *Stemonitis rhizoideipes*, PAN15524 = BR067231-10 (*typus*). A – CJB MY-96, capillitium. B – CJB MY-139, capillitium with attached flakes. C – capillitium. D – capillitium, detail of expansions and bulbous thickenings. Scale bars: one scale division denotes 10 μ m.

Stemonitis fusca has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Stemonitis splendens Rostaf., Sluzowce Monogr. 195. 1874.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Cap Gros, elev. 50 m, near coast on dead pine log in *Pinus pinea* wood, 16 July 1998, Jan Bosselaers leg., CJB MY-176 (= Hooff 3764, part of material in BR and YY); same data, elev. 60 m, near coast on dead pine log in *Pinus pinea* wood, 21 July 2001, Jan Bosselaers leg., CJB MY-160; same data, elev. 48 m, N 41° 51' 7.8" E 3° 8' 35.2", near coast on dead pine stump in *Pinus pinea* wood, 30 July 2002, Jan Bosselaers leg., CJB My-80, CJB MY-84 (partly in BR), CJB MY-87 (partly in BR), CJB MY-90 (partly in BR, Lado and Hooff 6522); same data, near coast, 31 July 2002, on leaves and moss near dead pine stump, Jan Bosselaers leg.,

CJB MY-81, on pine needles near dead pine stump, CJB MY-82 (partly in BR), on grass near dead pine stump, Jan Bosselaers leg., CJB MY-85; Mont Ras, elev. 63 m, N 41° 54' 26.1" E 3° 7' 37.2", on fallen dead tree trunk near small stream in cork oak wood, 2 August 2002, Jan Bosselaers leg., CJB MY-96 (partly in BR and Lado), CJB MY-98; Fitor, elev. 230 m, N 41° 54' 53.8" E 3° 5' 25.3", in hills on pine stump and pine needles in mixed wood with cork oak and pine, 6 August 2002, Jan Bosselaers leg., CJB MY-139.

Other material examined: *Stemonitis rhizoideipes*, Bhutan, Dochula, on tree stump, 25 September 1980, Rajesh Sharma leg., PAN15534 = NB13467 = BR067231-10 (holotypus).

The specimens collected demonstrate the striking variability of *Stemonitis splendens*. While the Mont Ras material is typical *splendens* (»var. *splendens*«) characterised by a capillitium with major branches at right angles to the columella, no internal net and a surface net with small (15–30 µm) meshes composed of thick, smooth threads (Fig. 3A), the Palamós and Fitor material have an internal capillitium net with sometimes large membranous expansions at the junctions, as well as a surface net composed of irregular, larger meshes (40–100 µm) with thin threads and short free ends (»var. *webberi* (Rex) Lister«, Fig. 3B). Some sporocarps within certain collections (CJB MY-90, CJB MY-139) also have peridial flakes attached (Fig. 3B), reminding of *Symphytocarpus flaccidus* (Lister) Ing et Nann.-Brem. or *Stemonitis rhizoideipes* Nann.-Brem., Sharma et Thind (NANNENGA-BREMEKAMP et al. 1984). However, the specimens differ from *Symphytocarpus flaccidus* by their long (up to 8 mm) stalks, their blackish brown colour and the presence of a capillitium surface net. On the other hand, the type specimens of *Stemonitis rhizoideipes* (PAN15534) clearly differ from CJB MY-90 and CJB MY-139 by the bent sporocarps, the almost complete absence of connections between the columella and the surface net and the very large, regularly spaced, star-shaped, partly bulbous expansions at the junctions of the surface net (Fig. 3C-D). Moreover, all the material collected in the Baix Empordà region falls well within the range of variation of the numerous collections in BR identified as *Stemonitis splendens* by Nannenga-Bremekamp.

Stemonitis splendens has been reported from Spain before (ILLANA et al. 1990, LADO 1991), but not yet from the Province of Gerona.

Stemonitopsis hyperopta (Meyl.) Nann.-Brem., Nederl. Myxomyceten 206. 1974.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 7 August 2002, Jan Bosselaers leg., CJB MY-114; Fitor, elev. 230 m, N 41° 54' 53.8" E 3° 5' 25.3", in hills on fallen pine trunk in mixed wood with cork oak and pine, 6 August 2002, Jan Bosselaers leg., CJB MY-107 (= Hooff 6527).

Stemonitopsis hyperopta has been reported from Spain before (ILLANA et al. 1990, LADO 1991), but not yet from the Province of Gerona.

Stemonitopsis subcaespitosa (Peck) Nann.-Brem., Nederl. Myxomyceten 211. 1974.

Material examined: Spain, Catalonia, prov. Gerona: Palamós, Puig Boter, elev. 40 m, N 41° 52' 6.7" E 3° 9' 40.0", near coast on fallen branch in mixed wood with cork oak and pine, 9 August 2002, Jan Bosselaers leg., CJB MY-118, part of material in BR and Lado.

Description: Sporocarps in loose clusters, 1.5–2.3 mm tall, on a common hypothallus (Fig. 4D). Sporocarp dark brown (Munsell 7.5YR 4/4), cylindrical, rounded at base and

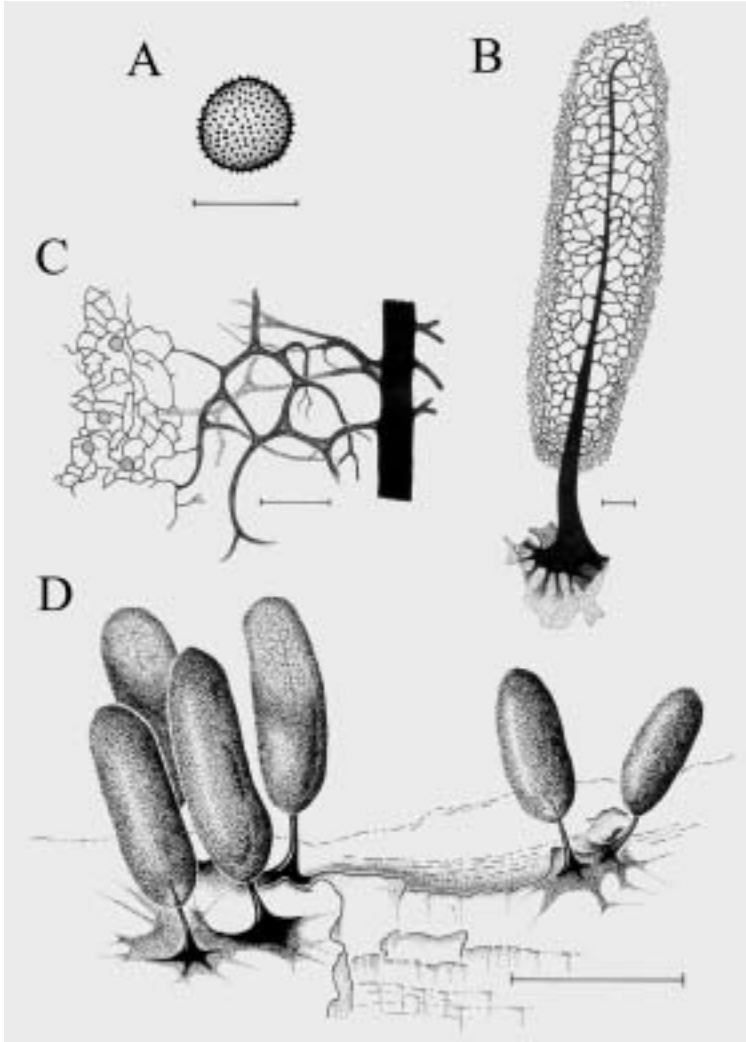


Fig. 4. *Stemonitopsis subcaespitosa* (CJB MY-118). A – spore. B – sporocarp with spores blown out. C – capillitium, detail of internal net and surface net. D – habitus. Scale bars: A – 10 μ m; B – 100 μ m; C – 50 μ m; D – 1 mm.

apex, 0.8–1.7 mm long and 0.3–0.5 mm wide. Stalk black, fibrous, widening at base, opaque in transmitted light. Hypothallus membranaceous and silvery, with reddish-brown reticulations darkening to black around bases of stipes. Peridium not observed. Capillitium with 2–3 μ m wide, sinuous internal branches having membranous expansions at junctions, forming an internal net with 3–4 meshes between columella and periphery (Figs. 4B-C, 5A-B). Capillitium surface net almost complete, meshes 10–20 (40) μ m diameter, with thin (1 μ m) wavy threads and some short (1–3 μ m) thorns (Figs. 4C, 5C). Spores dark brown in mass, pale lilac-brown in transmitted light, sometimes with lighter zone at pore, 8–9 μ m diameter, finely warted (Figs. 4A).

The specimens can be attributed to *Stemonitopsis subcaespitosa* based on their small size, their almost complete capillitium surface net composed of thin wavy threads with some thorns and their large, evenly warted spores.

This is the first report of *Stemonitopsis subcaespitosa* from Spain.

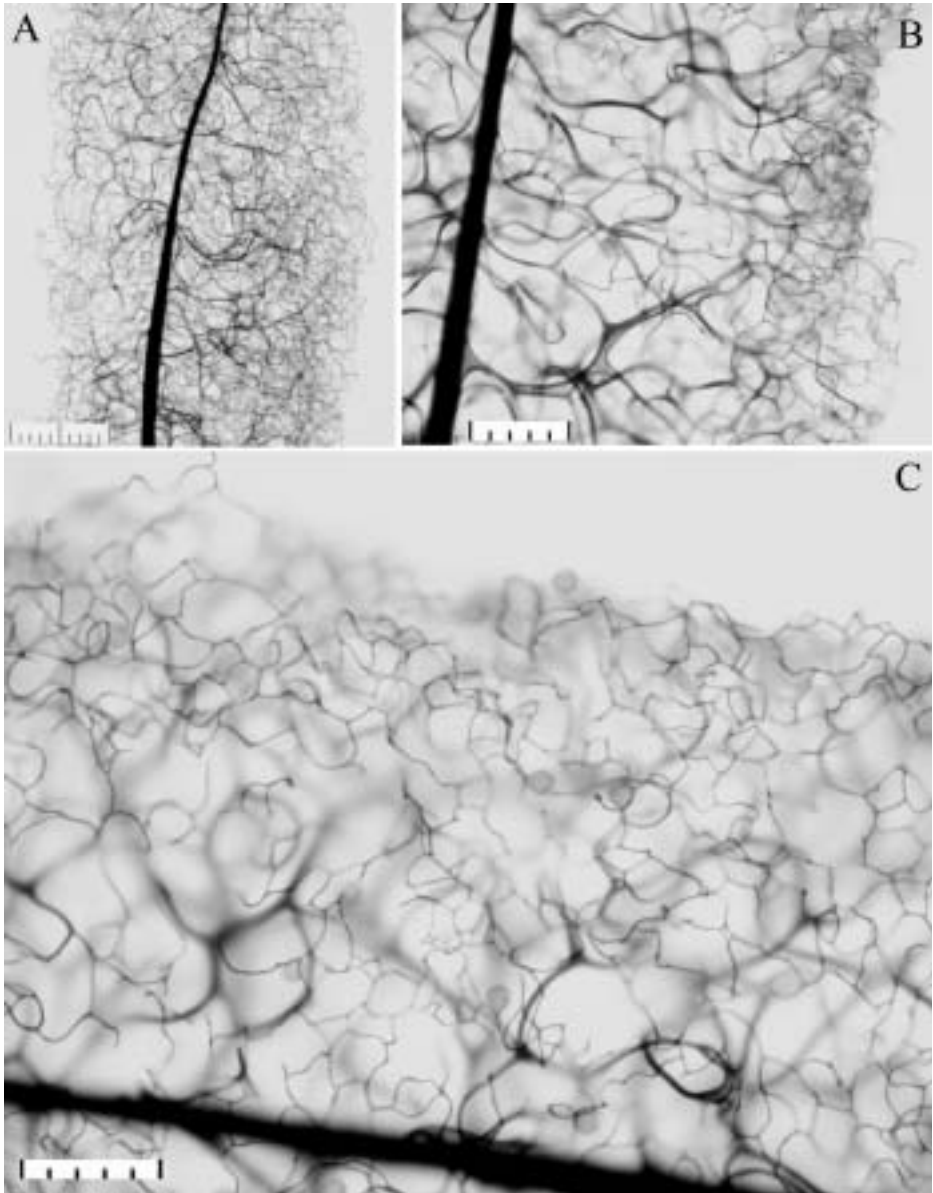


Fig. 5. *Stemonitopsis subcaespitosa* (CJB MY-118). A – capillitium. B – capillitium, detail of internal net with membranous expansions. C – capillitium, detail of surface net. Scale bars: one scale division = 10 μ m.

Trichia scabra Rostaf., Sluzowce Monogr. 258. 1875.

Material examined: Spain, Catalonia, prov. Gerona: Mont Ras, elev. 63 m, N 41° 54' 26.1" E 3° 7' 37.2", on fallen dead tree trunk near small stream in cork oak wood, 2 August 2002, Jan Bosselaers leg., CJB MY-97, CJB MY-99; same locality, 17 April 2003, Jan Bosselaers leg., CJB MY-211.

CJB MY-99, fructificating in a crack of the tree bark, is somewhat anomalous in having the sporocarps sandwiched between two layers of hypothallus.

Trichia scabra has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) before.

Trichia varia (Pers. ex J.F.Gmel.) Pers., Neues Mag. Bot. 1: 90. 1794.

Material examined: Spain, Catalonia, prov. Gerona: Mont Ras, elev. 65 m, N 41° 54' 22" E 3° 7' 34", on fallen dead branch in small stream in cork oak wood, 17 April 2003, Jan Bosselaers leg., CJB MY-209.

Trichia varia has been reported from the Province of Gerona (ILLANA et al. 1990, LADO 1991) and from the Baix Empordà region (VIDAL-FRIGOLA and GRÀCIA 1990) before.

Acknowledgements

The author is much indebted to Johannes van Hooff, Myriam De Haan and Dr. Carlos Lado for interesting comments on some of the specimens and to an anonymous referee for valuable comments that helped improve the manuscript. Thanks are also due to Ann Bogaerts and Dr. André De Kesel for permission to study the myxomycete collection in BR and for their much appreciated practical assistance. The author is also grateful to Prof. Mieke Verbeken, University of Gent, Department Biology, Mycology, for permission to use the Nikon Eclipse E600 microscope and digital camera and for stimulating discussions and practical help. Hans Henderickx is gratefully acknowledged for the collection of *Physarum* cfr. *viride* in Mont Ras, Catalonia.

References

- ALMEIDA, M. G., 1987: Sinopse dos Myxomycetes de Portugal. Micologia, Departamento de Biologia Vegetal, Faculdade de Ciências de Lisboa. Lisboa.
- ANONYMOUS, 2003: Instituto nacional de meteorología. <http://www.inm.es/>
- CASTILLO, A., MORENO, G., ILLANA, C., LAGO, J., 1997: A critical study of some Stemoniatales. Mycol. Res. 101, 1329–1340.
- FARR, M. L., 1981: How to know the true slime molds. WCB/McGraw-Hill, Boston.
- ILLANA, C., HEYKOOP, M., MORENO, G., 1990: Contribution to the study of the myxomycetes in Spain. III. Catalogue of myxomycetes in Spain. Mycotaxon 38, 37–69.
- LADO, C., 1991: Catalogo comentado y síntesis corológica de los myxomycetes de la Península Ibérica e Islas Baleares (1788–1990). Ruizia 9, 1–142.
- LADO, C., 1993: Myxomycetes of Mediterranean woodlands. In: PEGLER D. N., BODDY, L., ING, B., KIRK, P. M. (eds.), Fungi of Europe: investigation, recording and mapping, 93–114. Royal Botanic Garden, Kew, London.

- LADO, C., 1994: A checklist of myxomycetes of the mediterranean countries. *Mycotaxon* 52, 117–185.
- LADO, C., PANDO, F., 1997: Flora Mycologica Iberica. Vol. 2. Myxomycetes, I. Ceratiomyxales, Liceales, Trichiales. J. Cramer, Madrid.
- NANNENGA-BREMEKAMP, N. E., YAMAMOTO, Y., SHARMA, R., 1984: *Stemonaria*, a new genus in the Stemonitaceae and two new species of *Stemonitis* (Myxomycetes). *Proc. Kon. Ned. Akad. Wet. Ser. C* 87, 449–469.
- NEUBERT, H., NOWOTNY, W., BAUMANN, K., MARX, H., 2000: Die myxomyceten Deutschlands und des angrenzenden Alpenraumes unter besonderer Berücksichtigung Österreichs. Karlheinz Baumann Verlag, Gomaringen.
- OYAMA, M., TAKEHARA, H., 1970: Revised standard soil color charts. Japan Research Council for Agriculture, Forestries and Fisheries, Tokyo.
- VIDAL-FRIGOLA, J. M., GRÀCIA, E., 1990: Aportació al coneixement de la micoflora del baix empordà i Rodalies (Catalonia). II. Myxomycetes. I. *Butll. Soc. Catalana Micol.* 13, 43–59.