



A new species and two new records of Stemonitidaceae from China

ZHANG BO & LI YU*

Engineering Research Center of Chinese Ministry of Education for Edible and Medicinal Fungi, Jilin Agricultural University, 2888 Xincheng Street, Changchun City, China
email: yuli966@126.com

Abstract

A new species of Stemonitidaceae, *Comatricha clavicolumella*, collected in Jigong Mountain Scenic Area, Henan Province, China, is described. *C. clavicolumella* has a columella that usually ends in a clavate expansion at the apex of the sporocysts, and has smaller spores than usual for the genus (about 5–5.5 µm in diam.). Two newly recorded species from China, *C. ellae* and *C. reticulospora*, are also described. We present a scanning electron micrograph study of the species.

Key words: *Comatricha*, myxomycetes, SEM, Stemonitidaceae, taxonomy

Introduction

The Stemonitidaceae are a common but important and beautiful family of Myxomycetes. Since Elias Magnus Fries established the family in 1829, 17 genera and 216 species have been reported, of which 11 genera and 41 species have been reported in China (Kirk *et al.* 2008). *Comatricha* is a large genus of the Stemonitidaceae that was described by Preuss (1851). About 42 species of the genus *Comatricha* have been reported (Kirk *et al.* 2008, Lado 2001, 2005–15), three of them, *C. laxa* Rostaf., *C. nigra* (Pers. ex J.F. Gmel.) J. Schröt. and *C. pulchella* (C. Bab.) Rostaf., are known in China (Li & Li 1989, Li 2007).

A new species of *Comatricha* was collected from Jigong Mountain Scenic Area, Henan Province, China, in July 2015. This species has smaller spores than other species (about 5–5.5 µm in diam.) and has a clavate columella at the apex of the sporotheca. Two newly recorded species, *Comatricha ellae* Härk. and *C. reticulospora* Ing & P.C. Holland, are also described and illustrated in this paper.

Materials and methods

During our investigation on Myxomycetes in China, a new species of *Comatricha* was found on bark of a dead log in Jigong Mountain Scenic Area, Hebei Province, and two new records of *Comatricha* were found in Sichuan Province, Liaoning Province and Zhejiang Province. The fruiting bodies and microscopic structures were examined by light and scanning electron microscopy (Martin & Alexopoulos 1969, Zhang & Li 2012). Permanent slides were mounted in Hoyer's medium (Martin & Alexopoulos 1969), having been prepared according to Robbrecht (1974) by first dispersing capillitia in a drop of 94% alcohol and determining the colour after one minute. The colour terms are those used in the *Flora of British fungi: colour identification chart* (Anonymous 1969). Observations and measurements of the morphological characteristics were done using a stereomicroscope (20×) and an optical microscope (100×). Approximately ten sporocarps of each collection were measured, and about 20 spores and ornamentation measurements were made using an oil immersion objective. Sporocarps, capillitia and spores were measured using a Nikon dissecting microscope and Zeiss compound microscope, and photographs were taken with a Leica DM2000 microscope. For scanning electron microscopy (SEM) sporophores were attached to a holder, coated with gold using a Hitachi E-1010 sputter and examined with a Hitachi S-4800 scanning electron microscope at 10 kV at the Changchun Institute of Applied Chemistry, Chinese Academy of Sciences. Specimens are deposited in the Herbarium of the Mycological Institute of Jilin Agricultural University (HMJAU).

Results

Taxonomy

Comatricha clavicolumella B. Zhang & Yu Li, *sp. nov.*

Mycobank: MB 815624, Fig 1, 2

Sporocarps in tufts, stalked, 2–2.2 mm total height, purple-brown. *Sporocysts* 1.3–1.5 mm long, elongate to cylindrical. *Stalk* 0.7–0.8 mm long, up to 1/3 of the total height, black, shiny. *Peridium* evanescent. *Columella* reaching the apex of the sporocysts, usually ending in a clavate expansion at the apex of the sporocysts. *Capillitium* arising from the entire length of the columella, abundant, dark brown, the threads branched, flexuous, looped at the surface, without free ends. *Spores* 5–5.5 µm in diam., globose, banded-reticulate with 5–7 meshes across the hemisphere, dark brown.

Holotype:—CHINA. Henan Province: Jigong Mountain Scenic Area, on bark of a dead log, 11 July 2015, Zhang Bo 2015122305 (HMJAU10522).

Etymology:—Clavicolumella (Latin), referring to columella ending in a clavate expansion at the apex of the sporocysts.

Distribution:—Known only from the type locality, Jigong Mountain Scenic Area.

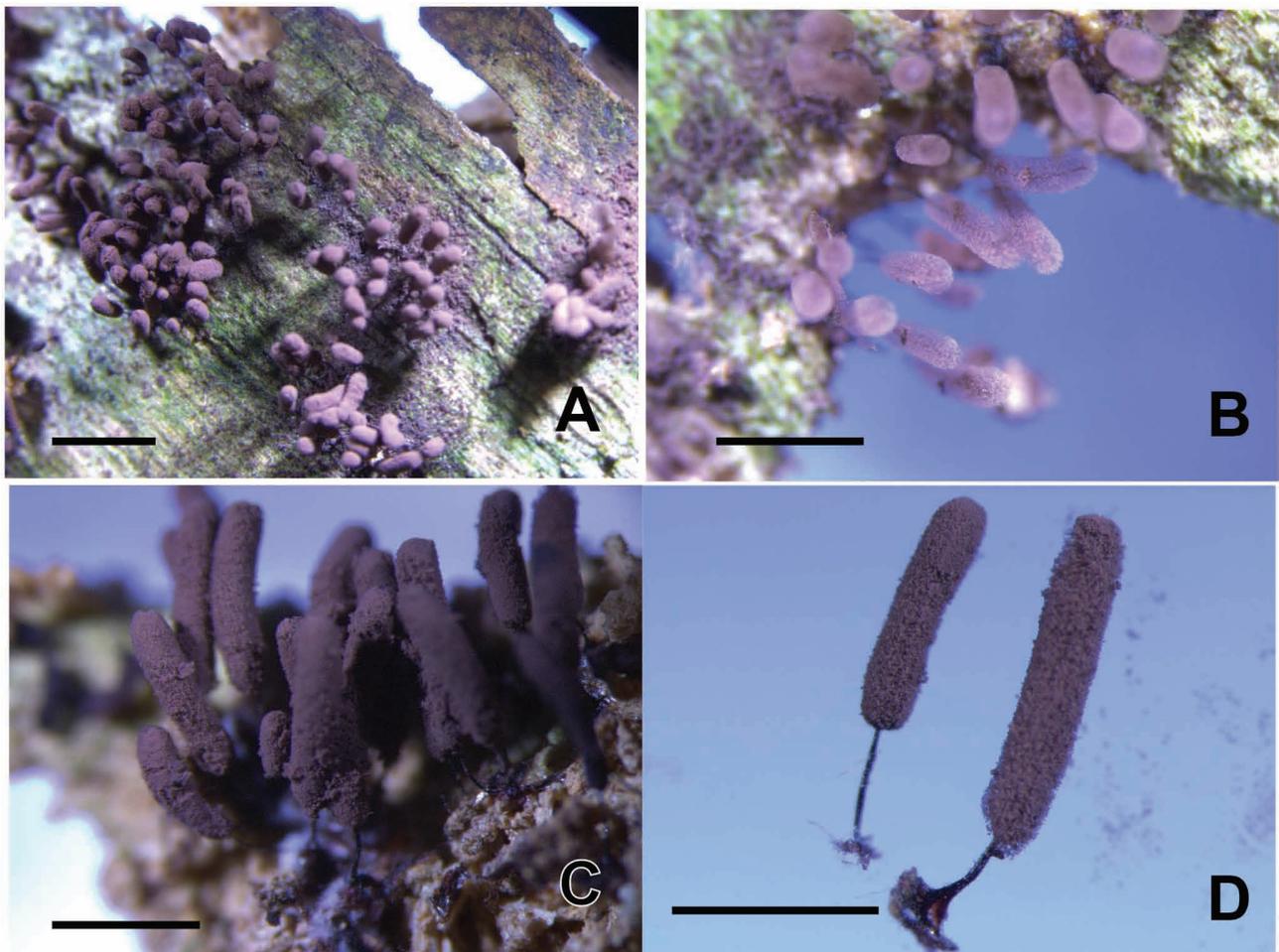


FIGURE 1. Fruiting bodies of *Comatricha clavicolumella* (holotype). Bars: A = 2 mm, B = 1.5 mm, C, D = 1 mm.

Comments:—About 42 species of *Comatricha* have been reported in the world (Kirk *et al.* 2008, Lado 2001, 2005–15), of which nine species have reticulated spores and 33 species have spines or verruculose spores. Of the accepted species, only *C. anomala* Rammeloo, *C. mirabilis* R.K. Benj. & Poitras and *C. reticulospora* Ing & P.C. Holland are similar to *C. clavicolumella* in having cylindrical or short cylindrical to ovoid sporocysts and reticulated spores. However, *C. anomala* has larger sporocarps (1.5–3.3 mm tall) and larger verruculose spores (9–10 µm in diam.), with 2–5 small areas of incompletely reticulated spores (Rammeloo 1976). *Comatricha mirabilis* has smaller sporocarps

(0.5–1.5 mm tall), a fugacious peridium persisting at the base as a small collar, and larger spores approximately 10–13 μm in diameter (Benjamin & Poitras 1950). *Comatricha reticulospora* has larger, delicately reticulate spores (c. 8–10 μm in diam.) with about six meshes across the diameter (Ing & Holland 1968).

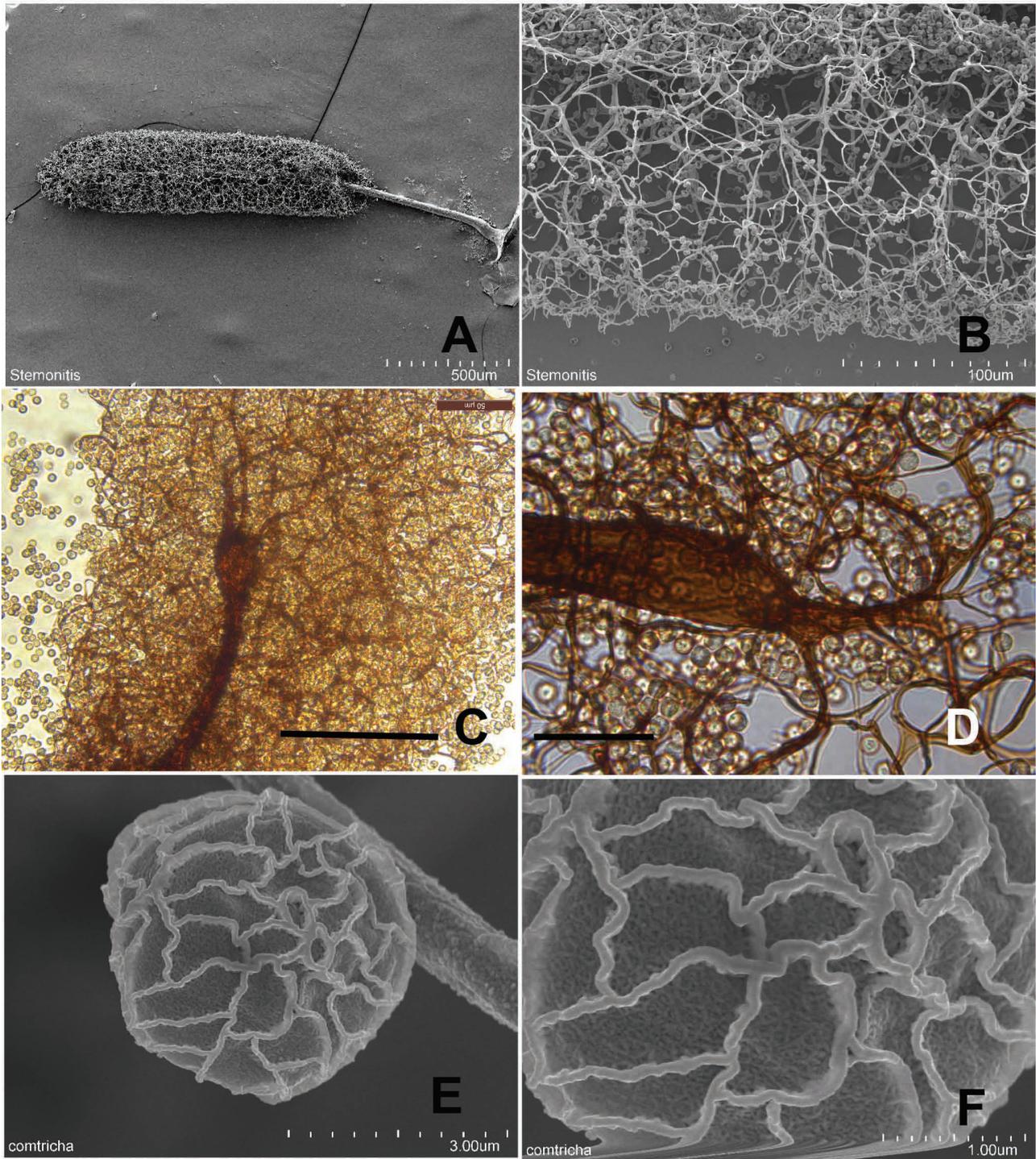


FIGURE 2. *Comatricha clavicumella* (holotype): A. Sporocarp. B. Part of columella and capillitia. C, D. Clavate expansion at the apex of columella and part of capillitia by transmitted light. E, F. Spore marked with banded-reticulate with 7 meshes across the hemisphere. Bars: C = 50 μm , D = 10 μm .

Comatricha ellae Härk., *Karstenia* 18(1): 23 (1978) Fig 3

Sporocarps scattered, stalked, 0.7–0.9 mm total height, blackish brown. *Stalk* black, shiny, 0.3–0.4 mm long. *Sporocysts* globose, 0.3–0.4 mm diam., dark brown. *Columella* reaching the centre of the sporocysts. *Capillitium* dark, flexuous,

arising from all parts of the columella, branched and anastomosed to form a surface net. *Spores* violaceous-brown, faintly warted, 9–11 μm in diameter.

Specimens examined:—CHINA. Sichuan Province: Hongyuan grassland, on bark of a dead log, 22 July 2013, Zhang Bo 2016010901 (HMJAU10523). CHINA, Liaoning Province: Laotudingzi National Nature Reserve, on bark of a dead log, 13 September 2009, Li Ming 2015111805 (HMJAU10524).

Comments:—*Comatricha ellae* has been recorded in Europe (Härkönen 1978), including Madrid, Spain (Pando & Lado 1987), as well as Mexico (Moreno *et al.* 2001) and Tanzania (Ukkola 1998). The Sichuan and Liaoning specimens have larger spores (9–11 μm in diam.) than specimens from elsewhere (7–10 μm in diam.). The Sichuan, Liaoning and type specimen all have a similar habitat of dead logs and display faintly warted spores.

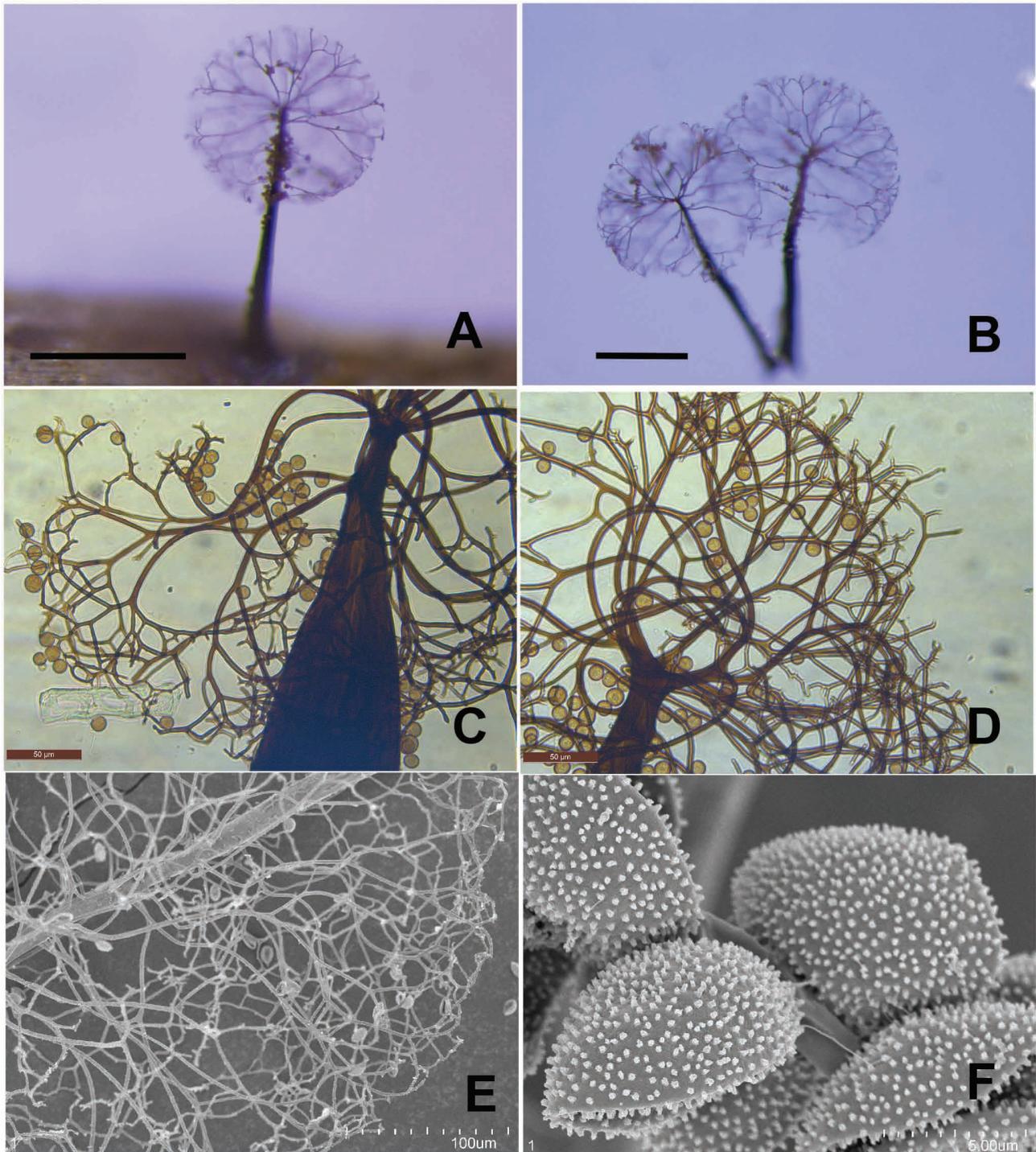


FIGURE 3. *Comatricha ellae*: A, B. Sporocarps. C, D. Part of columella and capillitia by transmitted light. E. Part of capillitia and some spores. F. Spores under SEM with faint warts. Bars: A, B = 1 mm.

Comatricha reticulospora Ing & P.C. Holland, *Trans. Brit. Mycol. Soc.* 50(4): 685 (1967) Fig 3

Sporocarps clustered, 1.5–2 mm total height, dark brown. *Sporocysts* cylindrical. *Peridium* evanescent. *Stalk* short, black, shiny, 0.1–0.2 mm long. *Columella* reaching apex of the sporocysts, thick. *Capillitium* rising from all the columella, branched and anastomosed, with numerous longer, straight and pointed free ends. *Spores* brown to blackish brown, 9–10 µm in diam., globose, marked with ridges and spinules forming an incomplete reticulate.

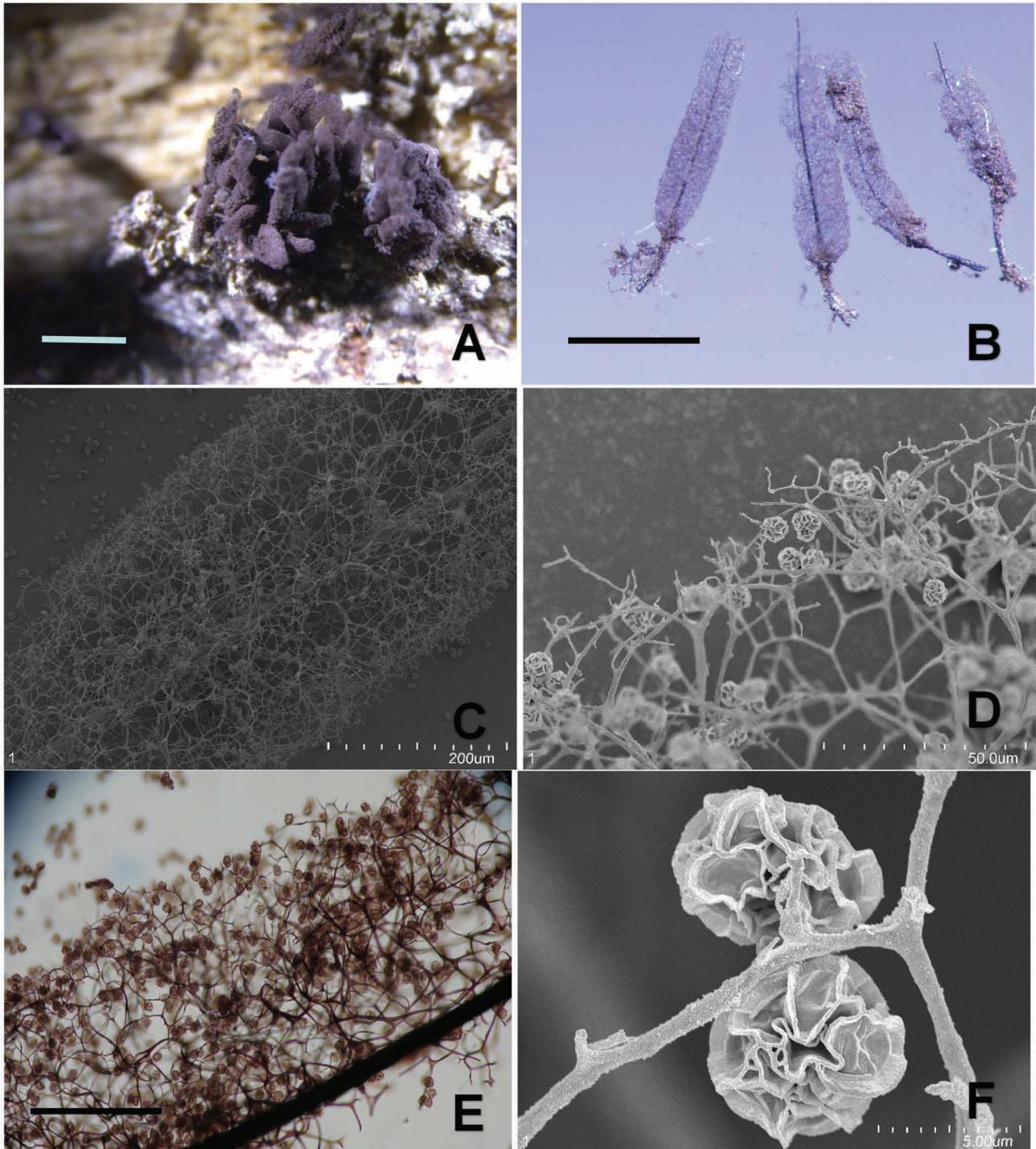


FIGURE 4. *Comatricha reticulospora*: A, B. Sporocarps. C, D. Part of columella and capillitia. E. Part of capillitia and some spores by transmitted light. F. Two spores marked with ridges and spinules forming an incomplete reticulate (SEM). Bars: A, B = 1 mm.

Specimens examined:—CHINA. Sichuan Province: Sangdui County, on bark of a dead log, 26 July 2013, Zhang Bo 2015110902 (HMJAU10524). CHINA. Zhejiang Province: Qingyuan County, Zhang Bo 2015111308 (HMJAU10525).

Comments:—*Comatricha reticulospora*, which has been recorded in UK (Ing 1968), is apparently rare in Asia. The Sichuan specimen has slightly larger spores (9–10 µm in diam.) than the type specimen (6–10 µm in diam.). However, the Sichuan and the type specimen were found in similar habitats (dead logs), and have a dark brown spore mass, faintly thick capillitium and pale brown sporocarps.

Acknowledgements

The authors are grateful to Dr Hai-Xia Ma (Institute of Tropical Bioscience and Biotechnology, Chinese Academy of Tropical Agricultural Sciences), Dr Xiao-Lan He (Soil and Fertilizer Institute, Sichuan Academy of Agricultural Sciences) and Tian-Hao Li (Jilin Agricultural University) for their help in the field collections. This research received financial support from the National Natural Science Foundation of China (No. 3140010180) and the National Science and Technology Foundation Project (2014FY210400).

References

- Anonymous (1969) *Flora of British fungi: colour identification chart*. Edinburgh, Royal Botanic Garden, 6 pp.
- Benjamin, R.K. & Poitras, A.W. (1950) An addition to the myxomycete genus *Comatricha*. *Mycologia* 42: 514–518.
<http://dx.doi.org/10.2307/3755567>
- Härkönen, M. (1978) *Comatricha ellae*, nomen novum (Myxomycetes). *Karstenia* 18: 23.
- Ing, B. & Holland, P.C. (1968) New species of *Comatricha* and *Paradiachea*. *Transactions of the British Mycological Society* 50: 685–686.
[http://dx.doi.org/10.1016/S0007-1536\(67\)80101-3](http://dx.doi.org/10.1016/S0007-1536(67)80101-3)
- Kirk, P.M., Cannon, P.F., Minter, D.W. & Stalpers, J.A. (2008) *Dictionary of the fungi*. 10th Ed. CAB International, Wallingford, pp. 759–771.
- Lado, C. (2001) *Nomenmyx: a nomenclatural taxabase of myxomycetes*. Editorial CSIC-CSIC Press, pp 20–21.
- Lado, C. (2005–2015) *An online nomenclatural information system of Eumycetozoa*. Real Jardín Botánico, CSIC, Madrid, Spain. Available from: <http://www.nomen.eumycetozoa.com> (accessed 29 April 2015)
- Li, Y. (2007) *Flora fungorum sinicorum Myxomycetes II: Physarales Stemonitales*. Science Press, Beijing, 204 pp.
- Li, Y. & Li, H.Z. (1989) Myxomycetes from China I: a checklist of Myxomycetes from China. *Mycotaxon* 35 (2): 429–436.
- Martin, G.M. & Alexopoulos, C.J. (1969) *The Myxomycetes*. University of Iowa Press, Iowa City, pp. 154–168.
<http://dx.doi.org/10.2307/1218569>
- Moreno, G., Illana, C. & Lizárraga, M. (2001) SEM studies of the Myxomycetes from the peninsula of Baja California (Mexico) III. Additions. *Annales Botanici Fennici* 38: 225–247.
- Pando, F. & Lado, C. (1987) Myxomycetes corticícolas ibéricos I: Especies sobre *Juniperus thurifera*. *Boletín de la Sociedad Micológica de Madrid* 11 (2): 203–212.
- Preuss, C.G. (1851) Uebersicht untersuchter Pilze, besonders aus der Umgegend von Hoyerswerda. *Linnaea* 24: 99–153.
- Rammeloo, J. (1976) *Comatricha anomala*, a new myxomycete from Belgium. *Bulletin du Jardin Botanique National de Belgique* 46: 237–240.
<http://dx.doi.org/10.2307/3667418>
- Robbrecht, E. (1974) The genus *Arcyria* Wiggers in Belgium. *Bulletin du Jardin Botanique National de Belgique* 44: 303–353.
<http://dx.doi.org/10.2307/3667676>
- Ukkola, T. (1998) Myxomycetes of the Usambara Mountains, northeast Tanzania. *Acta Botanica Fennica* 160: 1–37.
- Zhang, B. & Li, Y. (2013 ‘2012’) Myxomycetes from China 16: *Arcyodes incarnata* and *Licea retiformis*, newly recorded for China. *Mycotaxon* 122: 157–160.
<http://dx.doi.org/10.5248/122.157>