



## A new species, *Stemonitis sichuanensis*, and a newly recorded species, *Stemonitis marjana* (Myxogastria) from China

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A new species, *Stemonitis sichuanensis*, collected in Gexigou National Natural Reserve, Sichuan province, China, is described herein. *This new species* has a columella that usually ends in an ovoid to triangular expansion at the apex of the sporotheca and small spores (about 6–7 µm in diam.). We present a scanning electron micrograph study of *S. sichuanensis* and a key to the species in the genus *Stemonitis*. Holotype specimens of *S. sichuanensis* are deposited in the Herbarium of the Mycological Institute of Jilin Agricultural University (HMJAU), Changchun, China. We also report a new record of another species of *Stemonitis*, *S. marjana* Y. Yamam., in this paper, specimens of which are also deposited in the HMJAU.

**Key words:** Myxomycetes, SEM, taxonomy, Stemonitaceae

The Stemonitidaceae is a common, important, and beautiful family of myxomycetes. Since Fries established the family in 1829, 17 genera and 216 species have been reported, of which 11 genera and 39 species have been reported from China (Kirk *et al.* 2008). *Stemonitis* is a common genus of Stemonitidaceae that was proposed by Gleditsch in 1753. About 17 species (Kirk *et al.* 2008, Lado 2001, 2005–2015) of the genus *Stemonitis* have been reported throughout the world, of which seven species (Li & Li 1989, Li 2007), *Stemonitis axifera* (Bull.) T. Macbr., *S. flavogenita* E. Jahn, Verh. Bot., *S. fusca* Roth., *S. herbatica* Peck, *S. pallida* Wingate, *S. splendens* Rostaf., and *S. virginensis* Rex, have been reported in China.

*Stemonitis sichuanensis*, a new species collected from Gexigou National Natural Reserve, Sichuan Province, China, in July 2013, is described and illustrated below. *Stemonitis marjana* is a newly recorded species in China, which was collected from the campus of Jilin Agricultural University, Jilin Province, in August, 2013. Specimens of these two species have been deposited in the Herbarium of the Mycological Institute of Jilin Agricultural University (HMJAU), Changchun, China.

### MATERIALS AND METHODS

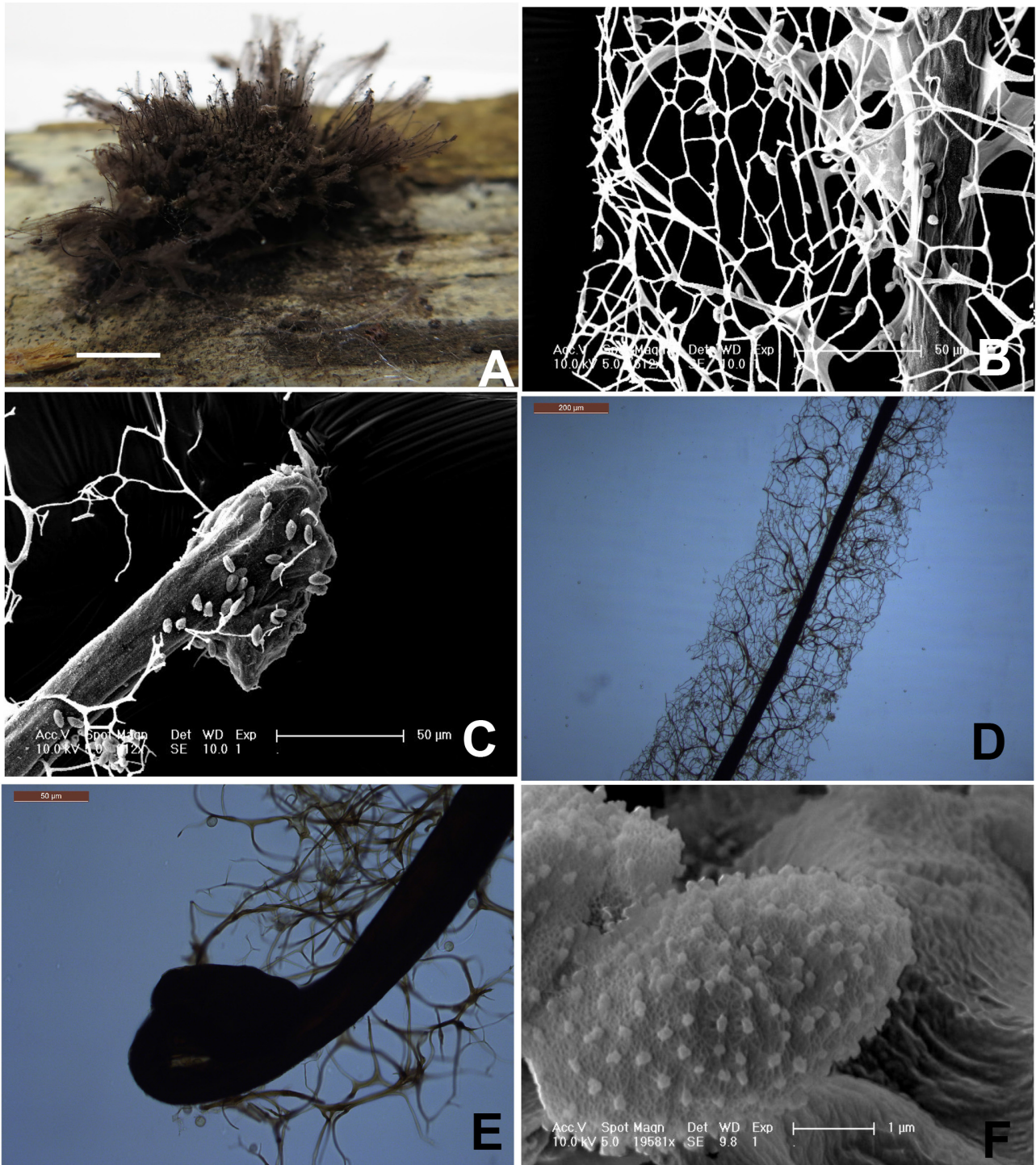
The fruiting bodies and microscopic structures were examined with light and scanning electron microscopes (Martin & Alexopoulos 1969; Zhang & Li. 2012). Permanent slides were mounted in Hoyer's medium (Martin & Alexopoulos 1969). The latter were prepared according to Robbrecht (1974) by spreading the capillitium in a drop of 94% alcohol, determining the colour after one minute, and then mounting in Hoyer's medium. The colour terms are those used in the Flora of British Fungi Colour Identification Chart (Anonymous 1969). Observations and measurements of morphological characteristics were carried out under a stereomicroscope (20×) and optical microscope (100×). About 10 sporocarps of the collection were measured, and about 20 spore and ornamentation measurements were made under an oil immersion objective. Sporocarps, capillitia, and spores were measured using a Nikon dissecting microscope, and photographs were taken with a Leica DM2000 microscope. The sporocarps attached to the holder were 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. The specimens are deposited in the Herbarium of the Mycological Institute of Jilin Agricultural University (HMJAU).

## RESULTS

### TAXONOMY

*Stemonitis sichuanensis* B. Zhang & Yu Li, sp. nov. figure 1

Mycobank: MB812760



**FIGURE 1.** *Stemonitis sichuanensis* (Holotype): A. The fruiting bodies growing on decaying logs. B. Capillitium and columella by SEM. C. Columella ending in an ovoid to triangular expansion at the apex of the sporotheca by SEM. D. Part of capillitium and columella by transmitted light. E. Part of capillitium at the top of sporotheca, with a ovoid to triangular expansion at the apex by transmitted light. F. Spores marked with warts as viewed by SEM.

Description:—Sporocarps in tufts, stalked, 10–13 mm total height, dark brown, cylindrical. Stalk black, polished, 1.5–3 mm long, about 1/8–1/6 of total height. Sporotheca cylindrical, rounded at the apex and base, dark brown. Peridium fugaceous.

Columella usually ending in an ovoid to triangular expansion at the apex of the sporotheca. Internal net of the capillitium consisting of rather thick threads with many, usually large, expansions at the junctions, surface net with angular meshes, these mostly exceeding 50 µm, usually thin threads without free ends. Spores reddish brown in mass, 6–7 µm in diam., densely, evenly, minutely warted.

HOLOTYPE. CHINA, Gexigou National Natural Reserve, Sichuan province, on the bark surface of a dead log, 24 July 2013, Zhang Bo 2013051309 (Holotype, HMJAU10426).

Etymology:—*sichuanensis* (Latin), referring to collection from Sichuan province.

Distribution:—Currently known only from the type locality, Gexigou National Natural Reserve, Sichuan Province in China.

Comments: The genus *Stemonitis* Gled. has been reported to contain 17 species, of which 5 species have spores with a small-meshed reticulation consisting of spinules connected by ridges. Another 12 species have spinulose or warted spores. Among these 12 species, only *S. flavogenita* E. Jahn and *S. capillitionodosa* G. Moreno, D. W. Mitch. (Moreno *et al.* 2010) are similar to *S. sichuanensis* in having a columella with an expanded apex, but *S. flavogenita* has a columella usually ending in a membranous expansion just below the apex, and its spores are very densely, minutely warted, and smaller (about 7–9 µm in diam.). *Stemonitis capillitionodosa* is characterized by its aggregates of sporocarps, short stalk, capillitium with large meshes and prominent nodes, a columella that is widened at the apex, and densely spinulose spores (about 9–11 µm in diam.). *Stemonitis sichuanensis*, by comparison, has larger sporocarps (about 10–13 mm in total height), a columella usually ending in an ovoid to triangular expansion at the apex of the sporotheca, and smaller spores (about 6–7 µm in diam.).

***Stemonitis marjana* Y. Yamam., Karstenia 40:197 (2001) figure 2**

Description:—Sporocarps clustered, 2–3.5 mm total height, black-brown. Sporotheca cylindrical. Stalk black, polished, 1–1.5 mm long, sometimes fibrous at the base. Hypothallus membranous, pale brown. Peridium fugaceous, sometimes leaving a collar at the base of the sporotheca. Columella black, reaching nearly to the apex. Capillitium arising from the length of the columella, thick, branched, and anastomosed to form an inner net, and forming an irregular surface net, with free ends pointing outwards. Spore black in mass, and brownish-grey by transmitted light, spinulose-reticulate, 7–9 µm in diam. Plasmodium unknown.

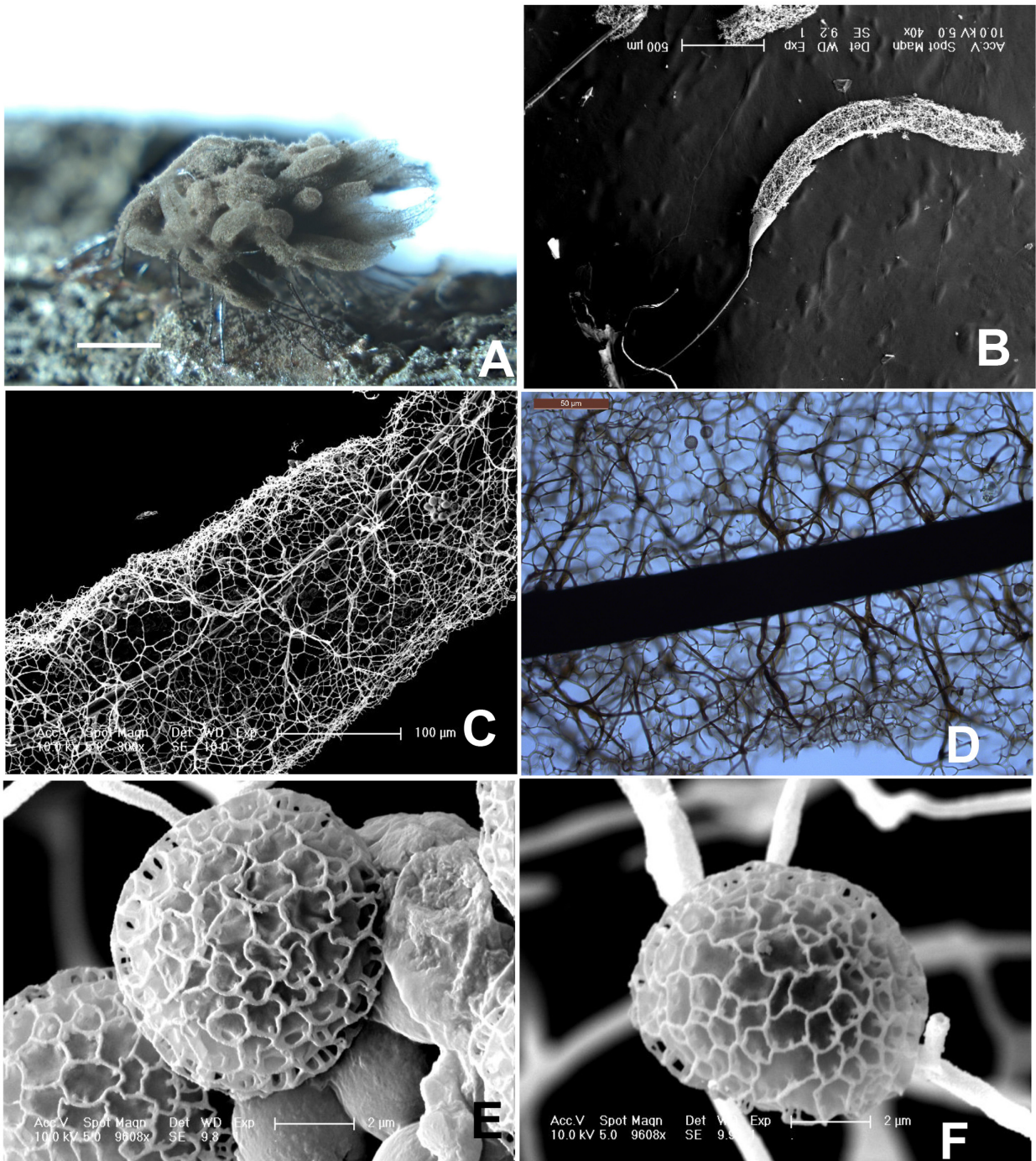
Specimen examined: CHINA, Jilin Province, campus of Jilin Agricultural University, on the bark surface of a decaying log, 25 August 2013, Zhang Bo2015051310 (HMJAU10431).

Comments: *Stemonitis marjana* has been recorded in Japan (Yamamoto 2000) and France (Michel *et al.* 2011). The Jilin specimen has slightly smaller spores than the type specimen (8.8–9.8 µm in diam.); however, its spores are similar to those of the specimen from France (about 6.5–8 µm in diam.). The type specimen, Jilin specimen, and French specimen all have a similar habitat (decaying logs), rust to rust-tawny spinulose-reticulate spores

**Key to the genus *Stemonitis***

1	Spores reticulate .....	2
1	Spores warted or spinulose.....	6
2	Larger sporocarps, almost exceeding a height of 3 mm .....	3
2	Smaller sporocarps, not exceeding a height of 3 mm.....	5
3	Sporocarps almost 6–20 mm total height .....	<i>S. fusca</i>
3	Sporocarps almost 3–6 mm total height .....	4
4	Larger spores, about 8–9 µm in diam. ....	<i>S. inconspicua</i>
4	Smaller spores, not exceeding 7 µm in diam.....	<i>S. virginiensis</i>
5	Capillitium regular branched, with many membranous expansions at the junction.....	<i>S. marjana</i>
5	Capillitium irregular branched, with few or no membranous expansions at the junction .....	<i>S. foliicola</i>
6	Spores united in clusters of 4–12 or more .....	<i>S. uvifera</i>
6	Spores free .....	7
7	Most spores less than 6.5 µm in diam. ....	8
7	Most spores more than 6.5 µm in diam. ....	9
8	Larger sporocarps, about 7–20 mm total height .....	<i>S. axifera</i>
8	Smaller sporocarps, not exceeding 3mm total height.....	<i>S. farrensis</i>
9	Surface net small-meshed, diameter usually less than 25 µm.....	10
9	Surface net large-meshed, diameter usually more than 25 µm .....	15
10	Columella ending with expansions.....	11
10	Columella ending without expansions.....	13
11	Columella ending with membranous cup-like expansions .....	<i>S. flavogenita</i>
11	Columella ending with widened expansion at the apex .....	12
12	Capillitium with prominent nodes, spores 9–11 µm in diam. ....	<i>S. capillitionodosa</i>
12	Capillitium with an ovoid to triangular expansion, spores 6–7 µm in diam .....	<i>S. sichuanensis</i>

- 13 Larger sporocarps, about 7–13 mm height ..... *S. lignicola*  
 13 Smaller sporocarps, not exceeding 7 mm height ..... 14  
 14 Surface net fragile, on dead wood or bark ..... *S. pallida*  
 14 Surface net persistent, on grass or dead leaves ..... *S. herbarica*  
 15 Larger sporocarps, more than 5 mm height ..... 16  
 15 Smaller sporocarps, less than 5 mm height ..... 17  
 16 Stalk about 20%–25% of total height, with rhizoid-like veins at the base ..... *S. rhizoideipes*  
 16 Stalk about 25%–30% of total height, without rhizoid-like veins at the base ..... *S. splendens*  
 17 Spores bearing dark spinules ..... *S. laxifila*  
 17 Spores bearing fine pale warts ..... *S. mussooriensis*



**FIGURE 2.** *Stemonitis marjana*: A, B. Sporocarps. C. Part of capillitium and columella. E. Part of capillitium and columella by transmitted light. D, F. Spores marked with spinulose-forming reticulation.

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