



Identification of a new species, *Trichia macrospora*, and a newly recorded species, *T. flavicoma* (Myxogastria), in China

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Abstract

A new species, *Trichia macrospora*, collected in Jiangxi province, China, is described herein. *Trichia macrospora* has larger (about 17–19 µm in diam.) densely verrucose spores than other described species of *Trichia*, with abundant long, slim spiculations. We present a scanning electron micrograph study of the species and a key to the genera of the species. Holotype specimens of *T. macrospora* are deposited in the herbarium of the Mycological Institute of Jilin Agricultural University (HMJAU), Changchun, China. We also report a new record of a species of *Trichia*, *T. flavicoma* (Lister) Ing, in this paper, specimens of which are deposited in the HMJAU.

Key words: Myxomycetes, SEM, taxonomy, Trichiales

INTRODUCTION

Trichia is a common and an important genus of the Trichiaceae. The genus *Trichia* was established by Haller in 1768, and more than 34 species have been reported throughout the world (Kirk *et al.* 2008, Lado 2001, 2005–12). Among the 34 accepted species of *Trichia*, 17 have an apparent stalk. Fourteen species have been reported in China (Chen & Li 1999; Chou 1937; Li & Li 1989; Li *et al.* 1989, 1990, 1992, 1993; Liu *et al.* 2002; Wang & Li 2006).

The new species described herein, *T. macrospora*, was found on the surface of the leaves of a dead bamboo in the Junfeng Mountains, Jiangxi Province, China in July 2013. Its appearance differs from that of all other members in this genus. Another newly recorded species, *T. flavicoma*, was found on an old gate in Changbai Mountain National Nature Reserve, Jilin province, in December 2014.

MATERIALS AND METHODS

The sporocarps and microscopic structures were examined by light and scanning electron microscopes (Martin & Alexopoulos 1969; Zhang & Li. 2012). Permanent slides were mounted in Hoyer's medium (Martin & Alexopoulos 1969). They were prepared according to Robbrecht (1974) by spreading the capillitium in a drop of 94% alcohol, determining the colour after 1 min and then mounting in Hoyer's medium. The colour terms are those used by the Flora of British Fungi (Anonymous 1969). Observations and measurements of the morphological characteristics were done 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, capillitium 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 Mycological Institute, Jilin Agricultural University (HMJAU).

RESULTS

TAXONOMY

Trichia macrospora B. Zhang & Yu Li, sp. nov. FIGURE 1–2

Mycobank: MB 812411

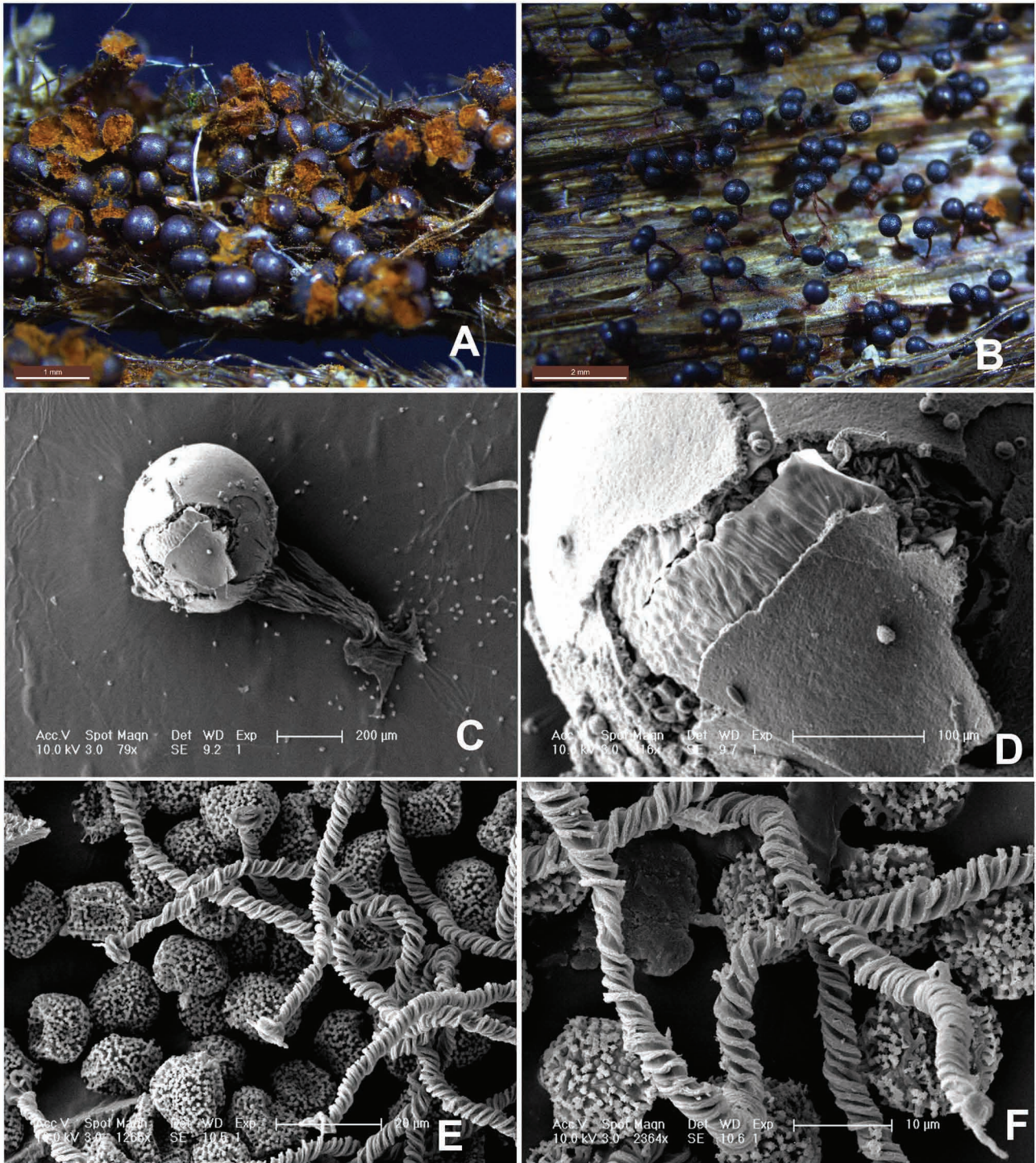


FIGURE 1. *Trichia macrospora* (Holotype): A, Sporocarps, many showing irregular dehiscence. B, Numerous sporocarps growing on the leaves of bamboo. C, A complete sporocarp. D, A double, dehiscent peridium, with a membranous inner layer and a cartilaginous outer layer. E–F, Portion of the capillitium and spores, showing the ornamentation.

Description:—Sporocarp a stalked sporangium, gregarious or heaped, total height 1–1.2 mm. Sporotheca subglobose to broadly ovoid, dark purplish-brown to dark brown. Stipe 0.4–0.5 mm long, blackish, rough longitudinally, sometimes fused in clusters of 2–8 or more. Peridium double, with an inner membranous surface, closely attached to the outer cartilaginous layer, which is dark brown to black by transmitted light and reddish brown by reflected light. Dehiscence occurring at the top of the sporotheca, irregular. Hypothallus membranous and poorly developed, dark brown. Capillitium abundant and dense, threads 5–6 μm in diam., with 4–5 spirals, 250–440 μm long, with abundant free, short ends, decorated with acute tips and plate-like swellings at the base of the tips. Spores rust colored to rust tawny in mass, dark brown by transmitted light, 17–19 μm diam., globose to sub-globose, densely verrucose, apex of the verrucose decorated with abundant long slim spinule, sometimes forming an incomplete reticulation. Plasmodium unknown.

HOLOTYPE. Jiangxi province, China. The specimen was discovered on the surface of the leaves of a dead bamboo on June 19, 2013, Zhang Bo 2013100911 (Holotype, HMJAU10387).

Etymology:—*macrospora* (Latin), refers to spores that are larger than those of any other species of *Trichia*.

DISTRIBUTION:—Currently known only from the locality of Jilin Province in China.

COMMENTS: The genus *Trichia* Haller has been reported to contain 34 species, of which 16 have an apparent stalk. Among these 16 species, only *T. munda* (Lister) Meyl., *T. heteroelaterum* H.Z. Li & Yu Li, *T. nodosa* G. Moreno, D.W. Mitchell, W.C. Rosing & S.L. Stephenson, *T. antactica* Aramb. & Spinedi, *T. subfusca* Rex. are similar to *T. macrospora* in having a smaller sporotheca (not exceeding a height of 1.5 mm), but *T. munda* (Meylan 1927a) has a longer stalk and warted spores (9–12 μm in diam.). *Trichia heteroelaterum* (Li & Li 1989) has a branched capillitium, with swellings at intervals and warted spores (10–12.5 μm in diam.), *T. nodosa* (Moreno *et al.* 2013) has a single, membranous peridium and a wider capillitium (with an abundant free end and nodes), whereas *T. antactica* (Arambarri & Spinedi 1989) has a membranous peridium and verruculose spores (10–12.5 μm in diam.). *Trichia subfusca* (Rex 1980) has a thinner capillitium (4–6 μm in diam., with abrupt ends) and minute roughened spores (11–15 μm in diam.).

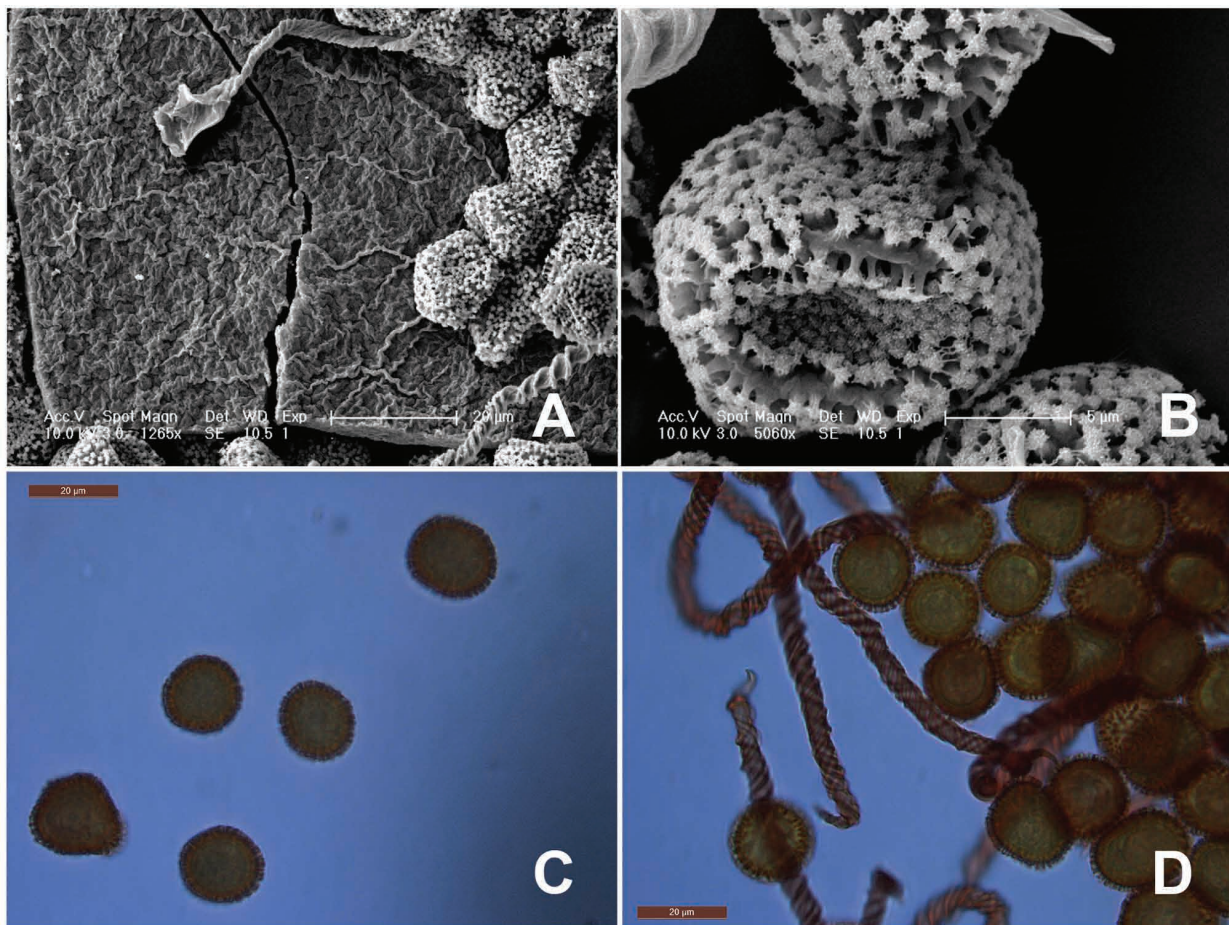


FIGURE 2. *T. macrospora* (holotype): A, Inner surface of the peridium, marked with wrinkles. B, Spinulose spores, decorated with more warts than other species of *Trichia*, sometimes forming an incomplete reticulate, at the apex of the warts. C, Five spores decorated with large warts by transmitted light microscopy. D, Capillitium and spores by transmitted light microscopy.

Trichia flavicoma (Lister) Ing, Trans. Brit. Mycol. Soc. 50(4):558 (1967) FIGURE 3–4

Sporocarps gregarious, stipate or occasionally sessile. Sporotheca subglobose to broadly ovoid dark brown. Stipe 0.6–0.8 mm long, blackish, rough longitudinally, sometimes fused in clusters of 2–4. Peridium single, thick. Dehiscence at the apex of the sporotheca, irregular. Hypothallus membranous disciform, transparent, dark reddish brown to dark brown. Capillitium abundant, dense, threads 5–6 μm in diam., with 4–5 spirals, the ends abundant, with long gradually tapering points. Spores 10–12 μm in diam., globose to sub-globose, rust to rust-tawny in mass, dark brown by transmitted light, densely spinulose. Plasmodium unknown.

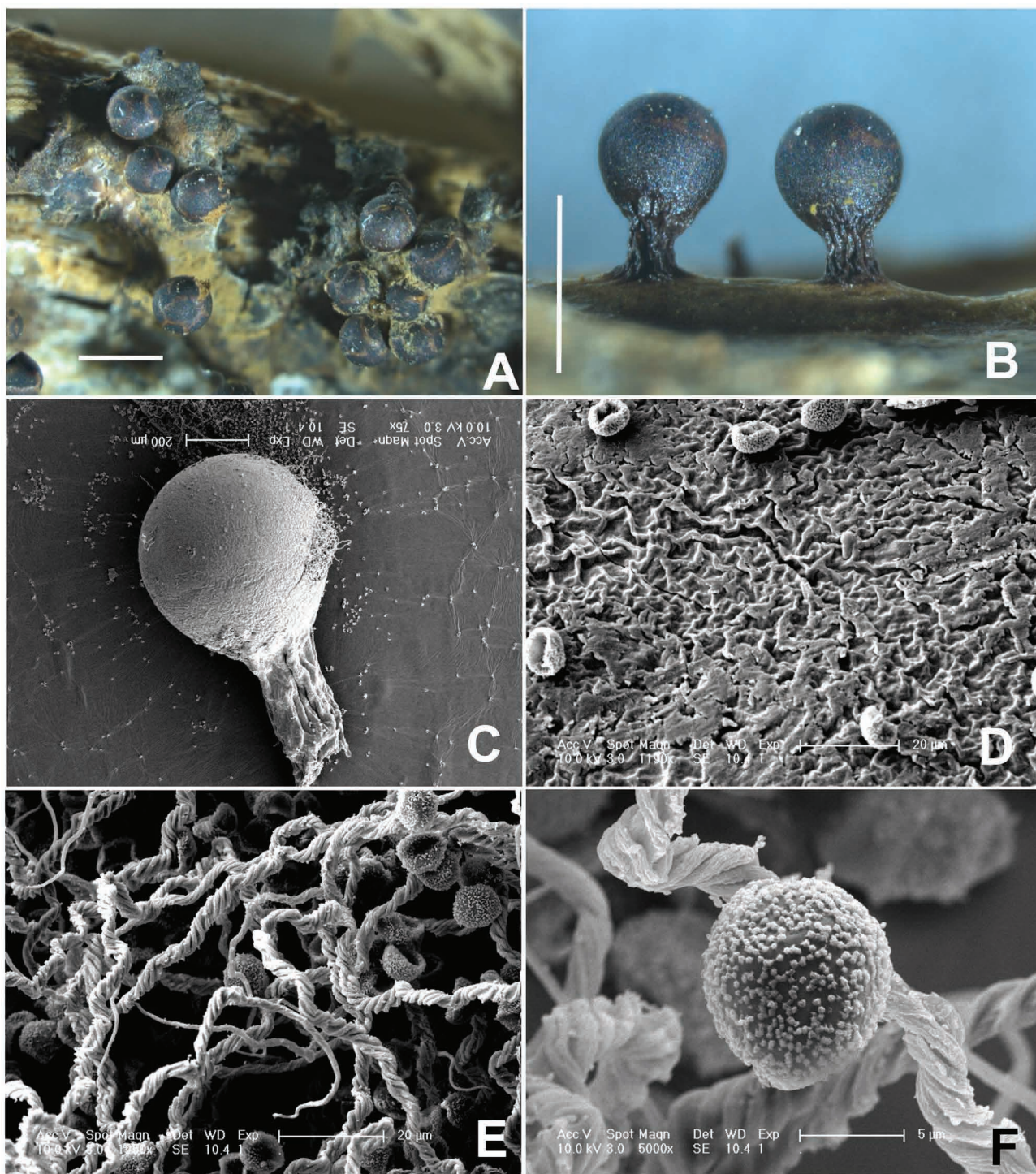


FIGURE 3. *Trichia flavicoma*: A, Group of sporocarps. B, Two sporocarps. C, A complete stalked sporocarp. D, Inner surface of the peridium, marked with low irregular ridges forming a net with small protuberances. E–F, Portion of the capillitium and several spores.

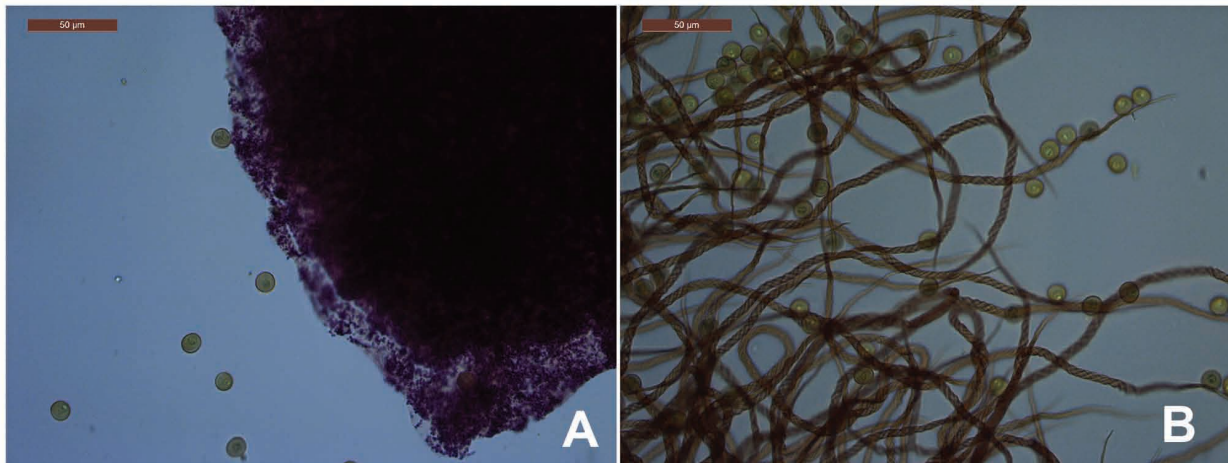


FIGURE 4. *Trichia flavicoma*: A, Portion of the peridium and several spores by transmitted light microscopy. B, Portion of the capillitium and several spores by transmitted light microscopy.

SPECIMEN EXAMINED: Jilin Province, China. The specimen was discovered in the Changbai Mountain National Nature Reserve on the surface of the bark of a dead log on 8 December 2014, Zhang Bo201504002 (HMJAU10425).

COMMENTS: *Trichia flavicoma* has been recorded in Great Britain (Ing 1967), California (Kowalski 1974), Spain (Moreno 1990), France, Israel, Algeria (Lado 1994), Turkey (Sesli & Denchev 2008), and apparently in New York (Hagelstein 1944). It has rarely been reported in Asia. The Jilin specimen has slightly larger spores than the type specimen (9–11 µm in diam.). However, both the Jilin and type specimen have a similar habitat (dead logs), a rust-tawny spore mass and a capillitium with 4–5 spirals.

Key to *Trichia* (including only species with a stalk)

1	Peridium bearing a central papilla on the outer surface of each platelet.....	<i>T. papillata</i>
1	Peridium not papillate.....	2
2	Substipitate or sessile sporocarp.....	3
2	Distinctly stalked sporocarp.....	4
3	Capillitium bearing 5–6 smooth spiral bands, spores 11–13 µm in diam.....	<i>T. conglobata</i>
3	Capillitium bearing 2 smooth spiral bands, spores 10–11 µm in diam.....	<i>T. brummea</i>
4	Fused stalk forming clusters of 2–20 or more.....	5
4	Stalk not fused.....	6
5	Persistent at the base as a shallow cuplike calyculus.....	<i>T. elaterensis</i>
5	Does not form a cuplike calyculus at the base of the sporotheca.....	<i>T. flavicoma</i>
6	Sporocarp distinguished by a cup and an operculum.....	<i>T. crateriformis</i>
6	Sporocarp without a cup and an operculum.....	7
7	Larger sporocarp, almost exceeding a height of 1.5 mm.....	8
7	Smaller sporocarp, not exceeding a height of 1.5 mm.....	12
8	Smaller spores, not exceeding 9 µm in diam.....	9
8	Larger spores, exceeding 9 µm in diam.....	10
9	Sporocarps about 1.4–1.7 mm, dark red-brown to nearly black.....	<i>T. microspora</i>
9	Sporocarps about 2.5–3.2 mm, dull yellow or olive yellow.....	<i>T. brimsiorum</i>
10	Spores 9–11 µm in diam.....	<i>T. botrytis</i>
10	Spores 11–13µm in diam.....	11
11	Peridium yellow, single and dehiscing at the apex.....	<i>T. decipiens</i>
11	Peridium consisting of two closely-connected layers and dehiscing along thin reticulate bands.....	<i>T. erect</i>
12	Larger spores, about 17–19 µm in diam.....	<i>T. macrospora</i>
12	Smaller spores, not exceeding 15 µm in diam.....	13
13	Long stalk, 2–2.5 times the diameter of the sporocarp.....	<i>T. munda</i>
13	Short stalk, not exceeding 2 times the diameter of the sporocarp.....	14
14	Pointed and tapered elaters, with free ends.....	15
14	Elaters with free ends, without points.....	16
15	Branched capillitium, swellings at intervals, bearing long or short side branches and spores 10–12.5 µm in diam.....	<i>T. heteroelaterum</i>
15	Capillitium decorated with a reticulum, with short free ends and globes to ellipsoidal spinose nodules.....	<i>T. nodosa</i>
16	Single, membranous peridium.....	<i>T. antactica</i>
16	Double, inner membranous, outer cartilaginous peridium.....	<i>T. subfusca</i>

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