

SHORT COMMUNICATION

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## Bambusicolous fungi in Japan (3): a new combination, *Kalmusia scabriscpora*

Received: October 21, 2004 / Accepted: December 2, 2004

**Abstract** *Leptosphaeria scabriscpora* collected from *Phyllostachys bambusoides* is reported from Japan. This species was described initially from China and has not been reported subsequently. Based on the morphological features of clypeate ascomata, long stipitate asci, and reddish-brown ascospores with median primary septum, it is transferred to the genus *Kalmusia*. The fungus produced a *Leptodothiorella*-like microconidial state in culture.

**Key words** Bamboo · *Massariosphaeria* · Montagnulaceae · Pleosporales · Taxonomy

*Kalmusia scabriscpora* (Teng) Kaz. Tanaka, Y. Harada & M.E. Barr, comb. nov.

Figs. 1–17

≡ *Leptosphaeria scabriscpora* Teng, *Sinensia* 4: 378, 1934 (basionym).

≡ *Massariosphaeria scabriscpora* (Teng) Shoemaker & C.E. Babc., *Can. J. Bot.* 67:1589, 1989.

Ascomata immersed under black clypeus-like structure composed of host epidermis and fungal mycelium, hemispherical, 1300–2000 μm diameter; in vertical section 200–300 μm high, 130–500 μm diameter, 2 to 6 grouped (Figs. 8, 12, 13). Beak about 85–100 μm long, with numerous periphyses, confluent at the center of ascoma. Ascomal wall 7.5–20 μm thick at sides, composed of 3–6 layers of brown polygonal thin-walled cells of 5–10 × 2.5–6.5 μm; at the rim

250–400 μm wide, of vertically orientated hyaline angular cells of 5–12.5 × 2.5–8 μm (Fig. 11). Pseudoparaphyses narrowly cellular, numerous, 1–2 μm thick, with septa at 10- to 15-μm intervals, branched and anastomosed (Fig. 10). Asci 124–153(–160) × (15.5–)17–21.5 μm (mean = 139.3 × 18.2 μm, *n* = 35), numerous, bitunicate, clavate, rounded at the apex and with an apical chamber, with a long stipe of 22–52.5 μm (mean = 37.2 μm, *n* = 35), arising from a peripheral hymenium, with 8 biseriolate ascospores (Figs. 5–7, 16b). Ascospores (29–)31–40.5 × (7–)8–10 μm (mean = 35.3 × 8.7 μm, *n* = 50), L/W 3.6–4.4 (mean = 4.1, *n* = 50), fusiform to ellipsoid, slightly curved, 5- (rarely 7)-septate, with a median primary septum (0.48–0.52; mean = 0.50, *n* = 42) and constricted, weakly constricted at other septa, the third cell from the apex enlarged, penultimate cells shortest, brown to reddish-brown, with one large globule per cell, echinulate, with a uniform sheath 10–20 μm thick (Figs. 1–4, 9, 16a).

Cultural characteristics: colonies on potato dextrose agar (Difco, Detroit, MI, USA) 47 mm in diameter after 4 weeks at 20°C in the dark, Greyish-Brown (5E4; Kornerup and Wanscher 1978) in the center and granular by forming conidiomata, Olive (2E3) in other parts, with entire margin; reverse Dark-Green (29F8); no pigment produced. On rice straw agar (Tanaka and Harada 2003), a microconidial state (*Leptodothiorella* Höhn.-like) formed on the surface of rice straws within 2 months. Conidiomata 160–250 μm high, 130–240 μm diameter, subglobose (Fig. 15). Wall 8–25 μm thick at sides. Conidiophores 6–10(–20) × 2.2–3.5 μm, simple or branched, 0–1-septate, cylindrical (Fig. 17b). Conidia phialidic, 4–6.5 × 1.2–1.8 μm, bacilliform to oblong, hyaline (Figs. 14, 17a).

Materials examined: on culms of *Phyllostachys bambusoides* Siebold & Zucc.: Japan, near Ooashi-River, Aburada, Kanuma, Tochigi, 139°43.4'E, 36°30.2'N, March 6, 2003, coll. N. Asama, 1023–1026 (in Herbarium of Hirosaki University, Fungi: HHUF 28608–28611). Dried culture specimen of microconidial state (grown on culms of *Oryza sativa* L.): from culture MAFF 239517 (HHUF 28612). Single ascospore culture isolated from HHUF 28608 (MAFF 239517 = JCM 12851).

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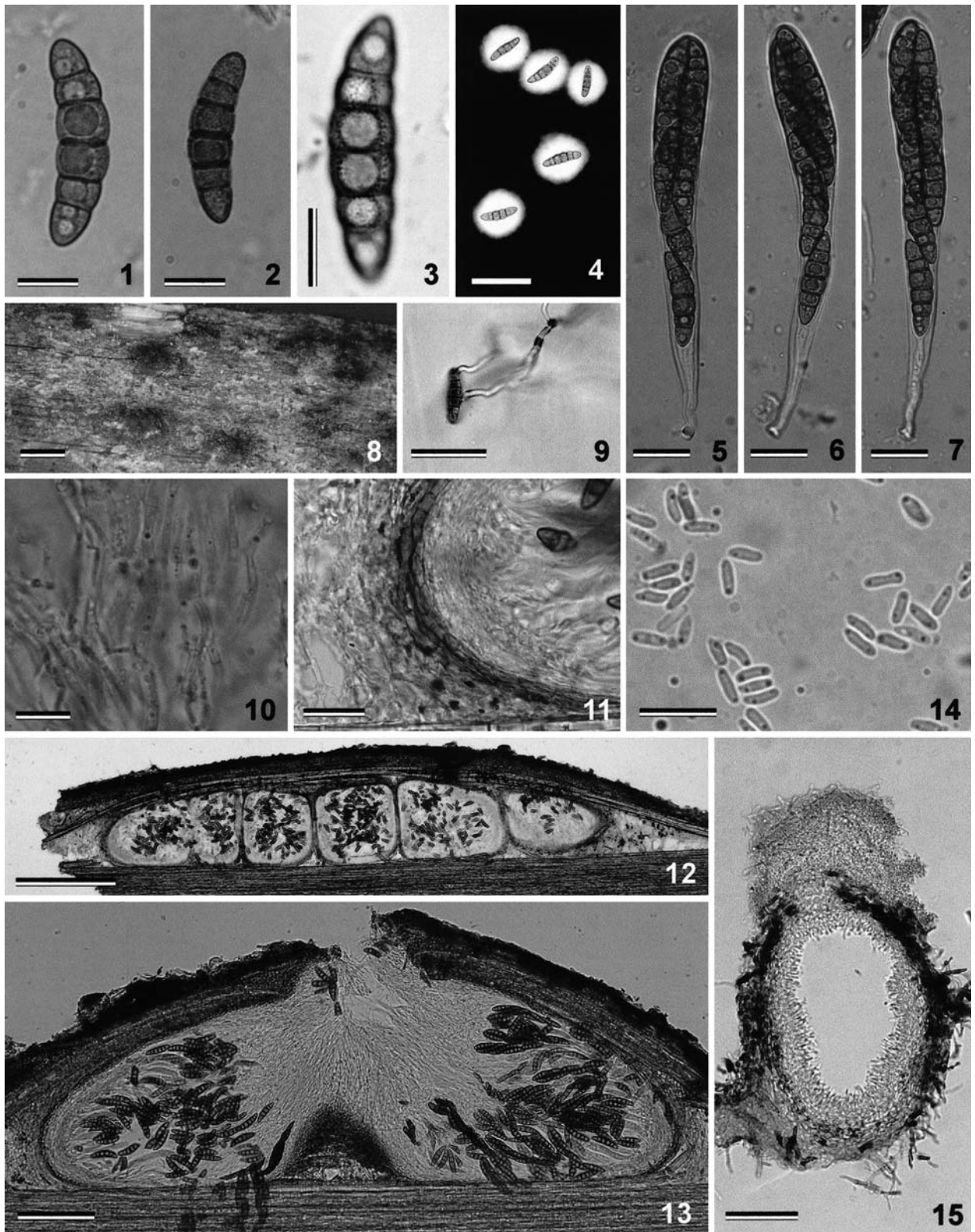
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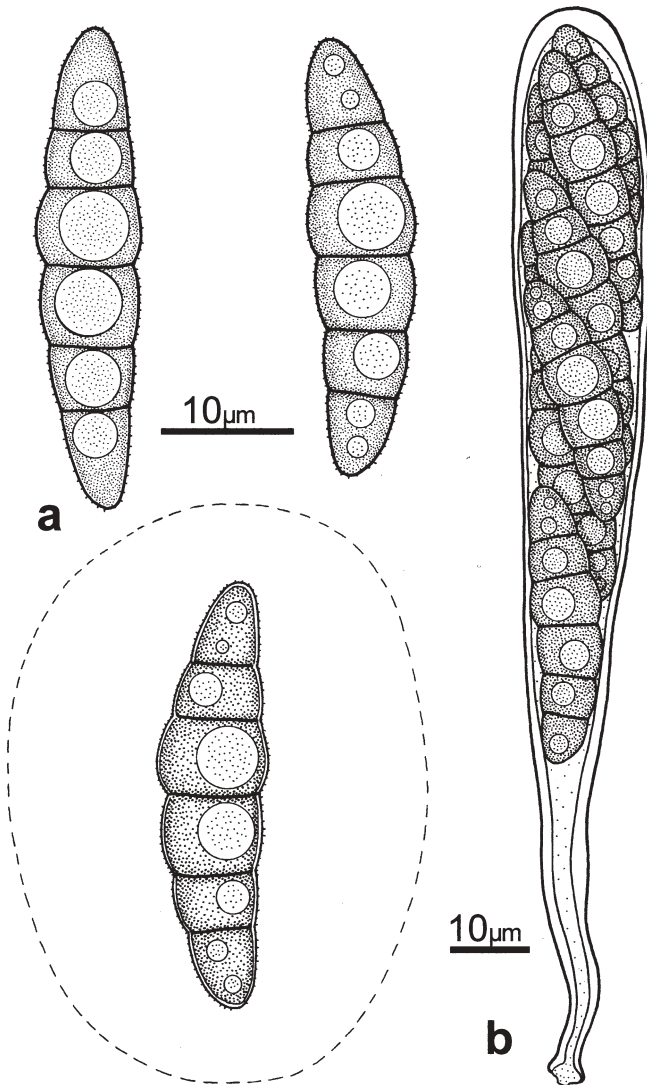
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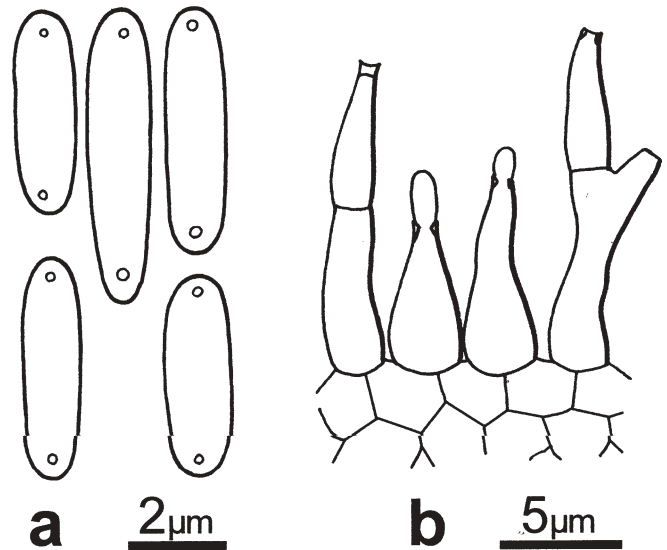
**Figs. 1–15.** Micrographs of *Kalmusia scabrispora*. **1–3** Ascospores (note the echinulate ornamentation in **3**). **4** Ascospores with sheath (in india ink). **5–7** Asci with long stipe. **8** Ascomata on host surface. **9** Germinating ascospore. **10** Narrowly cellular pseudoparaphyses.

**11** Ascomal wall at side. **12, 13** Ascomata in vertical section. **14** Conidia. **15** Conidioma in vertical section. (**1–13** from HHUF 28608; **14, 15** from culture MAFF 239517.) Bars **1–3, 10, 14** 10 $\mu$ m; **4, 9, 15** 50 $\mu$ m; **5–7, 11** 20 $\mu$ m; **8** 1 mm; **12** 250 $\mu$ m; **13** 100 $\mu$ m



**Fig. 16.** Line drawings of *Kalmusia scabrisspora* (on natural host). **a** ascospores. **b** ascus. (From HHUF 28608)

Notes: this fungus was originally described as a species of *Leptosphaeria* Ces. & De Not. by Teng (1934) and was later transferred to *Massariosphaeria* (E. Müll.) Crivelli by Shoemaker and Babcock (1989). However, we consider that neither genus is appropriate for placement of this fungus. This fungus does not have scleroplectenchymatous cells in ascomata, which is an important criterion for *Leptosphaeria* species (Câmara et al. 2002; Shoemaker 1984). The ascospores are symmetrically septate and with a median primary septum, whereas those of *Massariosphaeria* species are asymmetrical and with a suprmedian primary septum (Tanaka and Harada 2004). Morphological features, of this fungus, such as the ascomata composed of thin wall cells, the black clypeus-like structure composed of host epidermis and fungal mycelium, the clavate asci with a relatively long stipe, and the reddish-brown ornamented ascospores with a median primary septum, indicate that it belongs to the genus *Kalmusia* Niessl in Montagnulaceae (Barr 2001)



**Fig. 17.** Line drawings of *Kalmusia scabrisspora* (in culture). **a** conidia. **b** conidiophores. (from culture MAFF 239517)

rather than *Leptosphaeria* or *Massariosphaeria*. Therefore, we propose a new combination of *K. scabrisspora* (Teng) Kaz. Tanaka, Y. Harada & M.E. Barr.

The genus *Kalmusia*, typified by *K. ebuli* Niessl, is composed of five species (Barr 1992, 2001). Three further species described as *Montagnula* Berl.; *M. anthostomoides* (Rehm) Leuchtm., *M. rhodophaea* (Bizz.) Leuchtm. (1985), and *M. subsuperficialis* (Sacc. & Syd.) Shoemaker & C.E. Babcock (1989), have been suggested to belong in *Kalmusia* (Barr 2001), although transfer to the genus still has not been made. Species of *Kalmusia* occur on herbaceous stems or woody twigs. *Kalmusia clivensis* (Berk. & Broome) M.E. Barr is a plurivorous species and is reported several times (Barr 1992; Chen and Hsieh 2003; Huhndorf 1992; Munk 1957; Shoemaker 1984). In Japan, only *K. coniothyrium* (Fuckel) Huhndorf has been known (Phytopathological Society of Japan 2000).

Among the related species, *K. scabrisspora* resembles *M. anthostomoides* in size of asci and ascospores, but the latter has 7–9-septate ascospores (Ahn and Shearer 1995). In terms of ascospore septation, it is similar to *M. rhodophaea* and *M. subsuperficialis*, but the ascospores in the latter two species are less than 30 µm long (Leuchtmann 1985; Shoemaker and Babcock 1989).

**Acknowledgments** The authors gratefully acknowledge Noritaka Asama for providing the fungal specimens.

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