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FULL PAPER

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# Pleosporales in Japan (3). The genus *Massarina*

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**Abstract** Twelve species of the genus *Massarina* collected from Japan are reported in this article. Among them, 4 new species, *M. constricta*, *M. japonica*, *M. submediana*, and *M. uniserialis*, are described, illustrated, and compared to similar species. Two species, *M. scirpina* and *M. ryukyuensis*, are described as new combination, and 4 species, *M. arundinariae*, *M. fluviatilis*, *M. peerallyi*, and *M. rubi*, are reported from Japan for the first time. One bambusicolous species, *Metasphaeria tuberculosa*, is considered to be a synonym of *Massarina bambusina*.

**Key words** Lophiostomataceae · *Massarina* · *Metasphaeria* · Pleosporales

## Introduction

In this third report on the Pleosporales in Japan, the genus *Massarina* is discussed. We describe here 12 species of the genus that were collected mainly from riverside environments or bamboo host plants. The aim of this article is to renew information on the Japanese mycoflora of *Massarina*, which has been poorly known until now.

## Materials and methods

Methods for microscopic observation, single ascospore isolation, and cultivation were described in our previous paper (Tanaka and Harada 2003). The textura types of ascomal wall in surface view are as in Korf (1958). All specimens and isolates, except for some borrowed materials from YAM, are maintained at the Herbarium of Hirosaki University, Fungi (HHUF).

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## Taxonomy

***Massarina*** Sacc., Syll. Fung. 2:153, 1883.

Lectotype species. *Massarina eburnea* (Tul. & C. Tul.) Sacc., Syll. Fung. 2:153, 1883 (Hyde 1995a).

Anamorphs. *Acrocalymma* Alcorn & J.A.G. Irwin, *Anguillospora* Ingold, *Ceratophoma* Höhn., *Clavariopsis* De Wild., *Diplodia* Fr., *Periconia* Tode : Fr., *Phoma* Sacc., *Stagonospora* (Sacc.) Sacc., *Tetraploa* Berk. & Broome, *Tumularia* Marvanová & Descals (Aptroot 1998; Shearer 1993).

The genus *Massarina* was established by Saccardo in 1883 to segregate fungi with typically hyaline ascospores, which had previously been placed under the genus *Massaria* De Not. (Bose 1961). *Massarina* includes saprophytes and endophytes of woody plants and a few plant pathogens such as *M. walkeri* Shoemaker, C.E. Babc. & J.A.G. Irwin occurring on *Medicago sativa* L. (Hyde 1995c; Shoemaker et al. 1991). Most species of the genus are saprophytes, with a terrestrial, freshwater, or marine habitat (Aptroot 1998; Hyde 1995c).

This genus belongs in the Lophiostomataceae, Pleosporales (Kirk et al. 2001), and it is characterized as having single or aggregated, immersed to erumpent, spherical to hemispherical, pseudothecioid ascomata; cellular pseudoparaphyses; bitunicate, cylindrical to clavate or obpyriform asci; and hyaline, 1–3(–7)-septate, fusiform to long ellipsoid ascospores that mostly have a mucilaginous sheath or appendages (Aptroot 1998; Hyde and Aptroot 1997, 1998).

In 1961, the genus *Massarina* was reviewed in part by Bose (1961), who studied mostly European species. Barr (1992) discussed 16 species of *Massarina* from North America. Recently, Aptroot (1998) published "A world revision of *Massarina*," providing a list of 160 species that had been placed in the genus. Among these, 43 species were

accepted in the genus by Aptroot (1998). Since then, several species have been added to the genus (Ahn and Shearer 1999; Aptroot et al. 2000; Hyde and Goh 1998; Poon and Hyde 1998; Poonyth et al. 1999; Scheuer 1999; Tsui et al. 1999; Van Ryckegem and Aptroot 2001). At present, it has been estimated that the genus consists of about 125 species (Kirk et al. 2001). In Japan, however, only 6 species of the genus *Massarina* have been known so far, viz., *M. arundinacea* (Sowerby: Fr.) Leuchtm. (Katumoto 1968), *M. oplismeni* Katum. & Y. Harada (1979), *M. papulosa* (Durieu & Mont.) S.K. Bose [≡*Oletheriostrigula papulosa* (Durieu & Mont.) Huhndorf & R.C. Harris; Otani and Mikawa 1971], *M. pustulata* I. Hino & Katum. (1955), *M. ramunculicola* K.D. Hyde (Nakagiri 1993), and *M. yezoensis* I. Hino & Katum. (Hino 1961).

To date, the genus *Lophiostoma* Ces. & De Not., which is morphologically similar to *Massarina*, has mainly been distinguished by the presence of slitlike ostioles and "lophiostomatoid" peridium structure of ascomata. Recently, Liew et al. (2002) carried out a phylogenetic analysis of both genera based on molecular data. They concluded that these characters are very variable and cannot be applied to distinguish the genera because several *Massarina* species with narrowly fusiform ascospores [e.g., *M. armatispora* K.D. Hyde, Vrijmoed, Chinnaraj & E.B.G. Jones, *M. bipolaris* K.D. Hyde, *M. corticola* (Fuckel) L. Holm, *M. fronsisubmersa* K.D. Hyde, and *M. rubi* (Fuckel) Sacc.] formed a monophyletic clade with the genus *Lophiostoma*. Some fungi (e.g., *M. japonica* and *M. uniserialis*) in this article that are similar to *M. bipolaris* or *M. fronsisubmersa* may have affinities with *Lophiostoma*. However, we follow the generic consept of *Massarina sensu lato* proposed by Aptroot (1998) until the definition of both genera is further clarified.

1. ***Massarina arundinacea*** (Sowerby: Fr.) Leuchtm., Sydowia 37: 179, 1985 [1984]. Fig. 12

≡*Sphaeria arundinacea* Sowerby, Engl. Fungi 3, 1801: Fr., Syst. Mycol. 2: 429, 1823.

For other synonyms, see Aptroot (1998).

Asci 70–131.5 × 9.5–15.5 μm. Ascospores 23–40.5 × 3.5–6 μm. For further descriptions, see Katumoto (1968) and Shoemaker and Babcock (1989).

Cultural characteristics. Colonies on potato dextrose agar (PDA) 7.5 cm in diameter after 4 weeks, Hair Brown (5E4; Kornerup and Wanscher 1978) with irregular margin, arachnoid; reverse similar; no pigment is produced. On rice straw agar (RSA), ascomata were formed on the surface of rice straws within 1 month. Ascospores resemble those found in nature, measuring 29.5–36 × 4.5–5.5 μm (mean = 32.4 × 5.0 μm, $n$ = 20).

Materials examined. On culms of *Phragmites australis* (Cav.) Trin. ex Steud.: Toyohira River, riverbank, Sapporo, Hokkaido, 141°21′ E, 43°02′ N, June 23, 2000, KT. 366 (HHUF 27542); Sanpinai, Hirosaki, Aomori, 140°30′ E, 40°34′ N, July 1, 2001, KT. 552 (HHUF 27543, culture 4317); Oowasawa River, riverbank, Kadoke, Hirosaki, Aomori, 140°30.532′ E, 40°34.276′ N, July 29, 2001, KT. 600 (HHUF 27544, culture 4318); Akaiwa, Funadomari, Isl. Rebun, Hokkaido, 141°03′ E, 45°23′ N, Aug. 30, 2001, KT. 721 (HHUF 27545); Shibayachi-moor, Akita, 140°34.53′ E, 40°19.04′ N, Oct. 5, 2001, Y. Ooki & KT. 801 (HHUF 27546); Hirakawa, Yamaguchi, May 11, 1967, K. Katumoto (YAM 22555).

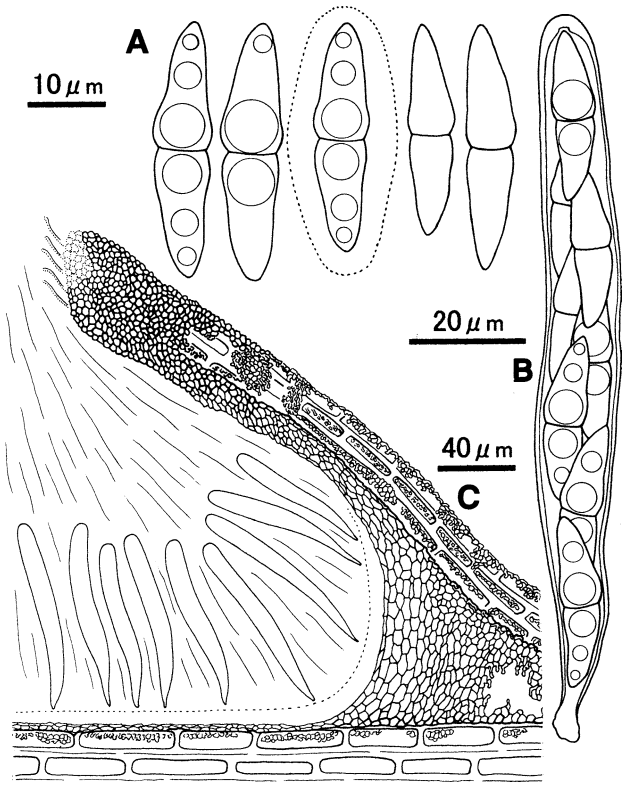



**Fig. 1.** *Massarina arundinariae*. **A** Ascospores; **B** Ascus; **C** Ascoma in longitudinal section (HHUF 27547)

Notes. This common species on *P. australis* has been described many times (Dennis 1978; Ellis and Ellis 1985; Eriksson 1967; Hedjaroude 1968; Leuchtmann 1984; Müller 1950; Shoemaker and Babcock 1989). It has already been recorded in Japan, as *Leptosphaeria arundinacea* (Katumoto 1968; Shirai and Hara 1927).

2. ***Massarina arundinariae*** (Ellis & Everh.) M.E. Barr, Mycotaxon 45: 211, 1992. Figs. 1, 13

≡*Didymosphaeria arundinariae* Ellis & Everh., North Am. Pyrenomyc. 732, 1892.

≡*Microthelia arundinariae* (Ellis & Everh.) Kuntze, Rev. Gen. Planta 3: 498, 1898.

Ascomata 250–280 μm high, 550–800 μm diameter (including the rim), with single locule of 350–450 μm diameter. Beak 60–70 μm long, 100–125 μm wide, composed of dark brown subglobose 2–8 μm diameter cells, with hyaline periphyses. Ascomal wall composed of vertically orientated rectangular to subglobose brown 4–15 × 3–8 μm cells at the rim, rim ~170–200 μm thick, poorly developed at the base. Pseudoparaphyses 1–2 μm thick. Asci 105–142 × 12.5–16 μm (mean = 121.0 × 13.8 μm, $n$ = 35), short-stalked (3–18 μm). Ascospores 27–34.5 (–37) × 6–8 μm (mean = 30.9 × 7.3 μm, $n$ = 50), length/width ratio (L/W) 3.8–4.6 (mean =

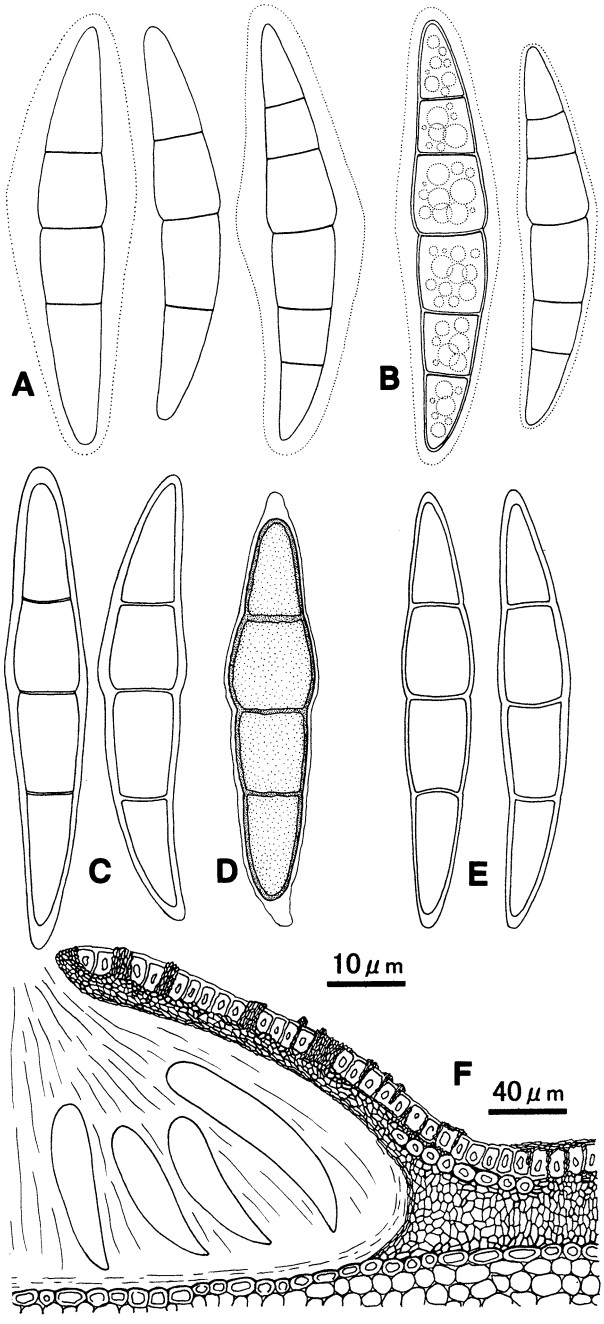



**Fig. 2.** *Massarina bambusina*. **A–E** Ascospores (**D**, Senescent spore); **F** Ascoma in longitudinal section. (**A** HHUF 26590; **B** culture 4321; **C**, **D**, **F** YAM 21809, holotype of *Metasphaeria tuberculosa*; **E** YAM 20337)

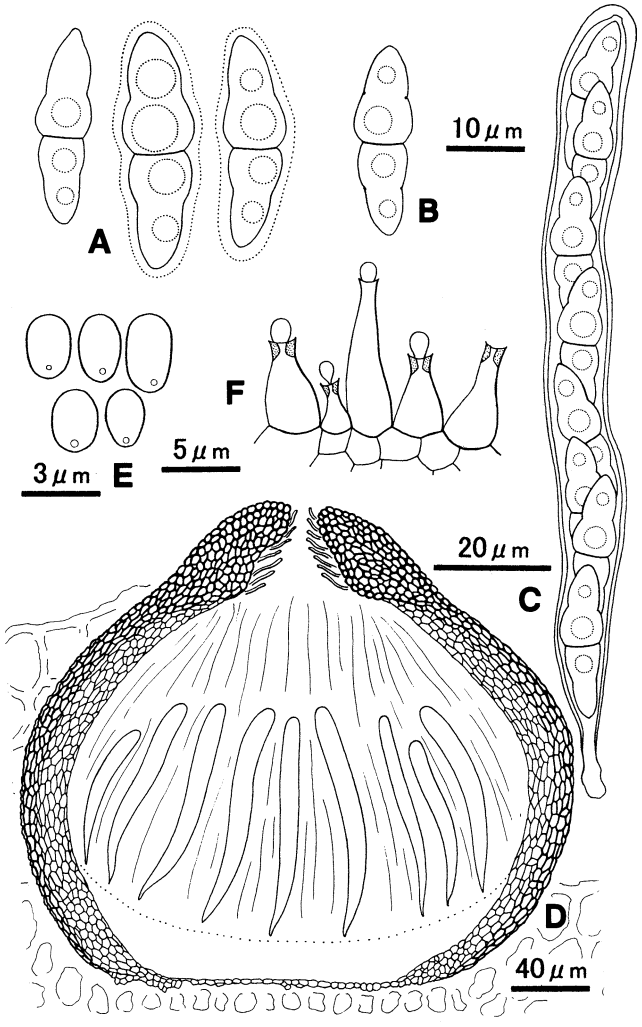



**Fig. 3.** *Massarina constricta*. **A**, **B** Ascospores; **C** Ascus; **D** Ascoma in longitudinal section; **E** Conidia; **F** Conidiophores. (**A**, **C**, **D** HHUF 27550, holotype; **B** HHUF 27549; **E**, **F** culture 4323)

4.3, $n = 50$), fusiform with acute ends, with a septum submedian (0.50–0.54, mean = 0.52, $n = 30$), hyaline, smooth, with an inconspicuous sheath 10(–20) μm wide. Ascospores become brown and two- to four-celled at germination. Germ tubes mainly occur from both ends, rarely from mid cells.

Cultural characteristics. Colonies on PDA 2.4 cm in diameter after 4 weeks, Dark Brown (7F2), sometimes with Greyish Green (30E6) margin; reverse Bluish Grey (20F3); no pigment is produced. On RSA, ascomata were formed under the epidermis of rice straws within 3 months. Ascospores are similar to those found in nature, measuring 25–33 × 6.5–8 μm (mean = 28.6 × 7.2 μm, $n = 50$).

Materials examined. On culms of *Phyllostachys bambusoides* Siebold & Zucc.: campus of Shinsyu University, Minamiminowa, Ina, Nagano, 137°56′ E, 35°51′ N, May 18, 2002, KT. 856 (HHUF 27547, culture 4319, 4320); KT. 857 (HHUF 27548).

Notes. Our materials agree in most respects with the description of *M. arundinariae* (Aptroot 1998; Barr 1992). It has been known from bamboo in North America and Hong Kong so far (Aptroot 1998; Lu et al. 2000).

3. ***Massarina bambusina*** Teng, Sinensia 7: 512, 1936. Figs. 2, 27, 36

=*Metasphaeria tuberculosa* I. Hino & Katum., Bull. Fac. Agric. Yamaguchi Univ. 7: 273, 1956.

Ascomata 150–300 μm high, 300–500 μm diameter. Beak none or short papillate, 25–50 μm long, 50–60 μm wide. Ascomal wall 10–20 μm wide at the sides, composed of pale brown 2–3 μm thick flattened cells; at the rim, composed of

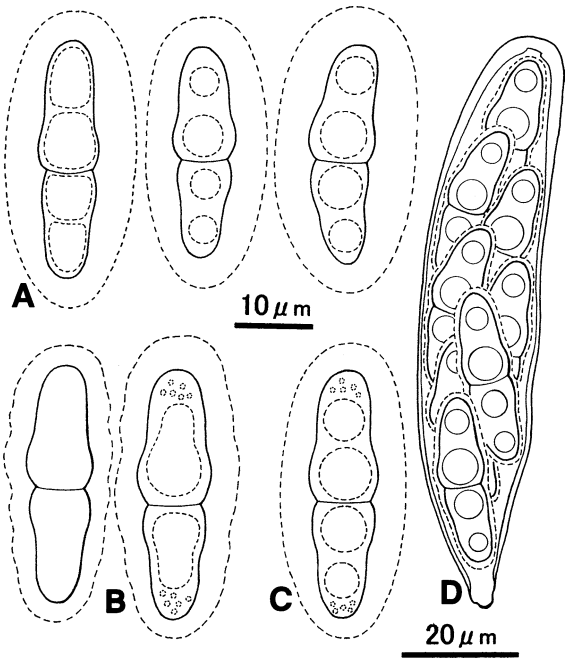



**Fig. 4.** *Massarina fulviatilis*. **A–C** Ascospores; **D** Ascus. (**A**, **D** HHUF 27552; **B** HHUF 27551; **C** culture 4327)

parallel rows of rectangular to polygonal brown thin-walled 5–13 × 5–8 μm cells; around the beak, of subglobose to rectangular dark brown thick-walled 2–5 μm diameter cells; at the base, poorly developed. Pseudoparaphyses 1.5–2.5 μm thick, occupying ostiolar region. Asci (86–) 97–140 (–150) × 22–28 (–30) μm (mean = 119.7 × 25.3 μm, $n$ = 51), short-stalked 4–15 μm. Ascospores (42–) 48–62 (–64.5) × 7–10 μm (mean = 54.7 × 8.4 μm, $n$ = 77), L/W 5.6–7.6 (mean = 6.5, $n$ = 68), fusiform with acute ends, 3–5-septate (1 + 1 + 1, 2 + 1 + 2), primary septum mostly supramedian (0.48), hyaline, smooth, with a sheath 2–3 (–6) μm wide.

Cultural characteristics. Colonies on PDA 3.2 cm in diameter after 4 weeks, Olive (2D4) with white margin; reverse similar; no pigment is produced. On RSA, ascomata were formed on the surface of rice straws within 2 months. Ascospores are similar to those on host, measuring 50–60 × 8–11.5 μm (mean = 56.4 × 9.9 μm, $n$ = 20), L/W 5.2–6.3 (mean = 5.7, $n$ = 20).

Materials examined. On culms of *Sasa kurilensis* (Rupr.) Makino & Shibata: Shikotsuko, Hokkaido, Sept. 5, 2001, YH (HHUF 26589); (HHUF 26590, culture 4321, 4322). On culms of *Phyllostachys bambusoides* Siebold & Zucc.: Mt. Kosobo, Miyazaki, Kyusyu, July 26, 1955, I. Hino & K. Katumoto (YAM 21809, holotype of *Metasphaeria tuberculosa*); Hikarishi, Yamaguchi, Aug. 30, 1960, I. Hino (YAM 20337, as *Leptosphaeria tigrisoides*).

Notes. The materials we examined are a good match to the description and illustrations of *M. bambusina* provided by Teng (1936). We consider *Metasphaeria tuberculosa* I. Hino & Katum. (1956), which was recorded from Kyushu, Japan, to be a synonym of *M. bambusina*, as there is no significant difference between the two taxa to warrant separate species status. The collection labeled "*Leptosphaeria tigrisoides* Hara?" YAM 20337 is also identical to *M. bambusina*. Actually, from illustrations given by Hara (1927), *L. tigrisoides* and *M. bambusina* seem to resemble each other, although the asci and ascospores of the former are more slender (ascus 80–120 × 12–16 μm, ascospores 44–50 × 5–6 μm; Hara 1927).

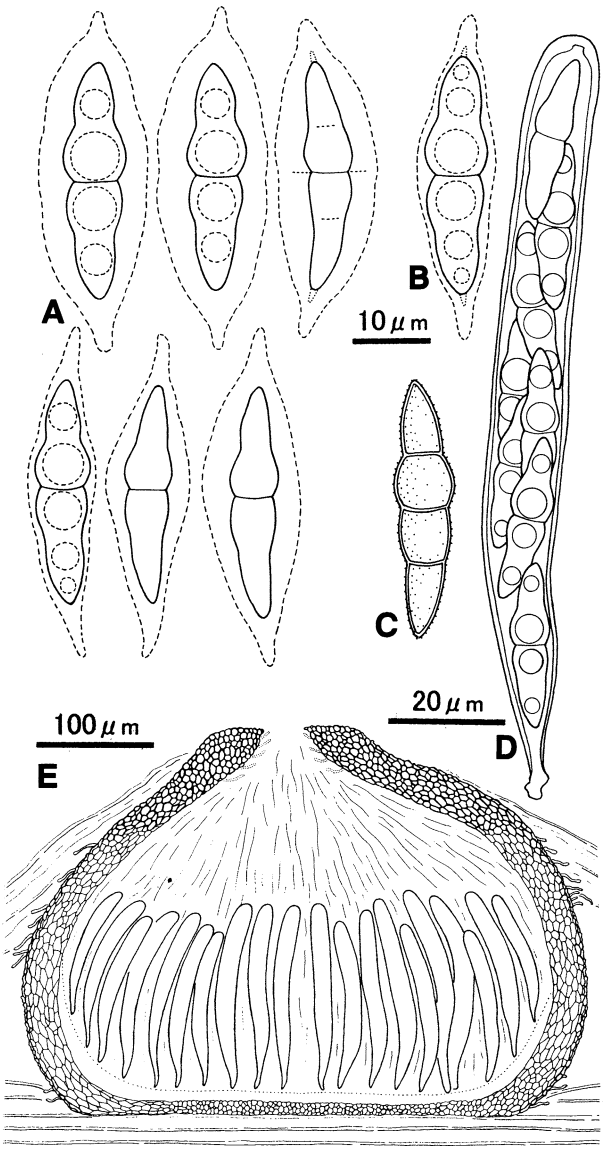



**Fig. 5.** *Massarina japonica*. **A–C** Ascospores (**C** Senescent spore); **D** Ascus; **E** Ascoma in longitudinal section. (**A**, **D**, **E** HHUF 27553, holotype; **B**, **C** culture 4329)

Another specimen of *L. tigrisoides* (YAM 20336, not the type) had been collected by Hara, who described the taxon, but it was in poor condition. We would like to keep this species in the genus *Leptosphaeria* Ces. & De Not., until the type specimen of *L. tigrisoides* is located and further information obtained.

4. ***Massarina constricta*** Kaz. Tanaka & Y. Harada, sp. nov. Figs. 3, 14, 15, 28, 32, 38

Ascomata 200–250 μm alta, 230–320 μm diam, dispersa vel congregata, immersa, dein erumpentia, globosa.

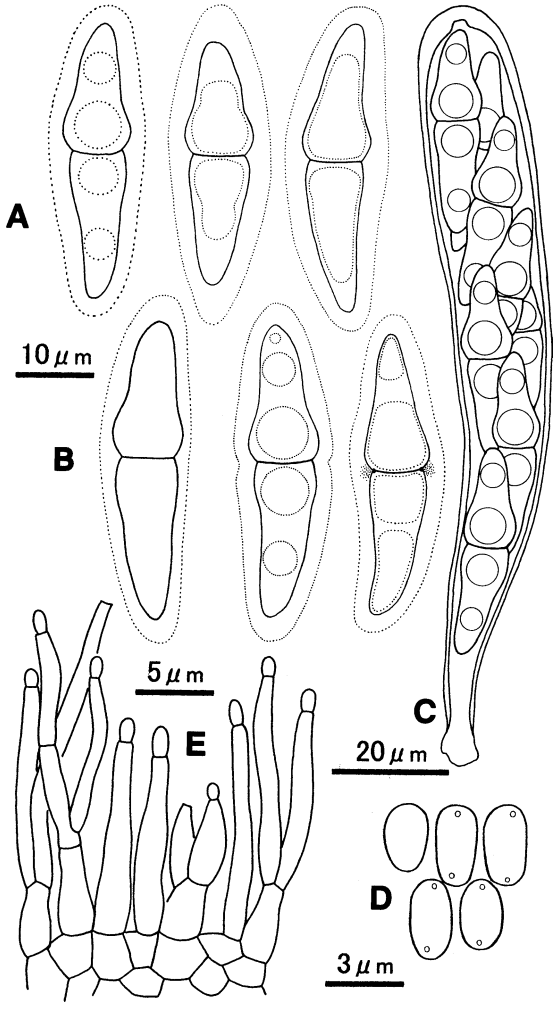



**Fig. 6.** *Massarina peerallyi*. **A**, **B** Ascospores; **C** Ascus; **D** Conidia; **E** Conidiophores. (**A**, **C** HHUF 27556; **B** HHUF 27557; **D**, **E** culture 4333)

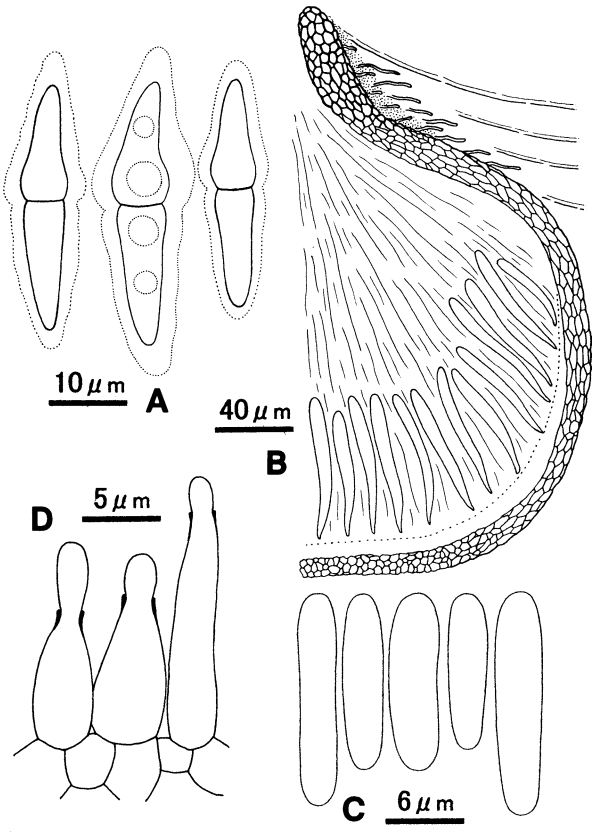



**Fig. 7.** *Massarina rubi*. **A** Ascospores; **B** Ascoma in longitudinal section; **C** Conidia; **D** Conidiophores. (**A**, **B** HHUF 27558; **C**, **D** culture 4335)

Rostrum breve, 50–65 μm altum, 75–100 μm latum, centrale, ex cellulis brunneis 5–8 μm diam compositum. Periphyses hyalinae. Paries ascomatis "textura prismatica," 20–33 μm crassus, ex cellulis polygonis vel subglobosis 5–10 × 2–5 μm compositus. Pseudoparaphyses cellulosae, 1–2 μm latae, septatae, ramificantes. Asci (112.5–) 127–165 (–170) × 10.5–13 μm, bitunicati, copiosi, cylindrici, apice rotundati, cum stipite 11–20 μm longo, 8-spori. Ascosporae (23.5–) 25–29.5 (–31) × 6.5–10 μm, uniseriales, late fusiformes, extremis acutis, rectae vel leviter curvatae, submedio 1-septatae, ad septum valde constrictae, hyalinae, guttulatae, laeves, cum vagina gelatinosa.

Holotypus. HHUF 27550.

Etymology. In reference to the strongly constricted ascospores.

Ascomata 220–250 μm high, 230–320 μm diameter, numerous, scattered to clustered, immersed, eventually erumpent, globose, glabrous. Beak none or short papillate, 50–65 μm high, 75–100 μm wide, central, with hyaline periphyses, wall composed of subglobose thick-walled dark brown 5–8 μm diameter cells. Ascomal wall surface a textura prismatica, in longitudinal section laterally 20–33 μm thick of 7–9 layers in two zones, outer of thick-walled brown cells, inner of polygonal to subglobose hyaline 5–10 × 2–5 μm cells; much thinner at the base. Pseudoparaphyses cellular, 1–2 μm thick, septate, branched. Asci (112.5–) 127–165 (–170) × 10.5–13 μm (mean = 143.6 × 11.8 μm, $n$ = 30), bitunicate, numerous, basal, cylindrical, apex rounded, with shallow ocular chamber, short-stalked 11–20 μm long, 8-spored, usually uniseriate. Ascospores (23.5–) 25–29.5 (–31) × 6.5–10 μm (27.3 × 7.9 μm, $n$ = 44), L/W 3.1–3.9 (mean = 3.5, $n$ = 44), broadly fusiform with slightly acute ends, straight or slightly curved, 1-septate, submedian (0.50–0.55, mean = 0.53, $n$ = 41), strongly constricted at the septum and midpoints of each cells, upper hemisphere broader, hyaline, with 1–2 guttules per cell, smooth, with an inconspicuous sheath, up to 2 μm wide. Ascospores become brown and 3-septate at germination. Germ tubes occur from each cell.

Cultural characteristics. Colonies on PDA 2.5 cm in diameter after 4 weeks, Hair Brown (5E4) to Olive (3F4), arachnoid, with white irregular margin; reverse similar; no pigment is produced (but purple pigment is formed in V8A). On RSA, *Phoma*-like conidiomata were formed on the surface of rice straws within 2 months. Conidiomata 125–150 μm high, 120–290 μm diameter, globose to depressed subglobose, with brown septate 3-μm-thick hyphae. Beak 22–50 μm long, 30–45 μm wide, short papillate. Wall in

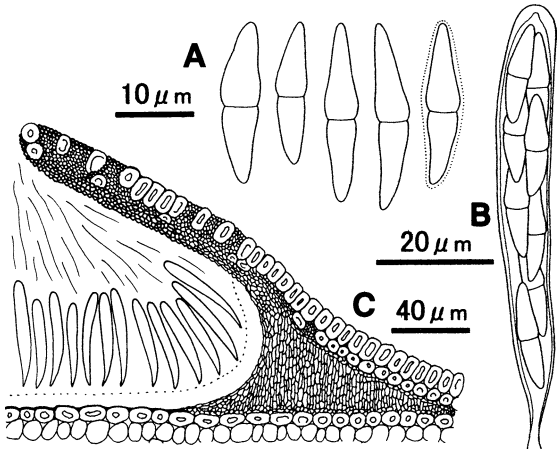



**Fig. 8.** *Massarina ryukyuensis*. **A** Ascospores; **B** Ascus; **C** Ascoma in longitudinal section (YAM 21940, holotype of *Metasphaeria ryukyuensis*)

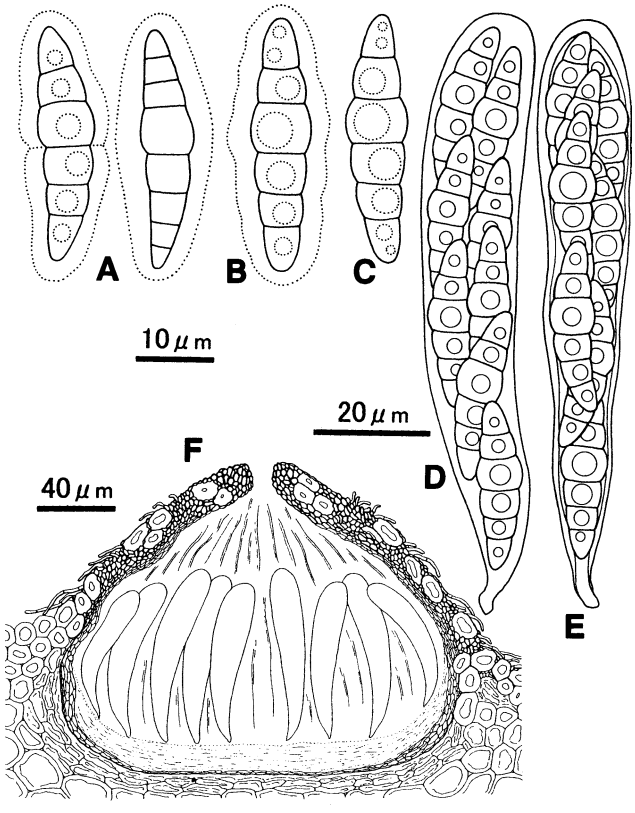



**Fig. 9.** *Massarina scirpina*. **A–C** Ascospores; **D**, **E** Asci; **F** Ascoma in longitudinal section. (**A**, **D** HHUF 27559; **B**, **E**, **F** HHUF 27560; **C** HHUF 27561)

longitudinal section 7–13 μm thick at the sides, composed of 2–4 layers of polygonal brown pseudoparenchyma cells. Conidiophores 3–12 × 2–4 μm, doliiform to lageniform, not branched, formed all around the locular cavity. Conidiogenous cells phialidic. Conidia 2–3.5 × 1.5–2 μm (mean = 2.8 × 1.8 μm, *n* = 40), subglobose, hyaline, smooth. Sometimes ascomata are formed among numerous

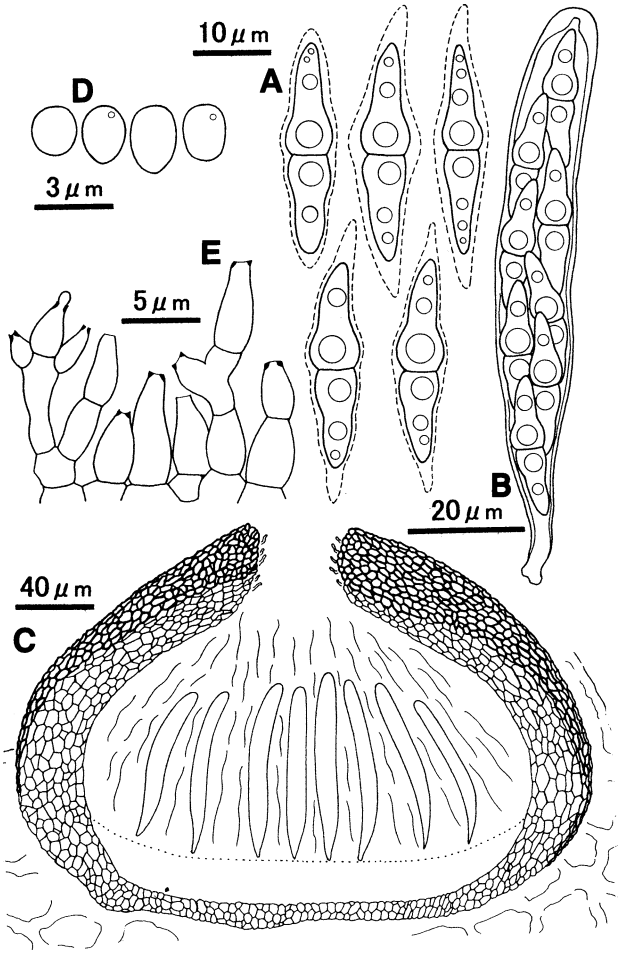



**Fig. 10.** *Massarina submediana*. **A** Ascospores; **B** Ascus; **C** Ascoma in longitudinal section; **D** Conidia; **E** Conidiophores. (**A–C** HHUF 27562, holotype; **D**, **E** culture 4339)

conidiomata. The ascospores are similar to those found in nature.

Materials examined. On twigs of an unknown woody plant: Hirakawa, riverbank, Matsuzaki, Hiraka, Aomori, 140°31.524′ E, 40°35.266′ N, Aug. 18, 2001, KT. 697 (HHUF 27549, culture 4323, 4324); KT. 698 (HHUF 27550, holotype, culture 4325, 4326).

Notes. *Massarina constricta* somewhat resembles *M. igniaria* (C. Booth) Aptroot in having uniseriate asci and broadly fusiform ascospores but can be separated on the basis of ascospore features and anamorphic state. *Massarina igniaria* having ascospores with primarily median septum, lacking a sheath, and not constricted at midpoints of each cell. The anamorph of *M. igniaria* is reported as *Periconia igniaria* E.W. Mason & M.B. Ellis, of hyphomycetous fungus (Booth 1968).

5. ***Massarina fluviatilis*** Aptroot & Van Ryckegem, Nova Hedwigia 73: 162, 2001. Figs. 4, 16

Ascomata 140–220 μm high, 180–320 μm diameter, covered with brown sparse hyphae. Beak 37–50 μm long, 50–75 μm wide. Ascomal wall surface of textura prismatica, in longitudinal section 20–35 μm thick at the sides, composed

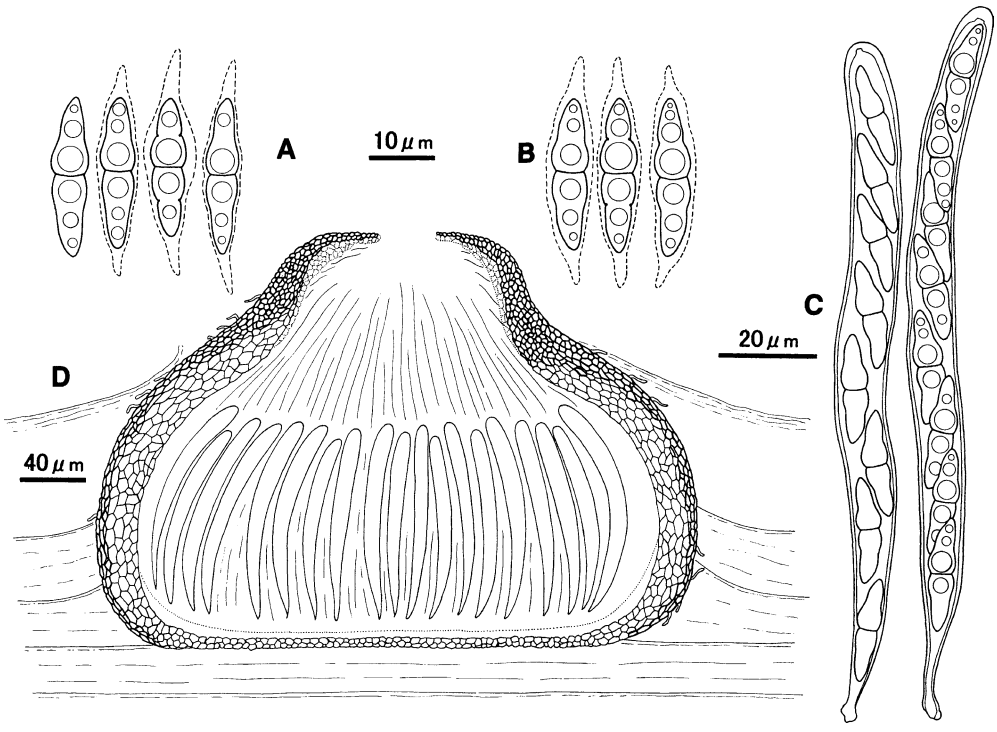



**Fig. 11.** *Massarina uniserialis*. **A**, **B** Ascospores; **C** Asci; **D** Ascoma in longitudinal section. (**A**, **C**, **D** HHUF 27563, holotype; **B** culture 4341)

of 4–6 layers of polygonal hyaline to brown 5–13 × 5–8 μm pseudoparenchyma cells. Pseudoparaphyses 1.5–2.5 μm thick. Asci 90–110 × 18–23.5 μm (mean = 99.0 × 20.2 μm, $n$ = 30), short-stalked (5–15 μm long). Ascospores 27–34 (–36) × 7–10 μm (mean = 30.5 × 8.4 μm, $n$ = 72), L/W 3.2–4.0 (mean = 3.6, $n$ = 72), broadly fusiform to ellipsoidal with rounded ends, with a septum submedian (0.51–0.55, mean = 0.53, $n$ = 72), hyaline, smooth, with a sheath 2–5 μm wide at the sides and sometimes fibrous near spore wall. Ascospores become 3-septate and brown at germination and produce germ tubes from each cell.

Cultural characteristics. Colonies on PDA, 4.4 cm in diameter after 4 weeks, Ivy (1F3) to Olive (1E3), with white irregular margin; reverse similar; no pigment is produced. On RSA, numerous ascomata were formed on the surface of rice straws after incubation for 1 month. Ascospores are similar to those found in nature, measuring 28.5–33 × 8.5–10 μm (mean = 30.7 × 9.3 μm, $n$ = 30). No anamorph was formed.

Materials examined. On twigs of an unknown woody plant: Toyohira River, riverbank, Sapporo, Hokkaido, 141°21.489′ E, 43°02.229′ N, Sept. 2, 2001, KT. 759 (HHUF 27551); KT. 760 (HHUF 27552, culture 4327, 4328).

Notes. Our collections are different from the original description of *M. fluviatilis* in some points. For instance, the asci are longer (69–82 μm long in *M. fluviatilis*), the ascospores are usually 1-septate (usually 2-septate and becoming 3-septate in the latter), and it has a woody host plant (*M. fluviatilis* occurs on leaf sheaths of *Phragmites australis*). However, we treated this fungus here as *M. fluviatilis* because the shape and size of ascospores resemble those found in the latter species. The ascospores of *M. fluviatilis* are 24–31 × 7–10 μm, broadly fusiform with rounded ends, guttulate, and with a wide mucilaginous sheath (Van Ryckegem and Aptroot 2001).

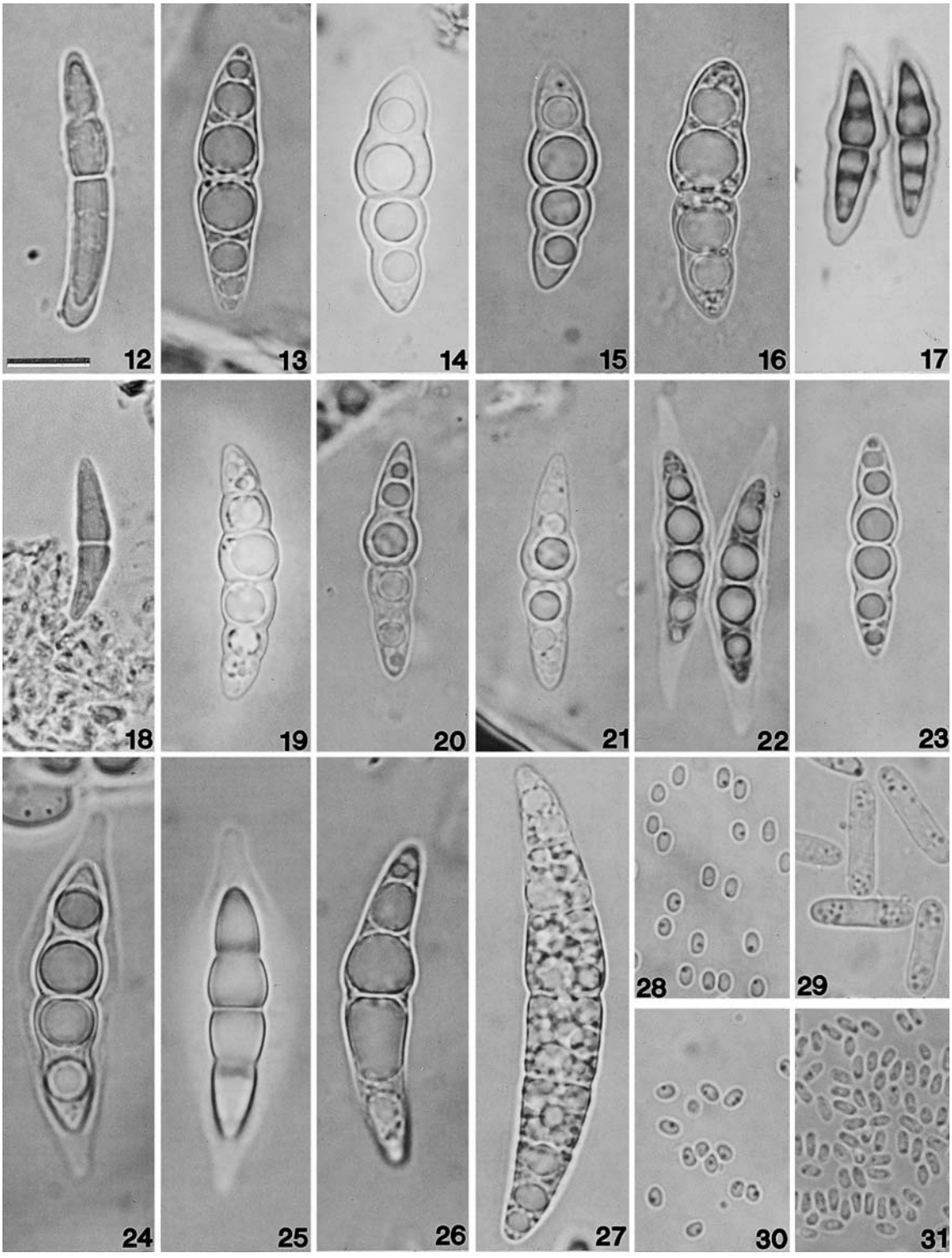
6. ***Massarina japonica*** Kaz. Tanaka & Y. Harada, sp. nov. Figs. 5, 24, 25, 33

Ascomata 240–300 μm alta, 360–450 μm diam, dispersa, aliquando congregata, immersa vel erumpentia, globosa vel subglobosa. Rostrum breve, centrale, ex cellulis brunneis 5–10 μm diam compositum. Periphyses hyalinae. Paries ascomatis "textura angularis," 20–30 μm crassus, ex cellulis brunneis prismaticis vel rectangulatis 7–18 × 3–5 μm compositus. Pseudoparaphyses cellulosae, copiosae, ~1.5 μm latae, septatae, ramificantes. Asci 122.5–153 (–170) × 12.5–17 μm, bitunicati, copiosi, cylindrici, apice rotundati, cum stipite 5–20 μm longi, 8-sporo. Ascosporae (26–) 29–33.5 × 6–9 μm, fusiformes, apicibus aliquantum acutis, rectae vel leviter curvatae, medio 1-septatae, hyalinae, guttulatae, laeves, cum vagina gelatinosa.

Holotypus. HHUF 27553.

Etymology. In reference to the place of collection.

Ascomata 240–300 μm high, 360–450 μm diam, numerous, scattered to sometimes in groups, immersed or becoming erumpent, globose to subglobose with a flattened base, covered with brown sparse hyphae. Beak short, central, of subglobose to polygonal 5–10 μm diameter thick-walled dark brown cells, with hyaline periphyses. Ascomal wall of textura angularis in surface view. Wall in longitudinal section 20–30 μm thick at the sides, composed of 6–8 layers of prismatic to rectangular brown cells 7–18 × 3–5 μm; at the base, 7–13 μm thick, composed of 4–6 layers of subglobose hyaline cells 4–7 μm in diameter. Pseudoparaphyses cellular, numerous, ~1.5 μm thick, septae, branched. Asci 122.5–153 (–170) × 12.5–17 μm (mean = 139.3 × 14.4 μm, $n$ = 50),




**Figs. 12–31.** Ascospores (**12–27**) and conidia (**28–31**) of *Massarina* spp. **12** *M. arundinacea* (YAM 22555); **13** *M. arundinariae* (HHUF 27547); **14**, **15** *M. constricta* (**14** HHUF 27549; **15** HHUF 27550, holotype); **16** *M. fluviatilis* (culture 4327); **17** *M. rubi* (HHUF 27558); **18** *M. ryukyuensis* (YAM 21940, holotype of *Metasphaeria ryukyuensis*); **19** *M. scirpina* (culture 4337); **20**, **21** *M. submediana* (HHUF 27562, holotype); **22**, **23** *M. uniserialis* (**22** HHUF 27563, holotype, right spore inverted; **23** culture 4341); **24**, **25** *M. japonica* (HHUF 27553, holotype); **26** *M. peerallyi* (HHUF 27557); **27** *M. bambusina* (culture 4321); **28** *M. constricta* (culture 4323); **29** *M. rubi* (culture 4335); **30** *M. submediana* (culture 4339); **31** *M. peerallyi* (culture 4333); **17**, **19**, **22**, **25** in blue ink. *Bar* (in **12**) 10 μm (all same magnification)

wider at the middle part, bitunicate, numerous, basal, cylindrical, rounded at the apex, apical chamber present, short-stalked (5–20 μm long), with 8 overlapping biseriate ascospores above, reducing to 1 below. Ascospores (26–) 29–33.5 × 6–9 μm (mean = 31.1 × 7.9 μm, *n* = 60), L/W 3.7–4.4 (mean = 4.0, *n* = 60), fusiform with somewhat acute ends, straight or slightly curved, 1-septate, median (0.48–0.51, mean = 0.50, *n* = 31), strongly constricted at the septum, slightly constricted at the midpoint of each cell, upper hemisphere broader, hyaline, usually with 2 fine guttules in each cell, smooth, with a sheath 2–5 μm wide at the sides, 4–7 μm at the ends, sometimes with inner spinelike structures at both ends. Senescent ascospores 3-septate, pale brown, echinulate. Ascospores germinating from one or both end cells.

Cultural characteristics. Colonies on PDA 1.2 cm in diameter after 4 weeks, Khaki (4D5) to Olive Brown (4E6) with irregular margin; reverse similar; no pigment is produced. On RSA, numerous ascomata were formed on the surface of rice straws within 1 month. Ascospores are similar to those found in nature, measuring 29–34 × 8–9 μm (mean = 31.7 × 8.2 μm, *n* = 20).

Materials examined. On twigs of an unknown woody plant: Toyohira River, riverbank, Sapporo, Hokkaido, 141°21.489′ E, 43°02.229′ N, Sept. 2, 2001, KT. 757-1 (HHUF 27553, holotype, culture 4329, 4330). Dried culture specimens: grown on culms of *Oryza sativa* L., from culture 4329 (HHUF 27554, 27555).

Notes. There are six *Massarina* species that produce ascospores having a bipolar elongated sheath or appendages like our fungus, i.e., *M. armatispora* K.D. Hyde & al., *M. bipolaris* K.D. Hyde, *M. fronsisubmersa* K.D. Hyde, *M. ingoldiana* Shearer & K.D. Hyde, *M. lunispora* K.D. Hyde & Goh, and *M. proprietunicata* K.M. Tsui & al. (Tsui et al. 1999). Among these, our fungus is most similar to *M. fronsisubmersa* and *M. bipolaris* in possessing similarly shaped ascospores and forming inner spinelike structures at the ends of the spore (Hyde 1994, 1995b; Hyde and Aptroot 1998). *Massarina japonica*, however, can be separated from *M. fronsisubmersa* by larger ascospores [(26–) 29–33.5 × 6–9 μm vs. 23–28 × 4–7 μm] and a shorter bipolar sheath (4–7 μm long vs. 8–18 μm long; Hyde 1994). It is also distinguished from *M. bipolaris* in that our fungus has a thin membrane like sheath around the spore wall, which is 2–5 μm wide at the sides, whereas in *M. bipolaris* the sheath is appendage like and formed only at the spore poles, 4–7 (–12) μm long. Also, the dimensions of the asci differ between the two taxa [122.5–153 (–170) × 12.5–17 μm in *M. japonica*, vs. 80–110 × 14–20 μm in *M. bipolaris*; Hyde 1994, 1995b].

7. ***Massarina peerallyi*** K.D. Hyde & Aptroot, Nova Hedwigia 66: 495, 1998. Figs. 6, 26, 31, 34

Ascomata 350–550 μm high, (430–) 600–700 μm diameter (including the rim), locule 400–450 μm diameter, with brown hyphae 2–3 μm thick. Beak 85–130 μm long, 75–130 μm wide, clypeate, with hyaline periphyses. Ascomal wall 25–50 μm thick at the base, composed of subglobose brown 3–8 μm diameter cells; wedge-shaped at the sides, up to 125 μm thick, composed of vertically orientated angular brown cells, 5–8 × 2–5 μm; upper part of polygonal brown 5–10 × 3–5 μm cells. Pseudoparaphyses 1.5–2 μm thick. Asci 100–144 × 17–22 μm, short-stalked (12–22 μm). Ascospores 31–43 × 7–10.5 (–11.5) μm (mean = 37.4 × 9.0 μm, *n* = 61), L/W 3.5–4.9 (mean = 4.2, *n* = 54), fusiform, with a septum supramedian (0.44–0.49, mean = 0.47, *n* = 57), hyaline, smooth, with a sheath 1–3 μm wide. Senescent spores 3-septate, pale brown. Ascospores become 1–3-septate at germination, giving rise to germ tubes from each cell.

Cultural characteristics. Colonies on PDA 1.7–4.7 cm in diameter after 4 weeks (growth rate is variable depending on the isolate), Olive Brown (4E4); reverse similar; no pigment is produced. On RSA, *Pleurophomopsis* Petr.-like conidiomata were formed on the surface of rice straws within 3 months. Conidiomata 150–200 μm high, 130–250 μm diameter, subglobose, sometimes gregarious. Beak 25–50 μm long, 35–45 μm wide, papillate. Wall in longitudinal section 17–25 μm wide at the sides, composed of 4–7 layers of polygonal to subglobose 3–8 × 2–4 μm cells. Conidiophores 9–30 × 1.5–3 μm, cylindrical, branched, formed all around the locular cavity. Conidiogenous cells phialidic. Conidia 3–3.5 × 1.5–2 μm, subglobose, hyaline, smooth.

Materials examined. On twigs of unknown woody plants: Nairo River, riverbank, Kafuka, Isl. Rebun, Hokkaido, 141°03.223′ E, 45°23.196′ N, Aug. 30, 2001, KT. 732 (HHUF 27556, culture 4331, 4332); Akagawa, riverbank, Kisakata, Akita, Sept. 23, 2001, KT. 788 (HHUF 27557, culture 4333, 4334).

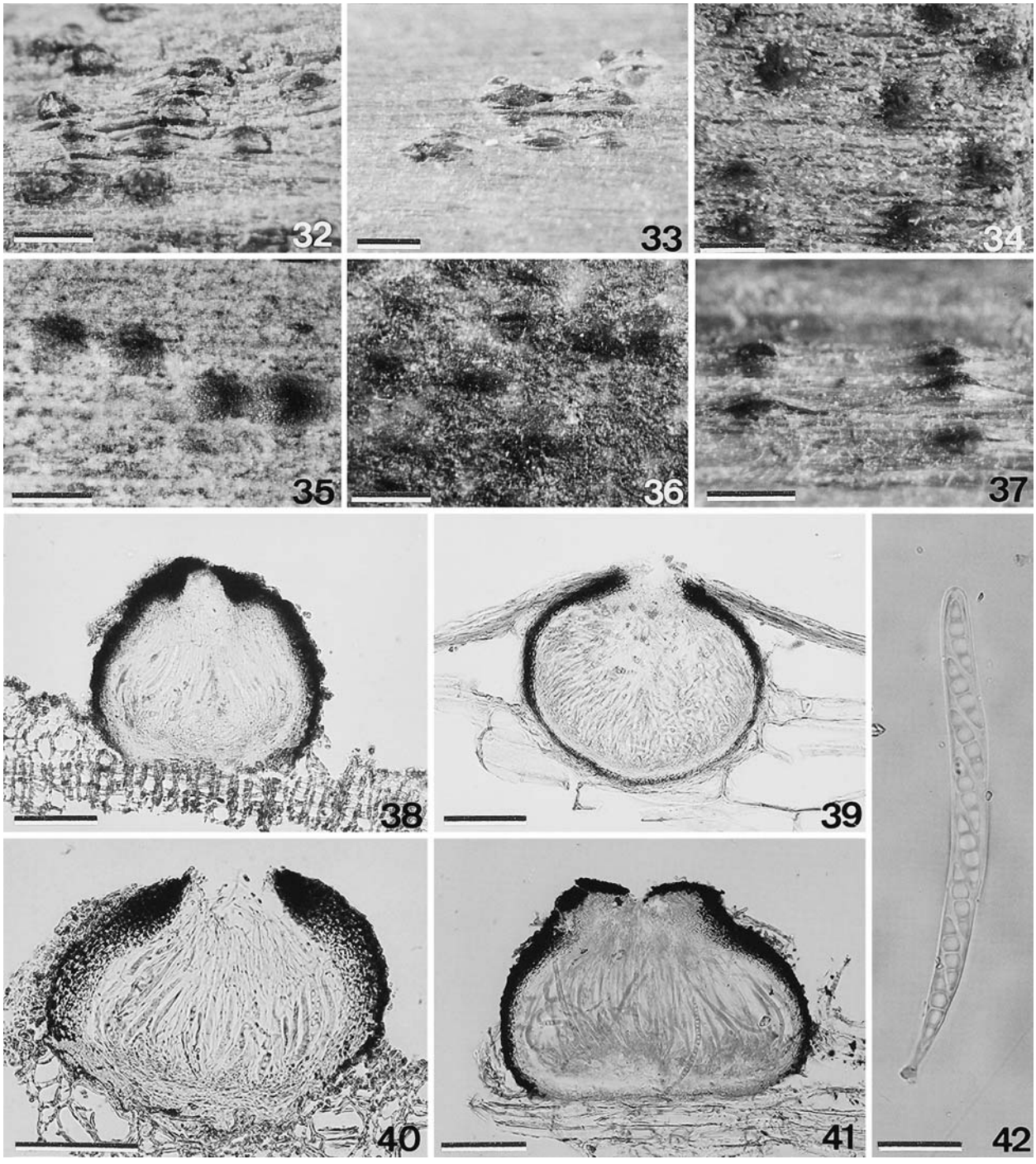
Notes. We identified these materials as *M. peerallyi*, although the dimensions of ascomata in our collections are somewhat larger than those for *M. peerallyi* (Hyde and Aptroot 1998).

8. ***Massarina rubi*** (Fuckel) Sacc., Syll. Fung. 2: 155, 1883. Figs. 7, 17, 29, 39

≡*Massaria rubi* Fuckel, Jahrb. Nass. Verh. Naturkd. 25–26: 303, 1871.

For other synonyms, see Aptroot (1998). See also Liew et al. (2002).

Ascomata 230–310 μm high, 280–350 μm diameter. Beak 50–75 μm long, 70–100 μm wide, with a brown clypeus-like growth of mycelium in the epidermis, composed of dark brown subglobose 5–10 μm diameter cells. Ascomal wall surface a textura angularis of cells 5–15 μm diameter; in longitudinal section 7–13 μm thick at the sides, composed of 3–4 layers of polygonal to rectangular 7–13 × 3–5 μm cells; at the base, of 5–8 μm diameter hyaline cells. Pseudoparaphyses 2–2.5 μm thick. Asci (67–) 74–90 (–100) × 9–12.5 μm (mean = 81.3 × 10.7 μm, *n* = 48), short-stalked (3–10 μm long). Ascospores (17.5–) 19–23 (–25) × 4–6 μm (mean = 20.6 × 4.8 μm, *n* = 50), L/W 3.6–4.8 (mean = 4.2, *n* = 45), fusiform, with a septum supramedian (0.46–0.50, mean = 0.48, *n* = 40), smooth, with a centrally constricted conspicuous sheath; sheath 1–2 μm wide above the septum, 2–5 μm long at both ends. Senescent spores 1-septate, pale brown, echinulate.




**Figs. 32–42.** Ascomata on host surface (**32–37**), in longitudinal section (**38–41**), and ascus (**42**) of *Massarina* spp. **32** *M. constricta* (HHUF 27549); **33** *M. japonica* (HHUF 27553, holotype); **34** *M. peerallyi* (HHUF 27556); **35** *M. ryukyuensis* (YAM 21940, holotype of *Metasphaeria ryukyuensis*); **36** *M. bambusina* (YAM 21809, holotype of *Metasphaeria tuberuculosa*); **37** *M. uniserialis* (HHUF 27563, holotype); **38** *M. constricta* (HHUF 27550, holotype); **39** *M. rubi* (HHUF 27558); **40** *M. submediana* (HHUF 27562, holotype); **41**, **42** *M. uniserialis* (HHUF 27563, holotype; **42** in blue ink). *Bars* **32–37** 500 μm; **38–41** 100 μm; **42** 25 μm

Cultural characteristics. Colonies on PDA 4.5 cm in diameter after 4 weeks, white to Putty (4E2) with irregular margin; reverse similar; no pigment is produced (but yellowish pigment is formed in V8A). On RSA, a *Coleophoma* Höhn.-like anamorph was formed on the surface of rice straws within 3 months. Conidiomata 170–250 μm diameter, subglobose. Wall of textura angularis in surface view, in longitudinal section 12–15 μm wide at the sides, of 3–5 layers of polygonal 5–13 × 5–8 μm brown pseudoparenchyma cells. Conidiophores doliiform to lageniform, 7–17 × 3.5–5 μm, formed all around the locular cavity. Conidiogenous cells phialidic. Conidia (9–) 11.5–18 (–21.5) × 3–4.5 μm (mean = 14.4 × 3.4 μm, $n$ = 31), cylindrical, hyaline, smooth.

Material examined. On stems of an unknown polygonaceous plant: Nairo River, riverbank, Kafuka, Isl. Rebun, Hokkaido, 141°03.223′ E, 45°23.196′ N, Aug. 30, 2001, KT. 731 (HHUF 27558, culture 4335, 4336).

Notes. This material showed good matches to the description of *M. rubi* [≡*Lophiostoma rubi* (Fuckel) E.M.Y. Liew, Aptroot & K.D. Hyde] provided by Aptroot (1998), except for cultural characteristics. *Massarina rubi* forms dark-colored colonies (Aptroot 1998; Taylor et al. 2001), while our fungus colonies are whitish with bright yellowish pigment. The anamorph of *Massarina polymorpha* (Rehm) Sacc., which is synonymous with *M. rubi*, is *Dendrophoma* Sacc.-like (conidia are 2–4 × 2 μm; Bose 1961; Sivanesan 1984), whereas in our fungus a *Coleophoma*-like anamorph was formed in culture. There remain some doubts, but we provisionally identified this material as *M. rubi*.

9. ***Massarina ryukyuensis*** (I. Hino & Katum.) Kaz. Tanaka & Y. Harada, comb. nov. Figs. 8, 18, 35

Basionym. *Metasphaeria ryukyuensis* I. Hino & Katum., Bull. Fac. Agric. Yamaguchi Univ. 15: 511, 1964.

Ascomata 100–140 μm high, 400–500 μm diameter, locule 225–280 μm diameter, numerous, scattered to clustered, immersed in culm, subglobose with a flattened base. Beak none or short papillate, central, composed of subglobose to polygonal dark brown 2–4 μm diameter cells around the ostiole. Ascomal wall in longitudinal section, composed of parallel rows of rectangular to polygonal brown 2–7 × 5–12 μm cells at the rim, poorly developed and thinner at the base. Pseudoparaphyses cellular, septate, branched. Asci 59–80 × 9.5–12 μm, with a short stipe 5–10 μm long, 8-spored. Ascospores (17–) 19–25.5 × 4–5.5 μm (mean = 21.8 × 4.6 μm, *n* = 39), L/W 4.2–5.3 (mean = 4.8, *n* = 39), fusiform, submedian (0.52–0.58, mean = 0.54, *n* = 37), hyaline, smooth, with a thin inconspicuous sheath.

Cultural characteristics. Not examined.

Material examined. On culms of *Pleioblastus linearis* (Hack.) Nakai: Motobu, Okinawa, July 19, 1961, I. Hino (YAM 21940, holotype of *Metasphaeria ryukyuensis*).

Notes. *Massarina ryukyuensis* is only known from the type material. This species is here placed in the genus *Massarina* because it has an ascomal wall composed of darker cells around the ostiole and hyaline 1-septate fusiform ascospores. According to the key in Aptroot (1998), it most resembles *Massarina rubi* (Fuckel) Sacc. in ascospore size. *Massarina ryukyuensis*, however, differs from *M. rubi* in that it has submedian rather than supramedian ascospores.

10. ***Massarina scirpina*** (G. Winter) Kaz. Tanaka & Y. Harada, comb. nov. Figs. 9, 19

Basionym. *Leptosphaeria scirpina* G. Winter, Hedwigia, 11: 146, 1872.

For other synonyms, see Shoemaker and Babcock (1989).

Ascomata 140–210 μm high, 140–250 (–400) μm diameter, scattered to clustered, immersed, globose to subglobose with a flattened base, with sparse, brown, smooth, septate mycelium on upper part of ascoma. Beak none or short papillate, 30–50 μm long, 35–50 μm wide, with black clypeus formed around the beak, without periphyses. Ascomal wall of textura angularis in surface view; in longitudinal section 7–10 μm thick at the side, 0–5 μm thick at the base, of 3–4 layers of polygonal to rectangular, hyaline to pale brown 5–13 × 1.5–2.5 μm pseudoparenchyma cells, but darker and more compact around the beak. Pseudoparaphyses 2–3 μm thick and broader at the base. Asci 80–132.5 × 13–20.5 μm (mean = 103.9 × 16.8 μm, *n* = 76), with a short stipe of 5–17 μm (mean = 10 μm, *n* = 39), (4) 8-spored, biseriate above and uniseriate below. Ascospores 27.5–36 (–38.5) × 6–10 μm (mean = 31.9 × 7.8 μm, *n* = 134), L/W 3.5–5.1 (mean = 4.1, *n* = 134), fusiform, 5(–7)-septate (2 + 1 + 2 or 3 + 1 + 3), submedian (0.50–0.55, mean = 0.52, *n* = 134), hyaline to pale green, smooth, provided with a gelatinous sheath 2.5–4 μm wide, widest around the enlarged cell or constricted at the primary septum. Senescent ascospores yellow to brown, minutely echinulate.

Cultural characteristics. Colonies on PDA 1.5 cm in diameter after 4 weeks, wetty, Beige (4C3); reverse similar; no pigment is produced. On RSA, numerous ascomata were formed on the surface of rice straws after incubation for 1 month. Ascospores are similar to those found in nature, measuring 29–33 × 7–8 μm (mean = 30.8 × 7.5 μm, *n* = 20). No anamorph was formed.

Materials examined. On culms of *Dactylis glomerata* L.: campus of Hirosaki University, Hirosaki, Aomori, 140°28′ E, 40°35′ N, June 13, 2001, KT. 543 (HHUF 27559); July 20, 2001, KT. 574 (HHUF 27560, culture 4337); Oct. 1, 2001, KT. 793 (HHUF 27561, culture 4338).

Notes. This species has frequently been reported and placed in various genera, such as *Leptosphaeria* Ces. & De Not. (Müller 1950; Dennis 1978; Ellis and Ellis 1985; Holm 1952), *Metasphaeria* Sacc. (Eriksson 1967), and *Trichometasphaeria* Munk (Holm 1957). Recently, Leuchtmann (1984) transferred it to the genus *Massariosphaeria* (E. Müll.) Crivelli, and this placement was supported by Shoemaker and Babcock (1989). This species, however, does not fit well in the genus *Massariosphaeria* (or *Chaetomastia* (Sacc.) Berl.) because it has hyaline, thin-walled, submedian, symmetrically septate ascospores, unlike the brown, thick-walled, supramedian, asymmetrically septate ascospores found in *Massariosphaeria phaeospora* (E. Müll.) Crivelli, the type species of the genus (Barr 1989). We consider that the fungus has more affinity to *Massarina* than to *Massariosphaeria* or *Trichometasphaeria* because of features of its ascomata and ascospores. Thus, a new combination is proposed here.

*Massarina scirpina* occurs on various herbaceous plants, such as *Carex*, *Molinia*, *Schoenoplectus*, and *Scirpus* (Ellis and Ellis 1985; Holm 1957) and may be cosmopolitan. It is similar to *Massarina lonicerae* S.K. Bose & E. Müll. (1967), which also has 5(–7)-septate ascospores, but differs from the latter by having small ascospores (32–49 × 9–12 μm in *M. lonicerae*).

11. ***Massarina submediana*** Kaz. Tanaka & Y. Harada, sp. nov. Figs. 10, 20, 21, 30, 40

Ascomata 170–240 μm alta, 240–320 μm diam, dispersa, erumpentia, depresso-globosa, glabra. Rostrum nullum vel papillatum, centrale, ex cellulis brunneis 5–10 μm compositum. Periphyses hyalinae, pauculae. Paries ascomatis "textura angularis," 20–35 μm crassus, ex cellulis rectangulatis vel polygonis 5–20 × 2–8 μm compositus. Pseudoparaphyses cellulosae, copiosae, aliquantum tortuosae, 1.5 μm latae, septatae, ramificantes et anastomosantes. Asci 92–120 × 10.5–13.5 μm, bitunicati, copiosi, cylindrici vel clavati, apice rotundati, cum stipite 10–16 μm longo, 8-spori. Ascosporae 24–31.5 × 5–7 μm, fusiformes, rectae vel leviter curvatae, 1-septatae, septo submedio, hyalinae, guttulatae, laeves, cum vagina gelatinosa.

Holotypus. HHUF 27562.

Etymology. In reference to the submedian primary septum of ascospores.

Ascomata 170–240 μm high, 240–320 μm diameter, scattered, erumpent, depressed globose, glabrous, assosiated with a purple coloration under the base of ascomata. Beak none or short papillate, central, with sparse short periphyses, wall ~40 μm wide, of subglobose to polygonal thick-walled dark brown 5–10 μm cells. Ascomal wall of textura angularis in surface view; in longitudinal section 20–35 μm thick at the sides, composed of 7–9 layers of rectangular to polygonal 5–20 × 2–8 μm cells, outer zone of dark brown thick-walled, inner zone of hyaline thin-walled; at the base, 7–13 μm thick, flattened and poorly developed. Pseudoparaphyses cellular, numerous, somewhat tortuous, 1.5 μm thick, septate, branched, and anastomosed. Asci 92–120 × 10.5–13.5 μm (mean = 106.1 × 11.7 μm, $n$ = 21), bitunicate, numerous, basal, cylindrical to clavate, apex rounded, with apical chamber, short-stalked 10–16 μm long, with 8 biseriate ascospores. Ascospores 24–31.5 × 5–7 μm (mean = 27.1 × 6.2 μm, $n$ = 52), L/W 3.8–5.3 (mean = 4.4, $n$ = 52), fusiform, straight or slightly curved, 1-septate, submedian (0.50–0.55, mean = 0.52, $n$ = 47), strongly constricted at the septum, upper hemisphere broader, hyaline, with guttules, smooth, with a thin sheath, 1–2 μm wide at the sides, 3–7 μm long at both ends.

Cultural characteristics. Colonies on PDA 5.8 cm in diameter after 4 weeks, white to Yellowish White (3A2), slightly radiate, with somewhat irregular margin; reverse similar; no pigment is produced (but in V8A, pinkish pigment is produced). On RSA, *Pleurophomopsis*-like conidiomata were formed on the surface of rice straws within 1 month. Conidiomata 60–150 μm diameter, subglobose, single or in groups, unilocular. Conidiophores 3–12 (–17) × 2–4 μm, cylindrical, branched. Conidiogenous cells phialidic. Conidia 2–3.5 × 1.5–2 μm, globose to subglobose, hyaline, smooth. Sometimes ascomal initials were found, which failed to mature within 4 months.

Materials examined. On twigs of an unknown woody plant: Oowasawa River, riverbank, Kadoke, Hirosaki, Aomori, 140°30.532′ E, 40°34.276′ N, Oct. 14, 2001, KT. 808 (HHUF 27562, holotype, culture 4339, 4340).

Notes. This collection would key out to *Massarina aquatica* J. Webster, which also has ascospores of similar dimensions. However, our fungus is distinguished from the latter by usually having a bipolar elongated ascospore sheath. The primary septum is submedian in our fungus but supramedian in *M. aquatica* (Aptroot 1998). Also, *M. submediana* formed a coelomycetous anamorph, whereas in *M. aquatica* a hyphomycetous anamorph, *Tumularia aquatica* (Ingold) Descals & Marvanová, has been reported (Webster 1965, as *Pyricularia aquatica*).

12. ***Massarina uniserialis*** Kaz. Tanaka & Y. Harada, sp. nov. Figs. 11, 22, 23, 37, 41, 42

Ascomata 250–300 μm alta, 230–380 μm diam, immersa vel erumpentia, subglobosa. Rostrum 60–80 μm longum, centrale, ex cellulis brunneis 3–5 μm compositum. Periphyses hyalinae. Paries ascomatis "textura prismatica," 25–35 μm crassus, ex cellulis polygonis 5–13 × 4–5 μm compositus. Pseudo-paraphyses cellulosae, copiosae, 1–1.5 μm latae, septatae, ramificantes et anastomosantes. Asci (116–) 122–155 (–165) × 8.5–11 μm, bitunicati, cylindrici, apice rotundati, cum stipite 7–18 μm longo, 8-spori. Ascosporae 21–26.5 × 5–7 μm, uniseriales, fusiformes, rectae vel leviter curvatae, 1-septatae, septo supramedio vel medio, constrictae ad septum, hyalinae, guttulatae, laeves, cum vagina gelatinosa.

Holotypus. HHUF 27563.

Etymology. In reference to the ascospore arrangement in ascus.

Ascomata 250–300 μm high, 230–380 μm diameter, staining the host tissue reddish-purple, scattered, immersed to erumpent, subglobose with a flattened base, with somewhat slitlike ostiole. Beak 60–80 μm long, central, composed of subglobose to polygonal dark brown thick-walled 3–5 μm diameter cells, with hyaline periphyses. Ascomal wall of textura prismatica in surface view; wall in longitudinal section 25–35 μm thick at the sides, composed of 4–6 layers of polygonal hyaline 5–13 × 4–5 μm pseudoparenchyma cells, outer layers of dark brown compressed cells; flattened and poorly developed at the base, of polygonal to subglobose hyaline 3–5 μm diameter cells. Pseudoparaphyses cellular, numerous, 1–1.5 μm thick, septate, branched, and anastomosed. Asci (116–) 122–155 (–165) × 8.5–11 μm (mean = 138.6 × 9.7 μm, $n$ = 32), basal, cylindrical, rounded at the apex, with a shallow apical chamber, short-stalked (7–18 μm long), with 8 uniseriate ascosproes. Ascospores 21–26.5 × 5–7 μm (mean = 23.8 × 6.0 μm, $n$ = 32), L/W 3.5–4.2 (mean = 4.0, $n$ = 32), fusiform, straight or slightly curved, 1-septate, slightly supramedian to median (0.48–0.50), constricted at the septum, weakly constricted at the midpoint of each cell, upper hemisphere broader, hyaline, with 2–3 guttules in each cell, smooth, with a sheath, ~1 μm at the sides, 5–9 μm at both ends.

Cultural characteristics. Colonies on PDA 2.1 cm in diameter after 4 weeks, Violet Brown (11E6); reverse similar; red to purple pigment is produced (on V8A pinkish pigment). On RSA, numerous ascomata were formed on the surface of rice straws within 2 months. Ascospores

resemble those found on the host, measuring 23–27 × 6–6.5 μm (mean = 24.0 × 6.2 μm, *n* = 30).

Materials examined. On stems of an unknown polygonaceous plant: Oowasawa River, riverbank, Kadoke, Hirosaki, Aomori, 140°30.532′ E, 40°34.276′ N, Aug. 25, 2001, KT. 715 (HHUF 27563, holotype, culture 4341, 4342). Dried culture specimens: grown on culms of *Oryza sativa* L., from culture 4341 (HHUF 27564, 27565).

Notes. The ascospores of *M. uniserialis* are usually arranged in one row. This feature is remarkable for the genus because most species of *Massarina* have biseriate ascospores (Aptroot 1998). This species is closest to *M. japonica* in gross ascospore morphology. However, the ascospores of *M. uniserialis* are consistently smaller (21–26.5 × 5–7 μm compared to (26–) 29–33.5 × 6–9 μm in *M. japonica*), and also the asci are more slender (8.5–11 μm wide vs. 12.5–17 μm wide in the latter).

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