

FULL PAPER

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## Notes on various plant-inhabiting fungi from Hachijo Island, Tokyo (1)

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**Abstract** Among plant-inhabiting fungi collected in June 2001 and in September 2002 on Hachijo Island, Tokyo, four fungi are described in this article. They consist of two new species, namely *Stagonospora hachijoensis* on *Miscanthus sinensis* var. *condensatus* and *Ascochyta ixorae* on *Ixora chinensis*, and two fungi newly added to the Japanese mycoflora, namely *Discosiella cylindrospora* on *Callistemon speciosum* and *Robillarda sessilis* on *Parthenocissus tricuspidatus*.

**Key words** Hachijo Island · Mycoflora · New species · New to Japan · Plant-inhabiting fungi

During surveys of the mycoflora of Hachijo Island, carried out mainly June 5–7, 2001 and September 24–26, 2002, many plant-inhabiting fungi were collected by the authors. Some were found to be new species, or at least new to Japan. In this report, two fungi are described as new species, namely *Stagonospora hachijoensis* J. Takeuchi et Tak. Kobay. on *Miscanthus sinensis* var. *condensatus* and *Ascochyta ixorae* Tak. Kobay. et Yasu. Ono on *Ixora chinensis*. The second two, *Discosiella cylindrospora* Sydow et P. Sydow on *Callistemon speciosum* and *Robillarda sessilis* (Sacc.) Sacc. on *Parthenocissus tricuspidatus*, are new additions to the Japanese mycoflora.

### Introduction

Hachijo Island is located about 290km south of Tokyo, at 33° N and 140° E (Fig. 1). The climate of the island is subtropical. Two peaks, Mt. Hachijo-fuji and Mt. Mihara, rise in the northern and southern parts of the island, respectively. The former is 854m above sea level and the latter is 701m above sea level.

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### Description

1. *Stagonospora hachijoensis* J. Takeuchi et Tak.  
Kobayashi, sp. nov. Fig. 2a–f

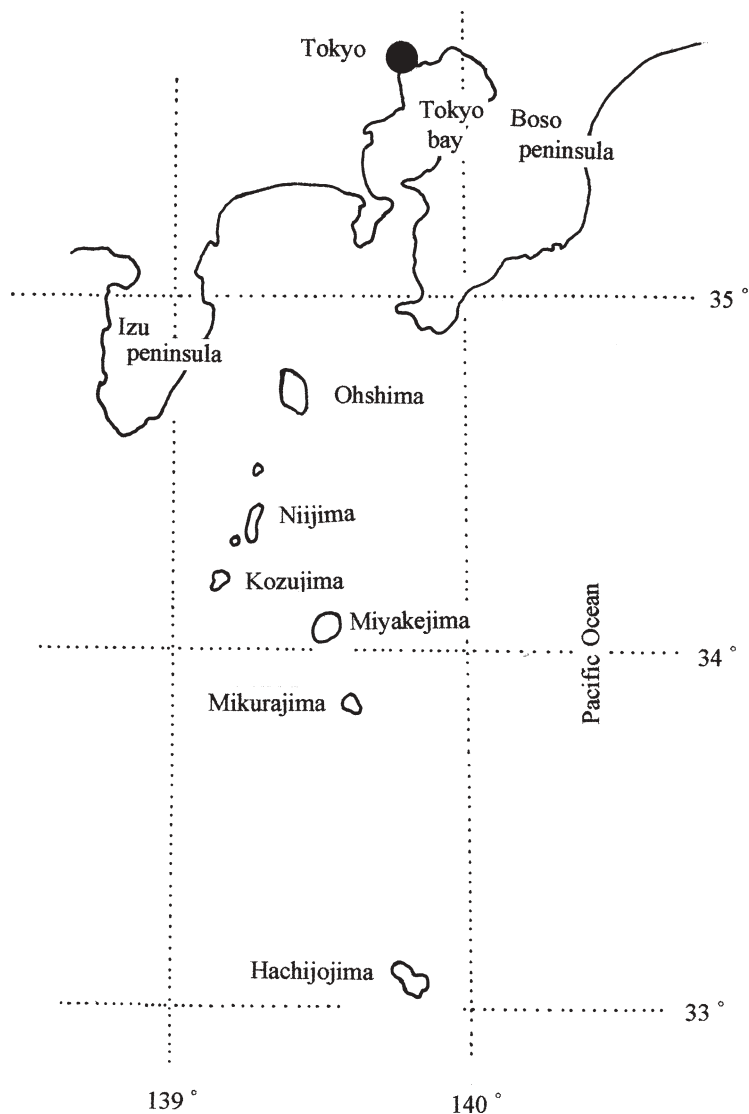
Previous record: *Stagonospora* sp. on *Miscanthus* sensu  
Takeuchi et al. (2002).

Maculis in foliis vivis fusoides, primo purpureo-brunneis, 5–10mm longis et 3–7mm latis, dein griseo-brunneis cum zonis purpureo-brunneis; pycnidiiis nigris, dispersis vel gregariis, immersis, dein erumpentibus, subglobosis, 175–315µm in diametro et 135–260µm altis; conidiophoris ampuliformibus, brevibus, hyalinis; conidiis hyalinis, cylindricis, ad apicem rotundatis, 14–29 × 2.6–4.6µm, 0–3-septatis, laevibus.

Holotypus: On living leaves of *Miscanthus sinensis* var. *condensatus* (Hack.) Makino (Japanese name: Hachijo-susuki), Ohgagoh, Hachijo-machi, Tokyo (Hachijo Island), August 15, 1999, by J. Takeuchi (TFM\*: FPH-7748). [TFM: abbreviation of the internationally registered herbarium]. Botanical Park, Ohgagoh, Hachijo-machi, Tokyo (Hachijo Island), June 6, 2001, by T. Kobayashi (TK) and Y. Ono (YO) (TFM: FPH-7760).

Leaf spots fusiform, initially purplish-brown, turning grayish-brown with a distinct purplish-brown border, 5–10mm long, 3–7mm wide. Pycnidia black, dispersed or

Fig. 1. Geographic position of Hachijo Island



gregarious, embedded beneath the epidermal layer, then erumpent breaking through the epidermis, subglobular, 175–315  $\mu\text{m}$  diameter, and 135–260  $\mu\text{m}$  high. Conidiophores ampuliform, hyaline, producing conidia holoblastically. Conidia cylindrical, hyaline, rounded at both ends, 14–29  $\times$  2.6–4.6  $\mu\text{m}$ , 0–3-septate, smooth.

Other specimens examined: On leaves of *Miscanthus sinensis* var. *condensatus*, Aogashima-mura, Tokyo (Aogashima Island), July 7, 1999, by J. Takeuchi (TFM: FPH-7749; isolate: MAFF 239158). [MAFF: abbreviation of the internationally registered culture collection]. Botanical Park, Ohgagoh, Hachijo-machi, Tokyo (Hachijo Island), June 6, 2001, by T. Kobayashi (TK) and Y. Ono (YO) (TFM: FPH-7750).

Disease name: Purple leaf spot (Murasaki-hanten-byo in Japanese).

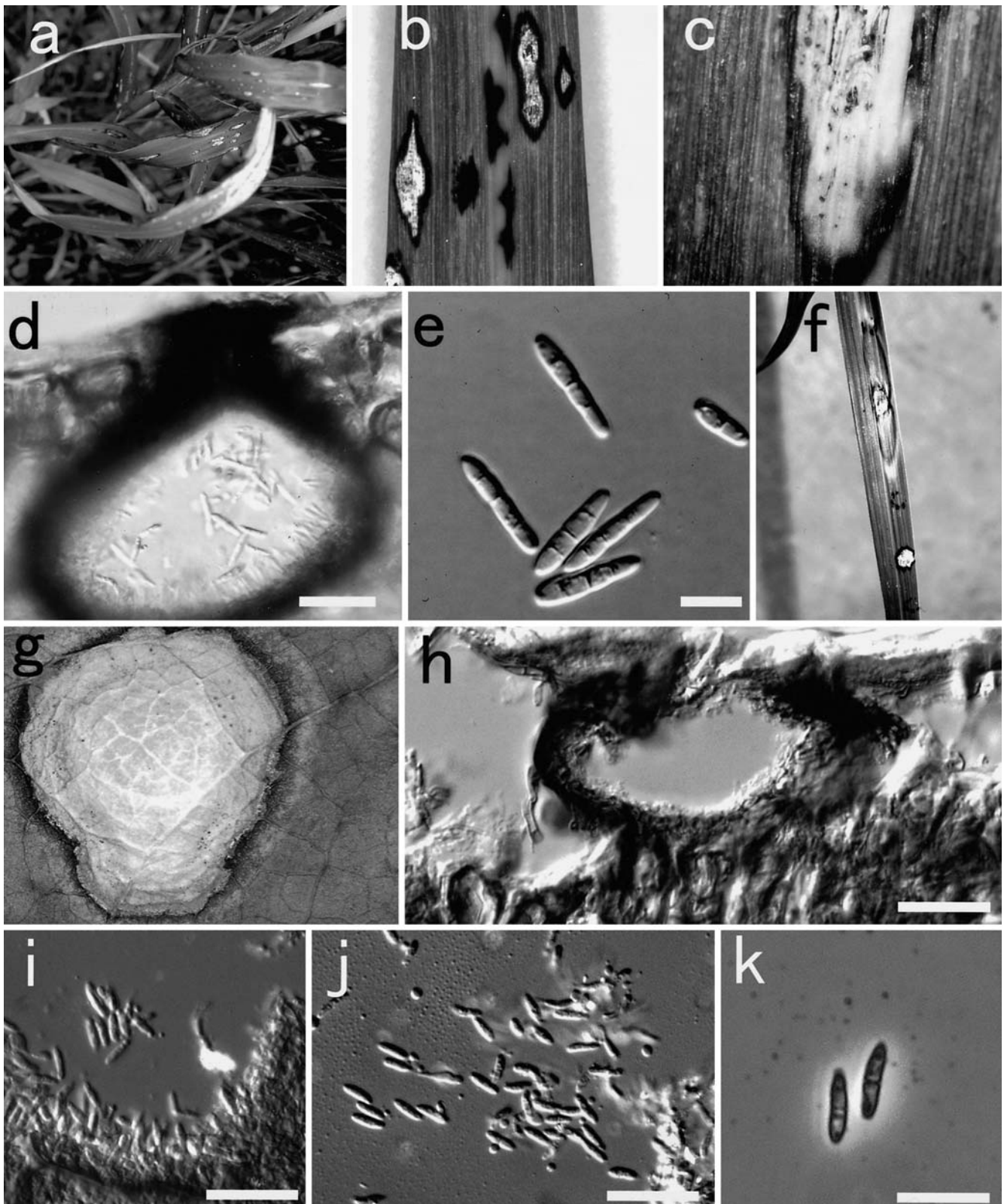
Note: This fungus causes purple leaf spots on *Miscanthus sinensis* var. *condensatus*. Isolates grown on potato dextrose agar (PDA) from a single conidium produced many pycnidia filled with abundant conidia similar to those on the host leaves. An inoculation experiment using a conidial

suspension gave positive results on *Miscanthus sinensis* var. *condensatus* (Gramineae), but negative results on *Setaria viridis* (Gramineae), *Vetiveria zizanioides* (Gramineae), *Abelmoschus esculentus* (Malvaceae), *Capsicum annuum* var. *annuum* (Solanaceae), *Hippeastrum* sp. (Amaryllidaceae), and *Narcissus* sp. (Amaryllidaceae) (Takeuchi et al. 2002). Colonies grew at temperatures from 5° to 30°C, with the best and fastest growth at 25° (Takeuchi et al. 2002). Although 491 species of *Stagonospora* have been described on various plants (Anonymous 2002), no species inhabiting *Miscanthus* plants has been found. Hence, this fungus is treated as a new species, *Stagonospora hachijoensis* J. Takeuchi et Tak. Kobayashi.

2. *Ascochyta ixorae* Tak. Kobayashi et Yasu. Ono, sp. nov.

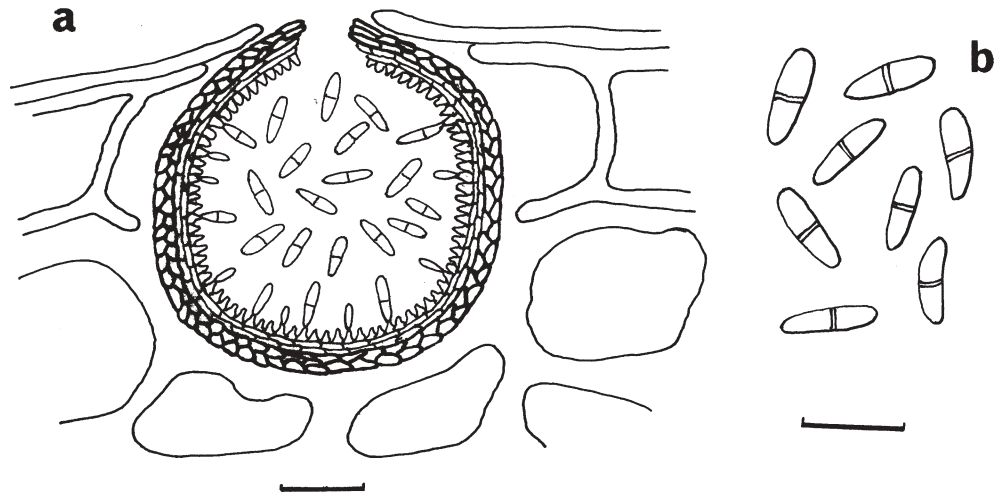
Fig. 2g–k; Fig. 3

Maculis in foliis vivis brunneis vel griseo-brunneis, subrotundatis vel ad margineum folii irregulariter semiorbicularibus, 10–20 mm in diametro; pycnidiis dispersis,



**Fig. 2.** **a–f** *Stagonospora hachijoensis*: **a** symptom on *Miscanthus csinensis* var. *condensatus*; **b** magnified symptom on a leaf; **c** pycnidial dots on a spot; **d** cross section of a pycnidium; **e** conidia; **f** Symptom on an inoculated leaf. **g–k** *Ascochyta ixorae*: **g** magnified leaf spot with pycnidial dots on *Ixora chinensis*; **h** cross section of a pycnidium; **i** a part of a pycnidium; **j** a conidial mass; **k** conidia with central transversal septum. Bars **d** 50  $\mu$ m; **h–j** 20  $\mu$ m; **e, k** 10  $\mu$ m (**e, i–k** are phase contrast)

**Fig. 3.** *Ascochyta ixorae*: **a** pycnidium and conidia; **b** conidia. Bars **a** 20  $\mu\text{m}$ ; **b** 10  $\mu\text{m}$



atro-brunneis vel nigricantibus, immersis, dein erumpentibus, globosis, 75–90  $\mu\text{m}$  in diametro, 50–100  $\mu\text{m}$  altis; conidiophoris ampulliformibus, brevibus, hyalinis; conidiis hyalinis, medio 1-septatis, oblongis vel paulo fusoideis, rectis, inaequilateralibus vel leviter curvatis, 7.5–10  $\times$  2–2.5  $\mu\text{m}$ , laevibus.

Holotypus: On living leaves of *Ixora chinensis* Lam. (Japanese name: Santanka), Hachijo-machi, Tokyo, June 6, 2001, by TK & YO.

Leaf spots brown to grayish-brown, subcircular on the leaf blade, irregularly hemispherical at the leaf margin, 10–20 mm diameter, and with scattered black pycnidia. Pycnidia blackish-brown to black, dispersed, immersed at first, then erumpent breaking through the epidermis, globular, 75–90  $\mu\text{m}$  diameter, 50–100  $\mu\text{m}$  high. Conidiophores ampulliform and hyaline. Conidia hyaline, 2-celled with a median transverse septum, oblong elliptical to somewhat fusoid, straight, inequilateral or slightly curved, 7.5–10  $\times$  2–2.5  $\mu\text{m}$  (8.6  $\times$  2.2  $\mu\text{m}$  average, l/b = 4.02), smooth.

Disease name: Brown spot (Kappan-byo in Japanese).

Note: No species of the genus *Ascochyta* has been previously described on *Ixora* spp., although about 1400 species in this genus have been recorded (Anonymous 2002). This is the first record of an *Ascochyta* on *Ixora* in Japan. The fungus is treated as a new species, *Ascochyta ixorae* Tak. Kobay. et Yasu. Ono.

3. *Discosiella cylindrospora* Syd. et P. Syd., Leafl Philip Bot 5:1546, 1912; Nag Raj, Coelomycetous anamorphs with appendage-bearing conidia: 328, 1993

Fig. 4a,b; Fig. 5

Pycnidia were produced on a leaf blade kept in a Petri dish containing a moist paper towel. No distinct spot in the area forming the pycnidia was observed. Pycnidia intraepidermal, black, subglobular, depressed, 70–125  $\mu\text{m}$  diameter, and 30–60  $\mu\text{m}$  high. Conidiophores ampulliform, hyaline. Conidia hyaline, cylindrical, 2-celled with a central transverse septum, 10–12.5  $\times$  1.8–3.7  $\mu\text{m}$  (11.6  $\times$  2.6  $\mu\text{m}$  average; l/b = 4.46), with one sticky appendage at each end.

Appendages hyaline, mucoid, straight or curved, 8–50  $\mu\text{m}$  in length.

Specimen examined: On dead leaf of *Callistemon speciosum* DC. (Japanese name: Burasshinoki), Hachijo Botanical Park, Ohgagoh, Hachijo-machi, Tokyo (Hachijo Island), June 6, 2001, by TK & YO.

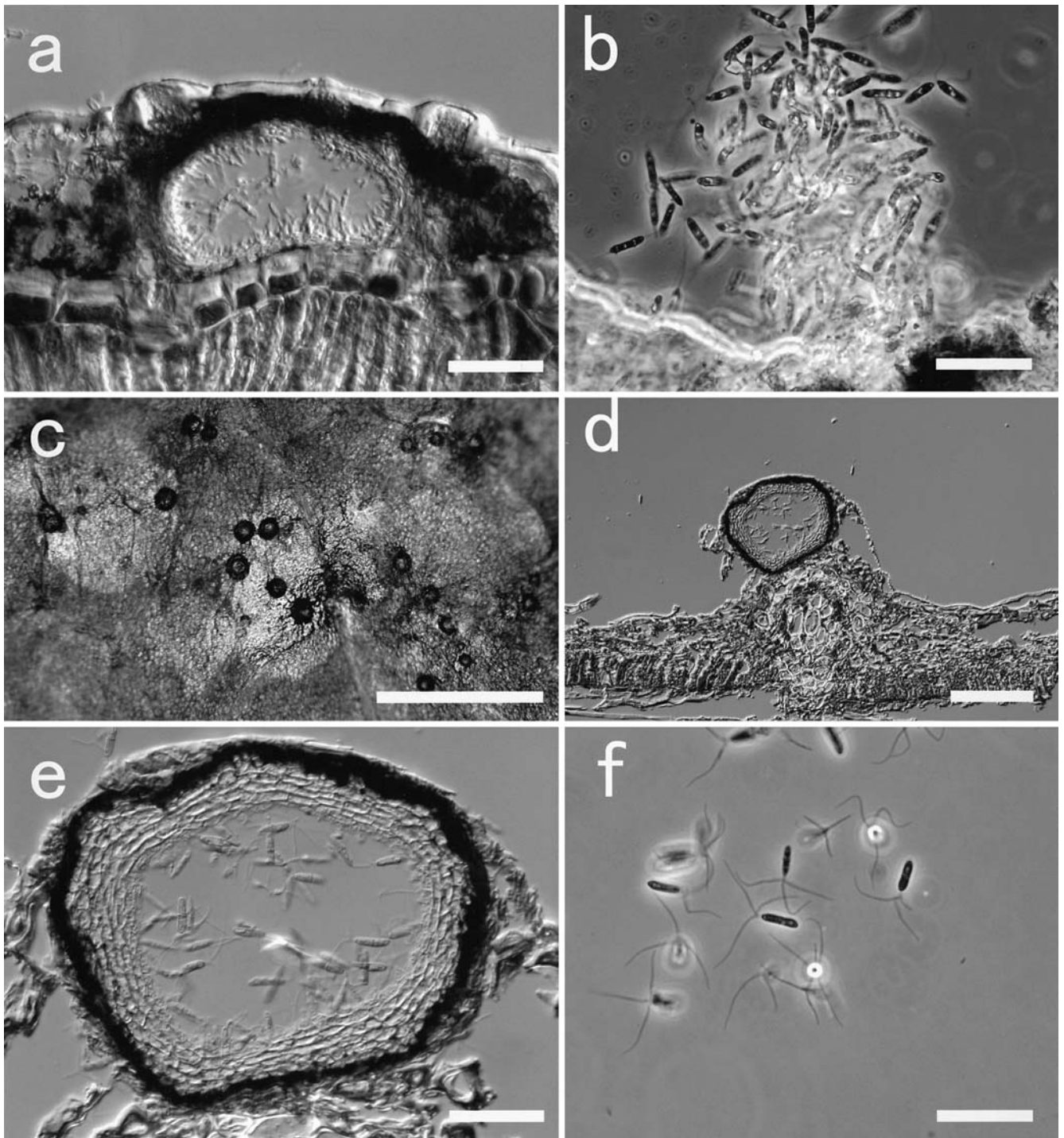
Note: The genus *Discosiella* was established by Sydow & P. Sydow (1912), based on the type species of the genus, *D. cylindrospora* inhabiting *Geranium subglomerulatum* collected in Palawan Island, Philippines. Since that time, only six species have been added to the genus (Nag Raj 1993). The morphological characteristics of the present fungus on *Callistemon* matched those of *D. cylindrospora* among the hitherto known species. This species has been also recorded on *Calycacanthus* sp. in New Guinea. This is the first record of the species in Japan and is only the third recorded discovery of it in the world. *Callistemon speciosum* is a new host plant for *Discosiella cylindrospora*.

4. *Robillarda sessilis* (Sacc.) Sacc., Michelia 2(6):8, 1880; Bilgrami et al., Fungi of India: 445, 1991; McKenzie & Jackson, Fungi, bacteria and pathogenic algae of Solomon Islands: 230, 1986; Nag Raj, Coelomycetous anamorphs with appendage-bearing conidia: 763, 1993

Fig. 4c–f; Fig. 6

Pycnidia of this fungus were produced on a diseased leaf kept in a Petri dish with a moist paper towel. Pycnidia black, immersed in the host beneath the cuticle, subglobular, 120–200  $\mu\text{m}$  diameter, 110–135  $\mu\text{m}$  high, filled with numerous conidia. Conidiophores hyaline, ampulliform. Conidia hyaline to subhyaline (pale greenish brown), oblong with rounded ends, 2-celled with a central, transverse septum, thick-walled, 10–12.5  $\times$  2.5–3.2  $\mu\text{m}$  (11.1  $\times$  2.7  $\mu\text{m}$  average, l/b = 4.1), furnished with 2–3 apical appendages. Appendages hyaline, straight or curved, persistent, and 13–26  $\mu\text{m}$  in length (18.7  $\mu\text{m}$  average).

Specimen examined: On dead leaf of *Parthenocissus tricuspidatus* (Siebold et Zucc.) Planch. (Japanese name: Tsuta), Hachijo Horticultural Research Center, Tokyo



**Fig. 4.** **a, b** *Discosiella cylindrospora*: **a** cross section of a pycnidium on *Callistemon speciosum* leaf; **b** conidial mass showing appendage at both ends. **c-f** *Robillarda sessilis*: **c** pycnidia-producing area on a leaf of *Parthenocissus tricuspidatus*; **d** cross section of a pycnidium;

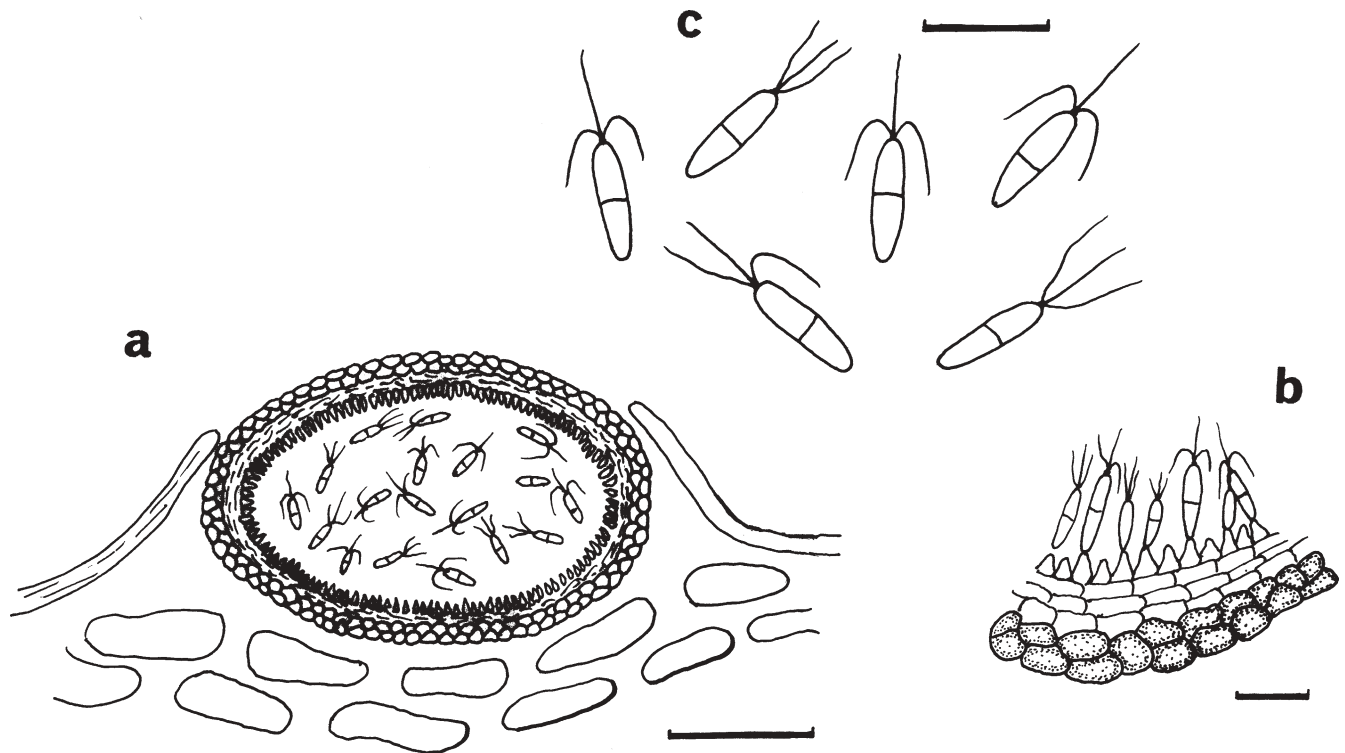
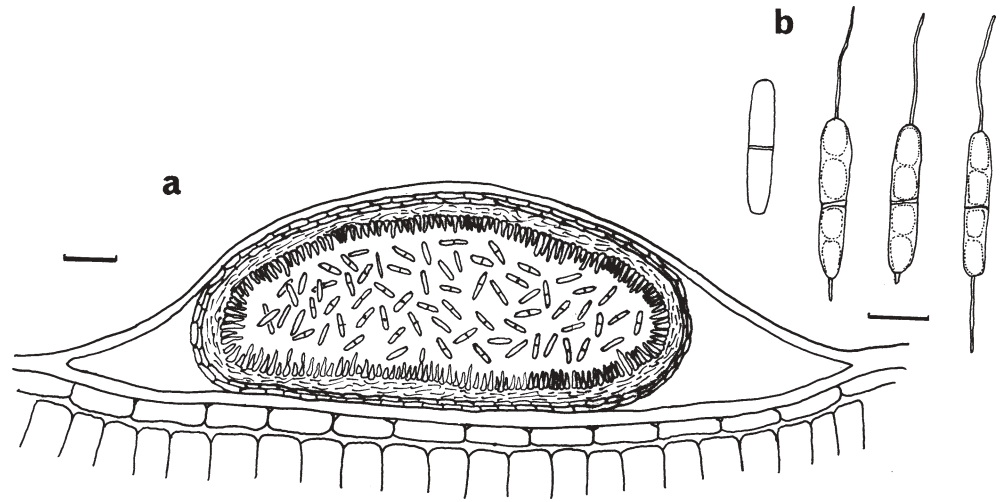
**e** magnified pycnidium containing conidia; **f** conidia mainly with three appendages on their tip. Bars **c** 1 mm; **d** 100  $\mu$ m; **b, e, f** 30  $\mu$ m (**b, f** are phase contrast)

Metropolitan Agricultural Experiment Station, Ohgagoh, Hachijo-machi, Tokyo (Hachijo Island), June 6, 2001, by TK and YO (TFM: FPH-7751).

Note: The genus *Robillarda* was described by Saccardo (1880 in *Sylogae fungorum* 1884). Thirty-five species have hitherto been described in the genus (Anonymous 2002).

Although 13 have been transferred to other genera, including *Pseudorobillarda* M. Morelet (later homonym and Synonym: *Pseudorobillarda* Nag Raj et al.), as a result of studies by Nag Raj (1993). Of the remaining 22 species, only 4 were confirmed as authentic members of the genus *Robillarda* (Nag Raj 1993) and recognized by Kirk et al.

**Fig. 5.** *Discosiella cylindrospora*:  
**a** pycnidium filled with conidia;  
**b** conidia with a central  
transverse septum and with  
one appendage at each end.  
(Bars **a** 10  $\mu$ m; **b** 5  $\mu$ m)



**Fig. 6.** *Robillarda sessilis*: **a** pycnidium filled with conidia; **b** a part of pycnidium; **c** conidia with a central transverse septum and with three appendages at their tip. Bars **a** 50  $\mu$ m; **b,c** 10  $\mu$ m

(2001). Concerning the other species, Nag Raj noted that some had no conidia on their type specimens, and for others there was no herbarium material, and often an insufficient description. The morphological characteristics of the present fungus matched those of *Robillarda sessilis* (Sacc.) Sacc., one of the authentic species in this genus.

*Robillarda sessilis* is found in Africa (Angola), Asia (India), Central America (West Indies), Europe (Hungary, Italy, Russia), North America (USA), and Oceania

(Solomon Is.), and has been recorded on many trees and herbs, such as *Bischofia javanica* Blume, *Bridelia retusa* Spring, *Cocos nucifera* L., *Dalbergia* sp., *Ficus andongensis*, *Fragaria vesca* L., *Fumana procumbens* (Dunal) Gren. et Godran, *Galphimia glauca* Cav., *Ludwigia adscendens* H. Hara, *Magnolia glandiflora* L., *Northea fasciculata*, *Paonia moutan* Sims (= *P. suffruticosa* Andr.), *Pinus ponderosa* Dougl., *Quercus incana* Roxb., *Randia dumetorum* Lam., *Rosa gentiana*, *Rubus caesius* L., and *Vitis cordifolia*

Michx.(Bilgrami et al. 1991; McKenzie and Jackson 1986; Nag Raj 1993; Nag Raj and Ponappa 1968; Singh and Agarwar 1974; Sydow et al. 1916). This is the first record of *Robillarda sessilis* in Japan, and *Parthenocissus tricuspoidatus* is a new host plant for this species.

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