

## Two *Ascochyta* species on *Althaea officinalis* and *Aralia elata*

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Two brown zonate leaf spot fungi new to Japan are described. *Ascochyta malvicola* on *Althaea officinalis* and *A. marginata* on *Aralia elata* were recorded in Kyoto Prefecture in 1988.

Key Words—*Althaea officinalis*; *Aralia elata*; *Ascochyta malvicola*; *Ascochyta marginata*; brown zonate leaf spot.

Two fungi in brown zonate leaf spots on *Althaea officinalis* L. and on *Aralia elata* Seem. were found in Kyoto Prefecture, Japan in 1988, and are identified as *Ascochyta malvicola* Sacc. and *A. marginata* J. J. Davis, respectively. These *Ascochyta* species are described as a new record in Japan.

### Description

*Ascochyta malvicola* Sacc., *Michelia* 1: 161, 1878.

Figs. 1, 2

Synonyms: *Phyllosticta destructiva* Desm. var. *destructiva*, *Ann. Sci. Nat. Bot.*, ser. 3, 3: 29, 1847; *A. althaeina* Sacc. et Bizz. apud Sacc., *Atti Ist. Veneto Sci.* 6, 2: 444, 1884; *Diplodina malvae* Togn., *Il Contr. Micol. Tosc.*, p. 12, 1885; *Diplodinula malvae* (Togn.) Tassi, *Bull. Lab. Orto Bot. Reale Univ. Siena* 5: 47, 1902.

For additional synonyms see Melnik (1977).

Leaf spots circular or irregularly shaped, appearing zonate, light brown, finally fading to yellow around the spots. Pycnidia epiphyllous, erumpent, pale brown to brown, globose to subglobose, 135.0–190.0  $\mu\text{m}$  in diam, 125.0–160.0  $\mu\text{m}$  high. Pycnidial wall pseudoparenchymatous, composed of several cell layers. Ostiole near the apex papillate. Conidiogenous cells hyaline, monophialidic, determinate, discrete, doliiform, arising from the cells of the innermost layer of pycnidial wall, 5.0–6.0  $\times$  4.0–5.5  $\mu\text{m}$ . Conidia hyaline, smooth, cylindrical to clavate, straight to curved, sometimes constricted at the middle part, medianly 1-septate, sometimes non-septate, 5.0–8.0(–9.5)  $\times$  2.0–3.0  $\mu\text{m}$ . Colonies on potato dextrose agar growing moderately slowly, reaching up to 5.3 cm in diam in 2 weeks at 25°C; surface felty, black to grayish brown; reverse colorless.

Habitat: On *Althaea officinalis* L. (*Birodo-aoi*). Also found on the genera *Abutilon*, *Alcea*, *Althaea*, *Gossypium*, *Hibiscus*, *Lavatera*, *Malva*, *Sida*, and on *Urena lobata* L. (Melnik, 1977).

Specimen examined: on leaves of *Althaea officinalis*

L., the Herbal Garden of the Kyoto Prefectural Research Institute of Agriculture, Iden-cho, Ayabe, Kyoto Prefecture, Japan, 7 August 1988, M. Yoshikawa, CBH-8801; the living culture derived from CBH-8801 on potato dextrose agar, CB-8879, has been kept at the senior author's laboratory. A dry specimen has been deposited in the Japan Mycological Institute.

Distribution: Specimen examined was from Japan. Also described with a worldwide distribution (Melnik, 1977).

Notes: The genus *Ascochyta* comprises over 600 described species, of which the majority are plant pathogens with a worldwide distribution. The major reason why so many species are involved in *Ascochyta* is the great dependency on the host plants for the species recognition. Many workers have continued to

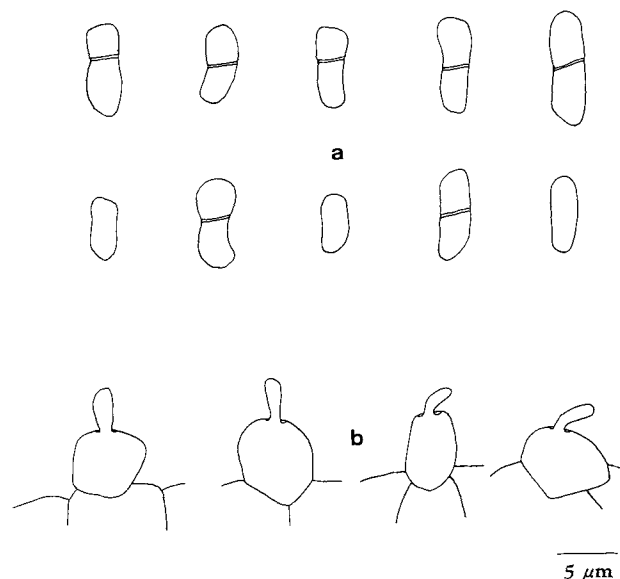


Fig. 1. *Ascochyta malvicola* Sacc. on *Althaea officinalis* L. a. Conidia. b. Conidiogenous cells and conidia.

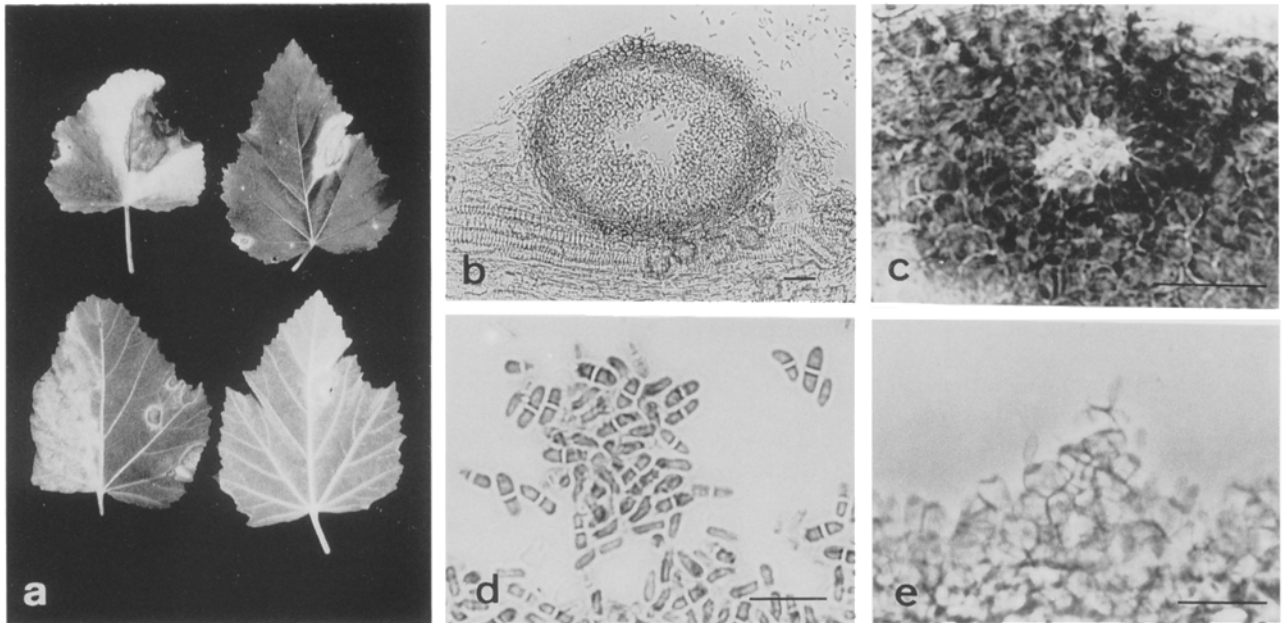


Fig. 2. *Ascochyta malvicola* Sacc. a. Brown zonate leaf spots on the leaves of *Althaea officinalis* L. (upper: upper surface view, lower: lower surface view). b. Vertical section of a pycnidium. c. Ostiole. d. Conidia. e. Conidiogenous cells. Scale bars = 20  $\mu\text{m}$ .

describe new species which do not morphologically differ from the previously described species recorded on closely related host plants. Recently Punithanlingam (1979, 1988) has made a reappraisal of all the *Ascochyta* species, in which several keys based on the morphology of known species are provided for three defined sections on the basis of the host plants, i.e., those on Gramineae, Monocotyledones excluding Gramineae, and Dicotyledones. The review of those on Dicotyledones has not been published yet.

Three species of *Ascochyta* have hitherto been

recorded on Malvaceae, i.e., *A. abelmoschi* Harter, *A. malvicola* Sacc., *A. abutilonica* Massenot (Melnik, 1977). They are mainly distinguished by the shape and size of pycnidia and conidia. *Ascochyta malvicola* occurring on *Althaea* species and other hosts among Malvaceae is much the same as the present fungus morphologically (Table 1). Therefore, the present fungus is identified as *A. malvicola* Sacc., new to Japan.

Formation of pycnidia and conidia on potato dextrose agar has not been observed yet.

Table 1. Morphological characteristics of closely related species of *Ascochyta* on Malvaceae.

Fungus	<i>A. malvicola</i> Sacc. (the present fungus)	<i>A. malvicola</i> Sacc. (1878)	<i>A. abelmoschi</i> Harter (1918)	<i>A. abutilonica</i> Massenot (1951)
Host	<i>Althaea officinalis</i>	<i>Abutilon</i> , <i>Alcea</i> , <i>Althaea</i> , <i>Gossypium</i> <i>Hibiscus</i> , <i>Lavatera</i> <i>Malva</i> , <i>Sida</i> , <i>Urena lobata</i>	<i>Hibiscus esculentus</i> <i>H. trionum</i> <i>H. palustris</i>	<i>Abutilon striatum</i>
Pycnidia	Erumpent Pale brown to brown Globose to subglobose Ostiole near the apex, papillate 125.0–190.0 $\mu\text{m}$	Erumpent or immersed Pale to dark brown Globose to subglobose Thin-walled 120–200 $\mu\text{m}$	Immersed Rusty brown Globose Thin-walled 65–225 $\mu\text{m}$	Semi-immersed Globose Thin-walled 100–140 $\mu\text{m}$
Conidiogenous cells	Hyaline Doliiform Monophialidic 5.0–6.0 $\times$ 4.0–5.5 $\mu\text{m}$	—	—	—
Conidia	Hyaline Smooth Cylindrical to clavate Sometimes constricted Medianly 1-septate, sometimes non-septate Straight to curved 5.0–8.0(–9.5) $\times$ 2.0–3.0 $\mu\text{m}$	Cylindrical to clavate Straight to curved Sometimes constricted (5)–7–10(–12) $\times$ 2–4 $\mu\text{m}$	Cylindrical to ovoid Straight to curved Constricted or not 4–14 $\times$ 2–4.5 $\mu\text{m}$	Oblong Straight Constricted 16–29 $\times$ 5–7 $\mu\text{m}$
References	The present paper (1995)		B. A. Melnik (1977)	

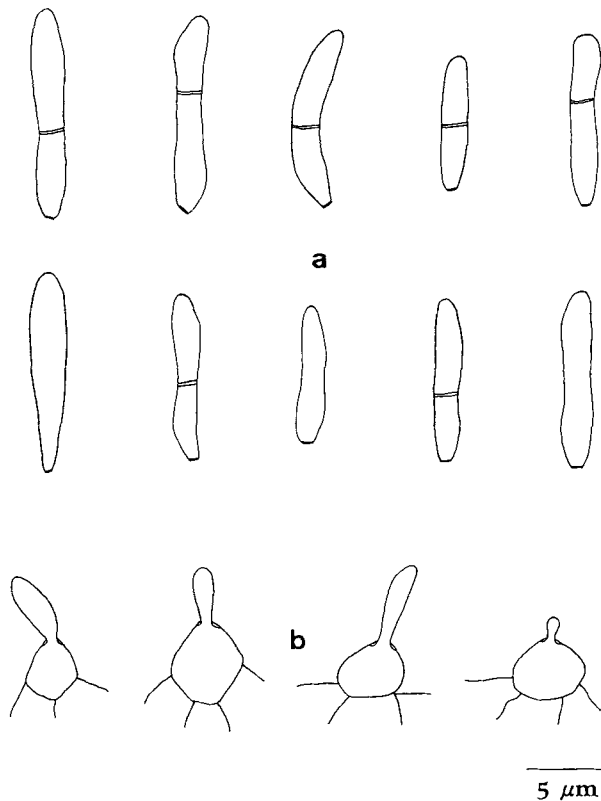


Fig. 3. *Ascochyta marginata* J. J. Davis on *Aralia elata* Seem. a. Conidia. b. Conidiogenous cells and conidia.

***Ascochyta marginata*** J. J. Davis, Trans. Wisconsin Acad. Sci. **18**: 263, 1915. Figs. 3, 4

Synonym: *Ascochyta starcii* Syd. apud Smarods, Schedae zu Fungi latvici exsiccati, fasc. 5, **230**: 75, 1932; *A. panacis* Meln., Nov. sist. nizshix. rast., p. 154, 1972.

Leaf spots circular or irregularly shaped, appearing zonate, brown to dark brown, finally fading to yellow around the spots. Pycnida epiphyllous, immersed to semi-immersed, brown to dark brown, globose to subglobose, 97.5–127.5  $\mu\text{m}$  in diam, 93.0–132.5  $\mu\text{m}$  high. Pycnidial wall pseudoparenchymatous, composed of several cell layers; cells near the ostiole dark brown and thick-walled. Ostiole at the apex papillate. Conidiogenous cells hyaline, monophialidic, determinate, discrete, ampulliform, arising from the cells of the innermost layer of pycnidial wall, 4.0–5.0  $\times$  2.5–5.0  $\mu\text{m}$ . Conidia hyaline, smooth, cylindrical to clavate, straight to curved, truncate at the base, sometimes constricted at the middle part, medianly 1-septate, sometimes non-septate, (6.0–)9.0–12.5(–15.5)  $\times$  2.0–3.0  $\mu\text{m}$ ; hilum thickened. Colonies on potato dextrose agar growing extremely slowly, reaching up to 3.1 cm in diam in 2 weeks at 25°C; surface cottony, pale green or gray-white; reverse colorless.

Habitat: On *Aralia elata* Seem. (*Taranoki*). Also found on *Acanthopanax sessiliflorum* Seem., *Aralia nudicaulis* L., and *Panax ginseng* C. A. Meyer (Melnik, 1977).

Specimen examined: on leaves of *Aralia elata*, the Herbal Garden of Kyoto Prefectural Research Institute of Agriculture, Iden-cho, Ayabe, Kyoto Prefecture, Japan, 3 September 1988, M. Yoshikawa, CBH-8802; the living culture derived from CBH-8802, CB-8894, has been kept at the senior author's laboratory. A dry specimen has

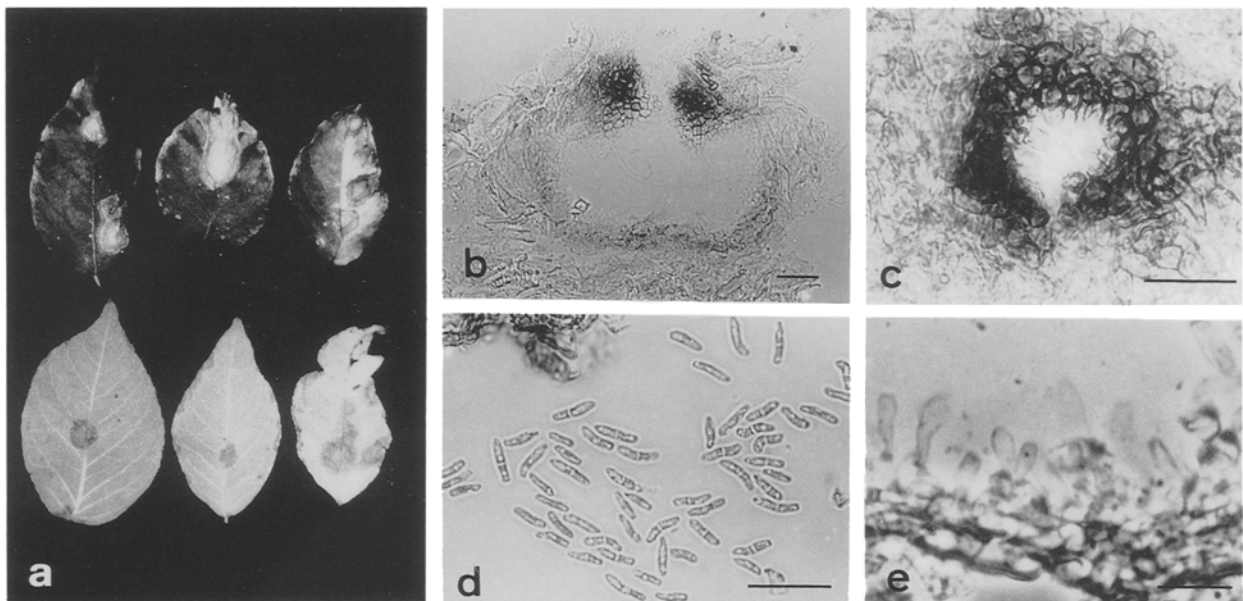


Fig. 4. *Ascochyta marginata* J. J. Davis. a. Brown zonate leaf spots on the leaves of *Aralia elata* Seem. (upper: upper surface view, lower: lower surface view). b. Vertical section of a pycnidium. c. Ostiole. d. Conidia. e. Conidiogenous cells. Scale bars = 20  $\mu\text{m}$ .

Table 2. Morphological characteristics of closely related species of *Ascochyta* on Araliaceae.

Fungus	<i>A. marginata</i> J. J. Davis (the present fungus)	<i>A. marginata</i> J. J. Davis (1915)	<i>A. stilbocarpae</i> Syd. (1924)	<i>A. ambrosiana</i> Unam. (1928)
Host	<i>Aralia elata</i>	<i>Acanthopanax sessiliflorum</i> <i>Aralia nudicaulis</i> <i>Panax ginseng</i>	<i>Stilbocarpa polaris</i>	<i>Hedera helix</i>
Pycnidia	Immersed Brown to dark brown Globose to subglobose Ostiole at the apex, papillate Thickened wall near the ostiole 93.0–132.5 $\mu\text{m}$	Immersed Pale to rusty brown Subglobose Thin-walled Ostiole rounded 100–200 $\mu\text{m}$	Immersed Subglobose Thin-walled 110–150 $\mu\text{m}$	Semi-immersed Dark brown Subglobose Thin-walled Ostiole rounded 90–124 $\times$ 73–116 $\mu\text{m}$
Conidiogenous cells	Hyaline Ampulliform Monophialidic 4.0–5.0 $\times$ 2.5–5.0 $\mu\text{m}$	—	—	—
Conidia	Hyaline Smooth Cylindrical to clavate Sometimes constricted Medianly 1-septate or non-septate Straight to curved Truncate at the base Hilum thickened (6.0–)9.0–12.5(–15.5) $\times$ 2.0–3.0 $\mu\text{m}$	Cylindrical Straight Sometimes constricted 6–12 $\times$ (2–)3–4 $\mu\text{m}$	Cylindrical Straight to curved 6–9 $\times$ 2.5–3 $\mu\text{m}$	Ovoid Not constricted 6.6–10 $\times$ 3.5–4 $\mu\text{m}$
References	The present paper (1995)	B. A. Melnik (1977)		

been deposited in the Japan Mycological Institute.

Distribution: Specimen examined was from Japan. Also reported from Latvia, Russia (Siberia) and North America (Melnik, 1977).

Notes: Three *Ascochyta* species occurring on Araliaceae hosts have been described, i.e., *A. ambrosiana* Unam., *A. marginata* J. J. Davis and *A. stilbocarpae* Syd. (Melnik, 1977). Among these, *A. marginata* has the most similar morphological characteristics to the present fungus (Table 2). The present fungus is therefore identified as *A. marginata* J. J. Davis, new to Japan, and *Aralia elata* is a new host plant of the fungus.

Formation of pycnidia and conidia on potato dextrose agar has not been observed yet.

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