Pseudocercospora siraitiae sp. nov. (hyphomycetes) on leaves of *Siraitia* cf. *siamensis* (*Cucurbitaceae*) in China

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A new species of *Pseudocercospora* was found on leaves of *Siraitia* cf. *siamensis* (*Cucurbitaceae*) in Yunnan Province, southwest China. The fungus differs from the species known on cucurbitaceous hosts by its curved conidia and long conidiophores arising from superficial mycelium. Species of *Siraitia* have hitherto not been reported as host plants of any cercosporoid fungi. Therefore, *P. siraitiae* is proposed as a new species. A key to species of *Pseudocercospora* on cucurbitaceous hosts is also provided.

Key words: cercosporoid fungi, new species, phytopathogenic fungi, taxonomy

Introduction

Among the plant pathogenic cercosporoid fungi, species of *Pseudocercospora* are characterised by pigmented, sympodially proliferating conidiogenous cells and inconspicuous conidial scars (Braun, 1995). Presently ten species of *Pseudocercospora* are known from cucurbitaceous hosts, namely *P. actinostemmatis* ('actinostemmae') Goh & W.H. Hsieh (Hsieh and Goh, 1990; Guo *et al.*, 1998), *P. cucurbitina* (Speg.) U. Braun (Braun, 2000b), *P. gymnopetali* Goh & W.H. Hsieh, *P. melothriae* Goh & W.H. Hsieh (Hsieh and Goh, 1990; Guo *et al.*, 1998), *P. scabrellae* Chaudhary, C. Gupta & Kamal (Chaudhary *et al.*, 1991), *P. sicerariae* Deighton (Deighton, 1976), *P. solenae-heterophyllae* (R.K. Verma & Kamal) U. Braun (Braun, 2000a), *P. thladianthae* (Sawada) Goh & W.H. Hsieh (Hsieh and Goh, 1990; Guo *et al.*, 1998), *P. trichosanthidicola* ('trichoxanthidicola') Kamal, A.N. Rai & A.S.

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Moses (Kamal *et al.*, 1991) and *P. zehneriae* (A.K. Kar & M. Mandal) U. Braun & Crous (Crous and Braun, 2003).

None of these taxa was reported as a pathogen of a species of the cucurbitaceous genus *Siraitia*. During collecting fungi in the Yunnan Province in the southwest of China, a specimen of *Pseudocercospora* was found on a species of *Siraitia*. This fungus is compared with the species of *Pseudocercospora* hitherto known on members of the *Cucurbitaceae* and is described here as new.

Materials and methods

Leaves of a member of the *Cucurbitaceae* infected by a fungus were collected in mainland China, Yunnan Province, Mojiang, 1550 m, on 12 August 2001. The host plant was identified as *Siraitia* cf. *siamensis* (Craib.) C. Jeffrey. Leaf sections containing the fungus were prepared with a razor blade, mounted in 5% KOH, and investigated with a light microscope. The values of the size ranges are the means of 30 conidia ± 1 SD. Extreme values are given in brackets.

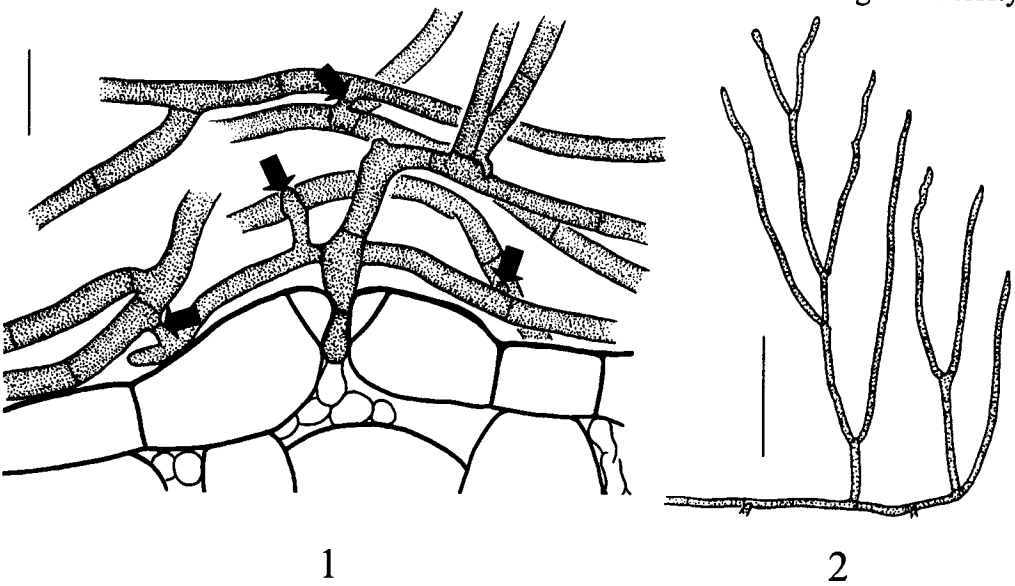
Taxonomy

Pseudocercospora siraitiae R. Kirschner & U. Braun, **sp. nov.** (Figs 1–5)

Maculae usque 20 mm latae, flavidae, margine indistincto. *Hyphae* immersae inter cellulas plantae, hyalinae, ex cellulis saepe usque 2.5 µm inflatis compositae. *Stromata* rara, pallide brunnea, usque 46 µm lata, 25 µm alta, subepidermalia. *Coloniae* hypophyllae, velutinae, brunneae. *Mycelium* externum per stomata emergens, repens, anastomosibus numerosis, pallide brunneum vel medio-brunneum. Conidiophora hypophylla, ex mycelio secundario oriunda, 100-208 × 4-5 µm, simplicia vel ramosa, brunnea. *Loci conidiogeni* inconspicui vel subdenticulati, in apice et lateribus cellularum conidiogenarum terminalium et intercalarium, 1-2 µm lati, non-incrassati, non-fuscati. *Conidia* solitaria, subcylindrica vel obclavata-cylindrica, pallide brunnea, levia, leniter vel valde curvata, (38-)49-70(-83) × 4-5 µm, (3-)4-6(-9) septis transversalibus, cellulis apicalibus obtusis, gradatim decrescentibus, hilis basalibus 1-2 µm latis, non-incrassatis, non-fuscatis.

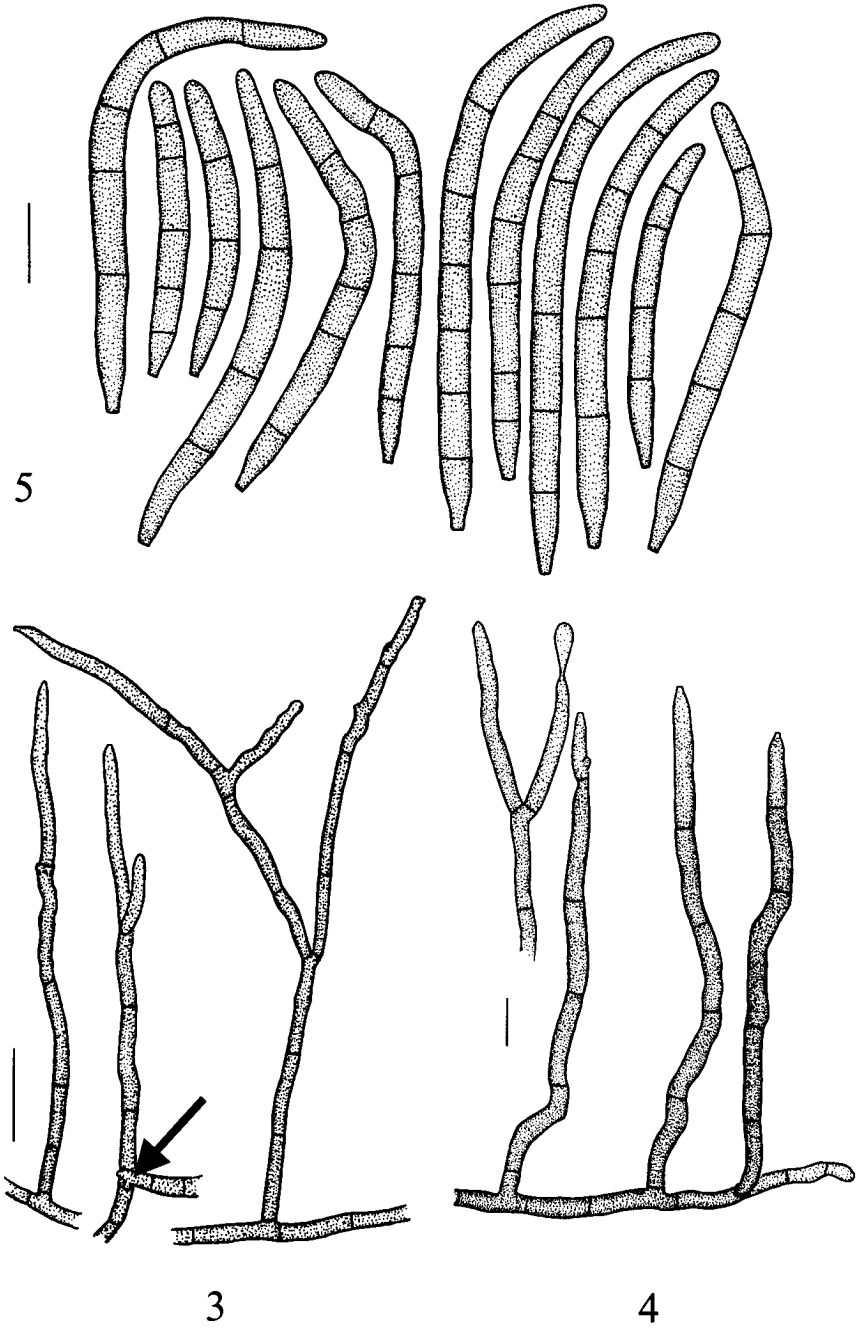
Holotype: CHINA, Yunnan Province, Mojiang, 1550 m, on leaves of *Siraitia* cf. *siamensis* (Craib.) C. Jeffrey (*Cucurbitaceae*), 12 August 2001, R. Kirschner, Z.L. Yang *et al.* 1041 (KUN).

Leaf spots yellow on the upper surface, without definite margins, up to 20 mm wide, without conidiophores; on the lower surface brown due to the velvety colonies. *Hyphal* cells within the leave tissues intercellular, hyaline, often swollen, up to 2.5 µm diam. (Fig. 1). *Stromata* rare, pale brown, up to 46 µm wide and 25 µm thick, subepidermal. *External mycelium* emerging through the stomata of the lower epidermis mostly from an aggregation of a few,



Figs 1–2. *Pseudocercospora siraitiae*. **1.** External mycelium arising from cells emerging through a stoma. Fungal cells in the intercellular spaces hyaline and swollen. Note the presence of anastomoses (arrows). **2.** Habit sketch of branched conidiophores arising from a repent hypha of the external mycelium. Bars: 1 = 10 µm, 2 = 50 µm.

hyaline, swollen cells, rarely from stromata in the substomatal chamber, repent, with many anastomoses with other hyphae (Fig. 1), conidiophores and seceded conidia, anastomoses particularly frequent just outside the stomata, hyphae pale or medium brown, smooth, 2-4 µm wide. *Conidiophores* arising from the superficial mycelium, 100-208 × 4-5 µm, unbranched when young, branched conidiophores not easily distinguishable from repent hyphae with unbranched conidiophores, brown, paler towards the apex, distances between septa mostly *ca.* 15-20 µm, conidiogenous loci inconspicuous or subdenticulate, terminal and lateral on the apical cell and lateral on intercalary cells, 1-2 µm wide, but unthickened and not darkened (Figs 2-4). Conidia formed singly, subcylindrical to obclavate-cylindrical, slightly to strongly curved, (38-)49-70(-83) × 4-5 µm, with (3-)4-6(-9) transverse septa, pale brown, smooth, apical cell gradually tapering, obtuse, basal hilum 1-2 µm wide, unthickened, not darkened (Fig. 5).



Figs 3–5. *Pseudocercospora siraitiae*. **3.** Conidiophores. Base of a seceded conidium anastomosing with the base of a conidiophore (arrow). **4.** Conidiophores. **5.** Conidia. Bars: 3 = 20 μm; 4, 5 = 10 μm.

Key to species of *Pseudocercospora* on cucurbitaceous hosts

1. Conidia 25-75 × 4-8 µm, occasionally in short chains; on *Solena heterophylla* Lour. ..... *P. solenae-heterophyllae*
1. Conidia narrower, not exceeding 6 µm, formed singly 2

2. Conidiophores in dense, often subsynnematous fascicles (40-115 µm long) as well as solitary, arising from superficial hyphae (5-25 µm long); on *Cyclanthera* Schrad. sp. ..... *P. cucurbitina*
2. Conidiophores solitary or loosely fasciculate, if densely fasciculate conidiophores much shorter, 5-45 µm long 3

3. Conidiophores very long and pluriseptate, exceeding 100 µm 4
3. Conidiophores shorter, not exceeding 70 µm 6

4. Stromata present, well-developed; conidiophores unbranched; on *Mukia maderaspatana* (L.) M. J. Roem. ('*Melothria scabrella* L.') ..... *P. scabrellae*
4. Stromata absent or only a few swollen cells; conidiophores often branched 5

5. Conidiophores arising from superficial hyphae; conidia frequently curved; on *Siraitia* cf. *siamensis* ..... *P. siraitiae*
5. Conidiophores fasciculate, emerging through stomata; conidia mostly straight; on *Lagenaria siceraria* (Molina) Standl. and ? *Trichosanthes anguina* L. ..... *P. sicerariae* (incl. ? *P. trichosanthidicola*)

6. Conidiophores short, 5-45 µm, in dense fascicles emerging through stomata and solitary, arising from superficial hyphae; on *Thladiantha nudiflora* Hemsl. ex Forb. & Hemsl. ..... *P. thladianthae*
6. Superficial hyphae with solitary conidiophores lacking 7

7. Stromata lacking or small, only a few swollen hyphal cells, 10-20 µm diam. 8
7. Stromata well-developed, 20-65 µm diam. 9

8. Leaf spots subcircular to angular, with a distinct dark brown border; conidiophores simple or occasionally branched; on *Actinostemma lobatum* Maxim. ..... *P. actinostemmatis*
8. Leaf spots angular, vein-limited, without distinct border; conidiophores simple; on *Zehneria umbellata* Thw. ..... *P. zehneriae*

9. Conidiophores 0-1(-2)-septate; conidia with obtuse apex; on *Gymnopetalum cochinchinense* Kurz ..... *P. gymnopetali*
9. Conidiophores 1-5-septate; conidia with acute apex; on *Melothria* spp. ..... *P. melothriae*

Discussion

Pseudocercospora siraitiae is the first cercosporoid species reported from a species of *Siraitia*. Among the known species of *Pseudocercospora* on cucurbitaceous hosts, *P. siraitiae* is very similar to *P. sicerariae* and *P. trichosanthidicola* because of the long conidiophores (exceeding 100 µm), and the predominant absence of stromata (Deighton, 1976; Kamal *et al.*, 1991). According to the original description, *P. trichosanthidicola* is morphologically hardly distinguishable from *P. sicerariae*. The host genera of these species, *Lagenaria* and *Trichosanthes*, belong in the *Cucurbitaceae*. Type material of the two cercosporoid species has to be compared, and the identities of the host plants should be checked.

Pseudocercospora siraitiae mainly differs from *P. sicerariae* and *P. trichosanthidicola* by the curved conidia and the conidiophores arising from external mycelium. The single other species of *Pseudocercospora* with conidiophores exceeding 100 µm in length and with curved conidia on cucurbitaceous hosts is *P. scabrellae*, but it differs from *P. siraitiae* in having conidiophore fascicles arising from stromata through the stomata and a conidial width not exceeding 4 µm (Chaudhary *et al.*, 1991).

Among the sections within *Pseudocercospora* proposed by Braun (1998), *P. siraitiae* could be placed in *Cercocladospora* (G.P. Agarwal & S.M. Singh) U. Braun because of the solitary conidiophores and scolecosporous conidia.

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