
Two New Species of *Pseudocercospora* From West Bengal

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The present paper deals with two new species of *Pseudocercospora* viz. *Pseudocercospora amoorae* and *Pseudocercospora takiensis*. They have been collected from West Bengal and are new to science.

Key words : Taxonomy, *Pseudocercospora*, West Bengal.

During the survey of phytopathogenic fungi from two different districts (Jalpaiguri and North 24 Parganas) of West Bengal, the author came across two species of *Pseudocercospora*, which are new to science. In Fungi of India Sarbhoy *et al.* (1977-1981) have recorded about twenty six species of *Pseudocercospora* from different states of India. The present paper deals with two new species of *Pseudocercospora*, namely *Ps. amoorae* and *Ps. takiensis*, which have been collected from the districts of Jalpaiguri and North 24 Parganas respectively of West Bengal.

The type specimens have been deposited in the Herbarium, CAB, International Mycological Institute, Kew, Surrey, England.

Detailed description and illustrations of these specimens as well as their latin diagnosis are incorporated here under.

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The fungi treated here were described in their natural habitat. Field studies of the behaviour of these fungi were made and specimens of infected host tissue were collected in different seasons during the year 1983-1986. The infected host tissue of living leaves were examined closely both with the help of magnifying glass and with unaided eye. The infected leaves were detached intact from the host plants and were spread out in between two blotting papers. The dried specimens then preserved in a packet adding a small amount of para-dichlorobenzene (PDB) for further study in the laboratory. For working out details of the fungi microscopic studies were made from slides prepared from both fresh and preserved specimens stained with lacto-phenol with a drop of cotton-blue. Detailed characters and colour of different parts of fungi and all measurements were recorded from water mount preparation in natural light. Camera lucida drawings were made with the aid of standard camera lucida attachment.

ENUMERATION

Pseudocercospora amoorae Das, sp. nov.

Etymology : From the name of the host genus.

(Fig. 1)

Maculae amphigeniae, subcirculares, primo rubido-brunneae, sed albido centro, margine rubido-brunneae, 2-6 mm latae; caespituli amphigeniae, in pagine superiore dense et aequaliter dispersi, atrobrunneae vel atrii; mycelium primarium immersum, hyphis fere incoloris, 2-3 μ m latae; stroma amphigeni substomatalia, globosa vel subglobosa, usque 43 μ m latum et 39 μ m altum; conidiophora amphigeni, 5-6 in fasciculo per stoma emergentia, pallide olivacea vel modice pallide olivacea brunneae, recta vel flexuosa, plerumque simplicia, interdum 1 ramosa, 0-4 septata interdum 1 geniculata, 3.5-5 x 16.5-49.5 μ m; mycelium secundarium superficiale, hyphis subhyalina, ramosa, 2-3 μ m latae, conidiophora secundaria lateraliter gerentes; conidia pallide olivacea, obclavato vel obclavato-cylindrica, recta vel curvata, pluriseptata, apice subobtusata vel subacuta, 3-4 x 40-115 μ m.

Habitat in foliis vivis: *Amoora rohituka* W. & A. (Meliaceae), Gayarkata, Jalpaiguri, Bengal occidentales, PCC 3451 (=IMI 284551), leg. A. K. Das, 24 October, 1983.

Leaf spot amphigenous, subcircular, reddish brown at early stage but whitish centre with reddish brown margin at maturity, 2-6 mm wide; caespituli amphigenous densely and evenly distributed over the surface, dark brown to black; primary mycelium internal, hyphae almost colourless, 2-3 μ m wide; stroma amphigenous, substomatal, globose to subglobose, upto 43 μ m wide and 36 μ m high; conidiophore amphigenous, 5-65 in a fascicle emerging through

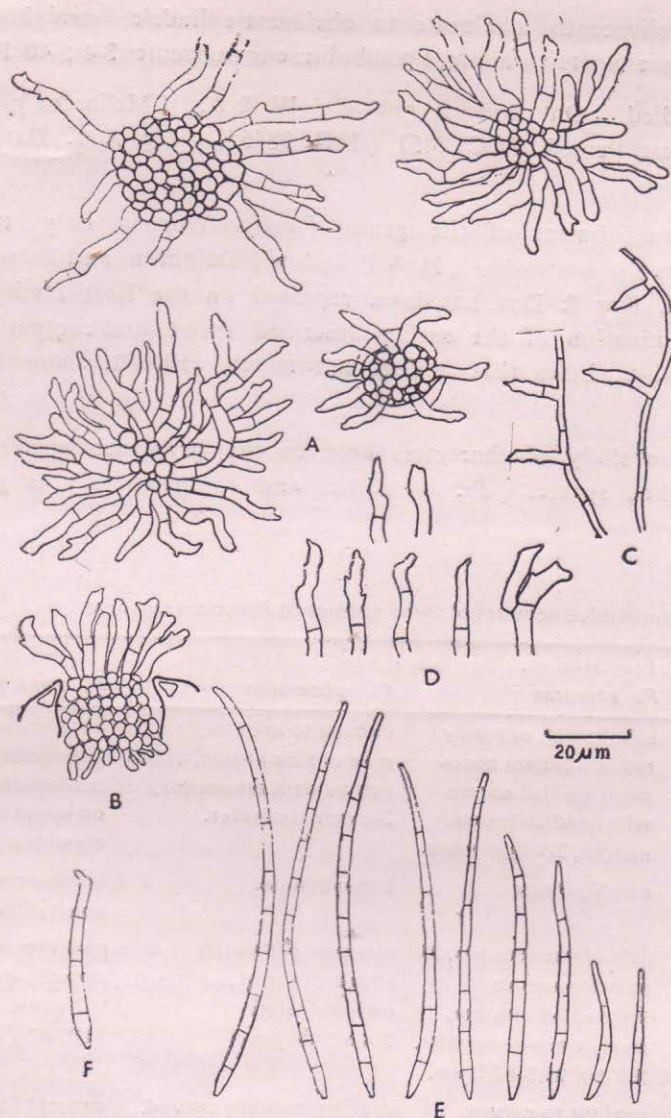


Fig. 1 : *Pseudocercospora amoora* sp. nov.

A, Conidiophore fascicles ; B, Section through stomata ; C, Secondary mycelial hyphae bearing conidiophores ; D, Conidiophores ; E, Conidia ; F, Conidia in germination.

stomata, pale olivaceous to midpale olivaceous brown, straight to flexuous, usually simple, occasionally once branched, 0-4 septate, sometimes once geniculate, $3.5-5 \times 16.5-49.5 \mu\text{m}$; secondary mycelium superficial, hyphae subhyaline, branched, $2-3 \mu\text{m}$ wide bearing secondary conidiophores laterally;

conidia pale olivaceous, obclavate to obclavate-cylindric, straight to curved, pluriseptate, base tapers to hilum, tip subobtuse to subacute, 3-4 x 40-115 μm .

Specimen studied: On *Amoora rohituka* W. & A. (Meliaceae), Gayarkata, Jalpaiguri, West Bengal, PCC 3451 (IMI 284551), leg. A. K. Das, 24 October 1983.

Since the establishment of the genus *Pseudocercospora* only two species (*Pseudocercospora subsessiles* (H. & P. Sydow) Deighton, and *Pseudocercospora mellicola* Yen, Kar & Das has been reported on the host family Meliaceae. A closer examination of the earlier described species and comparison with the present collection shows that it does not match with *Ps. subsessiles* and *Ps. mellicola*.

A comparative study of characters between the proposed species and two earlier described species (*Ps. subsessiles* and *Ps. mellicola*) is given in the Table 1.

Table 1: Comparative account of three species of *Pseudocercospora*

Characters	Proposed sp. <i>Ps. amoora</i>	<i>Ps. subsessiles</i>	<i>Ps. mellicola</i>
Leaf spot	subcircular, primarily reddish brown becoming whitish centre with reddish brown margin, 2-6 mm wide.	circular to angular, tan, grey or pale brown, bounded by dark brown line, 2-5 mm diameter.	angular to irregular, brownish white on upper surface and bright brown on lower surface 1-4 mm diameter.
Caespituli	amphigenous	hypophyllous	amphigenous but chiefly epiphyllous
Conidio-phores	pale olivaceous to mid pale olivaceous brown, 0-4 septate, rarely once geniculate, 3.5-5 x 16.5-49.5 μm .	very pale yellowish olivaceous, not septate, not geniculate 2-4 x 5-20 μm	pale brown olivaceous, concolorous, 0-3 septate, 0-2 geniculate, 3-4. 5x15-45 (-50) μm .
Conidia	straight to curved, obclavate to obclavate cylindric	straight to mildly curved, narrowly cylindric, slightly attenuated	generally slightly curved obclavate cylindric
Septation of conidia	pluriseptate	3-8 (-11) septate	3-9 septate
Measurement of conidia	3-4 x 40-115 μm	2-4 x 25-80 μm	3-4 x 28-92 μm

Besides these, no species of *Pseudocercospora* has yet been reported on the present host *Amoora rohituka* W. & A. Considering all these facts it is suggested

to give the separate identity of the present collection. Therefore, the proposed species is described and illustrated here as a new species.

Pseudocercospora takiensis Das, sp. nov.

Etymology : From the name of the locality.

(Fig. 2)

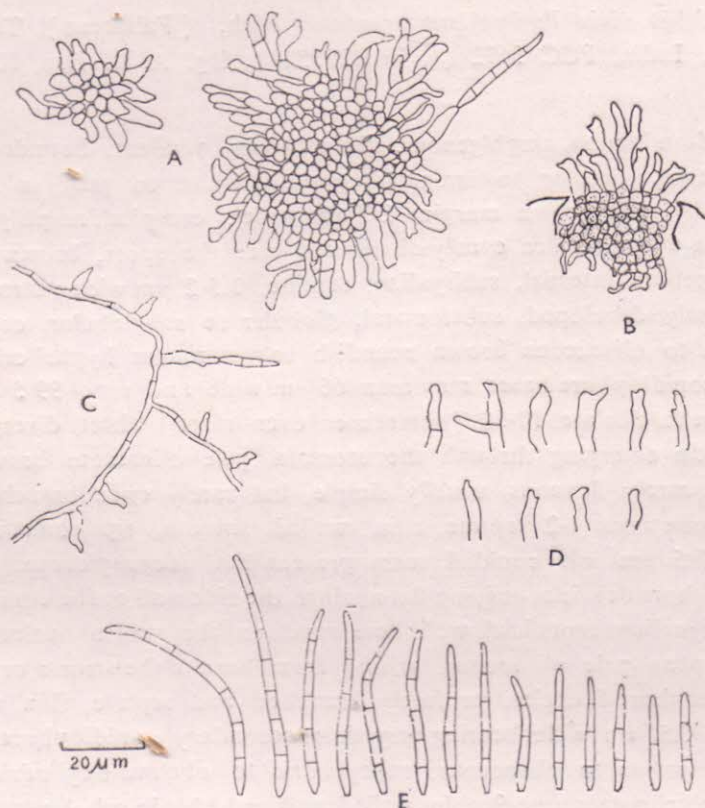


Fig. 2 : *Pseudocercospora takiensis* sp. nov.

A, Conidiophore fascicles ; B, Section through stomata ; C, Secondary mycelial hyphae bearing conidiophores ; D, Conidiophores ; E, Conidia.

Maculae amphigeniae, distinctae, venas limitatae, circulares vel irregulares, griseo-albido vel griseo-centro, pallide brunneae margine, 2-7 mm latae ; caespituli amphigenae, plerumque epiphyllae, a aequaliter disseminati, brunneae vel atrii ; mycelium primarium immersum, subhyalina, septata, 1.5-2 μ m latae ; stroma substomatalia, globosa vel subglobosa, usque 66 μ m latum et usque 39 μ m altum ; conidiophora fasciculata, 10-50 (interdum densae) in fasciculo per stoma emergentia, pallide olivaceae brunneae, plerumque recta, raro flexuosa, plerumque simplicia, raro 1 ramosa, plerumque aseptata, interdum 1-2 septata,

laevia, $3.5-5 \times 10-49.5 \mu\text{m}$; mycelium secundarium superficiale, hyphis pallide olivacea, ex cellulis basalibus stroma vel ex basibus fasciculorum conidiophorum oriundae, ramosa, septata, laevia, $2.5-3 \mu\text{m}$ latae, conidiophora secundaria lateraliter gerentes; conidia subhyalina vel olivacea, subcylindrica vel obclavato-cylindrica, recta vel curvata, pluriseptata usque 9, laevia, apice subobtusa vel subacuta, $3-5 \times 20-76 \mu\text{m}$.

Habitat in foliis vivis *Pachyrhizus angulatus* Rich. (Fabaceae), Taki, Bengal occidentales, India, PCC 3692 (=IMI 293584), leg. A. K. Das, 10 February, 1985.

Spots formed on lamina, amphigenous, distinct, very virulent, bounded by finer veins, scattered, circular to irregular, greyish white to grey in the centre surrounded by pale brown margin, 2-7 mm wide; caespituli amphigenous, well developed on dorsal surface, evenly distributed over the spots, brown to black; primary mycelium internal, subhyaline, septate, $1.5-2 \mu\text{m}$ wide; stroma present and moderately developed, substomatal, globular to subglobular, composed of light brown to olivaceous brown roundish to rectangular hyphal cells ($3-5 \mu\text{m}$ wide) and conidiophore bases, maximum $66 \mu\text{m}$ wide and upto $99.5 \mu\text{m}$ high; conidiophore fasciculate, 10-50 (sometimes even more) short divergent stalks in a fascicle emerging through the stomata, pale olivaceous brown, mostly straight but rarely flexuous, usually simple, but rarely once branched, mostly aseptate, sometimes 1-2 septate, thin walled, smooth, tip sometimes conic, $3.5-5 \times 10-49.5 \mu\text{m}$, old conidial scars present but inconspicuous, situated at the end of short denticles or lying flat against the side wall of the conidiophores; secondary mycelium superficial, well developed on the ventral surface, external mycelial hyphae pale olivaceous, arising from base of the stroma or from base of the conidiophore fascicles, profusely branched and septate, thin walled and smooth, $2.5-3.5 \mu\text{m}$ wide, bearing very short secondary conidiophores laterally; conidia subhyaline to olivaceous, subcylindric to obclavate-cylindric, straight to curved, pluriseptate upto 9, thin walled and smooth, tip subobtuse to subacute, base truncate to unthickened hilum, $3-5 \times 20-76 \mu\text{m}$.

Specimen studied: On *Pachyrhizus angulatus* Rich. (Fabaceae), Taki, 24 Parganas, PCC 3692 (IMI 192584), leg. A. K. Das, 10 February, 1985.

Since the establishment of the genus *Pseudocercospora* Speg., none of its species has yet been reported on the present host *Pachyrhizus angulatus* Rich. Deighton (1976 a, b; 1983; 1987) has described a large number of species of *Pseudocercospora* on different hosts under the family Leguminosae. However, of all the species of *Pseudocercospora* described so far, the present collection comes closely to *Ps. clitorae* (Atk.) Deighton, *Ps. angustata* (Chupp & Solheim) Deighton, *Ps. baubiniiae* (H. & P. Sydow) Deighton, *Ps. cotizensis* (Muller & Chupp) Deighton, *Ps. leguminum* (Chupp & Linder) Deighton, *Ps. nigricans* (Cooke) Deighton,

and *Ps. mungo* Deighton. For justifying the distinct identity of the proposed taxon, a comparative account of the morphological characters of closely related eight different species with the present collection are described below.

Ps. clitorae in which the leaf spots are moderate to deep brown with a slightly darker margin, caespituli punctiform, conidiophores epiphyllous, septate, 8-15 μm long, conidia obclavate-filiform, 2.5-3 x 49-92 μm .

In *Ps. angustata* leaf spots brownish to dingy grey, stroma small, dense fascicles, conidiophores not branched, not geniculate, septate, 2-3.5 x 10-50 μm , conidia very narrowly obclavate, 2.4 x 15-75 μm .

Ps. bauhinae leaf spots greyish brown to pale brown, fruiting chiefly hypophyllous conidiophores not branched, not geniculate, septate, 3-4.5 x 10-20 μm , conidia obclavate, 2.5-5 x 30-125 μm , mostly 30-65 μm .

Ps. cotizensis in which stroma small, conidiophores slightly geniculate, 3.5-6 x 15-75 μm , conidia obclavate, 2.5-5 x 40-90 μm .

In *Ps. leguminum* fruiting chiefly hypophyllous, densely effuse, stroma not developed, conidiophores hypophyllous, septate, maximum up to 300 μm long, 3.5-5.5 μm wide, conidia subcylindric, 5.5-7 x 24-44 μm .

Ps. nigricans in which fruiting effuse, sooty in colour, fascicles not compact, conidiophores branched, septate, 3.5-5 x 15-125 μm , conidia 3.5-5 x 20-80 μm .

Ps. stizolobii leaf spots dark brown, fruiting minutely floccose conidiophores sinuous, septate, 3-4 x 7.5-106 μm , conidia obclavate-cylindric, 3-4 x 6-85 μm .

Ps. mungo in which leaf spots merely indefinite, fruiting hypophyllous, conidiophores hypophyllous, sinuous, maximum up to 130 μm long, 4.5-7.5 μm wide, conidia clavate, 4.5-7.5 x 25-84 μm .

But in the present collection the leaf spots greyish white to grey centre surrounded by pale brown margin, fruiting well developed on dorsal surface, stroma well developed, conidiophores 10 to numerous, mostly aseptate, 3.5-5 x 10-49.5 μm , conidia subcylindric to obclavate-cylindric, pluriseptate up to 9, 3-5 x 20-76 μm .

From the above discussion it may be suggested that the present collection could not be accommodated in any of the already described species of *Pseudocercospora*. A comparative look to the morphological characters suggests the separate identity of the present collection. Therefore, the present collection is described and illustrated here as a new species.

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