
Studies on The Genus *Pseudocercospora* Speg.

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Four leaf-inhabiting hyphomycetous fungi have been collected and described from the West Bengal, of which *Pseudocercospora gymnematis* Kumar & Kamal, *Pseudocercospora sordida* (Sacc.) Deighton are reported for the first time from West Bengal. *Pseudocercospora rhoina* (Cooks & Ellis) Deighton is reported for the first time from India with one new combination into the genus *Pseudocercospora*.

Key words : Taxonomy, Hyphomycetes, *Pseudocercospora* Speg.

This paper gives an illustrated account of four species of the genus *Pseudocercospora* Speg. based on collections made from West Bengal. The genus *Pseudocercospora*, one of the largest number of 'Cercospora-like fungi' raised much interest among the taxonomists dealing with this type of fungi. To deal with this genus, unthickened conidial scars, nature of denticulation, proliferation of conidiogenous cell, coloured conidia and conidia with tapered to abruptly tapered basal cell to unthickened hilum, characteristics of *Pseudocercospora* Speg. (Deighton, 1976) have been primarily taken into consideration. Besides these, Deighton (1979, 1983, 1987) and Ellis (1971, 1976) were of opinion that external mycelial hyphae bearing conidiophores is an important character in *Pseudocercospora*. Holotype specimens are deposited in the Herbarium, Botany Department, Presidency College, Calcutta.

The specimens were collected from different localities of West Bengal under varied climatic conditions during different season of 1983-1987. The infected leaves having distinct symptoms were carried to laboratory in separate polythene bags. These were spread out in between two blotting papers and dried following stan-

standard technique. The fully dried specimens were packed with paradichlorobenzene in a separate paper envelope. A portion of the infected host tissue was detached carefully with a sharp blade. It was then mounted on a glass slide in a drop of lectophenol (0.1 per cent cotton blue solution was also used) and covered with a cover glass and heated on a spirit lamp flame so to make the tissue transparent. The prepared slides were sealed with paraffin wax. Free hand sections of the host leaf through the infected regions were also made to study the details of mycelial structures and stromata. The slides were carefully examined under different magnification of compound microscope. The measurements of different structures were also taken at the same time and camera-lucida drawings were prepared. A part of each specimens were sent to C. A. B. International Mycological Institute for accession and confirmation of the identity of fungi associated. The taxonomic determination were made with the help of relevant literature.

DESCRIPTION

Pseudocercospora gymnematis Kumar & Kamal,

Current Science 43 (3): 128 (1997).

(Fig. 1)

Spots formed on lamina, amphigenous, distinct on dorsal surface, circular to subcircular, brownish centre surrounded by greyish halo, vein limited, 1-4 mm in extent; caespituli effuse, amphigenous, chiefly epiphyllous, uniformly distributed over the spots, olivaceous brown; primary mycelium internal; subhyaline to mildly olivaceous, branched, septate, thin walled, 2.50-4.00 μm wide; stroma present, amphigenous, mostly on dorsal surface, moderately developed, sometimes poorly developed; composed of pale olivaceous brown swollen hyphal cells and conidiophore bases, up to 46 μm wide and 26 μm high; conidiophores amphigenous fasciculate, in fascicle of 2-23 spreading stalks emerging through the host epidermal cells, mostly flexuous, rarely straight, light to pale olivaceous, distinctly pluriseptate (2-8 septa), mostly simple, rarely once branched, smooth, thick-walled, 0-2 geniculations, slightly sinuous at the apex, scar present lying against the side wall of the conidiophore (2.00-3.00 μm diam.), tip mostly conoid, sometimes subobtuse or bluntly rounded, denticles broad and conoid, 3.00-4.00 x 2.00-82.5 μm ; secondary mycelium external, amphigenous, coming out through stomatal opening, pale olivaceous, branched, septate, producing lateral secondary conidiophores, 2.00-4.00 μm wide; conidia obclavate-cylindric, straight to curved, light to pale olivaceous brown, pluriseptate (3-13 septa), smooth, thin walled, tip subacute, sometimes subobtuse, base tapers to hilum, 2.50-4.00 x 33.00-73.00 μm .

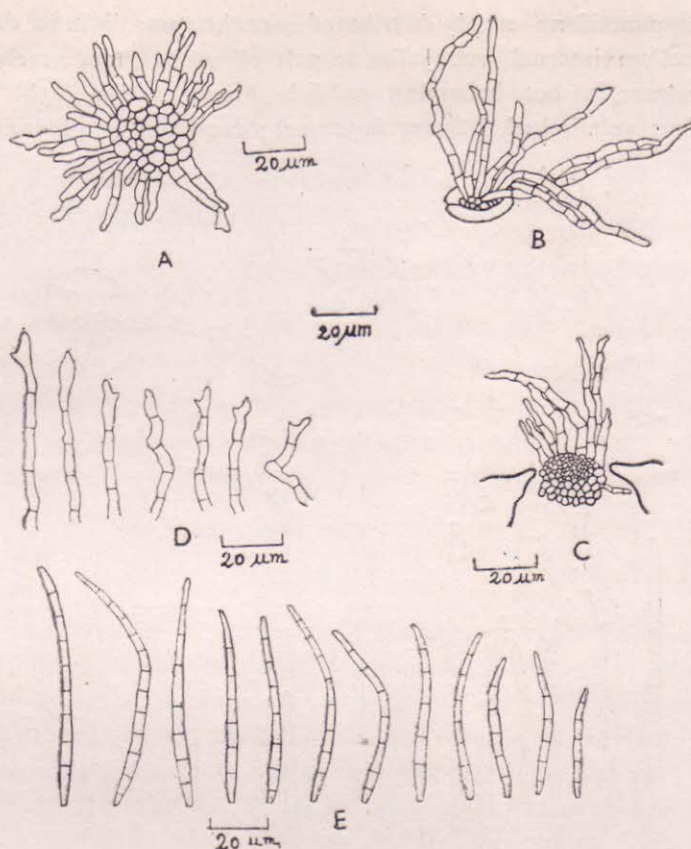


Fig. 1. *Pseudocercospora gymnematis* A-B. Conidiophore fascicles, C. Section through a stroma; D. Conidiophores; E. Conidia.

Specimen studied : On *Gymnema sylvestris* Roxb. (Fam. Asclepiadaceae), Jayanti Hill, Alipurdoor, West Bengal, India, PCC 3447 (=IMI 284547), leg. K. K. Sarbajna, 30 October, 1983.

First time reported from the State of West Bengal.

Pseudocercospora sordida (Sacc.) Deighton,
Mycological Paper Nos. 140 : 153 (1976).

Synonym : *Cercospora sordida* Saccardo,
Michelia 2 : 149 (1880).

(Fig. 2)

Spots formed on lamina, amphigenous, more prominent on dorsal surface, angular to irregular, occasionally aggregate to coalescent, spot initially light brown

hypophyllous, punctiform, evenly distributed over the spots, light to deep brown; primary mycelium internal, subhyaline to pale olivaceous, moderately developed, without any margin but becoming reddish brown within light brown halo, distinct, virulent veinlimited, 2.8 mm in extent; caespituli amphigenous, chiefly

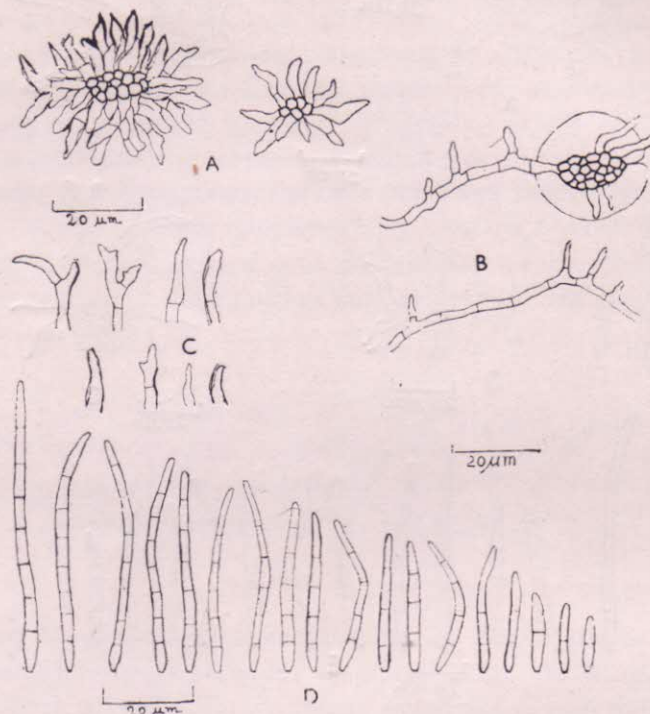


Fig. 2. *Pseudocercospora sordida*: A. Conidiophore ascicles; B. Secondary mycelial hyphae bearing conidiophores; C. Conidiophore; D. Conidia.

branched, septate, 2.00-3.00 μm in wide; stroma present, well developed, substomatal, amphigenous, sub-spherical; dark brown, composed of swollen, thick walled hyphal cells (upto 6.00 μm wide), 19.00-39.00 μm wide and upto 27.00 μm high; conidiophores amphigenous, mostly fasciculate, in fascicle of 7-60 or even more divergent stalks, emerging through the stomata and almost completely rupturing it, straight or slightly sinuous, light to pale olivaceous brown, mostly simple but rarely once branched, 0-2 septate, sometimes sub-geniculate, old conidial scar (2.00-3.00 μm diam.) present lying flat against the side wall of the conidiophores or on the shoulder of the short denticles, tip subobtuse to obtuse, 3.00-5.00 x 9.00-45.00 μm (generally 9.00-16.50 μm); secondary mycelium superficial, external mycelial hyphae originating from the base of the stroma or emerging through the stomata, light to pale olivaceous, much

branched and septate, 3.00-500 μm wide, developing lateral secondary conidiophores; conidia obclavate-cylindric straight to cylindric, straight to curved, light brown to pale olivaceous brown, smooth, pluriseptate (2-9 septa), tip subobtuse, base obconically truncate to unthickened hilum, 3.00-4.00 x 33.00-87.00 μm .

Specimen studied : On *Tecoma stans* Juss. (Fam. Bignoniaceae), Aisaptagram, Hooghly, West Bengal, India, PCC 3657 (=IMI 292572), leg. K. K. Sarbajna, 6 January, 1985.

First time reported from the State of West Bengal.

Pseudocercospora rhoins (Cook & Eills) Deighton,
Mycological Papers, Nos. 140 : 152 (1976)

Synonym : *Cercospora rhoina* Cooke & Ellis,
Grevillea 6 : 89 (1878).

(Fig. 3)

Spots formed on lamina, amphigenous, prominent on ventral surface, circular to irregular, sometimes coalescent, evenly distributed, dark brown to blackish brown, distinct, vein limited, velutinous, 2-6 mm in extent; caespituli amphigenous, chiefly hypophyllous, effuse, evenly distributed over the spots, blackish brown to black; stroma none; mycelium superficial, amphigenous, chiefly hypophyllous, external mycelial hyphae well developed and profusely branched forming net like structure on the spots, pale olivaceous, septate, developing from the base of the conidiophore fascicle and producing lateral and terminal conidiophores, 2.00-3.50 μm wide; conidiophores amphigenous, chiefly hypophyllous, nonfasciculate (non-stromatic), 2-5 divergent stalks in a loose fascicle, straight to bent, olivaceous brown to mid pale brown, simple to branched, smooth, thick-walled, occasionally once geniculate, pluriseptate (1-7 septa), septa indistinct to distinct, sometimes slightly constricted at some of the septa, dilated at the apex, tip subobtuse, old conidial scar present and conspicuous, situated on the shoulder of the short denticles or lying flat against the side wall of the conidiophores, 3.50-7.00 x 13.20-66.00 μm ; conidia obclavate, straight to bent, pale olivaceous, smooth, thin walled, pluriseptate (1-20 septa), tip subobtuse, base truncate, sometimes tapers to unthickened hilum, 3.50-5.00 x 20.00-115.00 μm .

Specimen studied : On *Rhus* sp. (Fam. Anacardiaceae), Baruipur, 24-Parganas, West Bengal, India, PCC 3808 (=IMI 303909), leg. K. K. Sarbajna, 1 February, 1986.

First time reported from India.

Pseudocercospora psidii (Rangel) K. K. Sarbajna & B. K. Chattopadhyay,
comb. nov.

Synonym : *Cercospora psidii* Rangel, Bol. Agr. Sao Paulo, Serie 164, 4 : 324
(1915).

(Fig. 4)

Blotch formed on lamina, amphigenous, circular to irregular, often aggregate to coalescent, dark to reddish brown, virulent, vein limited, more prominent on

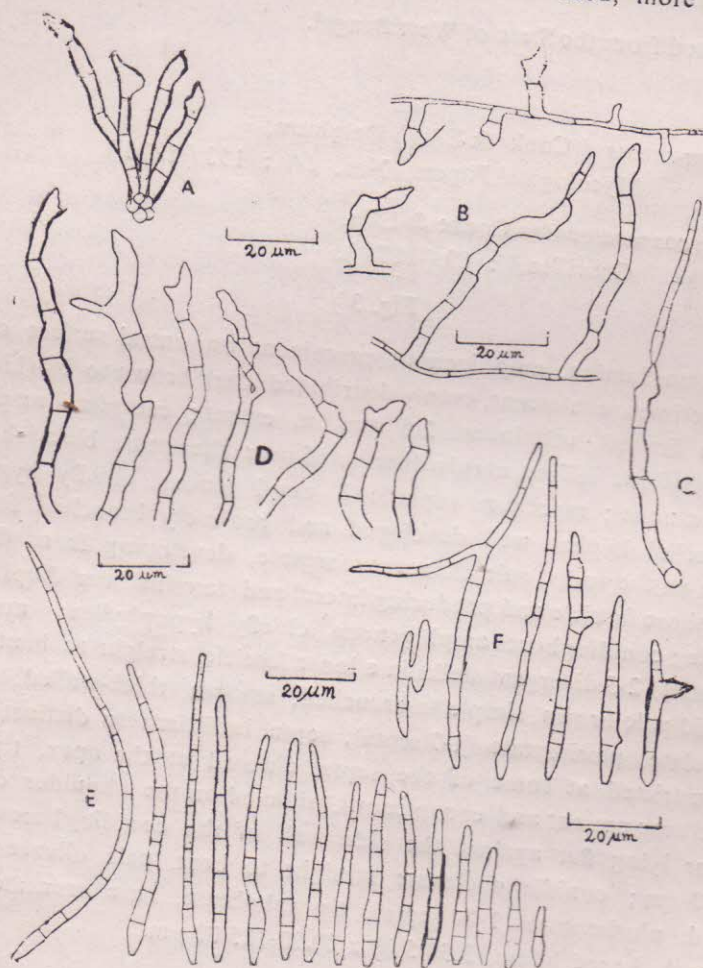


Fig. 3. *Pseudocercospora rhoina* : A. Conidiophore fascicle ; B. Secondary mycelial hyphae bearing conidiophores ; C. A solitary conidiophore bearing conidium ; D. Conidiophores ; E. Conidia ; F. Conidia showing germ tubes.

dorsal surface, 2-7 mm in extent; caespituli amphigenous, evenly distributed over the blotches, light to dark brown; primary mycelium internal, hyaline, branched and septate, 2.00-2.50 μm wide; stroma present, well developed, substomatal, amphigenous, globose to sub-globose, dark brown, composed of swollen, compact, brownish hyphal cells and conidiophore bases, 30.00-50.00 μm wide and upto 36.00 μm high, conidiophores amphigenous, chiefly hypophyllous, stromatic, fasciculate, in fascicles of 5-45 divergent stalks

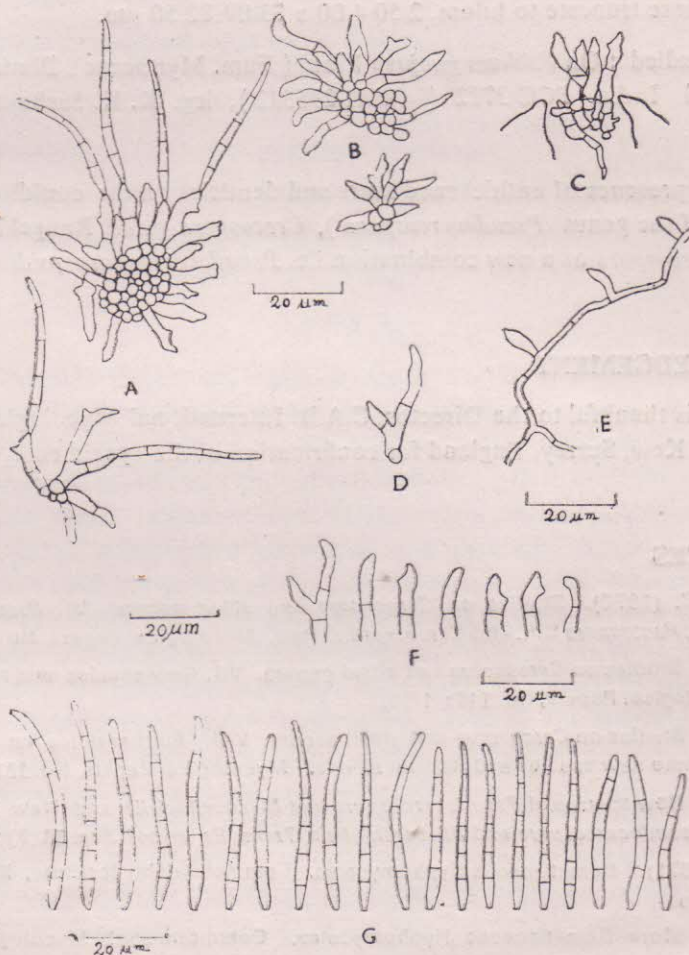


Fig. 4. *Pseudocercospora psidii*: A-B, Conidiophore fascicles; C, Section through a stroma; D, A solitary conidiophore; E, Secondary mycelial hyphae bearing conidiophores; F, conidiophores; G, Conidia

emerging through the stomata and sometimes rupturing through it, straight to bent, pale olivaceous, simple, smooth, thick-walled, non-geniculate, indistinctly septate (0-2 septa), denticles subconic, tip subobtuse to bluntly obtuse, conidial

scar present at the tip of the conidiophores, or sometimes lying against the side wall of the conidiophores, 3.50-6.00 x 13.00-45.00 μm ; secondary mycelium external, chiefly hypophyllous, originating from base of the conidiophore fascicles, external mycelial hyphae pale olivaceous, not much branched, septate, thin-walled and smooth, 2.00-4.00 μm wide, producing lateral secondary conidiophores; conidia obclavate-cylindric, pale olivaceous, straight to bent, smooth, thin-walled, pluriseptate (1-6 septa), septa indistinct to distinct, tip subobtuse, base truncate to hilum, 2.50-4.00 x 33.00-82.50 μm .

Specimen studied : On *Psidium guajava* Linn. (Fam. Myrtaceae), Bhatar, Burdwan, West Bengal, India, PCC 3722 (=IMI 295542), leg. K. K. Sarbajna, 5 March, 1985.

Note : The presence of unthickened scars and denticles on the conidiophores (the characters of the genus *Pseudocercospora*), *Cercospora psidii* Rangel is transferred to *Pseudocercospora* as a new combination i.e. *Pseudocercospora psidii* comb. nov.

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REFERENCES

- Deighton, F. C. (1976). Studies on *Cercospora* and allied genera. VI. *Pseudocercospora* Speg., *Pantospora* Cif., and *Cercoseptoria* Petr. Mycological Papers, No. 140 : 1-168.
- (1979). Studies on *Cercospora* and allied genera. VII. New species and redispositions. Mycological Papers, No. 144 : 1-56.
- (1983). Studies on *Cercospora* and allied genera. VIII. Further notes on *Cercoseptoria* and some new species and Redispositions. Mycological Papers, No. 151 : 1-13.
- (1987). New species of *Pseudocercospora* and *Mycovellosiella* and New combinations into *Pseudocercospora* and *Phaeoramularia*, *Trans. Br. mycol. Soc.* 88 (3) : 365-391.
- Ellis, M. B. (1971). *Dematiaceous Hyphomycetes*. Commonwealth Institute, Kew, England, 608 pp.
- (1976). *More Dematiaceous Hyphomycetes*. Commonwealth Mycological Institute, Kew, England, 507 pp.

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