

New *Stenella* Species from India

K. K. SARBAJNA AND B. K. CHATTOPADHYAY

Department of Botany, Presidency College, Calcutta 700 073, W.B., India

Three new species of *Stenella*, *S. plumeriae*, *S. alocasiae* and *S. colocasiae* are described and illustrated. They cause leaf spot diseases on *Plumeria acutifolia*, *Alocasia indica* and *Colocasia antiquorum* respectively.

Key words : Taxonomy, *Stenella*. Three new species.

The genus *Stenella* was first established by Sydow in 1930 citing *Stenella araguata* Tyd. as the type species. This genus and its type species have been redescribed and figured by Ellis (1971). Deighton (1979) transferred *Biharia vangueriae* to *Stenella vangueriae*. Deighton (1979) was of opinion that the genus *Stenella* has close similarities with the genus *Mycovellosiella* and equally closely related to members of the dematiaceous hyphomycetes, especially *Cladosporium* and *Cercospora*. But it differs from *Mycovellosiella* in having rough-walled external mycelial hyphae and usually verruculose conidia which are brown, usually catenate, subcylindric or narrowly obclavate-cylindric and more than 2 septate. Transfer from these genera (*Cercospora*, *Cladosporium*) have been made by Deighton (1971, 1979), Mulder (1975) and Singh and Kamal (1978). The type specimens have been deposited in the Herbarium, C. A. B. International Mycological Institute, Kew, Surrey, England, as indicated by IMI number.

DESCRIPTION

Stenella plumeriae sp. nov.

Etym.—From the name of the host genus
(Fig. 1)

Maculae amphigenae, distinctae, plerumque circulares vel semicirculares, centro pallide-brunneae, plerumque margin griseobrunneae vel atro-brunneae cinctae,

velutinae, numerosae, 1-2 mm latae; caespituli amphigeni, valutini, atro-brunnei vel fere atri, aequaliter et laxe dispersi; mycelium primarium immersum; stroma nullum; conidiophora hypophylla, fasciculata, 3-20 in fasciculo divergenti per stoma emergentia, brunnea recta vel flexa, plerumque simplicia, laevia, pluriseptata usque 7, apicem versus arcte sinuosa, distincta cicatrices conidiales, $3-4.5 \times 33-82.5 \mu\text{m}$;

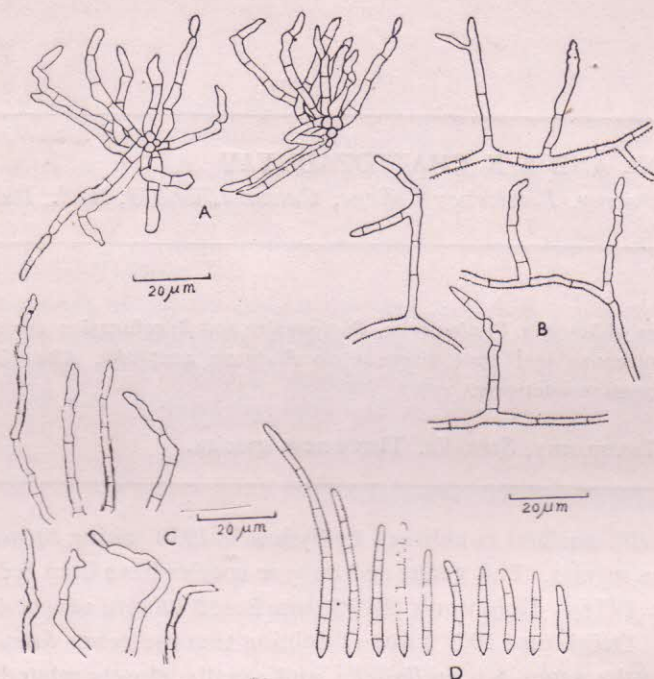


Fig. 1 : *Stenella plumeriae*

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

mycelium secundarium externum, plerumque hypophylli, hyphis pallide-olivacea, micronematum, ramosa, septata, verruculosa, $3.5-5 \mu\text{m}$ latae, conidiophora secundaria terminaliter et lateraliter gerentes; conidia obclavato-cylindrica, pallide olivaceo-brunnea, plerumque recta, interdum flexa, verruculosa, 1-10 septata, $3.5-5 \times 16.5-99 \mu\text{m}$, apice sub-obtusa, basi attenuata.

Habitat in foliis vivis *Plumeriae acutifoliae* Poir (Apocynaceae), Ichapur, 24-Parganas (North), Bengal occidentales, India, PCC 3815, leg. K. K. Sarbajna, 22 November, 1985.

Leaf spot amphigenous, distinct, mostly circular to semicircular, pale brown in the centre surrounded by greyish brown to dark brown margin, velutinous, numerous, 1-2 mm in extent; caespituli amphigenous, veluticus, dark brown to

almost black, evenly and loosely distributed over the spot; primary mycelium internal; stroma none; conidiophores hypophyllous, fasciculate in fascicle of 3-20 divergent stalks emerging through the stomata, brown, straight to flexuous, mostly simple, occasionally once branched, smooth, thick walled, pluriseptate upto 7, closely sinuous towards the apex, scar present at the tip or lying against the side wall of the conidiophores, $3.4.5 \times 33-82.5 \mu\text{m}$; secondary mycelium external, hyphae chiefly hypophyllous, pale olivaceous, micronematous, branched and septate, minutely verruculose, $3.5-5 \mu\text{m}$ wide, bearing obclavate-cylindric, pale olivaceous brown, mostly straight, sometimes bent, verruculose, thick-walled, distinctly pluriseptate (1-10 septa), $3.5-5 \times 16.5-99 \mu\text{m}$, apex subobtuse, base attenuated.

Speciman studied: On *Plumeria acutifolia* Poir (Apocynaceae), Ichapur, 24-Parganas (North), West Bengal, India, PCC 3815, leg. K. K. Sarbajna, 22 November 1985.

After comparing the type collection with descriptions of species already described (Deighton, 1971, 1979; Ellis, 1971, 1976; Kamal and Singh, 1978; Mulder, 1975; Prasad, 1986; Yen, Kar and Das, 1982 a, b, c,) it shows slight resemblance only to *S. aegles* S. S Prasad known on *Aegle marmelos* in colour of conidiophores, conidia and minutely verruculose secondary mycelium. However, *S. plumeriae* differs from *S. aegles* in the total absence of a stroma, size of conidiophores, shape, size and number of septa in conidia and in the symptoms it causes.

Stenella alocasiae sp. nov.

Etym.—From the name of the host genus

(Fig. 2)

Maculae amphigenae, distinctae, circulares vel subcirculares, interdum maculae aggregatae, primo-centro pallide-viridae, margin rubido brunneae vel atro-brunneae cinctae deinde centro griseo-albidae, margin rubido-brunneae cinctae ad flavidae halo, 2-17 mm latae; caespituli amphigeni, griseo-brunnei vel atro-brunnei, aequaliter disseminati; mycelium primarium immersum, subhyalina, ramosa et septata, $1.5-2.5 \mu\text{m}$ latum; stromata hypophylla, bene evoluta, substomatalia, globosa vel sub globosa, atro-brunnea, $23-66 \mu\text{m}$ diam., conidiophora fasciculata, 3-27 in fasciculo divergenti per stoma emergentia, recta vel flexa, pallide brunnea vel pallide olivaceo-brunnea, simplicia, usque ad 15 septata, pariete crassa, laevia, apicem versus arcuata sinuosa, distincta cicatrices conidiales, $3-4 \times 20-80.5 \mu\text{m}$; mycelium secundarium externum, pallide olivacea vel medio-olivaceo brunnea, repens et profuse ramosa, septata, pariete crassa, $2.5-5 \mu\text{m}$ latum; conidiophora secundaria lateraliter gerentes, conidiophora secundaria $3-7 \times 33-198 \mu\text{m}$; conidia pallide olivaceo-brunnea, cylindrica vel

obclavato-cylindrica, solitaria vel catenata, echinulata, plerumque recta, interdum curvata, 1-4 septata, $3-4 \times 12-59 \mu\text{m}$; apice sub-obtusa, basi truncato-attenuata.

Habitat in foliis vivis *Alocasiae indicis* Schott. (Araceae), Baruipur, 24-Parganas (South), Bengal occidentales, India, PCC 3469 (IMI 284569), leg. K. K. Sarbajna, 28 December, 1983.

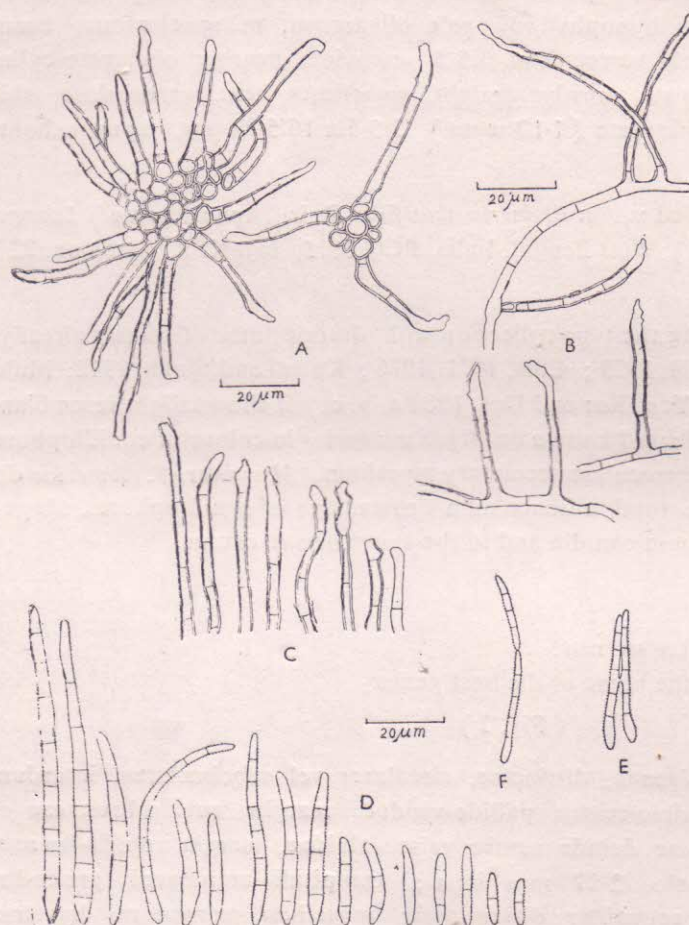


Fig. 2 : *Stenella alocasiae*

A, Conidiophore fascicles; B, Secondary mycelial hyphae bearing conidiophores; C, Conidiophores; D, Conidia; E, Anastomosis of conidia; F, Conidia in chain.

Leaf spot amphigenous, distinct, circular to subcircular, sometimes coalescent, primarily pale green in the centre surrounded by reddish brown or blackish brown margin, later greyish white in centre surrounded by reddish brown margin with

yellowish halo, sometimes spots with distinct concentric rings, occasionally leaving shot-hole, scattered, 2-17 mm in extent., caespituli amphigenous, greyish brown to blackish brown, evenly distributed over the spots; primary mycelium internal, sub-hyline, branched and septate, 1.5-2.5 μm wide; stromata hypophyllous, well developed, substomatal, globular to subglobular, dark brown, 23-66 μm diam., conidiophore fasciculate, consisting of 3-27 divergent stalks emerging through the stomata, straight to flexuous, pale brown to pale olivaceous brown, simple, with upto 15 septa, thick walled, smooth, closely sinuous towards the apex, spore scar lying at the sinuous tip or against the side wall of the conidiophores, 3-4 x 20-82.5 μm ; secondary mycelium external, pale olivaceous to mid olivaceous brown, repent and profusely branched, thick walled, 2.5-5 μm wide, producing laterally secondary conidiophores; secondary conidiophores 3-7 x 33-198 μm ; conidia pale olivaceous brown, cylindric to obclavate-cylindric, solitary or catenate, echinulate, mostly straight, sometimes curved, 1-4 septate, 3-4 x 12-59 μm , apex sub-obtuse, base truncate-attenuate.

Specimen studied: On *Alocasia indica* Schott. (Araceae), Baruipur, 24-Parganas (South), West Bengal, India, PCC 3469 (IMI 284569), leg. K. K. Sarbajna, 28 December, 1983.

Details of this species have been compared with those of described species of *Stenella* (Deighton, 1971, 1979; Ellis, 1971, 1976; Kamal and Singh 1978; Mulder, 1975; Prasad, 1986; Yen, Kar and Das, 1982 a, b, c.) and none will accommodate this species. No species of *Stenella* has been reported on this host.

Stenella colocasiae sp. nov.

Etym.—From the name of the host genus

(Fig. 3)

Maculae amphigenae, circulares, primo centro brunneae ad pallide brunneae halo, deinde centro griseo-albidae, margin atrobrunneae cinctae, 2-11 mm in diam, caespituli, amphigeni, atri, punctiformi, inaequaliter disseminati; mycelium primum immersum; stromata presentia, epiphylla, bene evoluta, cellulis brunneis leniter inflatis; conidiophora epiphylla, fasciculata, 3-5 in fasciculo divergenti per stoma emergentia, simplicia, recta vel curvata laevia, pariete crassa, pluriseptata (1-5), apicem versus arote sinuosa, brunnea, apicem versus pallidiora, 3.5-5 x 16.5-115 μm ; mycelium secundarium externum, macronematum, pallide olivacea, repentia et profuse ramosa, septata verruculosum, 2.5-3 μm latum; conidiophora secundaria terminaliter et lateraliter gerentes; conidia solitaria vel catenata (usque 2), obclavata, pallide olivacea, laevia vel echinulata, recta vel curvata, pluriseptata (2-5), 2.5-3 x 16.5-100 μm , apice sub-obtusa, cellula basali truncata hilo non incrassato.

Habitat in foliis vivis *Colocasiae antiquori* Schott (Araceae), Ichapur, 24-Parganas (North), Bengal occidentales, India, PCC 4967 (IMI 311131), leg. K. K. Sarbajna, 10 September, 1986.

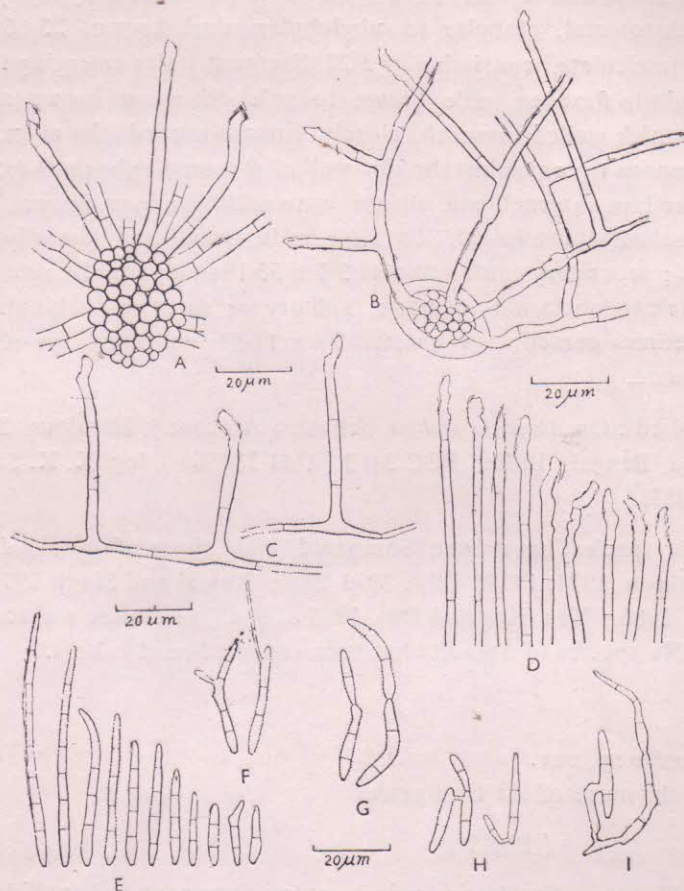


Fig. 3 : *Stenella colocasiae*

A & B. Conidiophore fascicles ; C, Secondary mycelial hyphae bearing conidiophores ; D, Conidiophores ; E, Conidia ; F, Conidia showing germ tubes ; G, Conidia in chains ; H & I, Anastomosis of conidia.

Leaf spot amphigenous, circular, initially small brownish centre with light brown halo, later greyish white centre surrounded by broad raised dark brown margin (1 mm in wide) sometimes leaving shot-hole, 2-11 mm in diam. ; caespituli amphigenous, black, punctiform, unevenly distributed over the spots ; primary mycelium internal ; stromata present, epiphyllous, well developed, compact of mass of hyphal cells and arising from the stomata ; conidiophores epiphyllous,

fasciculate, in fascicle of 3-5 divergent stalks emerging through stomata, simple, straight to bent, brownish, paler towards the apex, smooth, thick-walled, pluriseptate (1-5 septa) closely sinuous towards the apex, $3.5-5 \times 16.5-115 \mu\text{m}$; secondary mycelium external, macronematous, pale olivaceous, repent and profusely branched, septate, forming net work over the surface of the spots, conspicuously nodose at regular intervals of the secondary mycelium, verruculose, $2.5-3 \mu\text{m}$ wide, producing secondary conidiophores both laterally and terminally; conidia solitary or catenate (upto 2), obclavate, pale olivaceous, smooth to minutely verruculose, straight to bent, pluriseptate (2-5), conidia forming ladder, $2.5-3 \times 16.5-100 \mu\text{m}$; apex sub-obtuse, basal cell truncate with a unthickened hilum.

Specimen studied: On *Colocasia antiquorum* Schott. (Araceae), Ichapur, 24-Parganas (North), West Bengal, India, PCC 4967 (IMI 31131), leg. K. K. Sarbajna, 10 September, 1986.

Stenella colocasiae is clearly distinguished from other species in the genus by the conspicuous nodose of the echinulate secondary mycelium. The conidiophores are smooth, long ($16.5-115 \mu\text{m}$) closely sinuous towards the apex. The type species differs from other described species of *Stenella*, by its characteristics solitary to catenate, verruculose conidia, shape, size and number of septa in conidia. No species of *Stenella* has yet been reported on the present host. So, the present fungus is described as a new species.

ACKNOWLEDGEMENTS

The author wishes to thank the Director and staff of C. A. B. International Mycological Institute, Kew, Surrey, U. K., for their assistance and confirming the identity of the fungi; Mr. F. C. Deighton, who first brought his attention to this genus; the Head of the department of Botany, Presidency College, Calcutta, India for providing excellent facilities for this work.

REFERENCES

- Deighton, F. C. (1971). Brown leaf mould of *Canavalia* caused by *Stenella canavaliae* (H. et P. Sydow) comb. nov. *Trans. Br. Mycol. Soc.* 56: 411-418.
- Deighton, F. C. (1979). Studies on *Cercospora* and allied genera. VII. New species and redispositions. *Mycol. Pap.* 144: 1-56.
- Ellis, M. B. (1971). *Dematiaceous Hyphomycetes*, C. M. I., Kew, England, 608 pp.
- Ellis, M. B. (1976). *More Dematiaceous Hyphomycetes*, C. M. I., Kew, England 507 pp.
- Hansford, C. G. and Thirumalachar, M. J. (1948). Fungi of South India. *Farlowia* 3: 285-314.

- Mulder, J. L. (1975). Notes on *Stenella*, *Trans. Br. Mycol. Soc.* 65 (3): 514-517.
- Prasad, S. S. (1986). A new species of *Stenella* on leaves of *Aegle marmelos*. *Indian Phytopath.* 20: 253-255.
- Singh, S. and Kamal, (1978). *Fungi of Gorakhpur VI. Indian Phytopath.* 31: 315-317.
- Yen, Jo-Min, Kar, A. K. and Das, B. K. (1982a). Studies on hyphomycetes from West Bengal, India. I. *Cercospora* and allied genera of West Bengal. I. *Mycotaxon* 16 (1): 35-37.
- Yen, Jo-Min, Kar, A. K. and Das, B. K. (1982b). Studies on hyphomycetes from West Bengal, India. II. *Cercospora* and allied genera of West Bengal. II. *Mycotaxon* 16 (1): 58-79.
- Yen, Jo-Min, Kar, A. K. and Das, B. K. (1982c). Studies on hyphomycetes from West Bengal, India, III. *Cercospora* and allied genera of West Bengal. III. *Mycotaxon* 16 (1): 80-95

(Accepted for publication 10 August 1990)