

Three new forms of genus *Corynespora* gussow from north western tarai forests of U.P.

■ D.P. SINGH AND T.P. MALL

SUMMARY

This communication deals with the descriptions and illustrations of hitherto undescribed species of phytopathogenic foliar hyphomycetes viz., *Corynespora bahraichina* Singh and Mall sp. nov. on *Croton roxburghii* (Euphorbiaceae), *Corynespora carissae* Singh and Mall sp. nov. on *Carissa carandas* (Apocynaceae) and *Corynespora celastricola* Singh and Mall sp. nov. on *Celastrus paniculatus* (Celastraceae) collected from North Western Tarai Forests of U.P. The type specimens have been deposited in H.C.I.O., IARI, New Delhi and their accession number have been allotted. Morphotaxonomic determinations have been done by comparing with allied taxa in questions and consulting the available literature.

Key Words : Morphotaxonomy, Foliar fungi, *Corynespora*, Species novel

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During our survey of this region, a number of collections of living leaves exhibiting leaf spots and blights were encountered. Of these, upon critical examination and comparison of morphotaxonomic features with those of the allied forms, three taxa of species rank were found to be hitherto undescribed. These are described and illustrated as novel species of genus *Corynespora* viz., *C. bahraichiana* Singh and Mall sp. nov., *C. carissae* Singh and Mall sp. nov. and *C. celastricola* Singh and Mall sp. nov. parasitizing on the living leaves of *Croton roxburghii* (Euphorbiaceae), *Carissa carandas* (Apocynaceae) and *Celastrus paniculatus* (Celastraceae), respectively.

During collection trips infected leaf samples were taken in separate polythene bags from North Western Tarai Forest of Uttar Pradesh. Suitable mounts of surface scrapping and free hand cut sections were prepared from infected portions

of the leaf samples. Microscopic slides were prepared in cotton- blue lactophenol mixture, slides were examined and camera lucida drawing were made. Morphotaxonomic determinations of taxa were done with the help of current literature and resident expertise available. Holotypes have been deposited in HCIO, IARI, New Delhi and isotype retained in the departmental herbarium for further reference.

Taxonomic description :

Corynespora bahraichiana Singh and Mall sp. nov. (Fig. 1):

Maculae amphigenae, subcirculare vel fere circulare, 80-90 μ m diam; brunneae vel griseae ad inferne. Coloniae amphiphyllae, effusae, griseo-brunneae. Mycelium internum vel externum, tenuitunicatae, glabrae, ramosae, olivaceae vel brunneae. Stromata abesse. Conidiophora superficialis, singularis, ex-hyphis superficialis lateriter oriunda, macronemata, mononemata, erecta, recta vel flexusa, non-ramosa, cylindrica, glabra crassitunicata usque 6 septata, brunnea vel atro brunnea, 87-158 μ m longa et 8-12 μ m lata. Cellulae conidiogenae in conidiophoris incorporatae, terminalae, monotreticae, cicatrices incrassatae. Conidia acrogena, solitaria, simplicia non-ramosa, tenuitunicata, laevia, recta vel leniter curvata, cylindrica, 26-127x 9-22 μ m in diam, 3-

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8 distoseptata, apice vel rotundata, olivaceo brunnea hila incrassata.

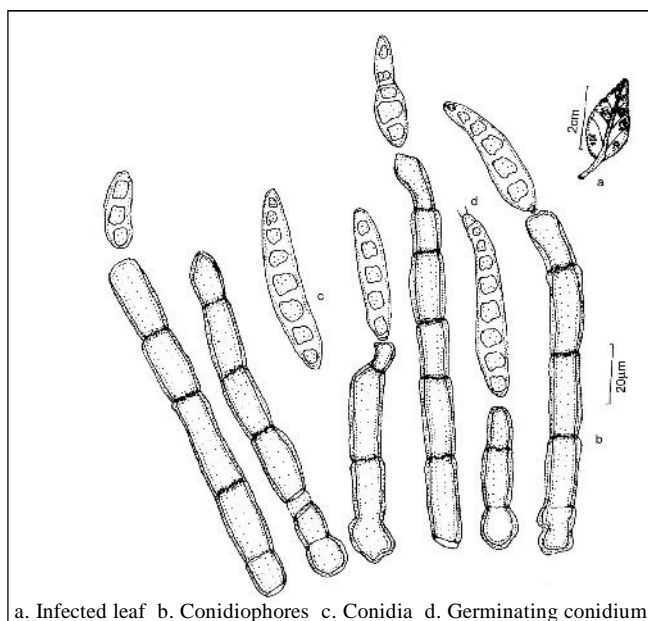


Fig. 1: *Corynespora bahraichiana* Singh and Mall sp. nov.

In folis vivis *Croton roxburghii* Bat. (Euphorbiaceae), Sirsia Forest Range, Bahraich (U.P.) India, 3rd. Feb, 2008, leg; D.P. Singh, BRH-1,669, DPS-0,269 (Isotypus), HClO - 48,556 (Holotypus).

Infection spots amphigenous, subcircular to almost circular, brown to grayish brown. Mycelium internal and external, thin walled, smooth, branched, olivaceous to brown. Stromata absent. Conidiophores arising singly as lateral branches from superficial hyphae, macronematous, mononematous, erect, straight to flexuous, unbranched, cylindrical, smooth, thick walled, up to 6 septae, brown to dark brown, 87-158 µm long and 8-12 µm wide. Conidiogenous cells integrated, terminal, monotretic, scars unthickened.

Conidia acrogenous, solitary, simple, unbranched, thin walled, smooth to slightly curved, cylindrical 26-127 x 9 - 22 µm in diam, 3-8 distoseptate, apex rounded olivaceous to olivaceous brown, hilum unthickened.

On living leaves of *Croton roxburghii* Bat. (Euphorbiaceae), Sirsia Forest Range, Bahraich (U.P.), India, 3rd. Feb, 2008, leg; D.P. Singh, BRH-1,669, DPS-0,269 (Isotype), HClO - 48,556 (Holotype).

A survey of literature reveals that among earlier described species of *Corynespora*, the morphotaxonomic features of *C. alstoniae* Meenu and Kamal (1998) are comparable with *C. bahraichiana* sp. nov. which is given in Table 1.

From the comparison (Table 1), it is clear that length of conidiophores of present collection is smaller than *C. alstoniae* significantly. Conidia of *C. alstoniae* having 2-15 pseudoseptate with unthickened hilum while solitary and having 3-8 pseudoseptate with unthickened hila in present species. Moreover, the conidia of *C. bahraichiana* are also at great variance from those of earlier described species. Therefore, treatment of *C. bahraichiana* deserves as a new taxon, of species rank.

Corynespora carissae Singh Mall sp. nov. (Fig. 2) :

Maculae amphigenae, circulares vel irregulares, per superficiem folii extensae, brunneae vel atrobunneae per totam folii 2-20 mm in diam. Coloniae amphiphylae, effusae. Mycelium external et internum, laevibus, ramosis, septatis, tenui-tunicatae, olivaceae vel brunneae. Stromata nulla notata. Conidiophora ex hyphis oriundo singulata vel 2-3 fasciculata laevia, crassitunicata, longa, cylindrica, ramosa vel non-romosis,

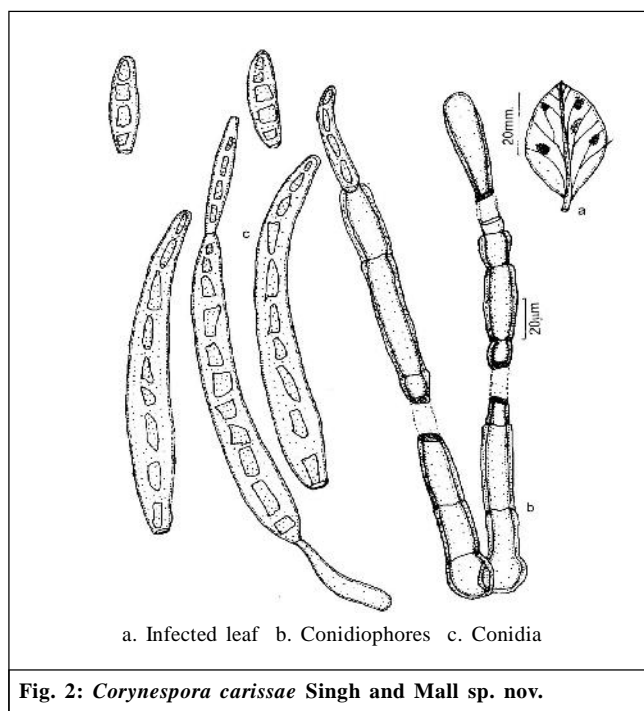


Fig. 2: *Corynespora carissae* Singh and Mall sp. nov.

Table 1 : Comparison of morphotaxonomic features of *C.alstoniae* and *C. bahraichiana* sp. nov.

<i>Corynespora</i> spp.	Conidiophores	Conidia
<i>C. alstoniae</i> Meenu et al.	Olivaceous brown to dark brown, septate with cylindrical proliferation, 121-473.5 x 6.0-13.5 µm in diam.	Clavate to obclavato cylindrical, subhyaline to light olivaceous, 2-15 pseudoseptatae, hilum unthickened, 48.5-154 x 8.5-21.5 µm in diam.
<i>C. bahraichiana</i> sp. nov.	Solitary, brown to dark brown 87-158 µm long and 8-12 µm wide in diam.	Cylindrical, olivaceous to olivaceous brown, 3-8 pseudoseptatae, hilum unthickened, 26-127 x 9-22 µm in diam.

erecta vel leniter procumbenta, lenter vel flexuosa, cellulae basali inflati, macronemata, mononemata, 4-15 septata cum 5-10 proliferations successivas cylindrica, brunnea 130-250 x 5-10 µm in diam. Cellulae conidiogenae integratae, terminales, monotreticae, inflatae ad apicem, cicatrices non- incrassatae. Conidia solitaria, sicca, acrogena, simplicia, laevia, non-ramosa, tenui-tunicata, cylindrica vel obclavato cylindrica, lenter curvata, ad apicem obtusa vel roundata, ad apicem obtusam attenuate, ad basim truncata vel obconicatruncate, 5-15 distoseptata cum 0-1 angulis distoseptis simulatibus, hilo crassata interdum germinato, olivaceo vel olivaceo brunneae, 40 - 120 x 10-23 µm in diam.

In folis vivis *Carissa carandas* Linn. (Apocynaceae), Nishangara Forest Range, Bahraich (U.P.) India, 20th Feb; 2007, leg; D.P. Singh, BRH-1,605, DPS-0,205 (Isotypus), HCIO - 47,904 (Holotypus).

Infection spots amphigenous, circular to irregular, spread on surface, brown to dark brown on both surfaces, 2-20 mm in diam. Colonies amphiphylous, effuse. Mycelium external and internal, smooth, branched, septate, thin walled, olivaceous to brown. Stroma not observed. Conidiophores arising singly from hyphae or in a fascicle of 2-3, smooth thick walled, long, cylindrical, branched to unbranched, erect to slightly procumbent, straight to flexuous, basal cell swollen, macronematous, mononematous, 4-15 septate with 5-10 successive cylindrical proliferations, brown, 130-25 x 5-10 µm in diam. conidiogenous cells integrated, terminal, monotretic, swollen towards the apex, scars, unthickened. Conidia solitary, dry arogenous, simple, smooth, unbranched, thin walled, cylindrical to obclavato cylindrical, slightly curved, apices obtuse to rounded, tapered gently to an obtuse apex, bases truncate to obconicatruncate, 5-15 distoseptate with 0-1 transverse band like pseudoseptation, hilum unthickened, sometimes germinating, olivaceous to olivaceous brown, 40-120 x 10-23 µm in diam.

On living leaves of *Carissa carandas* Linn. (Apocynaceae), Nishangara Forest Range, Bahraich (U.P.) India, 20th Feb; 2007, leg ; D.P. Singh, BRH-1,605, DPS-0,205 (Isotype), HCIO - 47,904 (Holotype).

Literature survey indicates that one species of the genus

Corynespora viz., *C. cassiicola* (Berk. and Curt) Wei has been described on the family Apocynaceae. The present collection, therefore, is compared with the same (Table 2).

From above comparative account, it is clear that there are major differences in dimensions of conidiophore and conidia of present collection from those of earlier described species. Hila are thickened in *C. cassiicola* whereas unthickened in present species. *C. cassiicola* has much longer conidiophores than those of *C. carissae* which are strictly unbranched and cylindrical in shape. No *Corynespora* species has, so far, been described on the host genus. Hence, the proposal of new taxon of species rank is worthwhile, to accommodate it.

Corynespora celsaericola Singh and Mall sp. nov. (Fig. 3) :

Maculae amphigenae, subcirculare vel irregular, brunneae vel blackish coloniae amphiphylae, effusae, brunneae. Mycelium internum, tenuitunicatae, glabrae, ramosa, olivaceo brunneae vel brunneae. Stromata nulla notata.

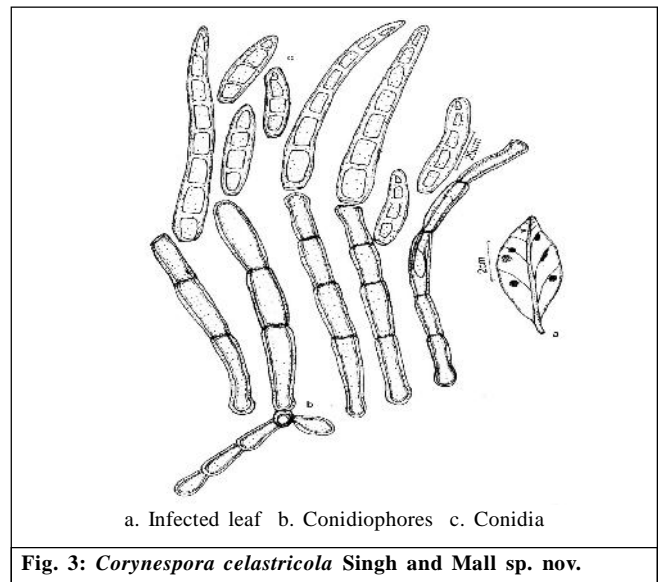


Fig. 3: *Corynespora celsaericola* Singh and Mall sp. nov.

Table 2 : Comparison of morphotaxonomic features of *Corynespora carissae* sp. nov. with *C. cassiicola*

<i>Corynespora</i> spp.	Conidiophores	Conidia
<i>C. cassiicola</i> (Berk. and Curt.) and Wei	Pale to mid brown, septate with 1 successive cylindrical proliferation, 110-850 x 4-11 µm in diam.	Obclavate to pale olivaceous brown, 4-20 pseudoseptate, hilum thickened, 40-220 x 9-22 µm in diam.
<i>C. carissae</i> sp. nov.	Conidiophores arising singly from hyphae or in fascicle of 2-3, branched to unbranched, 4-15 septate with 5-10 proliferations, brown; 130- 250x5-10µm in diam.	Conidia solitary, cylindrical to obclavato cylindrical, 5-15 distoseptate with 0-1 transverse band like pseudoseptation, sometimes germinating, olivaceous to olivaceous brown 40-120 x 10 - 23 µm in diam.

Table 3 : Comparative details of *C. cassiicola* and *C. celsaericola* sp. Nov.

<i>Corynespora</i> spp.	Conidiophores	Conidia
<i>C. cassiicola</i> (Berk. and Curt.) Wei	Pale to mid brown septate with 9 successive cylindrical proliferation, 110-850 x 4 - 11 µm in diam.	Obclavate to pale olivaceous brown, 4-20 pseudoseptate, hilum unthickened, 40-220 x 9-22 µm in diam.
<i>C. celsaericola</i> sp. nov.	Simple, macronematous, mononematous, branched, 0-5 septate with 2-3 proliferation 120-180 x 6-11µm in diam.	Obclavato cylindrical, 4-8 pseudoseptate and one euseptate, hilum unthickened, olivaceous brown, sub-hyline, 30-110 µm in diam.

Conidiophora, singularia, macronematosa, mononematosa, erecta vel procumbenta, recta vel flexuosa, ramosa, glabra, crassitunicata, usque 5 septata et 2-3 successive proliferata, 120-180 x 6-11 µm in diam. Cellulae conidiogenae in conidiophoris integratae, terminales, monotreticae, cicatrices non incrassatae; Conidia acrogenae, solitaria, simplicia, non-ramosa, tenuitunicata, glabra, recta vel curvata obclavato-cylindricata, 4-8 pseudoseptata et one euseptata, 30-110 µm in diam. apice obtusa vel rotundata, olivaceo brunnea vel subhyalina hila incrassata.

In foliis vivis *Celastrus paniculatus* Willd. (Celastraceae), Nishangara Forest Range, Bahraich (U.P.) India, 20th Feb., 2007, leg; D.P. Singh, BRH-1,599, DPS-0,199 (Isotypus), HCIO - 47,903 (Holotypus).

Infection spots amphigenous, subcircular to irregular brown to black. Colonies amphiphylous, effuse, brown. Mycelium internal thin walled, smooth, branched, olivaceous brown to brown. Stromata absent. Conidiophores arising singly, maronematous, mononematous, erect to procumbent, straight to flexuous, branched, cylindrical, smooth, thick walled upto 5 septate and 2-3 successive proliferations, 120-180 x 6-11 µm in diam. Conidiogenous cells integrated, terminal, monotretic scars unthickened. Conidia acrogenous, solitary, simple, unbranched, thin walled, smooth, straight to slightly curved to obclavato cylindrical, 4-8 pseudoseptate and one euseptate, 30-110 mm in diam, apex obtuse to rounded, olivaceous brown to sub-hyaline, hilum unthickened.

On living leaves of *Celastrus paniculatus* Willd. (Celastraceae), Nishangara Forest Range, Bahraich (U.P.) India, 20th Feb., 2007, leg., D.P. Singh, BRH-1,599, DPS-0,199(Isotype), HCIO - 47,903 (Holotype).

Literature survey indicates that no. species of the genus *Corynespora* has been described on the host family Celastraceae. The present collection, therefore, is compared with the type species *i.e.* *Corynespora cassiicola* (Berk. and Curt.) Wei in the given Table 3.

From the comparative account (Table 3), it is clear that the conidiophores and conidia of *C. cassiicola* are much longer than those of the present collection. The conidiophores of *C. cassiicola* have 9 successive proliferations which are against 2-3 in present collection. Conidia of *C. cassiicola* have 4-20 distoseptation with thickened hilum while 4-8 pseudoseptations and only one euseptation with unthickened hilum in present species. Therefore, treatment of *C. celastricola* as a new taxon, of species rank is justified.

The review of literatures (Bilgrami *et al.*, 1979, 1981, 1991; Ellis, 1971, 1976; Jamaluddin *et al.*, 2004; Singh and Singh,

1997; Meenu and Kamal, 1998; Sarbhoy *et al.*, 1986, 1996; Singh and Mall, 2007a, 2007b, 2008) reveals that these new taxa have not been reported either from North Western Tarai Forests of U.P. or India. Hence, these novel species are addition to Indian foliar mycoflora.

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