



IJCRR
Section: Healthcare
Sci. Journal
Impact Factor
4.016
ICV: 71.54

Two New Species of *Corynespora* from West Bengal, India

D. Haldar

Department of Botany, Krishnath College, Berhampore, Murshidabad-742101, West Bengal, India.

ABSTRACT

The present paper deals with the description and illustrations of the two undescribed species of *Corynespora* Gussow viz. *Corynespora calotropidis* Haldar sp.nov. and *Corynespora jatrophae* Haldar sp.nov. growing on the living leaves of *Calotropis gigantea* (Asclepiadaceae) and *Jatropha curcus* (Euphorbiaceae), collected from Murshidabad district, West Bengal, India. Morphotaxonomic identity of the species is presented here along with the microphotograph and visible symptoms on host plants consulting with the current literature.

Key Words: Anamorphic fungi, Morphotaxonomy, Foliicolous, *Corynespora*

INTRODUCTION

The genus *Corynespora* was erected by Gussow in the year 1906 with *Corynespora cassicola* (Berk. & Curt.) Wei = *C. mazei* Gussow as type species. It is a sac fungus and the present taxonomic position of the genus-Class-Dothideomycetes, Order-Pleosporales and the family-Corynesporaceae. The reproductive structure of this fungus is the conidia which are distoseptate with or without distinct hila and monoblastic terminal conidiogenous cells. The fungus causes foliar diseases in shrub, undershrub and perennial plants, predominating in the tropics and subtropical regions including India. The genus is represented by about 140 species throughout the globe (Farr & Rossman, Mycobank, 2016).

A good number of novel taxa of Hyphomycetes have been previously described by different workers of this country particularly from the Department of Botany, Presidency University, Kolkata (erstwhile Presidency College, Kolkata) and School of Mycology at D.D.U. Gorakhpur University and elsewhere, Bilgrami et al., 1991; Jamaluddin et al., 2004. Presently a number of species of the genus of *Corynespora* under hyphomycetes have been described from India and abroad by Bhat, 2010; Braun and Crous 2007; Castañeda et al., 2004; Dubey and Rai; 2003; Ellis, 1971, 1976; Haldar 2011, 2016a, 2016b, 2017; Hawksworth 1974; Jain et al., 2002; Kamal, 2010; Kamal, 1998; Kumar et al., 2007; Kumar and Singh 2016a, 2016b; 1998; Singh et al., 2000 Singh et al., 2007; Kharwar 1998; Singh et al., 2014; Kumar et

al., 2012; Kumar et al., 2006; Kumar and Singh 2016; Kai Zhang et al., 2009; Meenu et al., 1997; Mycobank, 2017; Pal et al., 2007; Singh et al. 2012; Seifert and Gams 2001; Seifert et al., 2011, Seifert et al., 2001; Savile 1962; Sharma et al., 2002; Sharma et al., 2003; Sharma and Chaudhary 2002; Xiu Guo and Cheng Kuei 2005; Singh and Mall 2011; Singh and Mall, 2012; Zhi Qiang and Xiu Guo 2007; Zhang et al., 2012 and Xiao-Mei Wang and Xiu-Guo Zhang 2007; 2016.

During working on the foliicolous fungi of Murshidabad district of West Bengal the author had collected two members of Hyphomycetes growing on the living leaves of *Calotropis gigantea* (Asclepiadaceae) and *Jatropha curcus* (Euphorbiaceae), which on critical examination found to be two new species of the genus *Corynespora*. Hence, these two species *Corynespora calotropidis* Haldar and *Corynespora jatrophae* Haldar have been created as new taxa.

MATERIALS AND METHODS

Plant specimens with distinct disease symptoms of the parasitic fungi on the leaves of different ages were detached intact from the host plants and they were kept in polythene bags and processed by following standard techniques, (Hawksworth 1974, Savile 1962). The infected leaves having distinct symptoms were collected and dried to make herbarium specimens. Morphological descriptions of the associated fungi are based on the slide preparations mounted on lacto-

Corresponding Author:

D. Haldar, Department of Botany, Krishnath College, Berhampore, Murshidabad-742101, West Bengal, India.
E-mail: haldar.dinesh85@gmail.com

ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

DOI: <http://dx.doi.org/10.7324/IJCRR.2017.9124>

Received: 20.04.2017

Revised: 09.05.2017

Accepted: 19.05.2017

phenol cotton blue mixture from infected areas of the leaves. Photographs of the infected spots on the host leaves were captured by Sony DSC-HX200, camera and for the examination of fungal structure and spore morphology. Morphotaxonomic study of the fungi was done through the low and high magnification 100x400 of the compound microscope, (Olympus-CX21i FS1 Research Microscope) by using USB INSTA CMOS camera. The microphotographs were stored in electronic format JPEG. Morphotaxonomic determinations of the new taxa were done with the help of most up to date literature and expertise available. Holotypes being deposited at AMH, Agharkar Research Institute (ARI), Pune (MS), India and isotypes retained in the Departmental herbarium for future reference. The nomenclatural novelties were deposited in Myco Bank (www.mycobank.org).

RESULTS AND OUTCOME

Corynespora calotropidis Halder sp.nov. (Fig.1)

Myco Bank MB 821073

Incidence in early winter spots formed on both the corresponding surface of the lamina, usually circular or sub circular, occasionally angular to irregular, rarely aggregate to coalescent, whitish to grey in the centre surrounded by thick blackish brown to black margin with reddish brown halo, distinct, virulent, scattered, 2.5-14.5 mm in diam; **Sexual morph:** undetermined. **Asexual morph:** *caespituli* amphigenous, well developed, centrally effuse, unevenly distributed over the spots, greyish brown to blackish brown; mycelium immersed and superficial, external mycelia hyphae olivaceous or sub hyaline, branched and septate, width not uniform; **conidiophore** non stromatic, arising singly or in groups (2-4), often closely grouped together to form synnemata in groups of 2-4 long stalks, with up to 4 cylindrical proliferations, light brown to straw coloured, slightly paler towards the tip, almost simple, smooth, thick-walled, distinctly pluriseptate sometimes swollen at the base of the cylindrical proliferations, tip slightly nodose or bluntly rounded, average length of the conidiophore, 609.59-1496.04 μm and average breadth, 39.05-60.57 μm ; **conidiogenous** cell monotretic, integrated, terminal, percurrent, cylindrical or doliiform, nodose tip, light to pale olivaceous, bearing *conidia* acrogenously; **conidia** solitary, obclavate, light to pale olivaceous or straw coloured, straight to curved, acrogenous, simple, distinctly pseudosepta (5-9), smooth, thick-walled, tip broadly rounded or obtuse or bluntly rounded, base truncate to unthickened hilum, average length of the conidia, 991.06-1309.29 μm and average breadth, 72.67-86.02 μm .

Specimen examined: On the living leaves of *Calotropis gigantea* R.Br. (Fam. Asclepiadaceae). Saktipur, Murshidabad, West Bengal, India; 14th October, 2016; Dinesh Halder, AMH

9861 (Holotype), KNC 0160 (Isotype).

Etymology- *calotropidis* in relation to the host genus.

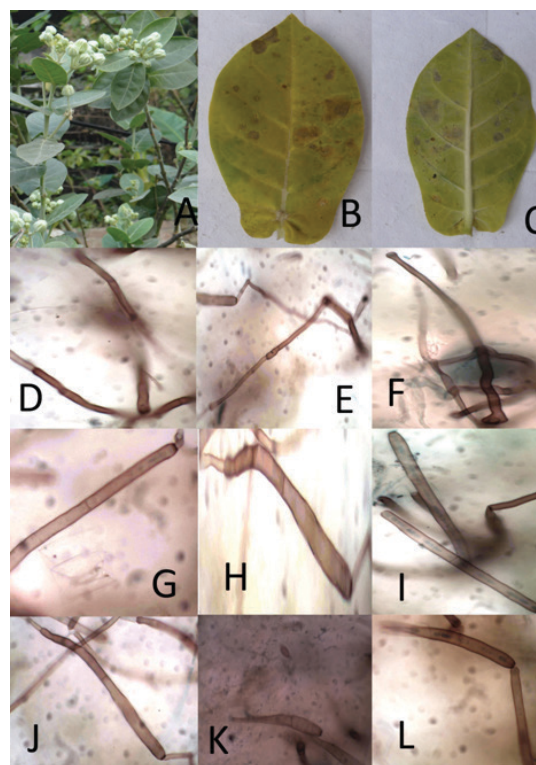


Figure 1: *Corynespora calotropidis* on *Calotropis gigantea*. A- Host plant. B-C: Leaf spots. D-G: Conidiophores. H-L: Conidia. Scale bars=20 mm.

Review of literature reveals that no species of *Corynespora* has yet been reported on the present host *Calotropis gigantea* R.Br. (Fam. Asclepiadaceae). Therefore *C. calotropidis* as a new taxon of species rank is found to be justified.

Corynespora jatrophae Halder sp.nov. (Fig.2)

Myco Bank MB 821082

Incidence in winter, spots formed on lamina, older leaf more affected, scattered, virulent, mostly irregular or circular blackish brown on upper surface and grey olivaceous on lower surface of the corresponding spot, not vein-limited, 3-5 mm in diam. **Sexual morph:** undetermined **Asexual morph:** *caespituli* amphigenous, chiefly epiphyllous, punctiform on the upper surface of the spot, velutinous on lower surface, mycelium external and internal, smooth sometimes branched, septate, thin walled, olivaceous to brown, **conidiophores** non stromatic arising singly from hyphae, fascicles not dense or in fascicle of 2-4, smooth, thick walled, long, branched to unbranched, erect to slightly bent, straight to flexuous, basal cell swollen, macronematous, mononematous, 6-18 septate, straw coloured average length of the conidiophores, 819.91-1488.65 μm ; average breadth 70.77-72.29 μm in diam. conidiogenous cells integrated, terminal,

monotretic, swollen towards the apex, scars unthickened, *conidia* solitary, acrogenous, simple, smooth, unbranched, thin walled, cylindrical to obclavate cylindrical, straight to mildly curved, often rostrate, smooth, apices obtuse to rounded, sub hyaline to olivaceous brown, tapered bases truncate, 2-10 pseudosepta, rarely euseptate, scars at the base, sometimes germinating, average length of the conidia, 538.85-982.75 µm in diam. and breadth (broadest part), 88.79-92.96 µm.

Specimen examined: On the living leaves of *Jatropha curcus* L., (Fam. Euphorbiaceae), Ring Road, Kashimbazar, Murshidabad, West Bengal, India, 6th November 2016, Dinesh Haldar, AMH 9849 (Holotype), KNC 0145 (Isotype).

Etymology-*jatrophae* in relation to the host genus.

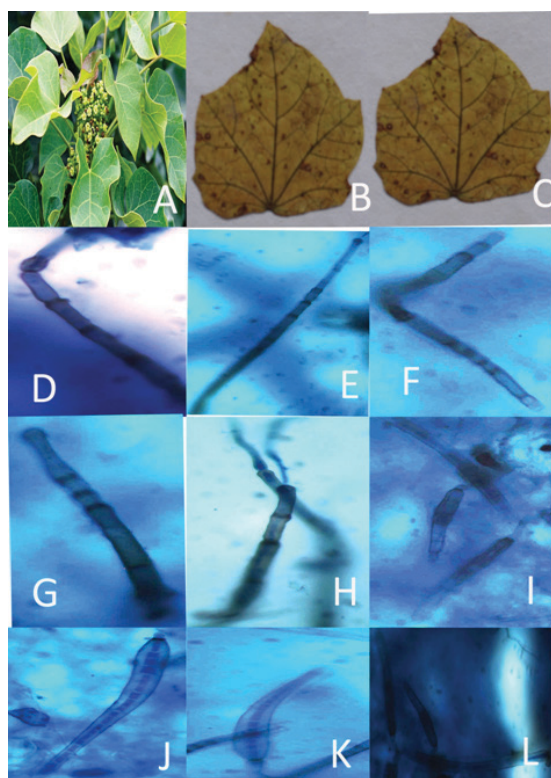


Figure 2: *Corynespora jatrophae* on *Jatropha curcus*. A-Host plant. B-C: Leaf spots. D-H: Conidiophores. I-L: Conidia. Scale bars=20 mm.

It is evident from the literature survey that no *Corynespora* have been described on the present host *Jatropha curcus* L., (Fam. Euphorbiaceae). Therefore, it merits recognition as a new taxon at species rank.

DISCUSSION

The fungi *Corynespora calotropidis* Haldar and *Corynespora jatrophae* Haldar are abundant in nature during the month of October to March of the year forming striking symptoms such as spots may be regular or irregular, sometimes

concentric rings with brown to dark brown margin, blotchy sooty in nature and blight. Spots become sometimes necrotic leaving holes in the leaves. The present study reveals that the *Corynespora calotropidis* Haldar and *Corynespora jatrophae* Haldar primarily grow on the leaf blades as well as petioles, stems, inflorescence and fruits. The characteristics of the symptoms depend on the nature of leaves as well as parasites. The effects may vary from plant to plant and even on the same plant. When infection reaches a certain degree of severity, the leaves curl, dry and drop down. Thus it may be concluded that the species of the genus *Corynespora* grow vigorously on leaves throughout the seasons but virulent in winter to early summer.

CONCLUSION

The newly described taxa *Corynespora calotropidis* and *Corynespora jatrophae* are the primary causes of leaf spot diseases of *Calotropis gigantea* and *Jatropha curcus* respectively. The present work will be helpful to a fungal taxonomist to identify the anamorphic fungal species, host range and phylogenetic relationship between different taxa of leaf-inhabiting fungi.

ACKNOWLEDGEMENTS

The author is thankful to the Principal, Krishnath College, Murshidabad, West Bengal for providing help during the present work. The author expresses his sincere gratitude to the Curator, AMH-ARI, Pune for depositing the holotype of the specimens and to the Curator, Myco Bank, International Mycological Association for providing accession number of the type specimens. The author acknowledges the immense help received from the scholars whose articles are cited and included in the references of this manuscript. The author is also thankful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed. I wish to acknowledge the extended help to Dr. J. B. Ray, my Ph.D. guide for critical comments on the present manuscripts and Dr. S. Bandyopadhyay, Head, Department of Botany, Krishnath College, Murshidabad for the identification of host plants. The author is also grateful to the Director, UGC, for financial support.

REFERENCES

1. Bhat, J. (2010). *Fascinating microfungi (Hyphomycetes)* of Western Ghats. Broadway Book Centre, Panaji, Goa, India. ISBN: 978-3-642-23341-8, pp 221.
2. Bilgrami, K.S., Jamaluddin, S. and Rizwi, A.A. (1991). *Fungi of India*. Today and Tomorrow's Printers and Publishers, New Delhi, pp. 798.

3. Braun, U., and Crous, P. W. (2007). The diversity of *Cercosporoid* hyphomycetes—new species, combinations, names and nomenclatural clarifications. *Fungal Diversity* 26: 55-728.
4. Castañeda Ruiz, R. F., Heredia, G. P., Arias, R. M., Saikawa, M., Minter, D. W., Stadler, M., and Decock, C. (2004). Two new Hyphomycetes from rainforests of México, and *Briansuttonia*, a new genus to accommodate *Corynespora alternarioides*. *Mycotaxon*, 2, 297-305.
5. Dubey, R.K. and Rai, A.N. (2003). Two new hyphomycetes from India. *Indian Phytopath*, 56:486-490.
6. Ellis MB (1971). *Dematiaceous Hyphomycetes*, Commonwealth Mycological Institute, Kew, England. pp 608.
7. Ellis MB (1976). *More Dematiaceous Hyphomycetes*, Commonwealth Mycological Institute, Kew, England. pp 507.
8. Farr DF and Rossman AY (2016). *Fungal Databases*, Systematic Microbiology Laboratory, ARS, USDA.
9. Gussow HT (1906). Übereine neue Krankheit an Gurken in England. *Zeitschrift für Pflanzenkrankheiten und Pflanzenschutz*. 16:10-13.
10. Haldar, D and Ray JB (2011). Studies *Cercospora* like fungi from West Bengal-II. *J. Mycopathol. Res*, 49(1):151-153.
11. Haldar D (2016a). Three new species of *Stenella* Sydow from West Bengal, India. *International Journal of Environmental Science and Technology*, 2(2):90-93.
12. Haldar D (2016b). New records of Three *Cercospora* Species from West Bengal, India. *International Journal of Plant, Animal and Environmental Sciences*, 6(4), 32-37.
13. Haldar D (2017). Two new dematiaceous fungi from West Bengal, India. *International Journal of Current Research and Review*, 9(6):4-7.
14. Hawksworth DL (1974). *Mycologist's Handbook*. Commonwealth Mycological Institute, Kew, Surrey, UK. pp.231.
15. Jain, SL, Rai, AN and Mehta (2002). Additions to *Corynespora* from India. *Indian Phytopath*. 55:51-56.
16. Jamaluddin, Goswami, MG and Ojha, BM (2004). Fungi of India. 1989-2001, *Scientific Publishers*. Jodhpur, India. pp.326.
17. Kai Zhang, Hong-Bo Fu and Xiu-Guo Zhang (2009). Taxonomic studies of *Corynespora* from Hainan, China. *Mycotaxon*. 109: 85-93.
18. Kamal (2010). *Cercosporoid* fungi of India. Bishen Singh Mahendra Pal Singh, Deharadun India. ISBN:978-81-211-0753-2, pp 351.
19. Kamal, M (1998). New species of *Corynespora*. *Mycological Research*, 102(3): 344-346.
20. Kumar, S, Singh, R and Pal, VK (2007). Three hitherto undescribed species of *Corynespora* from North-eastern Uttar Pradesh. *J. Basic Appl. Mycol*. 6:39-43.
21. Mycobank. (2017). Mycobank (Fungal databases nomenclature and species banks), accessed April 19 & 20, 2017, <http://www.mycobank.org>
22. Meenu, Kharwar, RN and Bhartiya, H.D (1998). Some new forms of genus *Corynespora* from Kathmandu valley of Nepal. *Indian Phytopath*. 51:146-151.
23. Meenu, Singh A and Singh SK (1997). Some new forms of genus *Corynespora*. *Indian Phytopath*, 50:17-24.
24. Pal, VK, Akhtar, M, Agarwal, D K, Chaudhary, R.K and Ahmad, N (2007). Diversity of foliar fungi in the forest flora of North-eastern UP: five new species of *Corynespora* Gussow. *Indian Phytopathology*, 60(3):330-340.
25. Savile, DBO. (1962). Collection and care of botanical specimens. Canada Department of Agriculture Publication Research Branch, 1113. pp.124.
26. Seifert, KA, Morgan-Jones G, Gams W and Kendrick WB. (2011). The Genera of *Hyphomycetes*. CBS Biodiversity Series no. 9, Utrecht; CBS-KNAW Fungal Biodiversity Centre, The Netherlands, pp.997.
27. Seifert, KA and Gams, W (2001). The taxonomy of anamorphic fungi. In *Systematics and Evolution*, Springer Berlin Heidelberg, pp.307-347.
28. Sharma, N, Chaudhary, S. and Kamal (2002). Three new species of genus *Corynespora*. *Indian Phytopath*. 55:178-181.
29. Sharma, N, Singh, PN and Kamal (2003). Three new taxa of *Corynespora* causing foliar blight in forest plants of North-eastern Uttar Pradesh. *J. Mycol. Pl. Pathol*. 33:26-32.
30. Singh, A, Kumar S, Singh R, Dubey NK (2012). A new species of *Corynespora* causing foliar disease on *Ficus religiosa* from forest of Sonbhadra, Uttar Pradesh, India. *Mycosphere* 3(5): 890-892.
31. Singh, D P and Mall, T P (2012). Three new taxa of *Corynespora* Gussow from India. *Environment Conservation Journal*, 13(1/2), 151-155
32. Singh, A, Singh, SK and Kamal (2000). Additions to *Corynespora* from India. *J. Mycol. Pl. Pathol*. 30:44-49.
33. XiuGuo, Z, and ChengKuei, S (2005). Taxonomic studies of *Corynespora* from China. *Mycotaxon*, 92:417-423.
34. Zhang, Y D, Ma, J, Ma, LG and Zhang, XG (2012). *Parablastocatena tetracerae* gen. et sp. nov. and *Corynesporella licualae* sp. nov. from Hainan, China. *Mycoscience*, 53(5): 381-385.
35. ZhiQiang, S and XiuGuo, Z (2007). Two new *Corynespora* species from Jianguo, China. *Mycotaxon*, 100:155-158.