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Biodiversity, Distribution and Taxonomy of Conidial Fungus *Corynespora* (Corynesporascaceae) Associated With Malvaceae

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Abstract

This paper deals the biodiversity, distribution and taxonomy of conidial fungus *Corynespora* associated with family Malvaceae, including a new species belonging to the genus *Corynespora*, viz. *C. sidae* sp. nov., was discovered on living leaves of Sida acuta Burm.f. (Malvaceae) from University Campus of Deen Dayal Upadhyay Gorakhpur University, Gorakhpur, Uttar Pradesh (UP), India. This species is described, illustrated and compared with similar taxa reported on Malvaceae based on morphological characters. The novel species is characterized by shorter conidiophores and longer and smooth conidia. The nomenclatural novelties were submitted in Mycobank.

Keywords: Anamorphic fungi; Morphotaxonomy; Malvaceae; *Corynespora*

Introduction

The foliicolous hyphomycetous genus *Corynespora* was established by Gussow [1]. The genus causes foliar diseases in plants, predominating in the tropics and subtropics regions including India, is characterized by producing distoseptate conidia with or without distinct hila and monoblastic, terminal conidiogenous cells. Most of the species of the genus are phytopathogenic while some species are reported as endophytes and saprobes. About 135 species of *Corynespora* have been reported from all over the world [2-4].

In the continuation of exploration of foliicolous fungi from eastern Uttar Pradesh, a species rank of the genus *Corynespora* was found to be hitherto undescribed. The detail descriptions and illustrations of *Corynespora sidae* are presented here in this communication

Material and Methods

Plant specimens with clear visible disease symptoms of parasitic fungi on living leaves were collected from University Campus of Deen Dayal Upadhyay (DDU) Gorakhpur University, Gorakhpur (26' 44" to 56.23" N and 83' 23" to 31"E), Uttar Pradesh. The samples were placed in separate polyethylene bags and transported to the laboratory and processed by following the standard techniques [5,6]. The sun dried and pressed leaf specimens were placed in air tight polyethylene bags and then kept in paper envelops along with collection details. Photographs of infection spots on host leaves were taken by using a Sony DSC-5730 camera. The specimens for microscopic observation were prepared by hand sectioning and scraping. Morphological descriptions are based on the slide preparations mounted on clear lacto-phenol cotton blue mixture from infected areas of the leaves. Observations were made with an Olympus BX-51 light microscope. Detailed observations of morphological characters and line drawings were carried out at different magnification through a light microscope (400× and 1000×). Measurements were made of 30 conidia, hila, and conidiophores, with the extremes given in parentheses. Morphotaxonomic determinations were made with the help of current literature. The type specimen has been deposited in the Ajrekar Mycological Herbarium (AMH), Agharkar Research Institute (ARI), Pune, Maharashtra (MS), India; and a part of the same were retained in the mycological herbarium of Birbal Sahni Institute of Palaeobotany (BSIPMH), Lucknow for future reference. The details of Description and nomenclatural novelties were deposited in MycoBank (www.MycoBank.org). The systematics of the taxon is given in accordance with given literatures [2,3,7-11].

Results

Corynespora sidae Sham. Kumar & Raghv. Singh, sp. Nov (Figures 1-3).

MycoBank: MB 816950

Etymology: Named after the host genus upon which it occurs. Anamorphic fungi, *Hyphomycetes*, *Foliicolous*, infection spots amphigenous, circular to sub-circular to irregular, 5–7 mm in diameter, concentric, dark brown to blackish. Colonies amphiphyllous, effuse and grayish. Mycelium internal.

Sexual morph: undetermined.

Asexual morph: Stromata absent. Conidiophores macronematous, mononematous, cylindrical, erect to procumbent, straight to flexuous, unbranched, smooth, thick-walled, 1–3-septate, mid brown, 80–165×5–

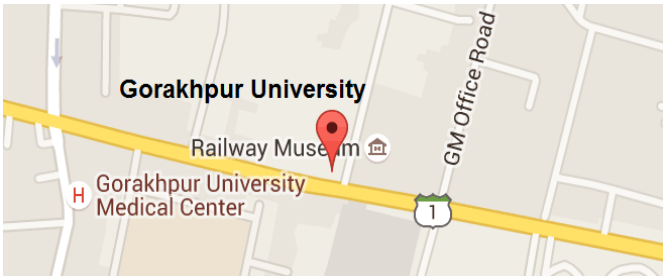

Figure 1: Location map (source: https://www.google.co.in)

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10 µm, basal cell swollen. Conidiogenous cells integrated, terminal, monotretic, scars unthickened. Conidia acrogenous, dry, solitary, unbranched, thin-walled, smooth, straight to curved, usually obclavate to obclavate-cylindrical, 2–24-distoseptate with 0–1 transverse band like eusepta, 25–220×7–17 µm, apex obtuse to rounded, olivaceous to very light brown, hilum thickened, 3.5–4.5 µm wide.

Type: India, Uttar Pradesh, DDU Gorakhpur University, University Campus, on living leaves of Sida acuta Burm.f. (Malvaceae), 10th December 2006, Coll., Shambhu Kumar, AMH-9706 (holotype), BSIPMH-050 (isotype).

Teleomorphs: not found.

Discussion

C. cassiicola, *C. hibisci* and *Corynespora* sp. have been reported on family Malvaceae. *C. cassicola* was reported from different corners of the world on different host of family Malvaceae viz., *Abelmoschus esculentus* (L.) Moench from Brunei Darussalam [12,13]; *Gossypium barbadense L.* from Barbados [14]; *Gossypium hirsutum* L. from Alabama [15], Georgia [16], India [17,18]; *Hibiscus cannabinus* L. from Papua New Guinea [19]; *Abelmoschus esculentus* (L.) Moench (=*Hibiscus esculentus* L.) from Cuba [20], Ghana [21], Sierra Leone [22]; *Hibiscus mutabilis* L. from Korea [23,24]; *Hibiscus sabdariffa* L. from Sierra Leone [22]; *Hibiscus* sp. from Cuba (Urtiaga, 2004) [20]; *Hibiscus syriacus* L. from Korea [25]; Pavonia sp. from Venezuela [26]; *Sida glomerata Cav.* from Venezuela [26]; *Sida rhombifolia* L. from Myanmar [13], Venezuela [27] and *C. hibisci* was reported on *Hibiscus syriacus* L. from Japan [28] while *Corynespora* sp. *Alcea* sp. [29] and *Malvaviscus* sp. [30] from Florida (was similar to *C. cassicola*). Therefore the present fungus is compared with closely similar species *C. cassiicola* and *C. hibisci* for novelty.

From Table 1, it is clear that the conidiophores of *C. sidae* is shorter and having less septa than *C. cassiicola* (110–850 × 7.5–10 µm, upto 9 successive proliférations septate) and *C. hibisci* (98–291 × 4–11 µm, 5–6-septate). The conidia of *C. sidae* are comparatively shorter and thicker than *C. cassicola* (40–220 × 4–8 µm, 4–20-distosepta) and longer, thinner and having more distosepta than *C. hibisci* (75–185 × 15–22.5 µm, 3–16-distosepta). Therefore, based on comparative analyses the present collection is treated as a new species s.

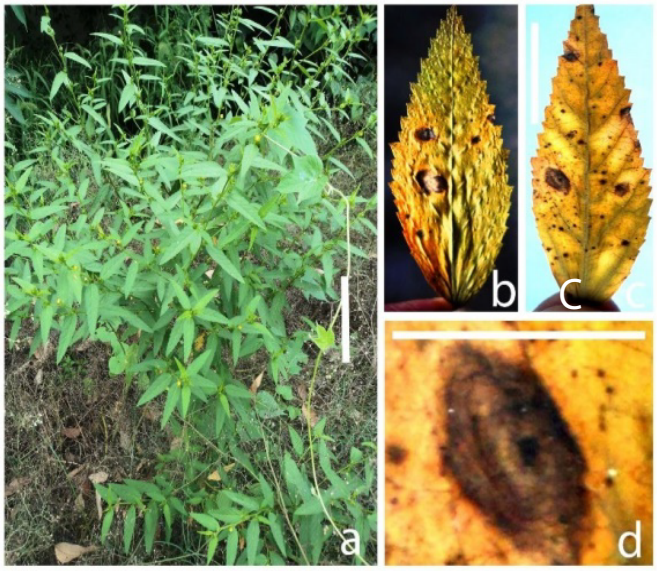
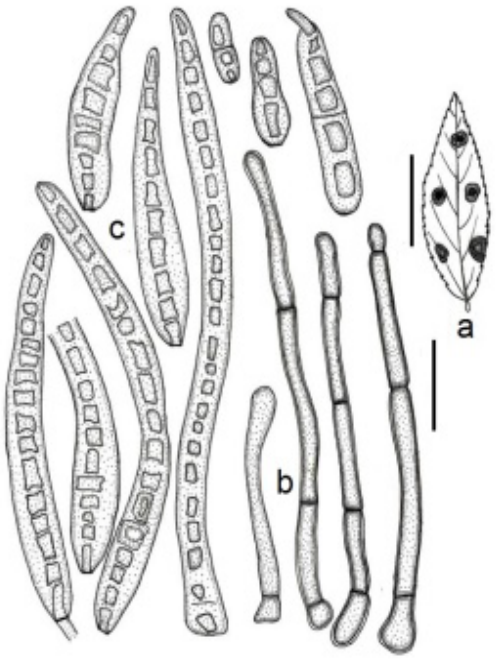


Figure 2: (a) *Sida acuta L.* (holotype AMH–9706).
(b) Symptom on lower surface.
(c) Symptom on upper surface.
(d) Symptom enlarges view. Scale bars: a–d=20 mm.



(a) Infection spot, (b) conidiophores, (c) conidia. Scale bars: a=20 mm, b,c=20 µm.

Figure 3: *Corynespora sidae* Lucida Drawing (holotype AMH–9706).

Corynespora spp.	Conidiophores	Conidia
C. cassiicola	110–850×7.5–10 µm, upto 9 successive proliférations septate	40–220×4–8 µm, 4–20-distosepta
C. hibisci	98–291×4–11 µm, 5–6-septate	75–185×15–22.5 µm, 3–16-distosepta
C. sidae	80–165×5–10 µm, 1–3-septate	25–220×7–17µm, 7–23-distosepta

Table 1: Comparison of *C. sidae* with *C. cassiicola* and *C. hibisci*.

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