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First report of foliar disease caused by *Cercospora apii s. lat.* on *Nymphaea nouchali* from Uttar Pradesh, India

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ABSTRACT

This paper shows the description and illustration of first report of foliar disease caused by *Cercospora apii s. lat.* on *Nymphaea nouchali* (Nymphaeaceae) from Uttar Pradesh.

Key Words: Foliar fungi, morphotaxonomy, *Cercospora apii s. lat.*, new record

INTRODUCTION

A large number of taxa described as separate, distinct species of *Cercospora* are morphologically indistinguishable form *C. apii* described on *Apium graveolens*, which is restricted only to a few members of family Apiaceae. Such species were described simply on the basis of one-host-one species concept of Chupp (1954). Such forms are found to be characterized by having solitary to fasciculate, normally long, brown, septate conidiophores with conspicuously-thickened and darkened conidiogenous loci and long, acicular, hyaline, pleuroseptate, conidia formed singly.

These *Cercospora apii*-like fungi occur on extremely wide range of hosts and are morphologically variable but indistinguishable from one another. They normally form definite leaf spots, often on weakened and senescing host plants, but may also grow as saprobes on necrotic plant tissue without causing lesions (Crous & Braun, 2003). Based on cross inoculation experiments and morphological examination by various workers and their own observation, Crous and Braun (2003) have concluded that *C. apii* like fungi form a morphologically, rather uniform complicated assemblage of taxa in which the process of speciation is not yet completed. This has resulted in a complex of plurivorous as well as more or less specialized taxa with various partly wider, partly narrower host ranges, which are, however, morphologically not yet distinguishable. Thus, *Cercospora apii*-like fungi indistinguishable from the *Cercospora* described on *Apium graveolens*, form a compound species referred to as *C. apii s. lat*.

The circumscription of *C. apii s. lat.* has been given by Crous & Braun (2003) followed by Kamal (2010). They suggested that the introduction of new names, for *Cercospora* collections, detected on new host genera and families, but which otherwise are indistinguishable from *Cercospora apii*, should be avoided, and such collections should simply be referred to as *C. apii s. lat.*

During our survey of the terai region of Uttar Pradesh, a large number of collections showing foliar disease have been collected. Of these, upon critical examination and comparison of morpho-taxonomic features with those of the similar forms, *Cercospora apii s. lat.* is found as new record on *Nymphaea nouchali* for Uttar Pradesh province.

METHODOLOGY

The infected leaf samples were collected from Gorakhpur, Uttar Pradesh. Surface scrapping and free

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hand cut sections were taken through infection spots and mounted in lactophenol cotton-blue mixture for microscopic examination. Line drawings were done with the help of a camera lucida and measurement with micrometry. Specimens have been deposited in Herbarium Cryptogamiae Indiae Orientalis (HCIO), Indian Agriculture Research Institute (IARI), New Delhi and duplicates have been retained in the departmental herbarium for future reference. Morphological determinations have been done with the help of current literature pertaining to taxonomy of *Cercospora*.

RESULTS AND DISCUSSION

Description of species

Cercospora apii s. lat. (Fig. 1)

= *Cercospora californiensis* Chupp (1954).

Infection spots amphigenous, circular, subcircular to irregular, brown, 2-20 mm in diam. Colonies amphiphyllous, effuse. Mycelium internal. Stromata well developed, subepidermal, pseudoparenchymatous, olivaceous brown, 20 µm wide. Conidiophores macronematous, fasciculate (4–6), erect to procumbent, straight to flexuous, geniculate, smooth, thin-walled, unbranched, 2–(4)–6 euseptate, brown, 105–(155)–205 × 3–(4)–5 µm in diam. Conidiogenous cells integrated, terminal to intercalary, polyblastic, scars thickened. Conidia solitary, simple, dry, acropleurogenous, smooth, thin-walled, 2–(7)–12 septate, straight to slightly curved, cylindrical to obclavate-cylindrical, acicular, apex rounded, base truncate, hyaline, 35–(92.5)–150 × 2–(3.5)–5 µm, hilum thickened and darkened, (1.5–)2–3(–4.5) µm wide.

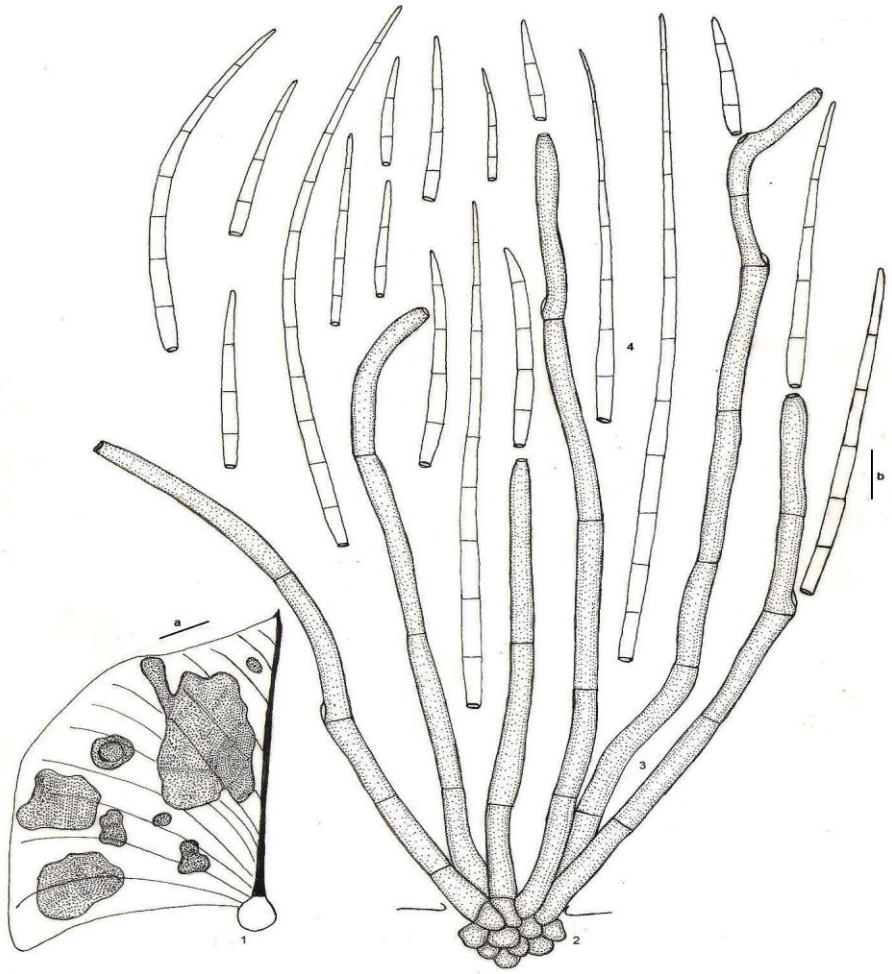

Fig. 1 – ***Cercospora apii s. lat.*** 1. Infection spots. 2. Stromata. 3. Conidiophores. 4. Conidia. Bars a = 20 mm, b = 20 µm.

Material Examined

On living leaves of *Nymphaea nouchali* Burm. f. (Nymphaeaceae), Professor's Colony, Gorakhpur, (U.P.), India, 1 March 2008, coll. Shambhu Kumar, GPU Herb. No. KSR–179, HCIO 48664.

DISCUSSION

Perusal of literature indicated that, *Cercospora californiensis* Chupp (1954) has been described earlier on the host [T: CUP; IMI 154325]. Crous & Braun (2003) and Kamal (2010) designated as species of true *Cercospora* (*Cercospora s. str.*) due to unavailability of type material but present critical morpho-taxonomic study confirmed that the fungus shows all similarities to *Cercospora apii s. lat.* (Crows & Braun, 2003). Hence, the fungus species must be transferred to *C. apii s. lat*. complex.

The fungus was earlier been recorded from Bangalore (Karnataka) but there was no record from Uttar Pradesh. Therefore, the collection was treated as new record for Uttar Pradesh province and worthwhile.

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