Cercospora premnae sp. nov. on potent ethno medicinal plant Premna mucronata from Shrawasti (U.P.) India

Mall TP

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ABSTRACT

In present study a new dematiaceous hyphomycetous foliicolous microfungi Cercospora premnae Mall sp. nov. on Premna mucronata is reported from Shrawasti (U.P.) India, as a result of survey of North Central Tarai Forest.

Keywords: Foliicolous fungi, Ethno medicinal plant, North Central Tarai Forest, Shrawasti, Uttar Pradesh.

1. INTRODUCTION

India is one of the twelve mega biodiversity countries of the world, has two of the worlds eighteen biodiversity hot spots located in the Western ghats and in the Eastern Himalayas. In north of North Tarai Forests, the Himalayas rise as a virtual wall beyond the snow line. Above the alluvial plain lies the Tarai strip, a seasonally marshy zone of sand and clay soils. The Tarai has higher rainfall than the plains, and the downward- rushing rivers of the Himalayas slow down and spread out in the flatter Tarai zone depositing fertile silt and reproductive means during the monsoon season and receding in the dry season. The Tarai, as a result has high water level and is characterized by moist sub tropical conditions and a luxuriant turnover of green vegetation all the year around. The climatological and topographical conditions favour the luxuriant growth and development of foliar fungi. This north Tarai Region of U.P. is next only to Eastern and Western ghats, as one of the hottest spots for biodiversity in general and the diversity of fungal organism inhabiting plant leaves in particular offers an ideal opportunity for the morphotaxonomic exploration of fungal organism in general and foliicolous fungi in particular. Keeping this in view the author surveyed the North Central Tarai forests of UP which include East and West Sohelwa, Shrawasti, Bahraich forest range and Bahraich Wildlife Sanctuary during April, 2010-September, 2011.

2. SCOPE OF STUDY

The foliicolous fungi cause huge losses every year in different parts of the world. The fungal pathogens producing leaf spots infect a large variety of hosts including most of the crops, forests and other plants. The destruction caused by these enemies of leaves is a serious problem before us. The focus of this research is identification & documentation of foliicolous fungi which will assist in the discovery of new fungicides and ideas to overcome from the severity of these enemies of nature as well as in the protection of floral diversity from the infection of these pathogens and also in the conservation of valuable flora of the area.

3. MATERIALS AND METHODS

During the servey of the forests of West Sohelwa Forests Range near Motipur rehar at Indo Nepal Border representing North Central Tarai Forests of U.P. (India), on Feb. 08, 2011, a novel dematiaceous hyphomycetous fungi belonging to the genus Cercospora Fresenius on a potent ethno medicinal plant Roxb.(Syn. Premna latifolia var. mucronata Roxb.) Bari arani, Ganiar, Agethu, Agnimatha (Verbenaceae) was encountered. The leaves and root bark of this ethno medicinal plant is important constituent in several medicine preparation, anti hepato toxic, anti vata remedy, useful in edema and degenerative disorders, an important constituent of herbal dushmuliashrit, cough expectorant, anti inflammatory, analgesic, suppress nervous system, improves digestion, blood purifier, useful in any type of skin disorders and cardiac stimulant. On critical study and comparison with other known species viz Cercospora volkameriae Speg. and C. lippiae Ellis and Everh (Ellis, 1976), it was found to the a new species. It has also been customary for plant pathologist and mycologist to describe as a new any Cercospora found on a host for the first time (Ellis,1976).Hence is descrived as Cercospora premnae Mall sp. nov. The Holotypes specimen has been deposited in HCIO, IARI, New Delhi for allotment of accession number.
**Species** • RESEARCH • CERCOSPORA PREMNAE SP. NOV.

**Table 1** Morphological features of Cercospora premnae, Cercospora volkameriae and Cercospora premnicola

<table>
<thead>
<tr>
<th>Name of species</th>
<th>Colour</th>
<th>Conidiophores Size(µm)</th>
<th>Structure</th>
<th>Size(µm)</th>
<th>Conidia Septation</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cercospora volkameriae</td>
<td>midpale-brown</td>
<td>50-160 x 4-5</td>
<td>simple</td>
<td>50-140 x 3-4.5</td>
<td>6-14</td>
<td>slightly obclavate</td>
</tr>
<tr>
<td>Cercospora premnicola</td>
<td>brown</td>
<td>90-160x0.6</td>
<td>branched</td>
<td>25.5-86 x up to 2</td>
<td>multisepate</td>
<td>acicular</td>
</tr>
<tr>
<td>Cercospora premnae</td>
<td>brown</td>
<td>80-150 x 3.5</td>
<td>branched</td>
<td>25-80x2.5</td>
<td>multisepate</td>
<td>straight</td>
</tr>
</tbody>
</table>

Cercospora premnae sp. nov.

- a. Infected leaf
- b. Stroma
- c. Conidiophores
- d. Conidia

**Figure 1**

4.1. Cercospora premnae Mall sp. nov. Infection spots amphigenous, with hypophyllous sporulation, oligoecous brown; mycelium partly immersed, sub hyaline, branched, septate; stroma pseudoparenchymatous, immersed, dark oligoeaceous brown, up to 30 µm diam; conidiophores macronematous, mononematous, fasciculate, smooth, straight to sinuous, brown, paler along the tip, geniculate, branched 80-150 x 3.5 µm; conidiogenous cells polyblastic, integrated, terminal, sympodial, distinctly ciciatrized, paler than the rest cells, conidia simple, solitary, acrogenous, smooth, multisepate, hyaline, acicular, truncate base with acute apex, straight flexuous, 25-80 x upto 2.5 µm (Figure 1 a,b,c,d).

On living leaves of Premna muncrata Roxb. (Verbenaceae); West Sohelwa Forest Range, Shravasti (U.P.) India, 08.02.2011; leg. T.P. Mall, BRH-3185, TPM-0285 (isotype), HCI0 (Holotype). Conagionis maculae amphiagenae, sporarum partu hypophylla, oligoeaceous-brunneae; mycelium hyphesis semi-immersis, sudhylainis, ramosis, septalis compositum; stroma pseudoparenchymaticum, immersum, obscure oligoeaceous-brunneum. Ad 25µm diametro; conidiophora macroamnemata, fasciculata, levia, rectavel sinusa, brunnea, apem versus phlildcios, genealcata, racemosa, 80-150 x 3.5 µm ; cellulae conidiogenae polyblasticae, integrate, terminals, sympodialia, cicatricibus distinctis notatae, quam celliae caeterae phllidiores ; conidia simplica, acrogena, singularia, levia, transverse multisepata, hyaline, acciculata, basi truncate, apice acuto, recta vel flexusa, 25-80 x 2.5 µm. In foliis vivis Premna muncrata Roxb. (Verbenacearum), West Sohelwa Forest Range, Shravasti (U.P.) India, 08.02.2011; leg. T.P. Mall, BRH-3185, TPM-0285 (isotype), HCI0 (Holotype).

The present fungus is closer to Cercospora volkameriae Spec. (Ellis, 1976) and Cercospora premnicola (Shukla et al., 1982) described on Verbenaceae, but to justify the distinct identity of Cercospora premnae a comparative account of morphological features of Cercospora volkameriae and Cercospora premnicola is given in Table 1. Survey of literature Bilgrami et al., (1979, 1981, 1991); Ellis, (1971, 1976); Ellis and Ellis, (1995); Jamaluddin et al., (2004); Mukerji and Juneja, (1974); Sarbhoy et al., (1986, 1996); Shukla et al., (1982) and Verma et al., (2008) reveals that this fungus is not found to be reported on living leaves of either Premna muncrata or any other members of Verbenaceae, its description as a new species is worthwhile. The specific epithet of Cercospora premnae is based on host name.

**5. CONCLUSION**

The Region of Shravasti U. P. is rich in phytodiversity in general as well as the diversity of fungal organisms inhabiting plant leaves in particular and it provides great scope for study of fungicolous fungi. Correct identity of a fungus absolutely free from ambiguities is vital for its employment in applied disciplines in general and it is more so for plant pathology where precision of details about the biology of the pathogen is primarily conditioned by its identity. In fact, without being equipped for ascertaining the correct identity of a fungal pathogen all studies concerning its phytopathological aspects would simply be misleading. However the end is still not insight and further investigation is warranted.

**ACKNOWLEDGEMENT**

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