Two new species of *Cladosporium*

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**ABSTRACT:** *Cladosporium chrysanthemi* and *C. desmodicola* causing leaf spots on *Chrysanthemum sp.* and *Desmodium gangeticum* DC. respectively were collected from West Bengal. These are described and illustrated in this paper. The type specimens have been deposited in the Herbarium, CAB, International Mycological Institute, UK.

**Key words:** Taxonomy, *Cladosporium*, biodiversity, new species

During mycological survey in some areas of West Bengal in 1984-87, several interesting hyphomycetous fungi were collected. This paper deals with description of two new hyphomycetous fungi.

**RESULTS AND DISCUSSION**

*Cladosporium chrysanthemi* A.K. Das sp. nov. (Fig. 1)

Maculae amphigenae, distinctae, numerosae, subcircularis vel irregularae, interdum aggregatae, griseo vel griseo brunneae, interdum margin griseo cinctae, 1-3.5 μm. latae. Caespituli hypophylli, brunneae. Mycelium immersum et superficialis, laevis. Stroma parvum, atrro-brunneae. Conidiophora solitaria vel fasciculata, 3-10 infasciculo, recta vel curvata, pallide brunneae, simplicia vel ramosa, interdum inflatae, terminalis et intercalaris, crasse tunicata, leavia, plurisepata, interdum geniculata, conidialibus nemerosis praedita, cicatrices conidiales distincto, apice subacute vel obtusa, 3.5-4.5 μm (6.5 μm inflatae) x 16.5-82 μm (raro 180 μm), raro curvata, cylindrica, laevia vel verruculosa, 3- septata, 10-36 x 3.5-5 μm.

Leaf spots amphigenous, distinct, numerous, subcircular to irregular, sometimes coalescent, grey to greyish brown, sometimes surrounded by raised grey margin, lesions occasionally developing a shot-hole appearance, 1-3.5 μm. in diam. Fruiting hypophyllous, brown. Mycelium immersed, superficial, smooth. Stroma poorly developed, arising from the epidermal hairs of the host, composed of thick-walled isodiametric cells, deep brown. Conidiophores solitary to fasciculate, with 3-10 divergent stalks in a fascicle, arising from the base of the stroma and rarely through the stomata.
straight to curved, pale brown, septate, simple to branched, sometimes nodose with terminal and intercallary swellings, thick-walled, smooth, with conspicuous scars, after succession of conidia, apex subacute to obtuse, 3.5-4.5 µm (6.5 µm at the swollen part) x 16.5-82 µm (rarely 180 µm). Conidia solitary to catenate, up to 3 in a chain, sometimes with one branched chain (i.e. conidiophore with two terminal scars), usually straight, rarely curved, cylindric, thin-walled, smooth to verruculose, up to 3-septate, often with a distinct protuberant scar at both the ends, 10-36 x 3.5-5 µm.

Habitat in foliis vivis Chrysanthemum sp. (fam. Asteraceae), Rahara, North 24 Parganas, Bengal, India. A.K. Das, 17. 3. 1985, IMI 295539 (holotypus), PCC 3719 (isotypus), HCIO No. 44743.

A number of species of *Cladosporium* have been reported from India (Sarbhoy et al., 1977; Bilgrami et al. 1979, 1981, 1991; Mukherjee and Bhasin 1989; Kar and Das 1988; Kumar and Kamal 1986). Review of literature (Deighton, 1979; Ellis, 1971, 1976; Subramanian 1971, 1983; Das 1990 and 1995) show that a few species of *Cladosporium* are reported on *Chrysanthemum cinerarifolium* Vis. The present collection has been compared with the parasitic species of *Cladosporium*, viz. *C. puccinioides* Cooke and *C. calotropidis* Stevens, and with two common saprophytic species, *C. herbarum* and *C. cladosporioides* (Table 1).

From the comparative account it can be concluded that *C. chrysanthemi* differs from other species by its poorly developed stroma, origin of conidiophores from the epidermal hairs of the host leaf, 3-10 conidiophores in a fascicle, maximum length of the conidiophores up to 180 µm, 3-septate, 10-36 µm long and catenate conidia.

*Cladosporium desmodicola* A.K. Das sp novo. (Fig. 2)

Maculae amphigenae, venas-limitatae, angulares vel irregularae, pallide brunneae vel griseobrunneae, 3-12 µm. latae. Caespituli amphigenae, plurumque epiphyllae, leniter effusae, pallide olivacea-brunneae vel fuscae. Mycelium partim immersum, partim superficiale, laevis. Stroma nullum. Conidiophora amphigenae, singularia vel fasciculata (3-5 infasciculo), recta vel flexuosa, apicem versus, inflatae, pallide vel pallide olivacea brunneae, laevis, crasse tunicata, pluriseptata (usque ad 15), cicatrices conidials distinctae, apicem obconico roundata vel roundata, intercalares inflatae 5-9 µm lata, 66-429 µm (560 µm) x 4-7 µm. Conidia solitaria vel catenata (usque ad 3), elliptica vel subsphaerica, olivacea, interdum pallide olivacea brunneae, 0-2 septata, laevis vel minute echinulata, 4.5-6.2 x 2.5 – 7.5 µm.

Leaf spots amphigenous, distinct on upper surface, few, vein-limited, angular to irregular, pale brown, sometimes leaving shot-hole, 3-12 µm. in diam. Fruiting amphigenous, mostly epiphyllous, slightly effuse, pale olivaceous brown to blackish brown. Mycelium partly immersed, partly superficial, smooth. Stroma none. Conidiophores amphigenous, arising singly or in groups of 3-5, straight to flexuous, distinctly and frequently nodose towards the apex, pale to pale olivaceous brown, smooth, thick-walled, up to 15 septate, non-geniculate, conidial scars present and conspicuous, obconic rounded to rounded at the tip, intercalar vesicular
### Table 1. Comparative account of species of *Cladosporium*

<table>
<thead>
<tr>
<th>Species</th>
<th>Habit</th>
<th>Stroma</th>
<th>Conidiophores</th>
<th>Conidia</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>C. chrysanthemi</em></td>
<td>Strictly hypophyllous, brown.</td>
<td>Poorly developed.</td>
<td>Solitary to fasciculate, 3-10 stalks arising from epidermal hairs,</td>
<td>Solitary, 1-2 septate, pale olivaceous, 20-40 µm long, borne in short</td>
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<td>3.5-4.5 x 16.5-82 µm (rarely 180 µm)</td>
<td>chains.</td>
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<tr>
<td><em>C. puecinnioides</em></td>
<td>Hypophyllous, brown.</td>
<td>Present, dark brown</td>
<td>Fasciculate, dark brown 40-80 µm long, olivaceous-fuligens at base, paler</td>
<td>Elongated, 1-2 septate, 4-5.5 x 20-34 µm</td>
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<td>above.</td>
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<tr>
<td><em>C. calotropidis</em></td>
<td>Amphigenous, circular, 1-5 cm. in diam, blackish grey.</td>
<td>Present, amphigenous, more copious on upper surface.</td>
<td>Arising from stromata, 10-20 in a fascicle, branched, 5-7 x 20-35 µm</td>
<td>Solitary or short chains of 3, cylindrical, ovoid 2.5-7 x 4.5-6.2 µm,</td>
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<tr>
<td><em>C. desmodicola</em></td>
<td>Amphigenous, mostly epiphyllous, pale olivaceous to blackish brown.</td>
<td>None</td>
<td>Solitary or in groups of 3-5, distinctly nodose towards upper part of the</td>
<td>Fairy long, often branched chain, oblong with distinctly verruculose with</td>
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<td></td>
<td>conidiophores, 4-7 x 66-429 µm (560 µm)</td>
<td>low warts, 0-1 septate, 3-8 x 5-23 µm (mostly 4-6 x 8-15 µm).</td>
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<tr>
<td><em>C. herbarum</em></td>
<td>Olivegreen or olivaceous brown.</td>
<td>Often well developed.</td>
<td>Macronematous, sometimes geniculation towards the apex, with terminal and</td>
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<td>intercalary swelling 3-6 µm wide and upto 250 µm long.</td>
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<tr>
<td><em>C. cladosporioides</em></td>
<td>Amphigenous, distinct on upper surface, initially grey becoming light brown surrounded by brown to black margin.</td>
<td>Non-stromatic</td>
<td>Solitary or fasciculate (3-8 in a fascicle), usually unbranched but</td>
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<td></td>
<td></td>
<td>occasionally branched, occasionally nodose, sometimes sinuous, sometimes</td>
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<td></td>
<td></td>
<td></td>
<td>subgeniculate, 3-6x33-330 µm (generally 33-132µm).</td>
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</table>


swelling 5-9 μm wide, 66-429 μm (maximum 560 μm) x 4-7 μm. Conidia solitary to catenate (upto 3 in a chain), ovoid to subsphaerical, olivaceous to pale brown. 0-2-septate, smooth to sparingly echinulate, scars protuberant, at either one or both ends, 4.5-6.2 x 2.5-7.5 μm.


A review of literature (Subramanian 1971, 1983; Deighton 1979; Ellis 1971 and 1976; Das 1990 and 1995; Kar and Das 1988; Kumar and Kamal 1986) show only one species of Cladosporium, viz. C. cladosporioides (Fres). de Vries (1952) is reported on Desmodium sp.

The proposed species, C. desmodicola has been compared with two other parasitic species, C. puccinoides and C. calotropidis, reported from India (Table 1).

The fungus is different from other species by its vein – limited leaf spots, non-stromatic, solitary to small groups of three to five conidiophores in a fascicle, conidiophores upto 560 μm long and smooth to sparingly echinulate conidia. These striking characters suggest separate identity of the species.

ACKNOWLEDGEMENT

The author thanks Dr. B.C. Sutton, Ex-Director, CAB International Mycological Institute, Kew, Surrey, England for identification of the specimens.

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Received for publication March 31, 2002