

## Two new species of *Pithomyces* Berkely & Brome from Sagar (M.P.) India

Dr. Sandhya Parihar

Sandhya Parihar, Govt. Holkar Science College, Indore, Madhya Pradesh, India

### Abstract

This paper gives an account of two new species, namely *Pithomyces cannacearum* on *Canna indica* L. (Cannaceae), and *Pithomyces careyae* on *Careya arborea* Roxb. (Lecythidaceae), Collected during the course of survey and investigation of the foliicolous fungi from Sagar (M.P.). The new fungal forms have been described, illustrated and compared with allied taxa after given the detailed mycotaxonomic treatment.

**Keywords:** foliicolous fungi, hyphomycetes, Morphotaxonomic, *Pithomyces*, sp.nov

### Introduction

A during survey of foliicolous fungi in Central India, an interesting foliicolous hyphomycetes fungal specimens was collected from Sagar (M. P.). On the basis of detailed mycotaxonomic treatment and observations two of the fungi was found to be un-described and assigned as species of genus *Pithomyces*. The present paper describes the fungus as new species, *Pithomyces cannacearum* and *P. careyae*.

### Materials and Methods

The specimens were collected from Botanic Garden of Dr. H.S. Gour University and Pankaj Nursery of Sagar, M.P. in India. The collected specimens were sprayed with aqueous HgCl<sub>2</sub> 0.1% solution to check the microbial decomposition and stored in airtight polythylene bags along with naphthalene balls. Microscopic slides were prepared by using lactophenol cotton blue mixture. The slides were studied under the compound microscope in different combination of eye pieces (10x, 12.5x, 15x) and objectives (10x, 40x, 45x and oil immersion). The desired camera lucida drawings of the interesting forms were made showing maximum diagnostic features available in the morphology and ontogeny of reproductive propagules and their measurements. The observation including symptomatology was then consolidated. The observations taken for each specimen were then compared with the forms already described about the particular fungus on the particular host species, host genus or host family, from India. The specimens constituting new records at least for this country and forms new to science were retained with care. Thus, the final sorting of specimens was done at this stage. Afterwards a thoroughly scrutinized and revised final host.

### Results and Discussions

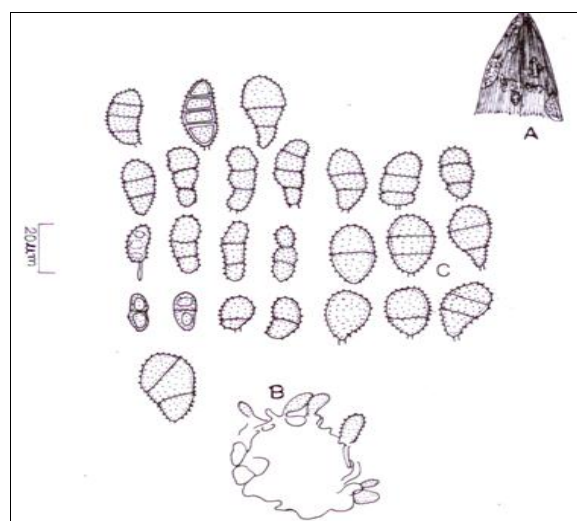
#### Taxonomic Description

##### 1. *Pithomyces cannacearum* Parihar sp. Nov. (Fig.1)

Maculae amphigenosae, parvae vel magnae, dispersae per totam ed superficiem, atro. brunneae. Coloniae amphiphyllosae, effusae, brunnea vel atrae. Mycelium

plerumque superficiale. Stromata nullus. Conidiophora micronematosa, mononematosa, ramosum recta vel flexuosa, pallide olivacea vel brunnea, laevibus vel minutes verruculosa 1-7  $\mu$ m. crassa. Conidiogenosae Cellulae monoblastae, incorporatae, terminales, determinatae, cylindrica, denticulatae longa. Conidia solitaria, acropleurogena, sicca, simplicia, disjungo omnino partis denticulis, cylindrica, ellipsiformia, clavata, oblonga in extremis roundata, pyriformia vel obpyriformia, fusco olivacea vel fuscae, verruculosa, interdum laevia, 0-3 transversae ad saepe 1 obliquis septata, 6.5-36 x 5-21.5  $\mu$ m.

In foliis sicca *Canna indica* L. (Cannaceae), Aug. 2005, Botanical Garden, Univeritsy, Sagar, M.P. India, leg. S. Parihar, S. U. Herb No.SRR 378 holotypus, HClO No. 46,408.



**Fig 1:** *Pithomyces cannacearum* Parihar sp. nov. A. Infected leaf B. Conidiophore C. Conidia

Lesions amphigenous, small to large, spreading over whole leaf surface, blackish brown. Colonies amphiphyllous, effuse, brown or black. Mycelium mostly superficial. Stroma none. Conidiophores micronematous, mononematous, branched,

straight or flexuous, pale olive to brown, smooth or minutely verruculose, 1-7  $\mu\text{m}$ . thick. Conidiogenous cells monoblastic, integrated, terminal, determinate, cylindrical, denticles long. Conidia solitary, acropleurogenous, dry, simple, detached through fracture of the denticle, cylindrical, ellipsoidal, clavate, oblong rounded at the ends, pyriform or obpyriform, dark olive to dark blackish brown, verruculose, sometimes smooth, with 0-3 transverse and often 1 oblique septum, 6.5-36 x 5-21.5  $\mu\text{m}$ .

### Material examined

On dry leaves of *Canna indica* L. (Cannaceae), Aug. 2005. Botanical Garden, University, Sagar, (M.P.) India, leg. S. Parihar, S.U. Herb No. SRR-378 holotype, HClO No. 46,408.

The present species has been compared with description & illustration of closely related species of *Pithomyces* such as *P. graminicola* Roy & Rai and *P. karoo* Marasas & Schumann (Ellis, 1976) [7], (Table-1.) A critical look to the table reveals that our specimen is quite different from all others in having comparatively clear symptoms, thicker conidiophores with longer & thicker conidia bearing more number of septa as against *P. graminicola* & *P. karoo* of the table.

The morphotaxonomic characters shows that our species bears the separate identity and cannot be accommodated with the earlier species. Therefore, it is concluded to describe and illustrate it as a new species. It is also noteworthy that no *Pithomyces* species has earlier been validly described either on the host genus or on host family.

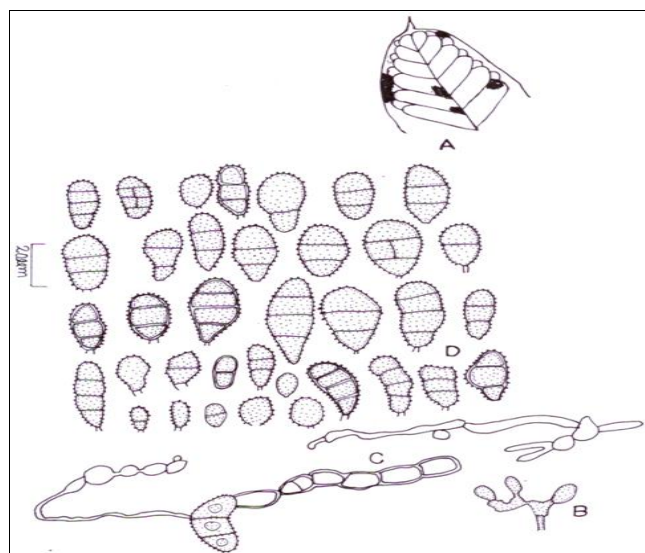
**Table 1:** Comparison of taxonomic characters of *Pithomyces cannacearum* with allied species

<i>Pithomyces</i> Spp.	Symptom	Stroma	Conidiophores	Conidia
<i>Pithomyces graminicola</i> Roy & Rai (Ellis, 1976) [7]	Colonies discrete, black, up to 2 mm long, sometimes coalescing	absent	Smooth or minutely verruculose, pale to mid brown, 1-35	Cylindrical rounded at the apex or clavate, smooth or minutely verruculose, with 1-2 trans. septa, straw coloured to oliv. brown, 10-20x 5-8 (mostly 12-15x6-7)
<i>P. karoo</i> Maras-as & Schumann (Ellis, 1976) [7]	Colonies effuse, grey, greyish olive or black, sometimes zonate	absent	Smooth or verruculose, hyaline to brown, 2-6	Very variable in shape, ellipsoidal, pyriform, clavate, cruciform, verrucose, with 2 transverse septa 0-1 longi. septum straw-coloured to dark brown, 17-30x8-18 $\mu\text{m}$
<i>P. canna-cearum</i> sp. nov.	Colonies amphiphyllous, effuse, brown or black.	absent	Smooth or minutely verruculose, pale to mid brown, 1-7	Very variable in shape, cylindrical, ellipsoidal, pyriform, clavate, cruciform, minutely verruculose, 0-3 trans. septa, dark oliv. to brown, 6.5-36 x 5-21.5

### 2. *Pithomyces careyae* Parihar sp. Nov. (Fig.2)

Maculae amphigenosae, coalescentes, fusco atro, irregulares, pleraeque extendentes per totam superficiem folii. Coloniae epiphyllousae, effusae, coopertus cum pulveraceus atro massa. Mycelium hypharum superficiale. Stromata nullus. Conidiophora micronematosa, mononematosa, ramosa, recta vel flexuosa, pallid olivacea vel brunnea, laevia, interdum minute verruculosa. Conidiogenosae cellulae monoblastae, incorporatae, terminales, determinatae, cylindrica, denticulatae longa. Conidia solitaria, acropleurogena, sicca, simplicia, disjungo omnino partis denticulis cylindrica, ellipsiformia, pyriformia vel massa. Mycelium hypharum superficiale. Stromata nullus. Conidiophora micronematosa, mononematosa, ramosa, recta vel flexuosa, pallide olivacea vel brunnea, laevia, interdum minute verruculosa. Conidiogenosae cellulae monoblastae, incorporatae, terminales, determinatae, cylindrica, denticulatae longa. Conidia solitaria, acropleurogena, sicca, simplicia, disjungo omnino partis denticulis cylindrica, ellipsiformia, pyriformia vel obpyriformia, clavatae, verruculosa interdum laevia, cum 0-3 transversae ad 1 longitrorsum septata, fuscae brunnea 6.5-36 x 5.5-20  $\mu\text{m}$ .

In foliis vivis *Careya arborea* Roxb. (Lecythidaceae), Feb. 2005, Pankaj Nursery, Sagar, M.P. India, leg. S. Parihar, S.U. Herb No. SRR- 399 holotypus HClO No. 46,678.



**Fig 2:** *Pithomyces careyae* Parihar sp. nov. A. Infected leaf B. Conidiophore C. Mycelium D. Conidia

Lesions amphigenous, small to large, spreading over whole leaf surface, blackish brown. Colonies epiphyllous, effuse, covered with powdery black mass. Mycelium mostly superficial. Stromata none. Conidiophores micronematous,

mononematous, branched, straight or flexuous, pale olive to brown, smooth, mostly verruculose. 1-4  $\mu\text{m}$ . thick. Conidiogenous cells monoblastic, integrated, terminal, determinate, cylindrical, denticles long. Conidia solitary, acropleurogenous, dry, simple, detached through fracture of the denticle, cylindrical, ellipsoidal, pyriform or obpyriform, clavate, verruculose, sometimes smooth, with 0-3 transverse and 1 oblique septa, dark blackish brown, 6.5-36 x 5.5-20  $\mu\text{m}$ .

### Material examined

On living leaves of *Careya arborea* Roxb. (Lecythidaceae), Feb. 2005. Pankaj Nursery, Sagar, M.P. India, leg. S. Parihar, S.U. Herb No. SRR- 399 holotypus HCIO No. 46,678.

The present species has been compared with description & illustration of closely related species of *Pithomyces* such as *P. karoo* Marasas & Schumann (Ellis, 1976) <sup>[7]</sup> & *P. charatum*

(Berk. & Curt.) Ellis (Ellis, 1976) <sup>[7]</sup> (Table-2).

A critical look to the table reveals that our collection is altogether different from all others in having very clear symptoms, smaller and comparatively thinner conidiophores having longer & thicker conidia as against the species given in table. It is concluded that for time being it is placed as new species of *Pithomyces*. It is also noteworthy that no *Pithomyces* species has earlier been validly reported on the host genus as well as on host family.

### Acknowledgements

The author is thankful to the Curator H.C.I.O. Division of plant Pathology. Indian Agricultural Research Institute New Delhi, for Accession and confirming the identity of several leaf spot fungal organisms collected for this investigation.

**Table 2:** Comparison of taxonomic characters of *Pithomyces careyae* with allied species

<i>Pithomyces</i> Spp.	Symptom	Stroma	Conidiophores	Conidia
<i>Pithomyces karoo</i> Marasas & Schumann (Ellis, 1976) <sup>[7]</sup> .	Colonies effuse, grey, greyish olive or black, sometimes zonate	absent	Smooth or verruculose, hyaline to brown, 2-6 $\mu\text{m}$ . thick	Very variable in shape, ellipsoidal, pyriform, clavate, cruciform, verrucose Straw-coloured to dark brown, 2 trans septa & 1 longi septum, 17-30x8-18
<i>P. charatum</i> Berk & Curt. (Ellis 1976) <sup>[7]</sup>	Colonies at first punctiform, black, upto 0.5 mm. diam, later sometimes becoming confluent	absent	Conidiophores micronematous, branched and anastomosing, smooth or occasionally verruculose, pale olive, 2-5 $\mu\text{m}$ . thick, denticles 2-10x 2-3.5	Conidia broadly ellipsoidal, the middle cells usually divided by longi septa, often constricted at the septa, echinulate or verruculose, a small piece of the denticle in variably remains attached to the base of the conidium. With 3-4 (mostly 3) trans septa, the middle cells usually divided by longi. septa, mid to dark brown when mature, 18-29x10-17
<i>P. careyae</i> sp.nov.	Colonies epiphyllous, effuse, covered with powdery black mass	absent	Micronematous, branched, straight or flexuous, smooth, sometimes minutely verruculose, pale oliv. To brown, 1-4 $\mu\text{m}$ . thick	Solitary, pleurogenous or acropleurogenous, ellipsoidal, pyriform, clavate, cylindrical, cruciform, verruculose, dark blackish brown, 0-3 trans. & 1 longi. Septa, 6.5-36x5.5-20

### References

- Alcorn JL. *Parapithomyces clitoriae* sp. nov. (Fungi Hyphomycetes) and its *Pseudocercospora* synanamograph. Aust. Syst. Bot. 1992; 5:711-715.
- Bilgrami KS, Jamaluddin, Rizwi MA. Fungi of India-Part-I, List of References, Today & Tomorrow's Printers & Publishers, New Delhi, 1979.
- Bilgrami KS, Jamaluddin, Rizwi MA. Fungi of India Part-II, Host Index & Addends, Today & Tomorrow's Printers Publishers, New Delhi, 1981.
- Ellis MB. Dematiaceous Hyphomycetes: Mycol., 1967, 8.
- Ellis MB. 'Dematiaceous Hyphomycetes' C.M.I., Kew England, 1971.
- Ellis MB. Dematiaceous Hyphomycetes-XI. Mycol. Pap., Kew, 1972.
- Ellis MB. 'More Dematiaceous Hyphomycetes'. C.M.I., Kew, England, 1976.
- Jamaluddin S, Goswami B, Ojha BM. Fungi of India, Scientific publishers Jodhpur, India, 1989-2001.
- Rao NK, Manoharachary C. A new *Pithomyces* species on leaf litter from A.P. India. Trans. Br. Mycol. Soc. 1988; 91(2):349-352.