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Addition to mycoflora of *Syzygium cumini* from Pakistan

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Abstract

The *syzygium cumini* (L.) skeels member of the Myrtaceae is of wider interest for its medicinal applications than for its edible fruit, commonly called jambolan. The purpose of the study was to get an overview of the mycoflora of this medicinally important plant. Twenty one species of fungi have been reported from the world while 13 species have been reported from Pakistan. In the present paper *Bidenticula cannaea* Deighton, *Monodictys paradoxa* (Corda) Hughes, and *Torula terrestris* (Upadhyay) MisraT, reported from different effected parts of *S. cumini* collected from different parts of Faisalabad district. *Monodictys paradoxa* (Corda) Hughes, and *Torula terrestris* (Upadhyay) Misra, are new reports from Faisalabad Pakistan on host *S. cumini*. *Bidenticula cannaea* Deighton is first time reported from Pakistan.
Keywords: Faisalabad, mycoflora, Pakistan, syzysium cumin.

Introduction

Syzygium cumini (L.) Skeels (Jamun) is an evergreen tropical tree belongs to the family *Mytraceae*. *S. cumini* is common in Faisalabad. It is found as wild and also cultivated for its fruit and pharmaceutical uses. *S. cumini* is a traditional medicine plant in Brazil for its Antileishmanial and antifungal activity. Fernanda *et al.* (2007). *Syzygium cumini* (Myrtaceae) is widely used traditional system of medicine to treat diabetes in India. The isolated compound mycaminose and ethyl acetate and methanol extracted compounds of *S. cumini* seed are undertaken to evaluate the anti-diabetic activity. The fruit is stated to be astringent, stomachic, carminative, antiscorbutic and diuretic. Kumar *et al.* (2008). The seeds are used for medicine to patients with diabetes mellitus or glycosuiria. In many cases, the blood sugar level quickly reduced sugar and there are no ill effects Narsimha *et al.* (1971). Muruganandan *et al.* (2001) reported the anti-inflammatory activity of leaf and barks. its dried bark is also used as anti-diabetic agents Villaseñor and Lamadrid (2005) Fruit as well as fruit juice is useful in treatment of various diseases such as diarrhea, dysentery, liver disorders bleeding piles, female sterility and polyuria, Morton (1987). the extract of leaves show strong antimicrobial activitys Guilherme (2007).

In the present paper, three hyphomycetous fungi are reported, found also on *S. cumini* identified, described and compared with other related species. These are also new reports from Faisalabad Pakistan. *Bidenticula cannaea* Deighton is first time reported from Pakistan.

Materials and Methods

Samples of *S. cumini* were collected form the city campus G. C. University, Jhang Road Faisalabad, Pakistan, University of Agriculture, Faisalabad, Pakistan and Guttwala Forest, Faisalabad, Pakistan. Effected parts of plant were observed with a hand lens and samples were collected. The cut pieces of affected parts of plants such as branch, bark, leaves, fruits, were kept in polythene bags with tags labeled with, date of collection; name of place; collector and host then stapled.

The dry samples were kept at -40 ^{o}C in lower temperature incubator (MIR-553) to kill insects, while wet samples were kept in blotting papers for drying, change of paper were made alternate day. Then they were also places at -40 ^{o}C in lower temperature incubator (MIR-553).

Isolation of fungi from sample

Before isolation the surface of these samples was sterilized with mercuric chloride ($HgCl_2$) 0.1% for one minute. For isolation of fungi following methods are used:

If the sample or the fungal material is ion large quantity, then fungi is picked with a sterilized needle after observing under the dissecting microscope.

But if the fungal material is in not in large quantity then different methods are used fro

isolation, as Moist chambers, Dilution plating, Direct plating , Indirect plating.

Lacto phenol is used for preparation of slides and staining of colored spore fungi while lacto phenol with cotton blue or cotton blue is used for fungi having hyaline spore. Slides were prepared with help of sterilized needles, which sterilized by heating in flame till red.

Identification

The slides were examined under calibrated optic microscope M7000D series cat, M7002D, magnification 4X, 10X, 40X, and 100X power objectives and eye piece with 10 X and 16X.

For identification of fungi taxonomic parameters as colony appearance; color and texture from both sides of Petri dish, mycelium color, septation, branching, conidiophores; septation, color branching and its measurements**,** conidiogenous cells, shape, septation, color and its measurements/mode of conidiogenesis, conidia shape, septation, color and its measurements were examined. Photographs were taken with Sony digital camera (T.20). Fungi were identified up to species level by consulting with standardized mycological literature Sutton, 1980, 1973; Carmecheil *et al.,* 1980; Punthalughan 1980, 1981, Kirk, 2008; CABI Bioscience data base; index of fungorum; HEC digital library.

The samples were preserved in mycological herbarium of G. C. University, Faisalabad. (G.C.U.M.H.)

Results and Discussions

***Bidenticula cannaea* Deighton, 1972, Trans British Mycology Society 59:425-427. Fig 1(A-C)**

Mycelium hyaline septate, branched. *Conidiophores* micronematous, mononematous, solitary, alternately branched, smooth, hyaline, up to 350×3-4 µm. *Conidiogenous cells* micro-nematous, terminali and intercallary, hyaline. *Conidia* hyaline, curved, fusiform, 3-6 transversely septate, 21-31.5 × 3.5 µm.

The fungus under study is identified as *Bidenticula cannaea* Deighton, after consulting Ellis1976; Charmicheal *et al.,* 1980. *Bidenticula* is monotypic genus has one species *B. cannaea* Deighton. Under study fungus is different from type species *B. cannaea.* Conidiophores of type species up to 500 × 2-4 µm, olivaceous in color while the conidiophores of under study fungus are 350 ×3-4 µm, hyaline. Conidia of type species 3-7 septate, 15-30 µ × 3.5-3.5 µm while conidia of under study fungus 3-6 septate and 21 - 31.5 × 3.5 µm**.** In present studies genus *Bidenticula* and species *B. cannaea* is first timr reported from Faisalabad Pakistan on the host *Syzygium cumini,*.

Specimen Examined: on branches of *S. Cumini;* Guttwala Forest Faisalabad Pakistan; 15 July, 2007; S.Q. Abbas and Sobia Mushtaq. G.C.U.M.H.# 19.

***Monodictys paradoxa* (Corda) Hughes, 1958, Can.J.Bot., 36: 786. Fig 2(A-C)**

=*Sporidesmium paradoxium* Corda

=*Coniosporium paradoxum* (Corda) Mason & Hughes.

Colonies black, Mycelium septate, branched. *Conidiophores* micronematous, mono-nematous, irregularly branched, flexuous, brown smooth. *Conidiogenous* cells monoblastic swollen. *Conidia* oblong ellipsoidal pyriform or sub spherical, brown color with many longitudinal and transverse septa and constriction at walls 17.5-42 (31.5µm) × 7-24.5µm (21µm).

Genus *Monodictys* resembles with *Alternaria*, *Ulocladium*, *Stemphyllum* as having compact, many celled conidia with many transverse, longitudinal and obleque septa. *Monodictys* differ from *Alternaria* and *Ulocladium* in conidial shape and attachment. Conidia in *Alternaria* and *Ulocladium* are ellipsoidal while *Monodictys* has subspherical to pyrifrom conidia. Similarly, *Stemphyllum* differ from *Monodictys* in having cicatrized conidia and in *Monodictys* conidia are not cicatrized. *M.castanea* differs from *M. paradoxa* in having veruculated conidia while *M. paradoxa* smooth walled of conidia. *M. melanospora* differs from *M. pardoxa* in having lower half of conidia pale and upper half dark in color but in *M. paradoxa* conidia are of same color. *Monodictys antique* differs from *M. paradoxa* in having deep lobed conidia. *M. fluctuate* differs from *M. paradoxa* in having irregular shaped conidia and *Monodictys paradoxa* has subspherical conidia. *Monodictys levis, M. glauca, M. asperospora* differ from *M. paradoxa* in having few celled conidia while *Monodictys paradoxa* has many celled conidia. *M. puterdinis* is closely resembled to *M. paradoxa* however it differs from *M. puterdinis* in having swollen conidiophores.

The fungus found on bark of *S.cumini* is identified as *Monodictys paradoxa* Hughes. The identification of fungus is carried out after consulting (Ellis, 1971, 1976; Charmicheal *et al.,*1980).

From Pakistan, two species of *Monodictys* has been reported, *Monodictys levis* and *Monodictys paradoxa* Ahmad *et al.* (1997).

M. levis (Woltshire); *Pinus*, Shrubland Soil; Rupal (Nangaparbat); Matushima (1993). *M. Paradoxa* (Corda) Hughes; on *Rubus grandis*, *loon Bagla*; (Ahmad 1967, 1969; Ahmad and Rizvi, 1969).

Specimen Examined

Monodictys paradoxa has not been reported on *Syzygium cumini* from Faisalabad, Pakistan. Further *Syzygium cumini* is an addition to host list of *Monodictys paradoxa*

Specimen Examined

M. paradoxa on bark of Syzygium *Cumini;* University of Agriculture Faisalabad, Pakistan; 23 April, 2007; S.Q.Abbas and Sobia Mushtaq, G.C.U.M.H# 25.

Torula terrestris *(Upadhyay)***, Misra, 1967, Can.J.Bot.,45:367-369. Fig 3 (A-E)**

Colony black powdery.*Conidiophores* smooth, micronematous, brown. *Conidiongenous* cells yellowish brown, verrculated 4-5 µm. Conidia dark brown in color, ellipsoidal,0-4 septate, with construction at septa and echinulation very prominent, 19-26 × 7.6µm. Lower end cells light in color while mid cells are dark brown.

The fungus has been identified as *Torula terrestris (Upadhyay),* Misra.

Following species of *Torula* have been reported from Pakistan Ahmad *et al.* (1997).

T. herbarum Link. *ex* Fr.; on *Albizia lebbec*; Lahore; Ahmad (1960,1968,1969)

T. darwinii Speg*: Citrullus vulgaris;* Fasilabad ; Mirza & Qurashi (1978).

T. thermophila Cooney & Emers., has been excluded from *Torula* and placed in genus *Scytalidium thermophilum* (Cooney & R. Emers.) Austwick, It was reported by Qureshi *et al.*, (1980).

*T. allii (*Harz.) Sacc.; soil, Karachi; Hussain et *al.*, (1966)

In the present studies, ***Torula terrestris*** is new report from Faisalabad Pakistan on hsot *Syzygium cumini.*

T. herbarum f. quaternella Sacc. and *T. ellissi* Yadav & Lal. differ from *T. terrestris*. *T. herbarum f. quaternella* and *T. ellissi* have smooth walled conida while *Torula terrestris* have verculated conidia. *T. herbarum* link ex Gray and *T. gramins* Desm**.** also differ from *Torula terrestris.* Conidia of *T. gramins* and *T. herbarum* have dark color of end cells, while in *T. terrestris* light pale color of end cells. *T. caligans* Ellis have 3 septate conidia and middle cell much bigger, while in *T. terrestris* conida 6 septate and all cells of conidia are same size. *T. ndjilensis* Kiffer, also differs from *T. terrestris* in having smooth conidiogenous cells and hyaline sterile cell in conidia, more thick in center 13-19 µm. whereas in *T. terrestris* conidiogenous cells are verrculated and sterile cells are absent in conidia.

Specimen Examined

On bark of S. *cumini*; The city campus GC University, Allama Iqbal Road Faisalabad, Pakistan; 10 July, 2007; S.Q. Abbas & Sobia Mushtaq. G.C.U.M.H # 32.

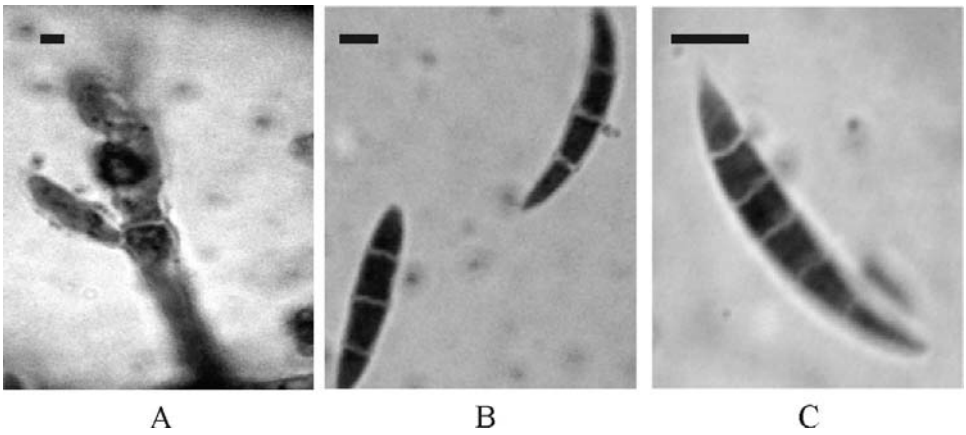

Fig. 1: *B. cannae*, (A-C). A. Conidia attached with conidiophores, B**.** Conidia with 3 septa, C**.** Conidium with 5 septa (1000X). Bar=5 µm

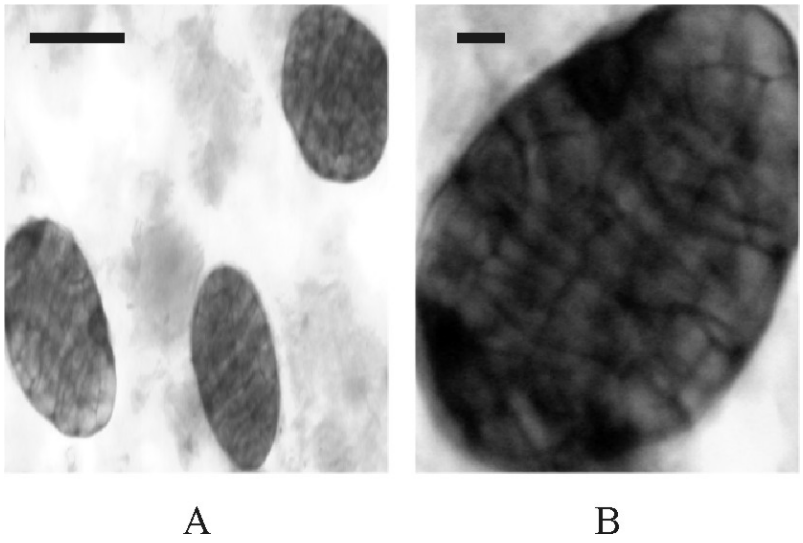

Fig. 2: ***Monodictys paradoxa*****, A.** Conidia400x. **B.** Conidium.(1000x). Bar=5 µm

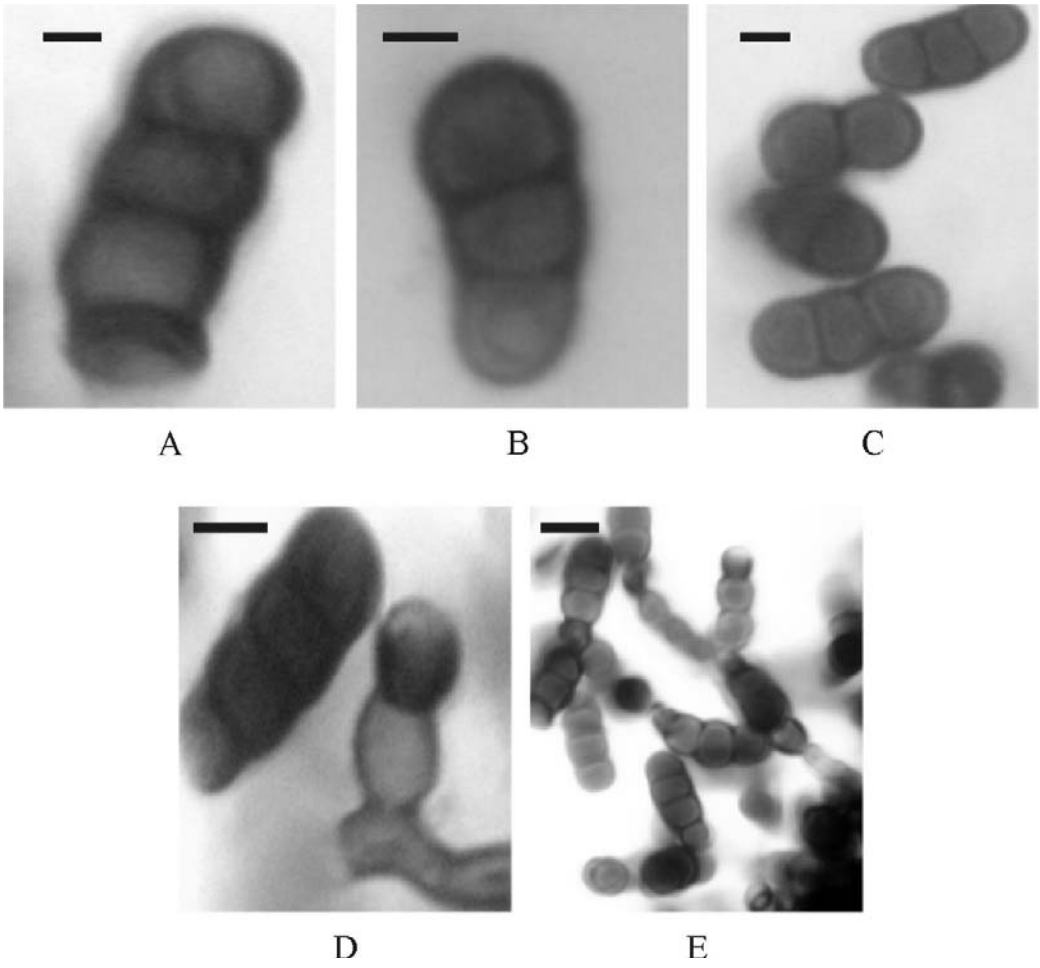

Fig. 3: *Torula terrestris*, A: Conidium with 2 septa, B**:** Conidium 2 septate, C**:** Conidia, **D:** Conidia attached with conidiophores (1000x), **E:** Conidia in chains (400x). Bar=5 µm

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