

NEW FUNGAL RECORDS ON *EUCALYPTUS* SPECIES FROM DISTRICT FAISALABAD PAKISTAN II

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Abstract

In the present paper three more fungi viz., 1) *Torula herbarum* (Pers.) link ex Gray on *E. microtheca*; 2) *Triadelphia* sp. on *E. alba* and 3) *Chuppia sarcinifera* Deighton on *E. falcata* have been reported on *Eucalyptus* spp., from District Faisalabad. Pakistan, thus the total recorded fungi on *Eucalyptus* spp., from Pakistan become thirteen.

Introduction

Pakistan is situated in South Asia. It lies between 23° to 30°N latitude and 61° to 75°30 east longitude. It has four provinces, i.e., Punjab, Sindh, Baluchistan and North Western Frontier (NWFP). Nearly three fourths of Pakistan receives average annual rainfall of less than 25 inches. The temperature varies from freezing point to 50°C. (Hussain, 2004) District Faisalabad is situated in province of Punjab. The total area of the District Faisalabad is of 58.56 square kilometer. It lies between longitude 73° and 74° east, latitude 30° and 31.5° North, at an elevation of 605 feet above sea level. The climate of Faisalabad is extreme with very little rainfall. The maxim temp in summer rises up to 48°C and minimum temperature in winter goes down to 04°C .

Genus *Eucalyptus* is a large genus belongs to family Myrtaceae, containing more than 700 species, most of them are native to Australia. *Eucalyptus* is very important plant due to its economic and medicinal value. Its importance is further increases due to its ability to environment stability and reclamation of saline land. Out of total fourty three species of *Eucalptus* from Pakistan, nineteen were reported from District Faisalabad. More than 1000 fungi have been reported on *Eucalyptus* spp. from all over the world. Whereas only seven fungi have been reported from Pakistan on *Eucalyptus* sp., viz., 1) *Laetiporus sulphureus* (Bull) Murril on *Eucalyptus tereticornis*, (Khan, 1989); 2) *Alternaria alternate* (Fr) Keissl. on *Eucalyptus* sp. (Ahmad, 1990); 3) *Fomes robiniae* (Murril) Sacc. and D. Sacc. on *Eucalyptus oleosa*, *E. odorata*, *E. paniculatas* and *E. regnans* (Khan, 1989); 4) *Ganoderma lucidum* (Curtis) P. Karst (as *Ganoderma applanatum*) on *E. citriodora* (Khan, 1989, Ahmad, 1990); 5) *Coniothyrium ahmedii* Sutton (syn. *Coniothyrium eucalypti* Ahmad) on *Eucalyptus* sp. (Sutton, 1974; Ahmad, 1971); 6) *Cercospora eucalypti* Cooke and Massee on *Eucalyptus bicostata*., (Mirza & Qureshi, 1978) ., 7) *Aspergillus ochraceus* G. Wilh on *Eucalyptus arboretum* (Matsushima, 1993).

Recently Abbas *et al.*, (2010b) reported three more fungi on *Euclyptus spp.* from Faisalabad Pakistan viz., 1) *Gliomastix novae-zalandia* Hughes and Dickinson on *Euclyptus citrodora*; 2) *Beltrania rhombic* Penzig on *E. globules*; 3) *Cerebella andropogonis* Ces on *E. botryoides*, *E. grandis* and *E. citrodora*.

In the present paper three more fungi viz., 1) *Torula herbarum* (Pers.) link ex Gray on *E. microtheca*; 2) *Triadelphia* sp. on *E. alba* and 3) *Chuppia sarcinifera* Deighton on *E. falcata* have been reported from District Faisalabad. Pakistan, thus the total recorded fungi from Pakistan become thirteen.

Materials and Methods

Diseased plant materials of different *Eucalyptus* spp., were collected from Gatwala Forest Faisalabad Pakistan.

Materials and Methods used were the same as described by Abbas *et al.*, (2010a and 2010b).

Identification

Identification up to species level were made after consulting Ellis (1971,1976) Sutton (1980) Charnichae *et al.*, (1980), Kirk (2010) and Constantinescu and Samson (1982).

Results and Discussion

A fungus was found on *Eucalyptus microtheca* specimen GCUFMH#31 and was identified as *Torula herbarum* (Pers.) Link ex Gray *Nat. Arr. Br. Pl.* 1:557(1821)Fig (1).

Description of the fungus identified: Mycelium septate, branched, brown, 2-6µm thick. Conidiophores 2-6 µm thick except for the conidiogenous cells which are 5.9-8.5µm thick. Conidia straight or slightly curved, cylindrical, rounded at the ends, pale brown to golden brown 3-5 septate, constricted at the septa.

The fungus under study was compared with *Torula* spp. It closely resembled with *Torula herbarum*, on the basis of conidial length, shape and conidiogenous cells. However fungus under study can easily be differentiated from other species of *Torula* spp. In *Rutola graminis* (= *Torula graminis*) conidia are generally 0-2 septate and 4-6µm thick, while in *Torula herbarum* conidia are 3-10 (mostly 4-5) septate and 5-9 (9) µm thick. In *T. caligans* conidia are 3-6 (mostly 4) septate and 8-13µm wide. In *T. herbarum* *f. quaternella* conidia are 1-3 (mostly 2) septate and 5-7µm wide, and in *Torula ellisii* conidia are catenate, cylindrical, obtuse at both the ends.

Four species and one variety of *Torula* has been reported from Pakistan viz., 1) *T. herbarum*: Link. ex Fr. on dead branches, leaves and pods of *Albizzia lebbek*, Lahore (Ahmad, 1960, 1968); *Torula herbarum f. quaternella* Sacc., on dead branches and leaves, Lahore, Ahmad (1969); 2) *T. alli* (Harz.) Sacc., from soil Karachi, Hussain *et al.*, (1966); 3) *T. darwini* Speg., On *Citrullus vulgaris*, Faisalabad, Mirza & Qureshi (1978); 4) *Scytalidium thermophilum* (as *Torula thermophila*), Qureshi *et al.*, (1980).

Torula herbarum is first time recorded on *Eucalyptus microtheca*, from District Faisalabad, Pakistan.

Specimen examined: *Torula herbarum* On the bark of *Eucalyptus microtheca* from Gatwala park Faisalabad Pakistan, 16March, 2007. Naila Sadaf and S.Q. Abbas, CUFMH #.31.

A fungus was also found on *Eucalyptus alba* specimen GCUFMH #32and was identified as *Tridelphia* sp. (Fig. 2).

Genus *Tridelphia* Shearer & Crane. *Mycologia*, 63: 247(1971).

This genus comprises of 17 species, described from all over the world. Kirk (2010).

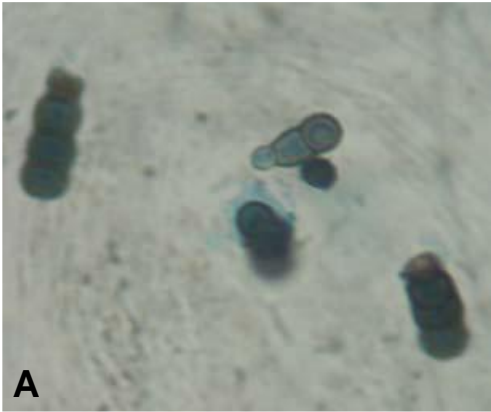


Fig. 1. *Torula herbarum*: A. Three and four celled conidia; with conidiogenous cells (1000x).

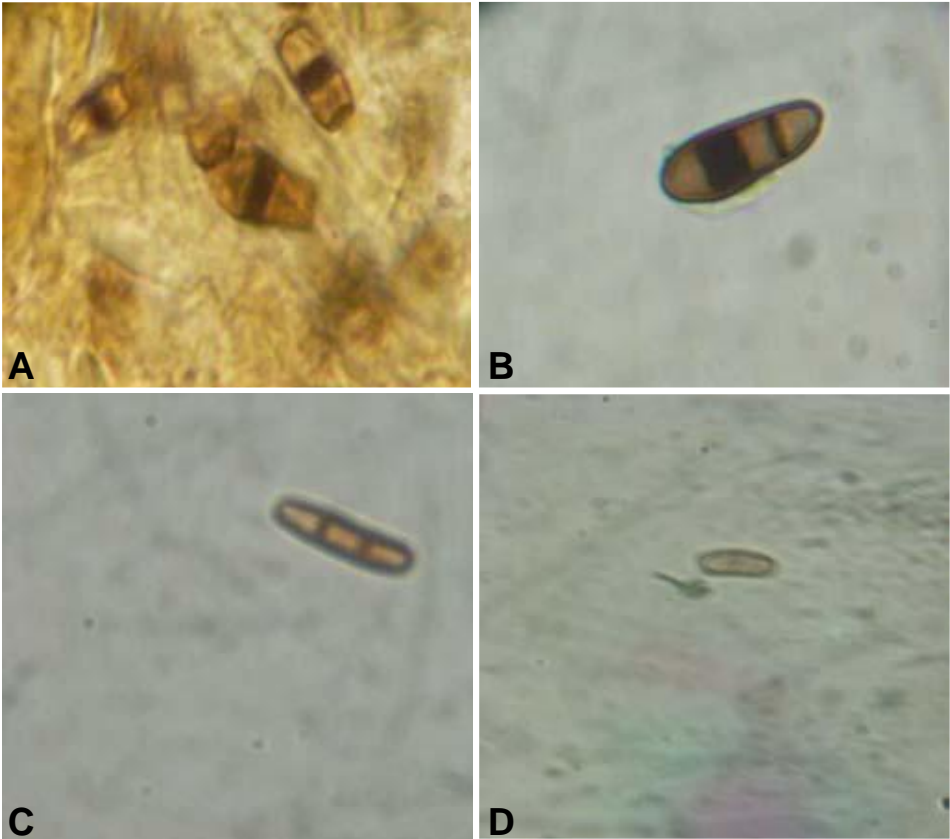


Fig. 2. (A-D): *Triadelphia* (A) Conidia yellowish brown, the median septum is in the form of a dark broad band, 1000 x (B) Conidium shows two dark brown bands, one band is more broader than the other 1000x (C) Conidium, 2-septate both septa of same thickness and not broad banded 1000 x. (D) unseptate conidium.

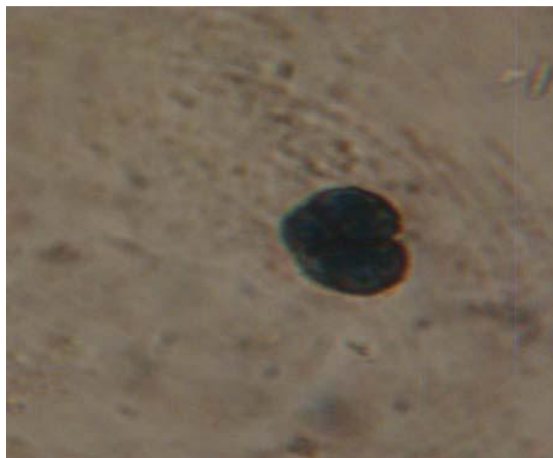


Fig. 3. *Chuppia sarcinifera* (A) Compact structure, Conidium, three celled (A, 1000x).

Triadelfhia sp.

Description of the fungus identified: Mycelium septate, branched and brown, conidiophores not seen, conidiogenous cells cylindrical, smooth, pale brown to golden brown $12 \times 3.8\mu\text{m}$. Conidia pleomorphic and are of four types.

1. Conidia hyaline to yellowish brown, cylindrical, straight to slightly curved 2-septate, median septum, dark golden brown and broad banded.
2. Conidia 2-septate, oval to elliptical broad banded and dark brown on wider side and relatively less wide and brown on narrow side.
3. Conidia 2-septate, cylindrical, brown both septa are of same thickness and not broad banded.
4. Conidia unseptate, cylindrical to elliptical and light brown.

The fungus on *Eucalyptus alba* is identified as *Triadelfhia* sp. It closely resembled to *Triadelfhia inquinans* (Sacc) Hughes and Piroz (1972), however it differs in lacking of hyaline spindle shaped transversely divided conidia, further more oval shaped, broad banded conidia are present in both taxa however both end are obtuse in under study *Triadelfhia* sp. while conidial apex are obtuse and base truncate in *Triadelfhia inquinans*. It also differs from other species of *Triadelfhia spp.* it looks as a new species and will be published in due course of time..

Previously *Triadelfhia* has not been recorded from Pakistan. (Ahmad *et al.*, 1997). Recently it is also recorded on *Morus alba* and on *Bombax ceiba* from Faisalabad, Pakistan. In the present study genus *Triadelfhia* is reported for the first time on *Eucalyptus alba*, from Faisalabad, Pakistan.

Specimen examined *Triadelfhia* sp. On the bark of *Eucalyptus alba* from Punjab Forest Institute Gatwala Faisalabad Pakistan. 16 March, 2007; Naila Sadaf and S.Q. Abbas; GCUFMH#32

A fungus was also found on *Eucalyptus falcata* GCUF # 33 and was identified as *Chuppia sarcinifera* Deighton. *Mycol.Pap.* **101**:32(1965); M.B.Ellis, Dematiaceous hyphomycetes (CAB, IMI, UK) 48-49 (1971) Fig. 3.

Chuppia is a monotypic genus (Kirk, 2010).

Description of the fungus: Colonies effuse, dark olivaceous to black. Mycelium branched, septate. Conidiogenous cells, monoblastic, denticulate, prominent, conidiophore 4-7µm thick, micronematous, flexuous, irregularly branched, golden brown to dark olive brown. Conidia dark brown, irregular in shape, muriform and constricted at walls, cells arranged in the form of clusters, 15- 48 x19-30 µm.

Chuppia sarcinifera can easily be differentiated from the *Tetracosporium zabo* which has 4 celled conidia, while in *Chuppia sarcinifera* conidia are 5 celled, it can also be differentiated from the genus *Cerebella* Ces., on the basis of conidiophores which are semi macronematous, monomenatous densely packed together covering the surface of stroma in *Cerebella*, while it is micromenatous unbranched straight or flexuous forming a foot shape cell in hyphae in the genus *Chuppia*.

Chuppia sarcinifera Deighton has not been recorded from Pakistan (Ahmed *et al.*, 1997). The genus *Chuppia* and the species *Chuppia sarcinifera* are for the first time reported on *Eucalyptus falcata* from Faisalabad, Pakistan.

Specimen examined *Chuppia sarcinifera* Deighton on the bark of *Eucalyptus falcata* Punjab Forest Institute Gatwala Faisalabad Pakistan 16, March, 2007, Naila Sadaf and S.Q. Abbas., GCUFMH#33.

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