



Official publication of Pakistan Phytopathological Society
Pakistan Journal of Phytopathology

ISSN: 1019-763X (Print), 2305-0284 (Online)

<http://www.pakps.com>



Research Report

COLLECTION OF *ALTERNARIA ALTERNATA* (FR.) KEISSL. IN FIRST FUNGAL CULTURE BANK OF PAKISTAN

Naureen Akhtar

Institute of Agricultural Sciences University of the Punjab Lahore Pakistan.

ABSTRACT

First Fungal Culture Bank of Pakistan (FCBP) has a collection of 59 isolates of *Alternaria alternata* that were isolated from different substrates collected from various localities of Pakistan. These isolates include plant pathogenic as well as saprophytic strains of *A. alternata*.

Keywords: Isolates, culture, sampling, conidia.

Institute of Agricultural Sciences (Previously called Institute of Mycology and Plant Pathology) University of the Punjab Lahore, Pakistan laid foundation of First Fungal Culture Bank of Pakistan (FCBP) in 2003. The objectives of the establishment of this research centre were conservation of indigenous fungal flora of Pakistan, availability of these cultures for research and teaching, collaboration with other world microbial culture collection centers as well as improvement in the literature and expertise in fungal taxonomy. FCBP is registered with World Data Centre for Microorganisms (WDCM), World Federation of Culture Collection (WFCC) and Microbial Research Center (MRCEN).

During twelve years of its establishment, FCBP managed to collect around 1300 identified pure cultures belonging to more than 70 different fungal genera. The most prominent genera are *Aspergillus*, *Alternaria*, *Fusarium*, *Penicillium*, *Trichoderma Drechslera* and *Curvularia*. *Alternaria* is the outstanding group and FCBP contains 59 isolates of only one species "*alternata*" of this genus. These isolates were recovered from a wide range of substrates and different areas of the country. FCBP has 18 isolates of *A. alternata* from leaf spot diseased samples (Table I); 8 isolates from rotting fruits (Table II); 10 isolates from plant parts other than

leaves and fruits (Table III); 11 strains from air mycoflora (Table IV); 5 from soil (Table V); 4 from dairy and bakery products (Table VI); and one each from industrial effluent, sewerage water and paper (Table VII).

These isolates were identified on the basis of morphological or cultural characters (Ellis, 1971; Simmons, 2007). *A. alternata* colonies attain the diameter of approximately 6 cm when grown on malt extract agar (MEA) medium at 25 °C in 7 days; colony radiate floccose with irregular margins without exudates. Grown on potato carrot agar (PCA) medium, colony diameter reaches 2-3 cm with 1-2 pairs of concentric growth rings; colony color greenish black, reverse black, exudates absent, radiate, floccose with irregular margins. Single chains of conidia in the branching head may have upto 15-20 conidia; no non-sporulating surface or aerial mass of mycelium. Conidia appear olivaceous, a dull gray green brown. Conidiophores short, secondary conidiophores produce by a single sub-erect conidiophore.

Primary conidiophores were comparatively shorter 40-90 x 3-4 µm in size, branched and geniculate. Conidia elliptical, first forming conidia are long and more elliptical later conidia in the chain, ovoid, ellipsoidal, sub-spheroidal, initial elliptical conidia are 25-30 x 5-9 µm, with 4-7 transverse septa and a few longitudinal septa, subsequent spores 7-35 x 5-12 µm, with 1-7

* Corresponding Author:

Email: naureenshahrukh@yahoo.com

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transverse septa and a very few or no longitudinal septa, with a conspicuous basal pore, with or without a short conical or cylindrical apical beak not exceeding one third of the conidial length (Simmon, 2007).

On this paper, a report on all records of FCBP *A. alternata* is presented in the form of tables which contained information regarding the collection and type of samples.

Table I: *A. alternata* isolates from diseased leaf samples.

Sr. No.	Plant name	Sampling site	Sampling date	Accession No.
1	<i>Rumex dentatus</i>	Lahore	12.05.03	FCBP0003
2	<i>R. dentatus</i>	Lahore	28.02.06	FCBP0589
3	<i>Hedra helix</i>	NathiaGali	27.07.03	FCBP0156
4	<i>Arachis hypogaea</i>	Rawalpindi	-	FCBP0188
5	<i>Spinacea oleracea</i>	Lahore	30.11.04	FCBP0352
6	<i>Cucurbita pepo</i>	Lahore	25.04.05	FCBP0402
7	<i>Cyperus rotundus</i>	Lahore	15.07.05	FCBP0492
8	<i>Gladiolus grandiflorus</i>	Kasur	29.03.05	FCBP0451
9	<i>Trianthemasp.</i>	Lahore	20.11.05	FCBP0556
10	<i>Brassica oleracea</i>	Lahore	-	FCBP0621
11	<i>B. oleracea</i>	Sargodha	24.03.09	FCBP0972
12	<i>Mangifera indica</i>	Lahore	-	FCBP0739
13	<i>Rosa indica</i>	Lahore	27.01.09	FCBP0965
14	<i>Eucllyptuscitriodora</i>	Lahore	30.05.09	FCBP1004
15	<i>Aloe vera</i>	Lahore	09.11.09	FCBP1071
16	<i>A. vera</i>	Lahore	11.06.07	FCBP0797
17	<i>Impatiens glaudulifera</i>	Swat	25.05.08	FCBP0881
18	<i>Parthenium hysterophorus</i>	Lahore	24.12.08	FCBP0919

Table II: *A. alternata* isolates from diseases fruits.

Sr. No.	Plant name	Sampling site	Sampling date	Accession No.
1	<i>Prunus persica</i>	Lahore	Not known	FCBP0328
2	<i>Citrullus vulgaris</i>	Murree	18.09.04	FCBP0335
3	<i>Lycopersicon esculentum</i>	Lahore	28.06.05	FCBP0479
4	<i>L. esculentum</i>	Lahore	12.12.05	FCBP0573
5	<i>Malus domestica</i>	Lahore	12.12.05	FCBP0574
6	<i>Citrus sp.</i>	Lahore	27.01.06	FCBP0597
7	<i>Citrus sp.</i>	Lahore	07.01.09	FCBP0953
8	<i>Psidium guajava</i>	Lahore	Not Known	FCBP1129

Table III: *A. alternata* isolates from plant parts other than leaves and fruits.

Sr. No.	Plant name	Plant part	Sampling site	Sampling date	Accession No.
1	Not Known	Stem Wood	Khanaspur	24.07.03	FCBP0100
2	Not Known	Stem Wood	Khanaspur	Not Known	FCBP0117
3	<i>Dalbergia sissoo</i>	Root bark	Sialkot	10.11.03	FCBP0189
4	<i>D. sissoo</i>	Root bark	Lahore	Not Known -	FCBP0194
5	<i>D. sissoo</i>	Root bark	Lahore	28.05.05	FCBP0435
6	<i>D. sissoo</i>	Root	Lahore	16.06.06	FCBP0687
7	<i>Syzygium cumini</i>	Stem bark	Lahore	Not Known	FCBP0780
8	<i>Gladiolus grandiflorus</i>	Bulb	Sihala	19.03.05	FCBP0404
9	<i>G. grandiflorus</i>	Bulb	Islamabad	19.03.05	FCBP0411
10	<i>Zea mays</i>	Seed	Lahore	30.05.05	FCBP0568

Table IV: *A. alternata* isolates from air mycoflora.

Sr. No.	Sampling site	Sampling date	Accession No.
1	Lahore	30.07.03	FCBP0093
2	Lahore	10.04.04	FCBP0246
3	Murree	18.09.04	FCBP0322
4	Jhelum	29.12.04	FCBP0385
5	Jhelum	29.12.04	FCBP0393
6	Kala Shah Kaku	03.01.05	FCBP0396
7	Kot Abdul Malik	29.05.05	FCBP0442
8	Okara	29.05.05	FCBP0461
9	Lahore	29.08.05	FCBP0532
10	Lahore	24.11.06	FCBP0704
11	Lahore	14.01.10	FCBP1117

Table V: *A. alternata* isolates from soil.

Sr. No.	Sampling site	Sampling date	Accession No.
1	Murree	10.10.04	FCBP0345
2	Lahore	Not Known -	FCBP0369
3	Lahore	23.02.06	FCBP0607
4	Lahore	25.05.06	FCBP0663
5	Lahore	20.10.08	FCBP0925

Table VI: *A. alternata* isolations from dairy and bakery products.

Sr. No.	Sample	Sampling site	Sampling date	Accession No.
1	Milk cream	Lahore	10.12.03	FCBP0216
2	Khoya	Lahore	12.12.05	FCBP0572
3	Cheese	Lahore	20.04.06	FCBP0646
4	Bread	Lahore	21.11.09	FCBP1086

Table VII: *A. alternata* isolates from waste water and paper product.

Sr. No.	Sample	Sampling site	Sampling date	Accession No.
1	Tannery effluent	Kasur	28.04.04	FCBP0260
2	Sewage water	Lahore	19.04.04	FCBP0265
3	Paper	Lahore	21.01.06	FCBP0749

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