

NEW RECORDS OF SOILBORNE ROOT INFECTING FUNGI IN PAKISTAN

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Abstract

Species of *Bipolaris*, *Botryodiplodia*, *Cephalophora*, *Cephalosporium*, *Colletotrichum*, *Corynascus*, *Curvularia*, *Exerohilum*, *Fusarium*, *Macrophomina*, *Melanospora*, *Nigrospora*, *Rhizoctonia*, *Sclerotium*, *Stemphylium* and an unidentified basidiomycete were recorded on several new hosts from Pakistan. *Cephalophora tropica*, *Corynascus* sp., and *Exerohilum holmii* are new reports from Pakistan.

During a survey of cultivated fields in different areas of Pakistan, several new hosts of root infecting fungi were encountered. Of these 45 new hosts of *Macrophomina phaseolina* (Shahzad & Ghaffar, 1986; Shahzad *et al.*, 1988), 51 new hosts of *R. solani* (Shahzad & Ghaffar, 1990), 3 of *Pythium aphanidermatum* and 5 of *P. periplocum* (Shahzad & Ghaffar, 1993) have already been reported. In the present report, new hosts of *Bipolaris australiensis* (44 hosts), *B. papendorfii* (2), *B. spicifera* (8), *Botryodiplodia theobromae* (8), *Cephalophora irregularis* (3), *C. tropica* (1), *Cephalosporium* sp., (3), *Colletotrichum capsici* (1), *Corynascus* sp., (5), *Curvularia lunata* (16), *C. oryzae* (1), *C. tuberculata* (14), *Exerohilum holmii* (4), *E. rostratum* (13), *Fusarium moniliforme* (1), *F. oxysporum* (5), *F. semitectum* (1), *F. solani* (17), *Fusarium* sp., (87), *Macrophomina phaseolina* (2), *Melanospora* sp., (4), *Rhizoctonia solani* (5), *Sclerotium rolfsii* (2), *Sclerotium* sp., (5) *Stemphylium lycopersici* (1) and an unidentified sterile basidiomycete (20) are presented. *C. tropica*, *Corynascus* sp., and *E. holmii* appeared to be a new fungus record for Pakistan (Mirza & Qureshi, 1978; Ahmed *et al.*, 1993). The fungi were identified after reference to Gilman (1957), Booth (1971), Ellis (1971), Domsch *et al.*, (1980) and Nelson *et al.*, (1983), and C.A.B., I.M.I. Catalogue of the culture Collection (Anon., 1988) and Jong & Edwards (1991) were consulted for synonymy.

Table 1. Soilborne fungi associated with various crops.

Fungus [Synonyms]	Hosts	#Districts
<i>Bipolaris australiensis</i> (Ellis) Tsuda & Ueyama [<i>Helminthosporium australiense</i> Bugnicourt; <i>Drechslera australiensis</i> (Bugni.) Subram. & Jain ex Ellis]	<i>Abelmoschus esculentus</i> (L.) Moench <i>Allium cepa</i> L.	1,2,4,6 1,7

Table 1 (cont'd.)

Fungus [Synonyms]	Hosts	#Districts
	<i>Arachis hypogaea</i> L.	1,16
	<i>Avena sativa</i> L.	16
	<i>Beta vulgaris</i> L.	1
	<i>Brassica rapa</i> L. (Perviridis group)	1
	<i>Cannabis sativa</i> L.	17
	<i>Capsicum annuum</i> L.	1,18
	<i>Carica papaya</i> L.	1
	<i>Cicer arietinum</i> L.	1,17
	<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	1,11
	<i>Cocos nucifera</i> L.	1,2
	<i>Coriandrum sativum</i> L.	1,2,11,14
	<i>Cucumis melo</i> L.	1,4,11
	<i>Cucurbita foetidissima</i> H.B.K.	1
	<i>C. pepo</i> L.	11
	<i>Cynodon dactylon</i> L.	1
	<i>Gossypium arboreum</i> L.	1,6,8,11
	<i>Helianthus annuus</i> L.	1,17
	<i>Ixora</i> sp.	1
	<i>Lactuca sativa</i> L.	1,11,14
	<i>Lagenaria siceraria</i> (Mol.) Standl.	1,7
	<i>Luffa aegyptica</i> Mill.	1
	<i>Lycopersicon esculentum</i> Mill.	1,2,6
	<i>Mangifera indica</i> L.	1,2,5
	<i>Medicago sativa</i> L.	1
	<i>Mentha piperita</i> L.	1,7
	<i>Momordica charantia</i> L.	1,7
	<i>Musa paradisiaca</i> L.	1,2,3,4,5
	<i>Pennisetum americanum</i> (L.) Levee	1,4
	<i>Petunia violacea</i> Lindl.	1
	<i>Piper betel</i> L.	1
	<i>Pisum sativum</i> L.	1,13
	<i>Portulaca oleracea</i> L.	1
	<i>Praecitrullus fistulosus</i> (Stocks) Pangal	11
	<i>Raphanus sativus</i> L.	1
	<i>Saccharum officinarum</i> L.	4
	<i>Sesamum indicum</i> L.	1
	<i>Solanum melongena</i> L.	1
	<i>S. nigrum</i> L.	11
	<i>Spinacea oleracea</i> L.	1
	<i>Triticum aestivum</i> L.	2,4,6,8,9,11

Table 1 (cont'd.)

Fungus [Synonyms]	Hosts	#Districts
	<i>Vigna mungo</i> (L.) Hepper	1,17
	<i>V. radiata</i> (L.) Wilczek	1,16,17
<i>Bipolaris papendorfii</i> (van der Aa) Alcorn		
[<i>Curvularia siddiquii</i> Ahmed & Quraishi; <i>C. papendorfii</i> van der Aa; <i>Dreschlera papendorfii</i> (van der Aa) Ellis]		
	<i>Helianthus annuus</i> L.	1
	<i>Vigna radiata</i> (L.) Wilczek	1,17
<i>Bipolaris spicifera</i> (Bainier) Subram.		
[<i>Brachycladium spiciferum</i> Bainier; <i>Helminthosporium tetramera</i> McKinney; <i>Curvularia spicifera</i> (Bain.) Boedijn; <i>Helminthosporium spiciferum</i> (Bain.) Nicot; <i>Curvularia tetramera</i> (McKinney) Boedijn ex Gilman; <i>Drechslera tetramera</i> (McKinney) Subram. & Jain; <i>D. spicifera</i> (Bain.) Arx]		
	<i>Capsicum annuum</i> L.	1,9
	<i>Cicer arietinum</i> L.	1,17
	<i>Cocos nucifera</i> L.	1
	<i>Gossypium arboreum</i> L.	1,8
	<i>Helianthus annuus</i> L.	1,8
	<i>Lens culinaris</i> Medic	1
	<i>Piper betel</i> L.	1
	<i>Vigna mungo</i> (L.) Hepper	1
<i>Botryodiplodia theobromae</i> Pat.		
	<i>Artocarpus heterophyllus</i> Lam.	1
	<i>Cucumis sativus</i> L.	11
	<i>Lycopersicon esculentum</i> Mill.	1
	<i>Manilkara zapota</i> (L.) van Royen	1
	<i>Musa paradisiaca</i> L.	2
	<i>Oryza sativa</i> L.	11
	<i>Portulaca oleracea</i> L.	1
	<i>Zinnia elegans</i> Jacq.	1
<i>Cephalophora irregularis</i> Thaxter		
	<i>Arachis hypogaea</i> L.	1
	<i>Cocos nucifera</i> L.	1
	<i>Helianthus annuus</i> L.	1
<i>Cephalophora tropica</i> Thaxter		
	<i>Helianthus annuus</i> L.	1
<i>Cephalosporium</i> sp.		
	<i>Helianthus annuus</i> L.	1,17
	<i>Musa paradisiaca</i> L.	3
	<i>Vigna radiata</i> (L.) Wilczek	1,15

Table 1 (cont'd.)

Fungus [Synonyms]	Hosts	#Districts
<i>Colletotrichum capsici</i> (Syd.) Butl. & Bisby		
	[<i>Colletotrichum bryoniae</i> (Ferr.) Maire.; <i>Colletotrichum boerhaviae</i> Pavgi & Singh; <i>Colletotrichum corylifoliae</i> Pavgi & Singh]	
	<i>Zingiber officinale</i> Roscoe	14
<i>Corynascus</i> sp.		
	<i>Cucumis melo</i> ssp. <i>melo</i> var. <i>flexuosus</i> (L.) Naudin	1
	<i>Cucurbita pepo</i> L.	1
	<i>Mentha piperita</i> L.	1,7
	<i>Raphanus sativus</i> L.	1
	<i>Triticum aestivum</i> L.	1
<i>Curvularia lunata</i> (Wakker) Boedijn		
	<i>Alhagi maurorum</i> Medik.	2
	<i>Arachis hypogaea</i> L.	1,16
	<i>Brassica rapa</i> L. (Rapifera group)	1,10
	<i>Canabus sativa</i> L.	17
	<i>Cocos nucifera</i> L.	1
	<i>Cynodon dactylon</i> (L.) Pers.	1
	<i>Lens culinaris</i> Medic	1,17
	<i>Luffa aegyptica</i> Mill.	1,2,7
	<i>Medicago sativa</i> L.	1,2,11
	<i>Mentha piperita</i> L.	1,7
	<i>Musa paradisiaca</i> L.	4,3
	<i>Piper betel</i> L.	1,2
	<i>Sesamum indicum</i> L.	1,8
	<i>Solanum melongena</i> L.	1,2,7
	<i>Sorghum bicolor</i> (L.) Moench	1,12
	<i>Vigna mungo</i> (L.) Hepper	1,2,17
<i>Curvularia oryzae</i> Bugnicourt		
	<i>Cucumis melo</i> L.	1
<i>Curvularia tuberculata</i> Jain		
	<i>Abelmoschus esculentus</i> (L.) Moench	1,6
	<i>Alhagi maurorum</i> Medik.	2
	<i>Amaranthus hybridus</i> L.	10
	<i>Beta vulgaris</i> L.	1
	<i>Capsicum annuum</i> L.	1,7
	<i>Cicer arietinum</i> L.	1
	<i>Cocos nucifera</i> L.	1
	<i>Cucumis sativus</i> L.	1
	<i>Gossypium arboreum</i> L.	1,8,11
	<i>Helianthus annuus</i> L.	1

Table 1 (cont'd.)

Fungus [Synonyms]	Hosts	#Districts
	<i>Lycopersicon esculentum</i> Mill.	1
	<i>Piper betel</i> L.	1
	<i>Saccharum officinarum</i> L.	7
	<i>Triticum aestivum</i> L.	2,11
<i>Exerohilum holmii</i> (Luttrell) Leonard & Suggs		
	[<i>Helminthosporium holmii</i> Luttrell; <i>Drechslera holmii</i> Subram. & Jain]	
	<i>Cicer arietinum</i> L.	1
	<i>Lens culinaris</i> Medic	1
	<i>Vigna mungo</i> (L.) Hepper	1
	<i>V. radiata</i> (L.) Wilczek	1
<i>Exerohilum rostratum</i> (Drechsler) Leonard & Suggs		
	[<i>Helminthosporium halodes</i> Drechsler; <i>Drechslera halodes</i> (Drechsler) Subram. & Jain; <i>Drechslera rostrata</i> (Drechsler) Richardson & Fraser]	
	<i>Alhagi maurorum</i> Medik.	2
	<i>Anethum graveolens</i> L.	1
	<i>Cicer arietinum</i> L.	1
	<i>Citrus limon</i> (L.) Burm. f.	1
	<i>Coriandrum sativum</i> L.	1,2
	<i>Gossypium arboreum</i> L.	11
	<i>Helianthus annuus</i> L.	1,8
	<i>Lycopersicon esculentum</i> Mill.	1
	<i>Medicago sativa</i> L.	1,17
	<i>Pisum sativum</i> L.	1
	<i>Spinacea oleracea</i> L.	1,11
	<i>Vigna radiata</i> (L.) Wilczek	1
	<i>Zea mays</i> L.	1
<i>Fusarium moniliforme</i> Sheldon		
	<i>Piper betel</i> L.	1
<i>Fusarium oxysporum</i> Schlecht.		
	<i>Brassica rapa</i> L. (Rapifera group)	1
	<i>Helianthus annuus</i> L.	1,9
	<i>Musa paradisiaca</i> L.	2,3,4,5
	<i>Vigna mungo</i> (L.) Hepper	1,17
	<i>V. radiata</i> (L.) Wilczek	1,16,17
<i>Fusarium semitectum</i> Berk. & Rav.		
	<i>Piper betel</i> L.	1
<i>Fusarium solani</i> (Mart.) Sacc.		
	<i>Abelmoschus esculentis</i> (L.) Moench.	1,2
	<i>Brassica rapa</i> L. (Rapifera group)	1
	<i>Glycine max</i> (L.) Merr.	1

Table 1 (cont'd.)

Fungus [Synonyms]	Hosts	#Districts
	<i>Lens culinaris</i> Medic.	1,17
	<i>Lycopersicon esculentum</i> Mill.	1,2
	<i>Musa paradisiaca</i> L.	2,3,4,5
	<i>Phaseolus vulgaris</i> L.	18
	<i>Piper betel</i> L.	1
	<i>Pisum sativum</i> L.	2
	<i>Sesamum indicum</i> L.	4
	<i>Trifolium alexandrinum</i> L.	2
	<i>Vigna mungo</i> (L.) Hepper	1,17
<i>Macrophomina phaseolina</i> (Tassi) Goid		
	[<i>Macrophoma phaseolina</i> Tassi; <i>Macrophoma philippines</i> Petrak; <i>Macrophomina phaseoli</i> (Maubl.) Ashby; <i>Rhizoctonia bataticola</i> (Taub.) Britton-Jones; <i>Sclerotium bataticola</i> Taub.]	
	<i>Cannabis sativa</i> L.	17
	<i>Solanum khasianum</i> L.	2
<i>Melanospora</i> sp.		
	<i>Helianthus annuus</i> L.	1
	<i>Lycopersicon esculentum</i> Mill.	1
	<i>Manilkara zapota</i> van Royen	1
	<i>Pisum sativum</i> L.	1,2
<i>Nigrospora</i> state of <i>Khuskia oryzae</i> Hudson		
	[<i>Nigrospora oryzae</i> (Berk. & Br.) Petch]	
	<i>Anethum graveolens</i> L.	1
	<i>Arachis hypogaea</i> L.	1
	<i>Beta vulgaris</i> L.	1
	<i>Cicer arietinum</i> L.	1
	<i>Cocos nucifera</i> L.	1
	<i>Coriandrum sativum</i> L.	1
	<i>Cynodon dactylon</i> (L.) Pers.	1
	<i>Eruca vesicaria</i> (L.) Cav. ssp. <i>sativa</i> (Mill) Thell.	1
	<i>Glycine max</i> (L.) Merr.	1
	<i>Gossypium arboreum</i> L.	1,7
	<i>Helianthus annuus</i> L.	1
	<i>Lens culinaris</i> Medic.	1,17
	<i>Lycopersicon esculentum</i> Mill.	1
	<i>Medicago sativa</i> L.	1
	<i>Oryza sativa</i> L.	11
	<i>Piper betel</i> L.	1
	<i>Trifolium alexandrinum</i> L.	1
	<i>Typha latifolia</i> L.	2
	<i>Vigna mungo</i> (L.) Hepper	1,17

Table 1 (cont'd.)

Fungus [Synonyms]	Hosts	#Districts
	<i>V. radiata</i> (L.) Wilczek	1,17
	<i>Zingiber officinale</i> Roscoe	14
<i>Rhizoctonia solani</i> Kühn		
	<i>Cannabis sativa</i> L.	17
	<i>Cucumis melo</i> L.	1,2,7
	<i>Musa paradisiaca</i> L.	1,2,4,5
	<i>Solanum khasianum</i> L.	2
	<i>S. nigrum</i> L.	1
<i>Sclerotium rolfsii</i> Sacc.		
	<i>Hordeum vulgare</i> L.	2
	<i>Vigna mungo</i> (L.) Hepper	2
<i>Sclerotium</i> sp.		
	<i>Coriandrum sativum</i> L.	2
	<i>Helianthus annuus</i> L.	8
	<i>Pisum sativum</i> L.	15
	<i>Solanum tuberosum</i> L.	19,20
	<i>Triticum aestivum</i> L.	7
<i>Stemphylium lycopersici</i> (Enjoji) Yamamoto		
	<i>Daucus carota</i> L.	1
Unidentified basidiomycete		
	<i>Arachis hypogaea</i> L.	16
	<i>Cocos nucifera</i> L.	1
	<i>Corchorus olitorius</i> L.	1
	<i>Coriandrum sativum</i> L.	1
	<i>Cynodon dactylon</i> (L.) Pers.	2
	<i>Glycine max</i> (L.) Merr.	1,4
	<i>Gossypium arboreum</i> L.	1,2,7,11
	<i>Helianthus annuus</i> L.	17
	<i>Lens culinaris</i> Medic.	1,17
	<i>Luffa aegyptica</i> L.	1
	<i>Lycopersicon esculentum</i> Mill.	1
	<i>Mangifera indica</i> L.	5
	<i>Medicago sativa</i> L.	1
	<i>Nicotiana tabacum</i> L.	7
	<i>Oryza sativa</i> L.	2,11

Table 1 (cont'd.)

Fungus [Synonyms]	Hosts	#Districts
	<i>Pisum sativum</i> L.	1,2
	<i>Psidium guajava</i> L.	1
	<i>Sesamum indicum</i> L.	8
	<i>Triticum aestivum</i> L.	2,7
	<i>Typha latifolia</i> L.	2

1. Karachi, 2. Thatta, 3. Hyderabad, 4. Tandojam, 5. Mirpurkhas, 6. Sakrand, 7. Nawabshah, 8. Khairpur, 9. Sukkur, 10. Shikarpur, 11. Jacobabad, 12. Jhatpat, 13. Quetta, 14. Lahore, 15. Faisalabad, 16. Rawalpindi, 17. Islamabad, 18. Abbottabad, 19. Kaghan, 20. Swat.

Acknowledgements

This work was carried out during 1986-1992 under World Bank and NSRDB Projects which is gratefully acknowledged.

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