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Diseases of Fibre Crops in India [1])

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Summary. The paper briefly reviews the work carried out in India on various diseases of some important fibre-crops so far. Majority of them including the wide-spread and destructive ones are caused by fungi. Next to these rank the diseases due to bacteria, viruses, nutritional disorders and nematodes.

Introduction

Plant fibres have been used by man for several thousand years. Among the fibre crops of economic importance that are mostly cultivated to-day, are: cotton (*Gossypium* spp.) and jute (*Corchorus capsularis* and *C. olitorius*). Besides these, the other fibre crops of lesser importance are: Sannhemp (*Crotalaria juncea*), Mesta (*Hibiscus cannabinus*), Roselle-hemp (*Hibiscus sabdariffa*) and Avage(*Agave* spp.).

Economic Importance

Cotton (*Gossypium* spp.): Cotton is the most important and widely grown fibre crop cultivated throughout India and is the main source for production of finest textiles. It is also a good cash crop.

Jute (*Corchorus* spp.): The cultivation of jute is concentrated in Assam, Bihar, Orissa, Travancore, Tripura, and West Bengal. Jute is used primarily for making coarse woven fabrics (bags and sackings, ropes, twines etc.) required for containers to store or transport large varieties of commodities.

Sann-hemp or Bombay-hemp (*Crotalaria juncea* L.): It is commonly cultivated in India for its fibre (hemp of commerce) and also for green manure. The plant yields very strong fibre used for various kinds of cordage, ropes, twines etc. and also coarse sheets, tents, screens and fishing nets. Sann-hemp fibre is much stronger than jute fibre and stands water well. It is used for making strong paper. It is cultivated on a large scale in Uttar Pradesh, Bihar and Central India. Elsewhere it is cultivated primarily for green manuring.

Mesta (*Hibiscus cannabinus* L.): This plant is cultivated mainly for fibre in the drier tracts of Deccan (comprising Andhra Pradesh, Mysore & Maharashtra), Madhya Pradesh and Bihar. The young

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tender leaves are delicious and are used as vegetable in some regions. The fibre obtained is of commercial value suitable for making ropes, fishing nets and cordage. The plant cuttings are employed in paper manufacture.

Shoe flower or Jaswand (*Hibiscus rosa-sinensis* L.): The bark yields a good fibre.

Roselle hemp (*Hibiscus sabdariffa* L.): It is cultivated in Bihar, Assam, Madras and Andhra Pradesh. Rosella fibre is strong and is employed in the preparation of gunnies, cordage, rope, fishing nets and generally for all purposes for which jute is used. Bags made of roselle fibre are extensively employed in Java for packing sugar. The stalks left over after fibre extraction are used as fuel.

Okra or Bhindi (*Abelmoschus esculentus* L.): The bast of this plant yields a strong useful fibre of a white colour, long and silky. The plant is largely grown for its fruit which is used as a vegetable throughout India.

Silk cotton (*Bombax ceiba* L.): The "silk cotton" tree is indigenous to Gujarat, Kinkan and sub-Himalayan tracts and is often cultivated. The inner bark of the tree yields a good fibre suitable for cordage. The seeds yield so called red silk cotton or Smul cotton. The fibre though strong is too short and soft to be spun; it is largely used for stuffing pillows, cushions etc. Mixed with tree cotton it imparts a silky gloss to the fabrics.

Sisal or Agave (*Agave* spp.): The leaves of Agave yield a valuable coarse fibre. They are also planted along railway embankments and road-sides, and are suitable for hedging and fencing. They may also be planted to check soil erosion. Agave fibre is one of the important hard fibres, which are used in the manufacture of ropes, cordage, twines etc.

Ramie (*Boehmeria nivea* Hook & Arn.): It is cultivated in some parts of India. In Bengal, it is a garden crop and in Assam it is grown as a regular crop. The fibre is regarded as the longest, toughest and most silky of all vegetable fibres. It has great strength and durability and is highly resistant to the action of water.

Hemp fibre or Bhang (*Cannabis sativa* L.): It is a tall erect annual herb, strongly smelling. The fibre is extracted from the stalks either by water-wetting or dew-wetting. The fibre is strong, lustrous and durable. In India, the cultivation of this plant is permitted in the districts of Almora, Garhwal and Nainital in the Uttar Pradesh for its fibre and not for the production of hemp drugs (i. e. Bhang or Ganja). The plant is also wild in the Himalayas.

Diseases

Several diseases caused by fungi, bacteria, viruses and deficiency or nutritional disorders have been reported on such fibre-crops and a

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Table showing different diseases, their causal organisms and distribution etc. of fibre-crops in India

Name of the Disease 1	Causal organism 2	Distribution and Remarks 3
Agave americana L. (Century plant, American aloe), F. Amaryllidaceae)		
Leaf spot	*Alternaria tenuis* auct.	Reported from Calcutta (1969) by MUKHERJI, S. & S. K.
Leaf spot	*Ascochyta* sp.	Minor.
Leaf rot	*Botryosphaeria agaves* (P. HENN.) BUTLER	Reported from Pusa, Bihar
Leaf spot	*Coniothyrina agaves* (DUR. & MONT.) PETRAK & SYDOW	Reported from Bilikere (Mysore)
Leaf rot	*Cucurbitaria agaves* SYD. & BUTLER	Reported from Dehra Dun (U. P.).
Leaf spot	*Diplodia* sp.	Rare
Leaf spot	*Microdiplodia agaves* (NIESSL) TASSI	Report from Shillong (Assam), Pusa (Bihar).
Leaf spot	*Pleospora bataanensis* PETRAK	Report from Allahabad, U. P.
Saprophyte	*Sirodesmium indica* CHANDRA & TANDON	Described from Allahabad (CHANDRA & TANDON, 1965).
Leaf spot	*Fusariella concinna* (SYD.) HUGHES	First recorded by PONNAPPA, (1970) from Mysore.
Saprophyte	*Rosellinia macrospora* MHASKAR & RAO	From Purandhar (Poona), MHASKAR (1974).
Agave longifolia auct.		
Anthracnose	*Colletotrichum agaves* CAV.	General Distribution
Agave sisalana (= *Agave rigida* Mill. var. *sisalana* ENGELM.)		
Anthracnose	*Colletotrichum agaves* CAV.	On living leaves, reported from Assam, Bengal and Kanpur (U. P.).
Root-rot	*Hormiscium lechlerianum* SACC.	Wilting in nursery, Barrackpore, Bamra (Orissa), MUKHERJEE, 1970.
Leaf spot	*Leptosphaeria agaves* SYD. & BUTLER	Reported from Dehra Dun (U. P.).
Agave vera-crucis MILL.		
Sooty-mould	*Capnodium anonae* PAT.	Report from Bilikere (Mysore).
Agave wightii DRUM. & PRAIN		
Leaf spot	*Diplodia* sp.	Minor

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Leaf blight	*Phytophthora palmivora* BUTLER	Reported by RAMAKR. & SEETHALAKSHMI (1956) from Coimbattore (T. N.).
Agave spp. (Sisal)		
Leaf spot	*Botryosphaeria agaves* (P. HENN.) BUTLER	Rare, reported first from Pusa (Bihar).
Anthracnose	*Colletotrichum agaves* CAV.	A general disease of foliage.
Leaf spot	*Coniothyrina agaves* (DUR. & MONT.) PETRAK & SYD.	Reported from Bilikere (Mysore), Dehra Dun (U. P.).
Leaf rot	*Cucurbitaria agaves* SYD. & BUTLER	Reported from Dehra Dun, rare.
Leaf spot	*Microdiplodia agaves* (NIESSL) TASSI	A general infection on foliage.
Leaf spot	*Striodiplodia agaves* (NIESSL) ZAMB.	Reported from Dharwar (Mysore), rare.
Saprophytes (Myxomycetes)	*Perichaena chrysoperma* (CURREY) LISTER	On dead leaves, Mussoorie, (U. P.).
Saprophytes	*Ceratiomyxa fruticulosa* MULLER	On dead leaves, Dehra Dun (U. P.).
Saprophytes	*Physarum bitectum* LISTER	On dead leaves, Mussoorie (U. P.).
Saprophytes	*Physarum diderma* ROST.	On decaying leaves, Mussoorie (U. P.).
Saprophytes	*Physarum didermoides* (PERS.) ROSTAF.	On decaying leaves, Mussoorie (U. P.).
Saprophytes	*Physarum lateritium* (BERK. & RAV.) MORG.	On dead leaves, Mussoorie (U. P.)
Saprophytes	*Physarum nicaraguense* MACBR.	On dead leaves, Mussoorie (U. P.).
Saprophytes	*Physarum pusillum* (BERK. & CURT.) LISTER	On dead leaves, Mussoorie (U. P.).
Saprophyte	*Physarum vernum* SOMM. ex FR.	On dead leaves, Mussoorie, (U. P.).
Boehmeria nivea (L.) Gaud. (Ramie, F. Urticaceae)		
Leaf blight	*Alternaria tenuis* Auct.	First reported by RAO (1962) from Poona.
Saprophyte	*Allescherina boehmeriae* SYD. & BUTLER	On dead stems, Pusa (Bihar).
Fibre rot	*Aspergillus fumigatus* FRES.	Assam (MUSTAFEE 1971).
Leaf spot	*Ascochyta rheea* (COOKE) GROVE	A minor foliage disease.
Fibre rot	*Botryodiplodia* sp.	Assam (MUSTAFEE 1971).
Leaf spot	*Cercospora boehmeriae* PECK	General, first reported by CHOWDHURY (1957) from Jorhat (Assam).
Leaf spot	*Cercospora krugiana* MULLER & CHUPP	First recorded by GOVINDU & THIRUMALACHAR (1955).
Leaf spot	*Curvularia* sp.	Minor.
Stem canker	*Diplodia rheea* COOKE	Reported from Assam.
Fibre rot	*Fusarium oxysporum* SCHL.	Assam (MUSTAFEE 1971).

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Name of the Disease 1	Causal organism 2	Distribution and Remarks 3
Fibre rot	*Penicillium* sp.	Assam (MUSTAFEE 1971).
Fibre rot	*Torula* sp.	Assam (MUSTAFEE 1971).
Bombax ceiba L. (= *B. malabaricum* DC., = *Salmalia malabarica* (DC.) SCHOTT & ENDL.), Simul or Semur, Silk-Cotton Tree F. Bombacaceae).		
Sooty moulds	*Capnodium* sp.	General, black sooty growth on leaves.
Leaf spot	*Cercospora bombacina* RAMAKR. T. S. & K.	First described by RAMAKR. T. S. & K. (1950) from Walayar (Malabar), Kerala.
Leaf spot	*Cercospora bombacicola* MUNJAL et al.	MUNJAL et al. (1960) from Chamba, (H. P.).
Saprophyte	*Circinotrichum maculaeformae* NEES	PATIL (1964) reported from Poona.
Leaf spot	*Cladotrichum foliicola* (NIESSL) FERRO	Reported from Dehra Dun (BAGCHEE & SINGH, 1954).
Anthracnose	*Colletotrichum dematium* (PERS. ex FR.)	Reported from Allahabad (U. P.), minor.
Saprophyte	*Diatrype salmaliae* TILAK	On dried stems, at Aurangabad (R. RAO, 1966).
Cankers	*Haplosporella salmaliae* TILAK & RAO	On dried stems, at Aurangabad (TILAK & R. RAO, 1964).
White spongy rot	*Lentinus sajor-caju* FR.	BAGCHEE & SINGH (1954) reported from Dehra Dun.
Leaf spot	*Phyllosticta bombacis* BATISTA	MAHAKUL & MOHANTY (1969) reported from Bhubaneswar (Orissa).
White spongy rot	*Pleurotus flabellatus* (BERK. & BR.) SACC.	Reported from F. R. I., Dehra Dun, BAGCHEE & SINGH (1954).
White spongy rot	*Polyporus friabilis* BOSE	Reported from F. R. I., Dehra Dun, BAGCHEE & SINGH (1954).
Spongy sap-rot	*Polystictus hirsutus* FR.	Reported from F. R. I., Dehra Dun, BAGCHEE & SINGH (1954).
Mottled sap-rot	*Schizophyllum commune* FR.	Reported from F. R. I., Dehra Dun, BAGCHEE & SINGH (1954).
Leaf spot	*Sphaceloma bombacis*	At Mahabaleshwar, WANI & THIRUMALACHAR (1969).
White spongy rot	*Trametes corrugata* (PERS.) BRES.	Reported from F. R. I., Dehra Dun (BAGCHEE & SINGH 1954).
White spongy rot	*Trametes meyenii* KLOTZ.	Reported from F. R. I., Dehra Dun (BAGCHEE & SINGH 1954).
White spongy rot	*Trametes persoonii* FR.	Reported from F. R. I., Dehra Dun (BAGCHEE & SINGH 1954).
Saprophyte	*Tympanopsis lantanae* R. RAO	On dried stems, at Aurangabad (TILAK & RAO, 1969).
Cannabis sativa L. (Hemp, Ganja, Bhang, True hemp or Soft hemp., F. Cannabinaceae).		
Leaf spot	*Ascochyta prasadii* SHUKLA & PATHAK	SHUKLA & PATHAK (1968) from Udaipur.
Leaf blight	*Cercospora cannabina* WAKEFIELD	A general foliage disease.
Leaf spot	*Cercospora cannabis* HARA et FUKUI	Reported from Mysore by THIRUM. & CHUPP (1948).

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Saprophyte	*Chaetomium succineum* AMES	On leaves, Allahabad (SUDHIR 1964).
Downy mildew	*Pseudoperonospora cannabina* (OTTH) HOERNER	Reported from Delhi.
Stem rot	*Sclerotinia sclerotiorum* (LIB.) de BARY	Rare.
Wilt and dry rot	*Sclerotium rolfsii* SACC.	A general field disease.
Leaf spot	*Septoria cannabis* (LASCH.) SACC.	Reported from Pusa (Bihar), Dehra Dun (U. P.), Jammu & Kashmir.

Corchorus capsularis L. (Jute, F. Tiliaceae)

Fibre degradation	*Aspergillus atropurpureus* ZIMM.	Reported from Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Aspergillus fumigatus* FRES.	Reported from Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Aspergillus glaucus* LINK	Reported from Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Aspergillus terreus* THOM	Reported from Calcutta (BASU & GHOSH, 1950).
Saprophyte	*Cephaliophora uniformis* ANANTH.	On fibre, at Poona (ANANTHANARAYANANAN, 1963).
Fibre degradation	*Chaetomium chartarum* BERK.	On Jute and fibre, Calcutta (ROY, 1948).
Fibre degradation	*Chaetomium brasiliense* BATISTA et PONTUAL	On jute and jute fibre, Calcutta (ROY, 1948).
Fibre degradation	*Chaetomium indicum* CORDA	On jute and jute fibre, Calcutta (ROY, 1948).
Fibre degradation	*Chaetomium funicolum* COOKE	On jute and jute fibre, Calculatta (ROY, 1948).
Anthracnose	*Colletotrichum capsici* f. *corchorum* GHOSH	An important and wide-spread disease in W. Bengal of economic importance.
Stem canker	*Diplodia corchori* SYD.	First recorded by SHAW (1924).
Fibre rot	*Dendrophoma* sp.	On jute fabrics, Calcutta (BOSE & BHATTACHARYA, 1962).
Wilt	*Fusarium solani* (MART.) APP. & WOLLENW.	Reported from Calcutta, rare.
Collar, stem & root rot	*Macrophomina phaseoli* (MAUBL.) ASHBY	A serious and economically important disease, in Bengal, Bihar, Assam and Orissa, also causes seedling blight.
Ring spot	*Myrothecium roridum* TODE ex FR.	MUNJAL (1960) reported from Delhi.
Stem rot	*Macrophoma corchori* SAW.	First recorded by SHAW (1924), minor.
Saprophyte	*Oedocephalum indicum* ANANTH.	On jute bags, from Poona.
Saprophyte	*Orbilia obscura* GHOSH et al.	On jute bags, Barrackpore (W. Bengal).
Mildew	*Oidium* sp.	General foliage disease.
Fibre degradation	*Paecilomyces varioti* BAIN.	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Penicillium adametzi* ZALESKI	On Jute and its fibre, Calcutta (Basu & GHOSH, 1950).
Fibre degradation	*Penicillium brefeldianum* DODGE	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Penicillium citrinum* THOM	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).

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Fibre degradation	*Penicillium cyaneum* (BAIN. & SORT.) BIOURGE	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Penicillium implicatum* BIOURGE	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Penicillium luteum* ZUKAL	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Penicillium ochro chloron* BIOURGE	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Penicillium purpurogenum* STOLL	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Penicillium variabile* SOPP.	On Jute and its fibre, Calcutta (BASU & GHOSH, 1950).
Fibre degradation	*Penicillium vermiculatum* DANGEARD	On rotting jute cloth, Calcutta (BHATTACHARYA & BASU, 1954).
Fibre degradation	*Penicillium verrucolosum* PEYRONEL	On jute fibre and cloth, Calcutta.
Fibre degradation	*Stemphylium consortiale* (THUEM.) GR. & SKOLKE	On ropes, Calcutta.
Fibre degradarion	*Phoma* sp.	On stored fibres, Calcutta (BOSE & BHATTACHARYA, 1962).
Leaf spot	*Phyllosticta* sp.	Reported from Calcutta, minor.
Root rot	*Rhizoctonia* sp.	Minor.
Wilt	*Sclerotium rolfsii* SACC.	A general field disease.
Saprophyte	*Valsa* (*Euvalsa*) *corchori* SYD. & BUTLER	On stems, Poona.
Saprophyte	*Septonema punctiformae* B. & C.	On old jute bag, Poona (ANANTHANARAYANAN, 1963).
Saprophyte	*Trichothecium roseum* LINK	On old jute bag, Poona (ANANTHANARAYANAN, 1963).
Fibre degradation	*Talaromyces vermiculatus* BENJAMIN	On fibre, Calcutta.
Fibre degradation	*Verticillium glaucum* BONORDEN	On Jute cordages, Kanpur (U. P.).
Wilt (Bacterial)	*Pseudomonas solanacearum* E. F. SM.	Reported from West Bengal, SHARMA & MUKH. (1970).
Mosaic	Virus	Two strains reported by BISHT & MATHUR (1964) from U. P.
Corchorus olitorius L. (Jute)		
Leaf spot	*Botryodiplodia theobromae* PAT.	Minor disease
Leaf spot	*Cercospora macutensis* SYD.	A general foliage disease.
Stem canker	*Diplodia corchori* SYD.	Reported from Pusa, Bengal and Assam.
Stem rot	*Macrophomina phaseoli* (MAUBL.) ASHBY	Very severe and common disease of economic importance.
Stem gall	*Physoderma corchori* LINGAPPA	Reported by DAS & GUPTA (1964) from West Bengal, also by PRAKASH & GHOSH (1964).
Root rot	*Rhizoctonia* sp.	General disease.

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Leaf spot	*Phyllosticta* sp.	General disease.
Mildew	*Acrosporium* (= *Oidium* sp.) sp.	General disease.
Wilt (Bacterial)	*Pseudomonas solanacearum* E. F. Sm.	Reported by Sharma & Mukh. (1970) from West Bengal.
Crotalaria juncea L. (Sunn-Hemp, Bombay Hemp, F. Leguminosae)		
Leaf spot	*Alternaria crotalariicola* Rao	First described by Rao (1964) from Poona.
Leaf blight	*Alternaria tenuissima* (Fr.) Wilt.	At Poona, recorded by Garud (1970), a minor disease.
Leaf blight	*Bipolaris tetramera* (McK.) Shoem.	First described by Naphade (1968) from Poona.
Wilt	*Corticium solani* Bourd. & Galzin	A new disease reported by Pandotra & Sastry (1967) from Jammu-Tawi.
Leaf spot	*Cercospora crotalariae* Sacc.	General, Chona et al. (1959).
Anthracnose	*Colletotrichum curvatum* Briant & Martyn.	First reported by Mitra (1937) on seedlings. Some detailed studies by Kempanna et al. (1960) from Bangalore.
Stem rot	*Corticium solani* Bourd. & Galz.	(Thakur 1971).
Vascular wilt	*Fusarium oxysporum* Schl. f. sp. *crotalariae* Gordon.	A general field disease of great economic importance.
Leaf spot	*Helminthosporium crotalariae* Chowdhury	First described by Chowdhury (1955) from Kikilmukh (Assam).
Leaf spot	*Leptosphaerulina australis* McAlp.	From Poona (Naphade, 1970).
Powdery mildew	*Leveillula taurica* (Lev.) Arn.	Ashy growth on foliage, general.
Wilt & root rot	*Macrophomina phaseoli* (Maubl.) Ashby	An important field disease of economical significance.
Wilt	*Neocosmospora vasinfecta* E. F. Sm.	Reported from Dehra Dun, Pusa (Bihar ?, Samalkot (Madras)
Powdery mildew	*Oidium erysiphoides* Fr.	Minor.
Stem rot	*Pellicularia rolfsii* (Sacc.) West.	From Varanasi, U. P. (Upadhyay & Pavgi 1967).
Saprophyte	*Penicillium minio-luteum* Dierckx	Isolated from decomposing plants, New Delhi (Chona et al. 1958).
Root rot	*Pellicularia rolfsii* (Sacc.) West.	A severe disease in Uttar Pradesh
Leaf spot	*Phyllosticta crotalariae* Speg.	Rao (1964) recorded for the first time from Poona.
Stem spot	*Pyrenochaeta crotalariae* Rao & Solank.	First described by Rao & Solankure (1971) from Poona.
Brown root rot	*Rhizoctonia solani* Kuhn	A general field disease.
Galls	*Synchytrium ajrekari* Payak & Thirum.	Infection on leaves and stems, a minor disease.
Rust	*Uromyces decoratus* Syd.	General on leaves and stems.
Saprophyte	*Zythia bicolor* B. & Br.	Isolated from decomposing plants, New Delhi (Chona et al. 1958).

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Mosaic	Virus disease, Southern Sunn-hemp mosaic virus (TMV — Strain).	General distribution (RAYCHAUDHURI, 1947).
Leaf spot (Bacterial)	*Xanthomonas patelii* DESAI & SHAH	Described by DESAI & SHAH (1959) from Anand (Gujarat).
Gossypium spp. (*G. arboreum* L., *G. herbaceum* L., *G. hirsutum* L., *Gossypium* sp. etc. Cotton, F. Malvaceae).		
Leaf spot	*Alternaria macrospora* ZIMM.	Common and wide spread disease, detailed studies by RANE & PATEL (1956).
Leaf spot	*Alternaria tenuis* auct.	General, first reported by RAO (1963) from Poona.
Leaf blight	*Ascochyta gossypii* SYD.	Rare, reported from Kashmir.
Saprophyte	*Ascotricha chartarum* BERK.	On cotton wool, Bangalore.
Saprophyte	*Aspergillus niger* van TIEGH.	On fibre and seed, also causes boll rot, general distribution.
Saprophyte	*Aspergillus atropurpureus* ZIMM.	On fibre and seeds, Calcutta.
Saprophyte	*Aspergillus fumigatus* FRES.	On fibre and seeds, Bombay
Saprophyte	*Aspergillus ustus* (BARM.) THOM & CHURCH	On fibre and seeds, Madras
Saprophyte	*Basidiobolus* sp.	On fibre, rare.
Sooty mould	*Capnodium* sp.	A general disease in winter.
Sooty mould	*Caldariomyces indicus*	DWIVEDI 1961, from Varanasi, U. P.
Leaf spot	*Cercospora gossypina* COOKE	A common foliage disease.
Leaf spot	*Cercospora gossypii* LALL, GILL & MUNJAL.	First described by LALL et al. (1961).
Rust	*Cerotelium desmium* (BERK. & BR.) ARTH.	General disease.
Saprophyte	*Chaetomium amphitrichum* CORDA	On rotting stems, Nagpur, Pusa (Bihar).
Seedling blight	*Cochliobolus spicifer* NELSON	Also causes seed rot, pre- and post-emergence death of seedlings and defoliation of adult plants. BEDI et al. (1967) reported from Hissar (Haryana), Punjab.
Leaf spot	*Corynespora casiicola* (B. & C.) WEI.	From A. P. C. (SHARMA & NAYUDU 1970).
Stem rot	*Diplodia gossypina* COOKE	Reported from Bombay, also causes capsule rot, rare.
Vascular wilt	*Fusarium oxysporum* f. sp. *vasinfectum* (AKT.) SNYDER & HANSEN.	A very severe and wide-spread disease of great economic importance.
Leaf spot	*Curvularia lunata* (WAKK.) BOED.	From Maharashtra (PATIL & GADAGE 1972).

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Anthracnose	*Glomerella gossypii* (SOUTHW.) EDG. (C. S. = *Colletotrichum indicum* DASTUR)	Detailed studies by DASTUR (1934) & WILSON (1961).
Wilt	*Pellicularia rolfsii* (SACC.) WEST (I. S. = *Sclerotium rolfsii* SACC.)	A general field disease.
Leaf spot	*Helminthosporium gossypii* TUCKER	General disease, detailed studies by RANE and PATEL (1956)
Leaf blight	*Helminthosporium spiciferum* McK.	Reported from Punjab and Hariyana, SURYANARAYANA et al. (1966).
Powdery mildew	*Leveillula taurica* (LEV.) ARNAUD	A general foliage disease.
Root-rot & stem-break	*Macrophomina phaseoli* (MAUBL.) ASBHY. (*Rhizoctonia bataticola* (TAUB.) BUTL.)	A serious disease of great economic importance, in parts of Gujarat, U. P., Punjab. SULAIMAN & PATIL (1966) reported two races of this pathogen.
Saprophyte	*Memnoniella echinata* (RIV.) GALLOWAY	On fibres and decaying fabrics, Poona (ANANTHANARAYANAN, 1963).
Saprophyte	*Mucor hygrophilus* OUDEM.	On fibres, rare.
Root rot	*Macrophomina phaseoli* (MAUBL.) ASHBY var. *indica* MONIZ & BHIDE	Reported from Maharashtra and Gujarat with detailed studies of this pathogen (MONIZ & BHIDE, 1963).
Sooty mould	*Microxyphiella hibiscifolia* BAT. et al.	Reported from Punjab by SINGH and GROVER (1968).
Wilt	*Verticillium albo-atrum* R. & B.	Reported from Madras State, NATARAJAN (1968).
Wilt	*Verticillium dahliae* KLEBAHN	Reported by DASTUR et al. (1960).
Leaf-blight	*Myrothecium roridum* TODE ex FR.	General distribution (MUNJAL, 1960).
Wilt	*Neocosmospora vasinfecta* SMITH	
Stigmatomycosis	*Nematospora nagpuri* DASTUR	First described by DASTUR & SINGH (1930) from Nagpur. The fungus causes internal boll-rot.
Powdery mildew	*Acrosporium* sp. (x = *Oidium* sp.)	A general foliage disease.
Saprophyte	*Penicillium* sp.	On fibres, Bombay.
Saprophyte (Myxomycetes)	*Perichaena vermicularis* (SCHW.) ROSTAF.	On decaying bolls, Toklai (Assam), AGNIHOTHRUDU (1959).
Powdery mildew	*Oidiopsis gossypii* (WAKEF.) f. indica RAYCH.	Described by RAYCHAUDHURI (1949).
Leaf spot	*Pestalotia gossypii* HORI ex S. THURUDA	Rare (DASTUR et al. 1960).
Rust	*Phakopsora desmium* (BERK. & BR.) CUMMINS	A general foliage disease.
Saprophyte	*Phycomyces* sp.	On fibre, rare.

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Name of the Disease 1	Causal organism 2	Distribution and Remarks 3
Leaf-spot	*Phyllosticta gossypina* ELL. & MART.	A common foliage disease, detailed studies by BHAGWAT & BHIDE (1967) from Poona.
Seedling blight	*Phytophthora nicotianae* var. *parasitica* DAST. (= *Phytophthora parasitica* DASTUR)	A general disease in rainy season (DASTUR 1931, MITRA, 1929), also causes seedling-blight and boll rot.
Damping-off	*Pythium aphanidermatum* (EDS.) FITZ.	On seedlings, also causes wet rot, general (MAHMUD 1951).
Branch knots	*Pleosphaeropsis gossypii* DIED.	On dead branches, Pusa (Bihar).
Saprobe	*Podozyphium indicum* SHARMA et al.	On leaves, from Delhi (SHARMA et al. 1973).
Grey mildew	*Ramularia areola* ATK. P. S. = *Mycosphaerella areola* EHR. & WOLF	Very severe disease, of general distribution. Perfect stage first reported by GOKHALE & MOGHE (1967) from Nagpur.
Root-rot	*Rhizoctonia bataticola* (TAUB.) BUTLER	Reported from M. P., a severe disease (DASTUR, 1931).
Root-rot	*Rhizoctonia solani* KUHN	Reported from M. P., a severe disease (DASTUR, 1931).
Saprophyte	*Rhizopus nodosus* NAMYS	On cotton seeds, Madras.
Black soft rot	*R. nigricans* EHRENB.	Boll-rot in storage (Poona, RAO 1974).
Wilt-Verticillum	*V. albo-atrum* REINKE & BERTH.	From Coimbatore T. N., (NATRAJAN et al. 1968).
Wilt-Verticillum	*V. dahliae* KLEB.	From Madras, T. N. (PANDIAN & ISAAC. 1971).
Wilt & Basal rot	*Sclerotium rolfsii* SACC.	UPPAL (1932) reported from Bombay State.
Saprophyte	*Stachybotrys lobulata* BERK.	On fabrics, Poona (ANANTHARAYANAN, 1963).
Saprophyte	*Trichocladium opacum* (CDA.) HUGHES	On fabrics, Poona (ANANTHARAYANAN, 1963).
Pink rot	*Trichothecium roseum* LINK	Boll-rot in storage (Poona, RAO 1974).
Fibre degradation	*Verticillium glaucum* BONORDEN	Reported on cordage, Kanpur, U. P.
Black arm (angular leaf-spot)	Bacterial disease, *Xanthomonas malvacearum* (E. F. SM.) DOWSON.	Very severe and wide-spread disease of economic importance, reports of virulent races (VERMA & SINGH, 1970).
Wilt	*Xanthomonas Celebensis* var. *gossypii* RAMALINGAM et al.	A new disease reported from Coimbatore (T. N.) by RAMALINGAM et al. (1965).
Virus:		
Little or small Virus leaf		Severe, general distribution (GOKHALE, 1936).
Stenosis		Reported by UPPAL et al. (1944).

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Nematodous diseases:		
Root-knot	*Meloidogyae* spp.	Very severe disease in Punjab and other parts.
Non-Parasitic:	(physiological, nutritional or deficiency):	
Red leaf	N_2 (Nitrogen) deficiency in soil	Reported from Punjab and Maharashtra States.
Tirak or Bad-opening	Excess alkali salts (alkaline) in soils.	A severe disease in Punjab.
Inward rolling of the leaves (marginal)	Soil defect	Reported by AFZAL et al. (1935), VASUDEVA (1940) from Punjab.

Hibiscus cannabinus L. (Mesta, Kenak, Deccab hemp, Ambadi, Bimbli fibre, F. Malvaceae):

Leaf spot	*Alternaria dianthi* ST. & HALL	A general foliage disease
Hyper-parasite	*Ampelomyces quisqualis* CES.	A common hyper-parasite on *Acrosporium* sp. stage.
Leaf spot	*Cercospora abelmoschi-cannabini* (SAWADA) PRASAD et al.	Described by PRASAD et al. (1960) from Rajasthan.
Leaf spot	*Cercospora abelmoschi* ELL. & EV.	Reported from Nizamabad (A. P.).
Leaf spot	*Cercospora hibisci* TRACY & EARLE	Reported from West Bengal.
Leaf spot	*Cercospora hibiscina* ELL. & EV.	Reported from Bangalore (THIRUMALACHAR & CHUPP, 1948) and from Calcutta and Pusa (Bihar).
Flower blight	*Choanephora infundibulifera* (CURREY) CUNN.	
Anthracnose	*Colletotrichum hibisci* POLL.	A severe foliage disease at Calcutta (West Bengal).
Stem rot	*Diplodia hibiscina* CKE. & ELL.	Reported from Cuttack (Orissa) and Dehra Dun (U. P.)
Powdery mildew	*Erysiphe cichoracearum* DC.	From Coimbatore (T. N.), NARAYANASWAMI et al. (1968).
Leaf spot	*Helminthosporium* sp.	A minor disease.
Saprophyte	*Illosporium hibisci* STEV. & PIERCE	Reported from Gujarat on stems and roots.
Root rot	*Macrophomina phaseoli* (MAUBL.) ASHBY.	An important and severe field disease, general distribution.
Leaf blight	*Phyllosticta hibiscina* ELLIS & EVERH.	First reported by RAO (1964) from Poona.
Stem rot	*Pellicularia filamentosa* (PAT.) ROGERS	Reported from Bombay, Maharashtra.
Leaf & stem rot	*Phoma sabdariffae* SACC.	Reported from West Bengal.
Tip rot	*Phoma* sp.	GHOSH & MUKHERJI (1957) reported from Nilganj (W. Bengal).
Wilt & Stem rot	*Sclerotium rolfsii* SACC.	First reported by HUSAIN and THAKUR (1964) from Kalyanpur (Kaupur).
Brown rot	*Volutella* sp.	A rare disease, reported from West Bengal.

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Name of the Disease 1	Causal organism 2	Distribution and Remarks 3
Abelmoschus esculentus (L.) Moench. (= *Hibiscus esculentus* L.),		Okra, Bhindi, Lady's finger:
Leaf spot	*Alternaria dianthi* S. & H.	First reported by RAO (1962) from Poona.
Leaf spot	*Alternaria tenuis* auct.	HASIJA (1969) described this disease from Jabalpur M. P.
Hyperparasite	*Ampelomyces quisqualis* CES. (Syn. = *Cicinnobolus cesatii* de BARY)	A common hyperparasite on *Acrosporium* sp.
Leaf spot	*Cercospora abelmoschi* ELL. & EV.	Reported from Annamalainagar (T. N.), South India.
Leaf spot	*Cercospora hibisci* TRACY & EARLE	A common foliage disease.
Leaf spot	*Cercospora malayaensis* STEV. & SOLTHEIM	A general foliage disease.
Anthracnose	*Colletotrichum capsici* (SYD.) BUTLER	General.
Anthracnose	*Colletotrichum hibisci* POLL.	Reported from Nadiad (Gujarat), Dehra Dun (U. P.).
Powdery mildew	*Erysiphe cichoracearum* DC.	General disease
Leaf spot	*Cercospora peninsula* RANG. & SRIDHARAN	Reported from Hebbal, Mysore.
Slimy fruit rot	*Fusarium scripti* LAMB. et FANTR.	In storage, Allahabad (SRIVASTAVA et al., 1964).
Fruit rot	*Fusarium semitectum* BERK. & RAV.	In storage, general.
Fruit rot	*Fusarium oxysporum* SCHL.	In storage, general.
Seedling wilt	*Fusarium solani* (MART.) APPL. & WOLL.	Reported by CHATTOPADHYAY and BASU (1957) from Calcutta.
Fruit rot	*Cladosporium* sp.	General rot in storage
Black spot	*Helminthosporium nodulosum* (BERK. & CURT.) SACC.	On stored fruits, reported by TANDON & VERMA (1964), from Allahabad.
Leaf spot	*Leptosphaerulina australis* MCALP.	General
Soft rot	*Mucor* sp.	A general fruit rot in storage.
Root rot	*Macrophomina phaseoli* (MAUBL.) ASHBY	An important field disease, general.
Ring spot	*Myrothecium roridum* TODE ex FR.	On leaves, first recorded by MUNJAL (1960).
Leaf spot	*Leptosphaerulina australis* MCALP.	Reported from Hyderabad-Deccan, A. P.
Root & Collar rot	*Ozonium texanum* NEAL & WESTER var. *parasiticum* THIRUM.	SINGH (1963) reported this disease from Chota-Nagpur.
Saprobe	*Pseudotorula verrucospora* MATHUR & SINGH	On dried branches, reported by MATHUR & SINGH (1964), from Rajasthan.
Seedling blight	*Phytophthora palmivora* BUTLER	Reported from Coimbatore, BALAKRISHNAN (1947).

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Root and Collar rot	*Pythium aphanidermatum* (EDS.) FITZ.	SINGH (1963) from Chotanagpur, soft rot in storage, Poona.
Fruit rot	*Pythium indicum* BALAKRISHNAN	Reported from Coimbatore (T. M.).
Leaf spot	*Phyllosticta hibiscina* ELL. & EV.	First reported by RAO (1963) from Poona.
Fruit rot	*Rhizoctonia bataticola* (TAUB.) BUTLER	On stored fruits at Allahabad (TANDON & VERMA, 1964).
Saprobe	*Fumago* sp.	On stored fruits at Allahabad (TANDON & VERMA, 1964).
Wilt	*Sclerotium rolfsii* SACC.	An important field disease, general.
Galls	*Synchytrium hibisci* GUPTA & SINHA	GUPTA & SINHA (1951) described from Agra, U. P. on leaves & stems.
Rust	*Uromyces heterogeneus* COOKE	General distribution.
Wilt	*Verticillium dahliae* KLEB.	General disease.
Leaf spot (Bacterial)	*Xanthomonas esculenti* RANG. & EASWARAN	RANGASWAMI and EASWARAN (1962) described this disease from Annamalainagar (T. M.).
Hibiscus rosa-sinensis L. (Shoe-Flower, Jaswand)		
Saprophyte	*Anthostomella hibisci* RAMAKR.	On dead stems, Ernakulum (Kerala).
Leaf spot	*Cercospora abelmoschi* ELL. & EVER.	Reported from Varanasi (U. P.).
Leaf spot	*Cercospora hibisci* TRACY & EARLE	A common foliage disease.
Flower blight wet rot	*Choanephora infundibulifera* (CURREY) CUNNINGHAM	General, or a weak parasite.
Flower blight & wet rot	*Choanephora cucurbitarum* THAXTER	General, but a week parasite.
Leaf spot	*Colletotrichum hibisci* POLL.	A minor foliage disease.
Leaf spot	*Colletotrichum malvacearum* PAVGI & SINGH	Described by PAVGI and SINGH (1965) from Varanasi (U. P.).
Saprophyte	*Physarum serpula* MORG.	On decaying, bark at Tocklai (Assam), AGNIHOTHRUDU (1959).
Sooty mould	*Microxyphiella hibiscifolia*	SINGH & GROVER (1968) reported from Punjab.
Leaf spot	*Phyllosticta hibiscina* ELL. & EV.	A minor foliage disease.
Leaf spot (Bacterial)	*Pseudomonas hibiscicola* RANG. & GOWDA	First described by RANGASWAMI and GOWDA (1963) from Madras.
Leaf-curl	Virus	First reported by BHARGAGA (1952), minor disease.
Hibiscus sabdariffa L. (Roselle hemp, Patwa, or Roselle fibre plant).		
Leaf spot	*Alternaria dianthi* S. & H.	A general foliage disease.
Leaf spot	*Cercospora hibisci* TRACY & EARLE	A general foliage disease.

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Name of the Disease 1	Causal organism 2	Distribution and Remarks 3
Anthracnose	*Colletotrichum* sp.	A minor disease.
Leaf spot	*Curvularia lunata* (WAKK.) BOED.	A weak foliage pathogen.
Stem rot	*Diplodia hibiscina* COOKE & ELLIS var. *Sabdariffae* SACC.	Reported from Allahabad (U. P.).
Leaf spot	*Cercospora malayaensis* ST. & SOLHEIM	Reported from Pusa (Bihar) and Delhi.
Wilt	*Fusarium* sp.	Rare.
Leaf blight	*Helminthosporium tetramera* MCKINNEY	A minor foliage disease.
Leaf & stem rot	*Phoma sabdariffa* SACC.	Reported from Jorhat (Assam.).
Leaf & stem rot	*Phytophthora parasitica* DASTUR	Reported from Calcutta (West Bengal).
Stem rot	*Sclerotinia sclerotiorum* (LIB.) de BARY	Detailed studies by MUNDKUR (1934).

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large number of papers have been published from time to time on these aspects resulting in the accumulation of extensive literature, which, however, is scattered. An attempt has been made in this compilation to bring together all such literature together with diseases reported on these crops from India in a single concise publication. The diseases are classified on the basis of crops, arranged alphabetically with their causal organisms, nature and distribution, thus making this compilation complete so far as India is concerned. It is hoped, that such a publication will be of great utility not only to the Systematic Mycologists, but also to Plant Pathologists, the Extension Officers, Plant Protection Personnel and Progressive Farmers.

The hosts are arranged in an alphabetical order.

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References

AFZAL, M., TYAGI, S. S. and SINGH, B. (1935). A note on a survey of the disease of malformation in the Punjab-American cottons. Indian Jour. Agri. Sci., **5**: 624—631.

AGNOHOTHRUDU, V. (1959). Notes on fungi from North-East India, IV. Myxomycetes. Jour. Indian Bot. Soc. **38**: 418—491.

ANANTHANARAYANAN, S. (1963). Some interesting micro-fungi from flood affected substrate in Poona, India-I. Sydowia **16**: 77—84.

— (1963). Some interesting micro-fungi from flood affected substrates in Poona, India-II. Ibid. **16**: 205—211.

ANONYMOUS (1950). List of common names of Indian Plant Diseases. Ind. Jour. Agric. Sci. **20**: 107—142.

— (1960). Mycology and Plant Pathology: Report Indian Jute Comm. 1958—59, pp. 54—66.

— (1962). Report of Jute Agric. Research Inst., Barrackpore, Agric. Res., **2**: 47.

BAGCHEE, K. and SINGH, U. (1954). Indian Forest Records (Mycology), F. R. I., Dehra Dun, vol. **1**, No. 10, pp. 189—348 (Issued 1960).

BALAKRISHNAN, M. S. (1947). *Phytophthora palmivora* BUTLER causing a seedling blight of *Hibiscus esculentus* L. Proc. Indian Acad. Sci. B, **26**: 142—146.

— (1948). Some Indian Phycomycetes. I. *Pythium indicum* sp. nov. causing a fruit rot of *Hibiscus esculentus* L. Ibid. **27**: 161—173.

BASU, S. N. and GHOSH, S. N. (1950). Fungi growing on Jute. Jour. Sci. Industr. Res. New Delhi, **6**: 151—156.

BEDI, P. S., TRIPATHI, N. N. and SURYANARAYANA, D. (1967). Outbreaks and new records, India. A new disease of cotton in Punjab. Plant. Prot. Bull. F. A. O. **15** (4): 77.

— — — (1969). Host-range of *Cochliobolus spicifer* from *Gossypium hirsutum*. Ind. Phytopath. **22**: 270—271.

BHAGWAT, V. Y. and BHIDE, V. P. (1967). Leaf-spot of cotton caused by

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Phyllosticta gossypina Ell. et Martin in Maharashtra State. Mag. Coll. Agric. Akola, **7**: 23—32.

Bhattacharya, J. P. and Bose, R. G. (1954). Fungi growing on rot-proofed Jute cloth. Sci. and Cult. **20**: 190.

Bishat, N. S. and Mathur, R. S. (1964). Occurrence of two strains of jute mosaic virus in Uttar Pradesh. Curr. Sci. **33**: 434—435.

Bose, S. N. and Bhattacharya, J. P. (1963). Role of *Dendrophoma* and *Phoma* species in the rotting of jute. Nature. **196** (4849): 86—87.

Butler, E. J. (1918). Fungi and diseases in Plants. Thacker Spink and Co., Calcutta (Fibre crops on pp. 363—376).

Chattopadhyay, S. B. and Basu, P. K. (1957). Wilt of Bhendi (*Abelmoschus esculentus*). Sci. & Cult. **23**: 320—321.

Chauhan, M. S. and Suryanarayana, D. (1970). Physiological studies on the fungus causing *Myriothecium* leaf spot in Haryana, India. Cotton Growers Review, **47**: 29—35.

Chauhan, M. S., Suryanarayana, D. and Jalali, B. L. (1970). Toxin production by the fungus *Myrothecium roridum* attacking cotton in Haryana, India. Ibid. **47**: 292—297.

Chona, B. L., Lall, G. and Kakria, N. C. (1958). The fungi of Delhi. I. C. A. R. Bull. No. 81, pp. 43.

Chona, B. L., Lall, G. and Munjal, R. L. (1959). Some *Cercospora* species from India-I. Indian Phytopath. **12**: 76—84.

Chowdhury, S. (1955). Notes on fungi of Assam. I. Lloydia **18**: 82—87.

— (1957). Notes on fungi from Assam II. Ibid. **20**: 133—138.

— (1957). A *Cercospora* leaf spot of ramie in Assam. Trans. Brit. Mycol. Soc. **40**: 260—262.

Das, C. R. and Sen Gupta, P. K. (1964). Occurrence of stem-gall disease of jute caused by *Physoderma corchori* Lingappa in West Bengal. Ind. Phytopath. **17**: 180—181.

Dastur, J. F. and Singh, J. (1930). A new *Nematospora* on cotton bolls in Central Provinces (India). Ann. Mycol. **28**: 291—296.

— (1931). A short note on the diseases of cotton seedlings in the Central Provinces. Agric. & Livstk. India, **1**: 44—48.

— (1934). Cotton anthracnose in the Central Provinces. Ind. Jour. Agric. Sci. **4**: 100—120.

— (1939). Stem breaking of cotton. Agric. Live-Stk., India, **9**: 685—687.

Dastur, R. H., Asana, R. D., Sawhney, K., Sikka, S. M., Vasudeva, R. S. Quadiruddin Khan, Rao, V. P. and Sethi, B. L. (1960). Cotton in India — A monograph Vol. II, Publ. Ind. Centr. Cotton. Comm. Bombay (Diseases on pp. 164—216).

Datta, R. M. and Sen, S. N. (1967). Studies on the fibres of *Hibiscus cannabinus* L. and *Hibiscus sabdariffa* L., Substitute fibre crops of India. Fm. J. Calcutta 8 (7): 28—30.

Desai, M. K. (1957). Some diseases of cotton. The Farmer, April issue.

Desai, M. V. and Shah, H. M. (1959). A new bacterial leaf-spot of *Crotalaria juncea* L. Curr. Sci. **28**: 377—378.

Dwivedi, R. S. (1961). A new report of a *Caldariomyces* on cotton plants. Proc. Indian Sci. Congr., 48th yr. pt. III, p. 257.

Garud, A. B. (1970). A new leaf blight disease of *Crotalaria juncea* L. from India. Jour. Univ. Poona Sci. & Tech. **38**: 55—56.

Ghosh, T. (1957). Anthracnose of Jute. Indian Phytopath. **10**: 63—70.

— & Mukherji, N. (1957). Tip-rot of Mesta (*Hisbiscus cannabinus* L.), Curr. Sci. **27**: 67—69.

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GOKHALE, V. P. (1936). Preliminary observations on small leaf disease in cotton. Ind. J. Agric. Sci. **6**: 475—480.

— & MOGHE, P. G. (1967). First record of perithecial stage of *Ramularia areola* ATK. on cotton in India. Ind. Phytopath. **20**: 174—175.

GUPTA, S. C. and SINHA, S. (1951). Further additions to the *Synchytrium* of India. Ibid. **4**: 7—70.

HASIJA, S. K. (1969). A new leaf spot of *Abelmoschus esculentus* caused by *Alternaria tenuis* auct. Abs. 56th Ind. Sci. Congr. Pt. III, No. 41, p. 285.

HUSAIN, A. and THAKUR, R. N. (1964). Stem rot of *Hibiscus cannabinus* caused by *Sclerotium rolfsii*. Labdev Jour. Sci. & Tech. **2**: 70—71.

JOHN KURIAN, N. and MONIZ, L. (1966). Perfect stage of *Colletotrichum gossypii* in India. Indian Phytopath. **19**: 383—385.

KEMPANNA, C., YARANGUNTAIAH, R. C. and GOVINDU, H. C. (1960). Occurrence of *Colletotrichum curvatum* BRIANT. & MARTIN on *Crotalaria juncea* L. in Mysore. Curr. Sci. **29**: 357—358.

KULKARNI, G. S. (1934). Studies in the wilt disease of cotton in the Bombay Presidency. Ind. J. Agric. Sci. **4**: 976—1048.

— & MUNDKUR, B. B. (1931). Studies on the wilt disease of cotton in the Bombay Karnatak. Mem. Dept. Agric. India. Bot. **17**: 7—10.

— & MUNDKUR (1931). Studies in the wilt disease of cotton in the Bombay Karnatak II. The parasitism of the *Fusarium* associated with the wilt disease of cotton. Mem. Dept. Agric. India, Bot. **17**: 11—20.

— & MUNDKUR, B. B. (1931). Studies on the wilt disease of cotton in the Bombay-Karnatak-III. The Pathology of wilting in cotton plants. Ibid. **17**: 21—37.

KULKARNI, N. B., PATIL, B. C. and SULAIMAN, M. (1962). Pycnidial Formation by *Macrophomina phaseoli* on artificially inoculated cotton. Phytopathology **52**: 369—371.

KULKARNI, Y. S., THIRUMALACHAR, M. J. and PATEL, M. K. (1958). Stem-break disease of cotton incited by *Macrophomina phaseoli*. Ind. Cotton Grow. Rev. **12**: 247—248.

LALL, G., GILL, H. S. and MUNJAL, R. L. (1961). Some *Cercospora* species from India — V. Indian Phytopath., **14**: 115—119.

LIKHITE, V. N. (1936). Stenosis in Gujarat Cotton. Proc. Ass. Econ. Biol. Coimbatore, **3**: 15—17.

LUTHRA, J. C. and VASUDEVA, R. S. (1939). The root knot disease of cotton. Curr. Sci. **8**: 511.

MAHAKUR, S. K. and MOHANTY, N. N. (1969). Notes on some fungi hitherto not recorded from India. Indian Phytopath. **22**: 132—135.

MAHMUD, K. A. (1951). Damping off of cotton seedlings caused by *Phytium de Baryanum* HESSE. Sci. and Cult. **16**: 422—424.

MATHUR, P. N. and SINGH, G. (1964). A new *Pseudotorula* from Rajasthan. Indian Phytopath. **17**: 304—307.

MATHUR, R. S. (1964). Myxomycetes of India. Labdev. Jour. Sci. & Tech. Kanpur. (India). **2**: 164—174.

MHASKAR, D. N. (1974). Studies into some Indian Ascomycetes and Fungi Imperfecti. Doctoral Thesis, Univ. of Poona (Unpublished).

MITRA, M. (1929). *Phytophthora parasitica* DAST. causing "damping off" disease of cotton seedlins and "fruit-rot" of guava in India. Trans. Brit. Mycol. Soc. **14**: 249—254.

— (1937). An anthracnose disease of sann-hemp. Ind. Jour. Agric. Sci. **7**: 443—449.

MITTER, J. H. and TANDON, R. N. (1937). Fungi of Allahabad, India. — Part III. Proc. Ind. Acad. Sci. B, **6**: 194—201.

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Moniz, L. and Bhide, V. P. (1963). Root-rot of cotton in Maharashtra and Gujarat States caused by *Macrophomina phaseoli* (Maubl.) Ashby var. *indica* n. var. Ind. Cotton Grow. Rev. **17**: 292—302.

— (1969). Anthracnose of Mesta (*Hibiscus cannabinus*). Ind. Jour. Agric. Sci. **39**: 432—436.

Mukerjee, N. (1970). A preliminary report on the root-rot of *Agave sisalana* (Sisal). Indian Phytopath. **23**: 125—127.

Mukerji, K. G. and Juneja, R. C. (1975). Fungi of India. Emkay Publ., Delhi pp. 224.

Mukherjee, S. and Mukharji, S. K. (1969). A leaf-spot disease of *Agave americana* caused by *Alternaria tenuis*. Plant Dis. Reptr. **53**: 428—429.

Mundkur, B. B. (1934). A *Sclerotinia* rot of *Hibiscus sabdariffa*. Ind. Jour. Agric. sci., **4**: 758—778.

— (1936). Resistance of American cottons to *Fusarium* wilt in India. Proc. Ind. Acad. Sci. 3 B: 498—501.

— & Kheswalla, K. F. (1942). Indian and Burman species of the genera *Pestalotia* and *Monochaetia*. Mycologia **34**: 308—317.

Munjal, R. L., Lall, G. and Chona, B. L. (1960). Some *Cercospora* species from India. — IV. Ind. Phytopath. **13**: 144—149.

— (1960). A commonly occurring leaf spot disease caused by *Myrothecium roridum* Tode ex Fr. Ibid. **13**: 150—155.

Mustafee, T. P. (1971). Fibre-deteriorating microflora of Ramie. Sci. & Cult. **37**: 386—387.

Naphade, S. R. (1968). A new leaf blight disease of *Crotalaria juncea* from Ind. Plant Dis. Reptr. **52**: 377—378.

— (1970). Sydowia **24**: 241—244.

Narayanaswami, P. and Ramakrishnan, K. (1968). Madras Univ. J. **38** B: 84—99.

Natarajan, M. K., Sivaprakasam, K. and Ramakrishnan, K. (1968). Record of *Verticillium* wilt of cotton in Madras State. The Madras Agric. Jour. **55**: 455—457.

Pandian, T. T. and Ivor Isaac (1971). *Verticillium dahliae* Wilt of Cotton. Curr Sci. **40**: 416.

Pandotra, V. R. and Sastry, K. S. M. (1967). Wilt: A New Disease of Hemp in India. Ind. Jour. Agric. Sci. **37**: 520.

Patel, M. K. and Kulkarni, Y. S. (1950). Bacterial leaf spot of cotton. Indian Phytopath **3**: 51—63.

Patil-Kulkarni, B. G. and Aswathaiah, B. (1962). *Phytophthora* boll rot of cotton. (*Gossypium barbadense* L.) in Mysore. Sci. & Cult. **28**: 233—234.

Patil, S. D. (1964). Contributions to the fungi of Maharashtra. — I. Jour. Univ. Poona, Sci. & Tech. Sect. **28**: 35—38.

Patil, B. P. and Gadage, N. B. (1972). *Curvularia* leaf-spot of cotton in Maharashtra State. Curr. Sci. **41**: 343.

Pavgi, M. S. and Singh U. P. (1965). Parasitic fungi from North India. — IV. Mycopath. et Mycol. Appl. **27**: 81—88.

Ponnappa, K. M. (1970). Proc. Ind. Acad. Sci., B. LXXI (2): 66—67.

Prakash, G. and Ghosh, T. (1964). Stem galls in cultivated Jute. Jute Bull. **26**: 237—239.

Prasad, N., Mathur, R. L. and Agnihotri, J. P. (1960). *Cercospora abelmoschi-cannabini* (Sawada). Prasad, Mathur & Agrni. com. nov. causing leaf spot disease of Ambari Hemp (*Hibiscus cannabinus* L.) in Rajasthan. Sci. & Cult. **25**: 600—601.

Ramakrishnan, K. (1955). Ascomycetes from South India. — III. Proc. Ind. Acad. Sci. B. **42**: 249—257.

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

RAMAKRISHNAN, T. S. and SEETHALAKSHMI, V. (1956). Studies in the genus *Phytophthora*. — IV. New hosts for *P. palmivora* from South India. Proc. Ind. Acad. Sci. B. **44**: 79—84.

RAMALINGAM M., LEWIN, H. D., SIVAPRAKASAM, K. and KRISHNAMURTHY, G. S. (1965). Bacterial wilt of cotton (*Gossypium hirsutum* L. race *latifolium*) caused by *Xanthomonas celebensis* var. *gossypii*. Ind. Jour. Microb. **5**: 51—54.

RANGASWAMI, G. and EASWARAN, K. S. S. (1962). A bacterial leaf-spot disease of Bhendi or Okra. Andhra Univ. Jour. **9**: 1—2.

— & GOWDA, S. (1963). On some bacterial diseases of ornamentals and vegetables in Madras State. Indian Phytopath. **16**: 74—85.

— & SESHADRI, V. S. and CHANNAMMA, K. A. L. (1970). Fungi of South India. Publ. Agric. Univ. Bangalore, pp. 193.

RAO, R. (1966). Some additions to fungi of India. — I. Mycopath. et Mycol. Appl. **28**: 45—48.

RAO, V. G. (1962). *Alternaria* diseases of Okra and Ramie. Plant Prot. Bull. F. A. O. Roma (Italy) **10**: 116.

— (1963a). Some new host records of *Alternaria* species from India. Mycopath. et Mycol. **19**: 181—183.

— (1963b). The genus *Phyllosticta* in Bombay-Maharashtra. — I. Sydowia, **16**: 275—283.

— (1964a). Two new species of *Alternaria* on economic hosts from India, Ibid. **17**: 70—73.

— (1964b). The genus *Phyllosticta* in Bombay-Maharashtra. — IV. Mycopath. et Mycol. Appl. **22**: 157—166.

— (1964c). The genus *Phyllosticta* in Bombay-Maharashtra. Ibid. **23**: 125—128.

— (1965). *Alternaria tenuis* auct. in Bombay-Maharashtra. Ibid. **27**: 257—264.

— (1974). Two new records of boll-rots of cotton from India. M. V. M. Patrika, **9**: 121—122.

RANE, M. S. and PATEL, M. K. (1956a). Diseases of Cotton in Bombay. — I. *Alternaria* leaf-spot. Ind. Phytopath. **9**: 106—113.

— — (1956b). Diseases of Cotton in Bombay. — II. *Helminthosporium* leafspot. Ibid. **9**: 169—173.

RAYCHAUDHURI, S. P. (1947). A note on mosaic virus of sun-hemp, (*Crotalaria juncea* L.) and its crystallization. Curr. Sci. **16**: 26—28.

— (1949). *Oidiopsis gossypi* (WAKEF.) RAYCHAUDHURI f. *indica* f. nov. on cotton. Trans. Brit. Mycol. Soc. **32**: 288—290.

ROY, A. K. (1969). Damping-off of bhendi and garden flowers. F. A. O. Plant Prot. Bull. **17**: 68.

ROY, T. C. (1948). Fungi of Bengal. Bull. Bot. Soc., Bengal **2**: 134—177.

SARKAR, A. (1960). Studies on the anthracnose fungus of *Hibiscus cannabinus* L., Lloydia, **23**: 97—101.

RAO, V. G. & SOLANKURE, R. T. (1971). An undescribed species of *Pyrenochaeta* on an economic host. Curr. Sci. **40**: 169.

SHARMA, B. B. et al (1973). Norw. J. Bot. **20**: 27—29.

SHARMA, B. D. and MURKHEJI, S. L. (1970). A bacterial wilt of jute (*Corchorus capsularis* L. and *C. olitorius* L.) caused by *Pseudomonas solanacearum* E. F. SMITH. Phytopath. Z. **67**: 93—94.

SHARMA, Y. R. and NAYUDU, M. V. (1970). Curr. Sci. **39**: 495—496.

SHAW, F. J. F. (1921—1924). Studies in diseases of the jute plant (1) *Diplodia corchori* SYD. Mem. Dept. Agric. India. Bot. Ser., 11: 37—58, 1921. (2) *Macrophoma corchori* SAW. Ibid. **13**: 193—199.

©Verlag Ferdinand Berger & Söhne Ges.m.b.H., Horn, Austria, download unter www.biologiezentrum.at

SHUKLA, D. D. and PATHAK, V. N. (1968). A new species of *Ascochyta* on *Cannabis sativa* L. Sydowia **21**: 277—278.

SIDDQUI, M. R. and RAO, S. B. P. (1964). *Ramularia areola* ATK. on herbaceum cottons in Vidharbha (Maharashtra). Indian Phytopath. **17**: 146—148.

SINGH, R. S. (1963). A root and collar-rot of "Bhindi". Indian Phytopath. **16**: 48—54.

— & GROVER, R. K. (1968). Sooty mould of cotton and other hosts caused by *Microxyphiella hibiscifolia* in North India. Plant. Dis. Reprt. **52**: 602—604.

SRIDHARAN, R. and RANGASWAMI, G. (1968). Studies on two *Cercospora* leaf spots of *Abelmoschus esculentus*. Indian Phytopath. **21**: 37—42.

SRIVASTAVA, M. P., CHANDRA, S. and TANDON, R. N. (1964). Post-harvest diseases of some fruits and vegetables. Proc. Natl. Acad. Sci. India, B. **34**: 339—342.

SUDHIR CHANDRA and TANDON, R. N. (1965). Three new foliicolous fungi. Curr. Sci. **34**: 257—259.

— (1964). *Chaetomium succineum* AMES. A new record to India. Curr. Sci. **33**: 532—533.

SULAIMAN, M. and PATIL, B. C. (1966). Existence of physiological races of *Macrophomina phaseoli* causing root-rot of cotton. Beitr. trop. sub-trop. Landwirtsch. Tropenveterinärmedizin, **4**: 291—298.

SUNDAREM, N. V. (1961). Notes on some fungi from South India. Indian Phytopath. **14**: 202—209.

SURYANARAYANA, D., BEDI, P. S. and TRIPATHI, N. N. (1968). *Helminthosporium* leaf blight — a new disease of cotton in Punjab and Haryana, Jour. Res., Ludhiana, **5**: 62—65.

TANDON, R. N. and ANNUPAM VERMA (1964). Some new storage diseases of fruits and vegetables. Curr. Sci. **33**: 625—627.

THAKUR, R. N. (1971). Occurrence of stem rot of *Crotalaria juncea* in Jammu and Kashmir. Ind. J. Mycol. & Pl. Path. **1**: 147—148.

THIND, K. S. and REHILL, P. S. (1957). The Mycomycetes of the Mussoorie-Hills. — VII. Indian. Phytopath. **100**: 86—96.

— & MANOCHA, M. S. (1957). The Myxomycetes of the Mussoorie-Hill. — VIII. Ibid. **10**: 97—106.

— — (1958). The Myxomycetes of the Mussorie Hill. — IX. Ibid. **11**: 10—22.

THIRUMALACHAR, M. J. and CHUPP, C. (1948). Notes on some Cercosporae of India. Mycol. Appl., **40**: 362—352.

TILAK, S. T. and RAO, R. (1964). The genus *Haplosporella* in India. Mycopath. et Mycol. Appl. **24**: 362—368.

— — (1969). Second Supplement to the fungi of India (1962—1967). Marathwada Univ. Aurangabad, pp. 312 (Published by Authors).

UPADHYAY, R. and PAVGI, M. S. (1967). Some new hosts of *Pellicularia rolfsii* (SACC.) WEST. from India. Sci. & Cult. **33**: 71—73.

UPPAL, B. N. (1932). *Rhizoctonia bataticola* on Sorghum, and Sclerotium rolfsii on cotton in Bombay. Int. Bull. Pl. Prot. **6**: 38.

— (1948). Diseases of cotton in India. Ind. Central Cotton. Comm. Bombay.

— and KULKARNI, N. T. (1937). Studies in *Fusarium* wilt of sunn-hemp. — I. The physiology and biology of *Fusarium vasinfectum* ATK. Ind. Jour. Agrip. Sci. **7**: 413—442.

— , KULKARNI, Y. S. and RANADIVE, J. D. (1943). Isolation of wilt resistant types of cotton. Ind. Central Cotton Comm. Mycol. Paper No. 1.

— , CAPOOR, S. P. and RAYCHAUDHURI, S. P. (1944). "Small-leaf" disease of cotton. Curr. Sci. **13**: 284—285.

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VARADA RANJAN, B. S. and PATEL, J. S. (1934). Stem-rot disease of Jute. Ind. Jour. Agric. Sci. **13**: 148—156.

VASUDEVA, R. S. (1935). Studies on the root rot disease of cotton in the Punjab. Ind. Jour. Agric. Sci. **5**: 496—512.

— (1940). A malformation of cotton leaves. Curr. Sci. **9**: 497—499.

— (1962). Diseases of Cotton in India. Ind. Central Cotton. Comm. Matunga, (Bombay), pp. 12.

VERMA, J. P. and SINGH, R. P. (1970). Races of bacterial blight of cotton (*Xanthomonas malvacearum* (E. F. SMITH) DAWSON). Curr. Sci. **39**: 20—21.

WANI, D. D. and THIRUMALACHAR, M. J. (1969). Studies on *Elsinoe* and *Sphaceloma* diseases of plants in Maharashtra (India). — V. Sydowia **23**: 257—260.

WILSON, K. I. (1961). Anthracnose of cotton in Bombay State. Ind. Phytopath. **14**: 53—60.

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