

THE FUNGI OF SOUTH WEST PAKISTAN. PART I

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The knowledge of the host range and distribution of parasitic fungi in a particular region is of great utility in plant pathological investigations.

West Pakistan formed a part of British India up to 1947 and its fungal flora has been listed by Butler and Bisby³ and Mundkur.²³ Ahmad¹ issued the first monograph on the mycoflora of West Pakistan but this excluded the areas included in South-West Pakistan, viz. the former province of Sind.

The only published report on the occurrence of fungal plant diseases in the former province of Sind, as far as known to the writers, is given by Uppal, Patel and Kamat²⁶ who listed 18 species in their *Fungi of Bombay* as Sind formed a part of Bombay Presidency till April 1936. The total species of fungi were, however, not more than 25 from this part, an area of over 61,200 square miles.

Systematic studies were therefore undertaken to identify the fungal flora, mainly parasitic, and in the work being presented here 212 species of fungi belonging to 68 genera and collected from 188 host plants are being reported from this region.

Sind or Sindh derives its name from "Sindhu" which means a collection of waters. This tract of land is about 360 miles long and 170 broad. It lies between 28° 30' and 23° 35' North latitude and 66° 42' and 71° 10' East longitude. It is bounded by the Thar desert in the east, the Arabian Sea and Rann of Kutch in the south, the great plain of Punjab in the north and in the west lie the Khirthar ranges. Thus it could be divided into three parts: (1) Sind proper, the alluvial plain through which the Indus flows, (2) the Kohistan or hilly country, extending between Karachi and Sehwan and rising northwards to the Khirthar range and (3) the Thar desert, spreading eastwards from the Nara river into Rajputana.

The climate of Sind is of the sub-tropical desert type with hot and dry weather prevailing for over 7 to 8 months. It is the driest and hottest of all the regions in Pakistan or India. Summer temperatures frequently rise to 114-116° F, but the average is 90° F. Winters are usually mild

and the average temperature is 60° F. The rainfall is scanty and variable, hardly 5 inches annually. Other peculiarities of the region are the sand-hills, longitudinal bits and transverse ridges, and the salt lakes which are frequently met in the desert. Winds are usually strong for most part of the year specially in the southern zone. All these climatic and physiographic features exert great influence on the phanerogamic flora which are the hosts of the fungi reported in this work.

The writers are aware that the present list of collections is, no doubt, meagre and represents only the beginning of the work, but this list of collections is being presented so that it may meet the needs of the university students and other phytopathologists working in different parts of Pakistan.

The identity of the collections given below has been confirmed through the help given by the staff of the Commonwealth Mycological Institute, Kew, England. A Phytopathological Herbarium has also been set up at Tandojam for reference.

The writers wish to place on record the valuable help received from various specialists in connection with this work, viz. Dr. G. C. Ainsworth, Messrs. F. C. Deighton, K. Pirozynski, G. F. Laundon, B. C. Sutton, Miss G. M. Waterhouse, Drs. M. B. Ellis, J. E. Mordue and C. Booth of the C.M.I., Kew, England, Professor G. B. Cummins of the Purdue University, Indiana, and Charles Chupp, Professor Emeritus of the Cornell University, New York, U.S.A. Thanks are also due to Drs. Asghar Jalis, Khushnood Ahmad Siddiqui, S. M. H. Jafri and E. Nasir for the help given in connection with the identification of the host plants.

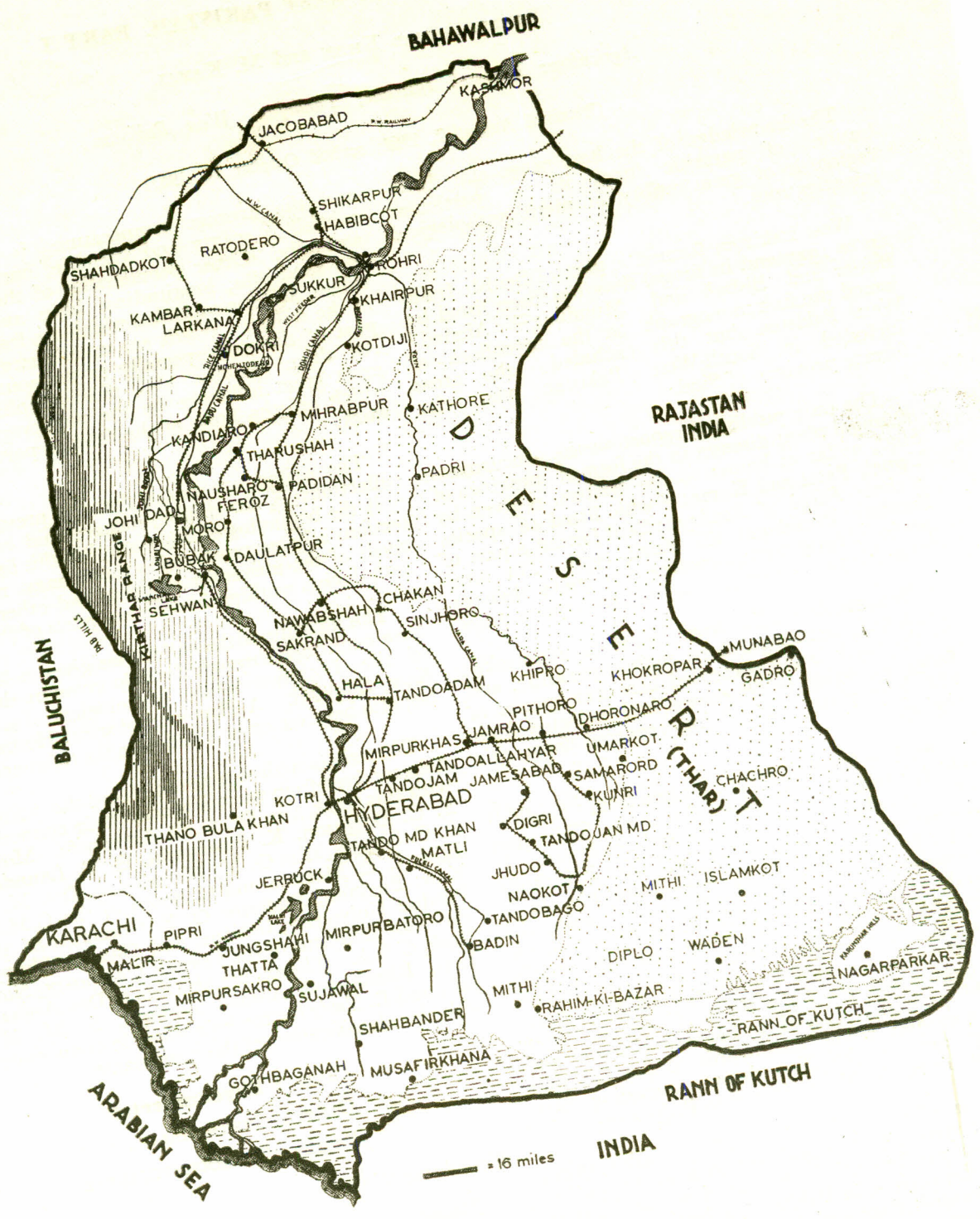
Class : **Phycomycetes**

Order : **CHYTRIDIALES**

Family : **CLADOCHYTRIACEAE**

Physoderma Wallr.

Physoderma sp.—On leaves of *Trifolium alexandrinum* L., Nawabshah, I.M.I., 112609. According to Miss Waterhouse the collection is near to *Physoderma alfalfae* (Pat. and Lagerh.) Karling or *P. meliloti*.



SIND—PHYSICAL

Order: PERONOSPORALES

Family ALBUGINACEAE

Albugo Pers. ex S.F. Gray.

Albugo bliti (Biv.-Bern.) Kuntze.—On leaves of *Alternanthera sessilis* (L) R. Br., Tandojam and Mirpur bathoro, I.M.I. 112600; and *Digera arvensis* Forsk., Tandojam, I.M.I. 123888.

A. candida (Pers. ex Hook.) Kuntze.—On leaves and stem of *Brassica campestris* var. *sarson* Prain., Tandojam, I.M.I. 112592.

A. ipomoeae-panduratae (Schwein) Swing.—On leaves and petiole of *Ipomoea aquatica* Forsk., Tandojam, Thatta and Jheruk, I.M.I. 118502; and *I. indica* Stapf., Tandojam, I.M.I. 123889.

A. portulacae (DC) Kunze.—On leaves of *Amaranthus polygamus* L. and *Portulaca oleracea* L., Tandojam, Mirwah and Mirpur Bathoro, I.M.I. 123990.

Family: PERONOSPORAEEAE

Bremia Regel.

Bremia lactucae Regel.—On leaves of *Sonchus oleraceus* L., Tandojam, I.M.I. 112591.

Peronospora Corda.

Peronospora cyperissiae de Bary.—On leaves of *Euphorbia thymifolia* L., Tandojam, I.M.I. 90819.

P. farinosa (Fr.) Fr.—On leaves of *Chenopodium album* L., Kazi Ahmed and Tandojam, I.M.I. 112606; and *C. murale* L., Tandojam, I.M.I. 90812.

P. favargerii Mayor and Viennot-Bourgin.—On leaves of *Euphorbia hypericifolia* L., Tandojam, I.M.I. 90147(b).

P. gaeumannii Mundkur.—On leaves of *Argemone mexicana* L., Tandojam, I.M.I. 90813. Miss Waterhouse remarks that the collection is scarcely different from *P. argemones* Gaum.

P. parasitica (Pers. ex Fr.) Fr.—On leaves of *Brassica campestris* var. *rapa* L., Ranipur and Tandojam, I.M.I. 90810; *B. campestris* var. *sarson* Prain., Tandojam, I.M.I. 90816; *Eruca sativa* Mill., Tandojam, I.M.I. 90815; and *Raphanus sativus* L., Tandojam, I.M.I. 90814.

P. tribulina Passerini.—On leaves of *Tribulus terrestris* L., Tandojam, I.M.I. 88669.

P. trifoliorum de Bary.—On leaves of *Medicago sativa* L., Tandojam, I.M.I. 90809; *Melilotus albus* Medikus, Tandojam and Sakrand I.M.I. 112583; *M. parviflora* Desf., Tandojam, I.M.I. 90811; *Trifolium resupinatum* L., Ranipur and Tandojam, I.M.I. 90808; and *Trigonella foenum-graecum* L. Tandojam, I.M.I. 112604.

P. viciae (Berk.) Casp.—On leaves and stems of *Lathyrus sativus* L., Tandojam, I.M.I. 106040 (S. Tahir and S. A. Khan); and *Vicia sativa* L., Tandojam, I.M.I. 88670. Miss Waterhouse informs that the type host of *P. viciae* (Berk.) Casp. is *V. sativa* but Gaumann made *V. grandiflora* the type host which is illegitimate and described the fungus on *V. sativa* as new, which they do not accept.

P. vistulensis Wrob.—On leaves and stems of *Suaeda fruticosa* (L) Forsk, Sakrand, I.M.I. 104692.

Peronospora sp.—On leaves of *Euphorbia granulata* Forsk., Tandojam, I.M.I. 90820.

Pseudoperonospora Rostov.

Pseudoperonospora cubensis (Berk. and Curt.) Rostov.—On leaves of *Cucumis melo* L., Tandojam, I.M.I. 86798; *C. melo* var. *utilissima* F. and Gard., Tandojam, I.M.I. 90817; *C. trigonus* Roxb., Tandojam, I.M.I. 91441; and *Luffa aegyptiaca* Mill., Tandojam, I.M.I. 90818.

Sclerospora Schroet.

Sclerospora graminicola (Sacc.) Schroet.—On leaves of *Pennisetum typhoideum* Rich., Tandojam, Sakrand, Umerkot and other places, I.M.I. 112590.

Class: Ascomycetes

SUB-CLASS: EUASCOMYCETES

SERIES: ASCOLOCULARES

ORDER: PSEUDOSPHAERIALES

Botryosphaeria Ces. and de Not.

Botryosphaeria ribis Grossenb. and Dagg.—From roots of *Sesamum indicum* DC., Tandojam, I.M.I. 112248 (Sher Mohd.).

Venturia de Not.

Venturia inaequalis (Cooke) Wint.—On leaves of *Pyrus malus* L., Tandojam, I.M.I. 83453. This is the perfect state of *Fusicladium dendriticum* (Wallr.) Fuckel.

SERIES: ASCOHYMENIALES

SUB-SERIES: PLECTOMYCETES

ORDER: ASPERGILLALES

FAMILY: GYMNOASCACEAE

Thielavia Zopf.

Thielavia sepedonium Emmons.—From roots of *Arachis hypogaea* L., Tandojam, I.M.I. 92714.

SUB-SERIES: PYRENOAMYCETES
ORDER: XYLARIALES
FAMILY: CHAETOMIACEAE

Chaetomium Kze. ex Fr.

Chaetomium globosum Kunze.—On seeds of *Oryza sativa* L., Dokri, I.M.I. 114742 (G. R. Solangi).

ORDER: XYLARIALES
FAMILY: PHYLLACHORACEAE

Phyllachora Nits.

Phyllachora cynodontis (Sacc.) Niessl.—On leaves of *Cynodon dactylon* (L) Pers., Tandojam, I.M.I. 112872.

P. vulgata Theiss and Syd.—On leaves of *Sporobolus glaucifolius* Hochst. ex Steud., Tandojam, I.M.I. 86535 (a).

ORDER: DIAPORTHALES
FAMILY: GNOMONIACEAE

Cochliobolus Drechsler.

Cochliobolus heterostrophus (Drechsler) Drechsler.—On leaves of *Sorghum halepense* (L) Pers., Tandojam, I.M.I. 104695.

C. miyabeanus (Ito. and Kur.) Drechsler.—On leaves of *Oryza sativa* L., Dokri, I.M.I. 104700 (S. A. Khan and Riaz Ahmad Khan).

C. spicifer Nelson.—From seeds of *Oryza sativa* L., Dokri, I.M.I. 114739, (G. R. Solangi); leaves of *Saccharum officinarum* L., Tandojam, I.M.I. 125074; and *Triticum vulgare* Vill., Tandojam, I.M.I. 125087.

Order: HYPOCREALES
Family: HYPOCREACEAE

Glomerella Sp. and V. Schrenk.

Glomerella cingulata (Stonem.) Spauld. and Sch.—On leaves of *Salvadora persica* L., Tandojam and Jati, I.M.I. 98258 (S. Tahir and S. A. Khan).

Neocosmospora E. F. Smith

Neocosmospora vasinfecta E. F. Smith.—From roots of *Cyamopsis psoralioides* (Lam) DC, Tandojam, I.M.I. 94518.

Order: ERYSIPTHALES
Family: ERYSIPTHACEAE

Erysiphe Hedw. f. ex Fr.

Erysiphe cichoracearum DC.—On leaves of *Cucumis trigonus* Roxb., Tando Jam, I.M.I. 90853; *Helianthus annuus* L., Tandojam, I.M.I. 104698; *Hibiscus esculentus* L., Tandojam; and on leaves, stems and petals of *Zinnia elegans* Jacq., Tandojam, I.M.I. 90841.

E. polygoni DC.—On leaves of *Brassica campestris* var. *rapa* L., Tandojam, I.M.I. 112598; on leaves and stems of *Coriandrum sativum* L., Tandojam, I.M.I. 90840; on leaves of *Coronopus didymus* (L) Sm., Tandojam and Hyderabad, I.M.I. 90848 and 112880; *Daucus carota* L., Tandojam, I.M.I. 90847; on leaves and stems of *Medicago falcata* Lam., Tandojam, I.M.I. 113936; *Peucedanum graveoleus* Benth., Tandojam, I.M.I. 90843; on leaves of *Phaseolus aureus* Roxb., Tandojam, I.M.I. 90852; *P. mungo* L., Tandojam, I.M.I. 90850 (a); and on leaves, stems and pods of *Pisum sativum* L., Tandojam, I.M.I. 90844. Note: Identification of *Erysiphe cichoracearum* and *E. polygoni* DC is tentative, and has been made on the basis of conidial state alone.

Leveillula Arnaud.

Leveillula taurica (Lév.) Arnaud.—On leaves of *Albizia lebbek* Benth., Tandojam, I.M.I. 104322; *Alysicarpus longifolius* W. and A., Tandojam, I.M.I. 86533; *Argemone mexicana* L., Tandojam, I.M.I. 112887; *Cadaba fruticosa* (L) Dce, Mirpur Khas, I.M.I. 104324; *Capparis cartilaginea* Decne, Tandojam, I.M.I. 113940; *Capsicum annuum* L., and *C. frutescens* L., Tandojam and Thana Bula Khan, I.M.I. 112596; *Celosia cristata* L., Tandojam, I.M.I. 76523; *Centaurea moschata* L., Tandojam, I.M.I. 72476; *Chenopodium murale* L., Tandojam, I.M.I. 90812; *Cicer arietinum* L., Tandojam, I.M.I. 112892; *Convolvulus arvensis* L., Tandojam, I.M.I. 104325; *Coriandrum sativum* L., Tandojam and Mirpur Khas, I.M.I. 118499; *Cyamopsis psoralioides* (Lam) DC, Tandojam, I.M.I. 123893; *Delphinium ajacis* L., Tandojam, I.M.I. 73181; *Euphorbia hirta* L., Tandojam; *Gaillardia pulchella* Fouger, Tandojam, I.M.I. 86532; *Glycyrrhiza glabra* L., Tandojam, I.M.I. 76522; *Hibiscus sabdariffa* L., Tandojam; *Impatiens balsamina* L., Tandojam; *Linum usitatissimum* L., Tandojam, I.M.I. 112891; *Lycopersicon esculentum* Mill., Tandojam and Thana Bula Khan, I.M.I. 118506; *Medicago sativa* L., Tandojam; *Nicotiana glauca*, Tandojam, I.M.I. 72476; and *Nicotiana sp.*, Tandojam, I.M.I. 112890, (S. Parwaiz); *Oxalis corniculata* L., Tandojam, I.M.I. 112888; *Papaver rhoeas* L., Tandojam, I.M.I. 73182; *Peganum harmala* L., Tandojam, I.M.I.

104701; *Phyllanthus niruri* L., Tandojam, I.M.I. 104323; *Rhynchosia minima* (L) DC, Tandojam, I.M.I. 112593; *Ricinus communis* L., Tandojam and Khalifo Qasim, I.M.I. 113941; *Salvadora persica* L., Tandojam, I.M.I. 76524 and 118500; *Sesamum indicum* DC, Tandojam, I.M.I. 104321; *Solanum melongena* L., Tandojam; and *S. nigrum* L., Tandojam; *Sonchus oleraceus* L., Tandojam, I.M.I. 86534; *Tagetes erecta* L., Tandojam, I.M.I. 104697; *Trigonella foenum-graecum* L., Tandojam, I.M.I. 118508; *Tropaeolum majus* L., Tandojam, I.M.I. 112889; and on leaves of *Verbena laciniata* (L) Briq., Mirpur Khas, I.M.I. 118511.

Oidium Link ex Fr.

Oidium mangiferae Bert.—On the inflorescens of *Mangifera indica* L, Mirpur Khas and Tandojam, I.M.I. 112883.

Oidium sp.—On the leaves of *Alhagi pseudalhagi* (M. Bieb.) Desv., Dokri and Rhauki, I.M.I. 107265; *Azadirachta indica* Juss, Mirpur Khas, I.M.I. 118503, (S. Tahir); *Beta vulgaris* L, Tandojam, I.M.I. 112884 (S. Parwaiz and A. Hamid); *Cassia laevigata* Willd., Tandojam, I.M.I. 90845; and *C. surattensis* Burm., Tandojam, I.M.I. 90846; *Citrullus vulgaris* Schd., Kunri and Tandojam, I.M.I. 123897; *Coccinia indica* W. and A, Tandojam, I.M.I. 112601; *Cocculus laeaba* DC., Tandojam, I.M.I. 104330; *Convolvulus arvensis* L, Tandojam and other places, I.M.I. 112885; *Cucumis melo* var. *utilissima* F. and Gard., Tandojam and Dokri, I.M.I. 83454; *Cuminum cyminum* L, Tandojam, I.M.I. 107268; *Eruca sativa* Mill., Tandojam, I.M.I. 118507; *Euphorbia hirta* Fork., Tandojam and other places, I.M.I. 90842; *Foeniculum vulgare* Maill., Tandojam, I.M.I. 107267; *Hibiscus cannabinus* L, Jati near Sujawal, I.M.I. 123900; *Lippia nodiflora* (L) L.C. Rich. ex Mich., Mirwah dist. Tharparkar, I.M.I. 118505, (S. Parwaiz); *Melilotus albus* Medik., Tandojam, I.M.I. 112892; *M. parviflora* Desf., Tandojam, I.M.I. 112811; *Phaseolus trilobus* (L) Ait., Jati near Sujawal, I.M.I. 123896; *Physalis minima* L, Tandojam and Tando Mohd. Khan, I.M.I. 123891; *Prosopis glandulosa* Torr., Tandojam, I.M.I. 90849; *Sesamum indicum* L, Tandojam, I.M.I. 90851; *Spinacea oleracea* L, Tandojam, I.M.I. 112886, (S. Parwaiz); *Trifolium resupinatum* L, Tandojam, I.M.I. 112620; *Xanthium strumarium* L, Miani Forest near Hyderabad and Rhauki, I.M.I. 115307; and on leaves of *Zizyphus nummularia* (Burm.) f. W. and A., Tandojam, I.M.I. 112602.

Phyllactinia Lév.

Phyllactinia corylea (Pers.) Karst.—On leaves of *Morus alba* L, Tandojam and Hyderabad, I.M.I. 112878.

P. dalbergiae Pirozyn.—On leaves of *Dalbergia sissoo* Roxb., Tandojam, I.M.I. 112595. Mr. Pirozynski of C.M.I. Kew; remarks that *P. subspiralis* (Salm.) Blumer has been illegitimately described.

Podosphaera Kze. ex Lév.

Podosphaera leucotricha (Ellis and Everh.) Salm.—On leaves of *Pyrus malus* L, Hyderabad, I.M.I. 113935.

Sphaerotheca Lév.

Sphaerotheca fuliginea (Schl.) Poll.—On leaves of *Lagenaria vulgaris* Ser., Tandojam and Thana Bula Khan, I.M.I. 123892.

S. pannosa (Wallr.) Lév.—On leaves and flower buds of *Rosa damascena* Tourn., Mirpur Khas, I.M.I. 118513 (S. Parwaiz).

Class: **Basidiomycetes**

Sub-Class: HETEROBASIDIOMYCETES

Order: UREDINALES

Family: MELAMPSORACEAE

Cerotelium Arth.

Cerotelium fici (Butl.) Arth.—On leaves of *Ficus carica* L, Tandojam, I.M.I. 90191 (a); and *F. religiosa* L, Tandojam, I.M.I. 91446.

Melampsora Cast.

Melampsora euphorbiae (Schub.) Cast.—On leaves of *Euphorbia* sp., Kotri and Tandojam, I.M.I. 93447, (Asghar Jalis and S. A. Khan).

Phakopsora Diet.

Phakopsora grewiae (Pat. and Har.) Cumin.—On leaves of *Grewia asiatica* L, Tandojam, I.M.I. 79798.

P. zizyphi-vulgaris (P. Henn.) Diet.—On leaves of *Zizyphus jujuba* Lam., Tandojam, I.M.I. 112587; and *Z. nummularia* (Burm. f.) W. and A., I.M.I. 112586.

Family: PUCCINIACEAE

Puccinia Pers.

Puccinia aeluropodis Ricker.—On leaves of *Aeluropus logopoides* (L) Trin., Dokri, I.M.I. 107264.

P. allii Rud.—On leaves of *Allium cepa* L, Tandojam, I.M.I. 113933, (S. Parwaiz).

- P. barbeyi* (Roum.) Magn.—On leaves of *Asphodelus tenuifolius* Cav., Tandojam, I.M.I. 93450. (S. Tahir and S. A. Khan).
- P. butleri* Syd.—On leaves of *Launaea nudicaulis* (L) Hk.f., Dokri, I.M.I. 106045.
- P. carthami* Corda.—On leaves of *Carthamus tinctorius* L., Tandojam, I.M.I. 89140.
- P. cynodontis* Desm.—On leaves of *Cynodon dactylon* (L) Pers., Tandojam and other places, I.M.I. 89016, (Anis and S. A. Khan)
- P. graminis* Pers.—On leaves, culms and glumes of *Hordeum vulgare* L., Tandojam, I.M.I. 112581; and *Triticum vulgare* Vill., Tandojam and other places, I.M.I. 112580.
- P. helianthi* Schw.—On leaves of *Helianthus annuus* L., Tandojam, I.M.I. 107269.
- P. kuehnii* Butl.—On leaves of *Saccharum spontaneum* L., Bhit Shah, I.M.I. 113938.
- P. penicillariae* Speg. var. *indica* Ramachar and Cummins.—On leaves of *Pennisetum typhoideum* Rich., Tandojam, I.M.I. 112589.
- P. recondita* Rob. ex Desm.—On leaves of *Triticum vulgare* Vill., Tandojam, I.M.I. 112612.
- P. scirpi* DC.—On leaves of *Scirpus tuberosus* Desf., Dokri, I.M.I. 107263.
- P. sorghi* Schw.—On leaves of *Zea mays* L., Tandojam, I.M.I. 112588.
- P. striiformis* Westend.—On leaves of *Triticum vulgare* Vill., Tandojam, I.M.I. 112579.
- P. trabuti* Roum. and Sacc.—On leaves of *Phragmites karka* (Retz.) Trin., Tandojam, I.M.I. 89246 (as *Uredo* sp.). Mr. Laundon of C.M.I. Kew remarks that the present collection differs from *P. isiacae* (Thuem). Wint. in that it shows paraphyses in the uredia. Dr. Cummins treats this collection as *P. trabuti*, and informs that Jorstad and Nannfeldt (1958) consider *P. isiacae* as a synonym of *P. trabuti*.
- P. tuyutensis* Speg.—On leaves of *Cressa cretica* L., Hyderabad, I.M.I. 107270 and 107271 (as *Aecidium* sp.). Dr. G. B. Cummins identifies the collection as *P. tuyutensis* Speg. (*P. cressae* Lagh.).
- Ravenelia* Berk.
- Ravenelia tandonii* Syd.—On leaves of *Acacia arabica* (Lamk.) Willd., Tandojam and Bhit Shah, I.M.I. 112584 (as *Uredo* sp.). According to Dr. J. W. Baxter the collection is the *Uredo* stage of *Ravenelia tandonii* Syd.
- Tranzschelia* Arth.
- Tranzschelia discolor* (Fackl.) Trawz. and Litv.—On leaves of *Prunus persica* S. and Z., Tandojam, I.M.I. 104702 (as *T. pruni-spinosae* (Pers.) Diet.). Dr. Cummins informs that he prefers the name *T. discolor* for the rust of cultivated *Prunus*.
- Uromyces* Link.
- Uromyces alhaginis* Szembel.—On leaves of *Alhagi pseudalhagi* (M. Bieb.) Desv., Hyderabad, I.M.I. 107270.
- U. ciceris-arietini* (Grogn.) Jacz. and Boyer.—On leaves of *Cicer arietinum* L., Tandojam, I.M.I. 112875.
- U. clignyi* Pat. and Har.—On leaves of *Dichanthium annulatum* (Forsk.) Stapf., Tandojam, I.M.I. 89017.
- U. eragrostidis* Tracy.—On leaves of *Desmostachya bipinnata* (L) Stapf., Tandojam, I.M.I. 112585.
- U. euphorbiae* Cooke and Peck.—On leaves of *Euphorbia hypericifolia* L., Tandojam, I.M.I. 90147 (a).
- U. giganteus* Speg.—On leaves of *Suaeda fruticosa* (L) Forsk., Kunri I.M.I. 118510.
- U. lineolatus* (Desm.) Schroet.—On leaves of *Scirpus maritimus* auctt., Tandojam, I.M.I. 89247.
- U. rumicis* (Schum.) Wint.—On leaves of *Rumex dentatus* L., Dokri and Tandojam, I.M.I. 106046.
- U. setariae-italicae* Yosh.—On leaves of *Brachiaria reptans* (L) Gard. and Hubb., Tandojam, I.M.I. 104705 (as *Uredo* sp.)*;
- U. striatus* Schroet.—On leaves of *Medicago sativa* L., Tandojam, I.M.I. 112876.
- U. trifolii* (Hedw.) Lév.—On leaves of *Trifolium alexandrinum* L., Tandojam, I.M.I. 112877; and

*According to Dr. Cummins *U. setariae-italicae* is the correct name for this rust.

Setaria verticillata (L) Beauv., Tandojam, I.M.I. 104703 (as *U. leptodermus* Syd.).

Dr. Cummins informs that *U. setariae-italicae* is the correct name replacing *U. leptodermus*.

T. resupinatum L., Nawab Shah and Tandojam, I.M.I. 112611. Dr. Cummins remarks that some teliospores are longitudinally striate, but it is best to name it as *U. trifolii* (Hedw.) Lév.

Uredo Pers.

Uredo sissoo Syd. and Butler.—On leaves of *Dalbergia sissoo* Roxb., Tandojam, I.M.I. 118509, (S. Parwaiz).

Order: USTILAGINALES
Family: USTILAGINACEAE

Sphacelotheca de Bary.

Sphacelotheca cruenta (Kuehn) Potter.—In the ovaries of *Sorghum vulgare* Pers., Tandojam, I.M.I. 112869 (M. M. S. Malik and Yakoob).

S. schweinfurthiana (Thuem) Sacc.—In the ovaries of *Imperata cylindrica* (L) Beauv., Hyderabad, I.M.I. 106039 (S. A. Khan and A. Basit).

S. sorghi (Link.) Clinton.—In the ovaries of *Sorghum vulgare* Pers., Tandojam, Sakrand, and other places, I.M.I. 112870.

Tolyposporium Woron.

Tolyposporium ehrenbergii (Kuehn) Pat.—In the ovaries of *Sorghum vulgare* Pers., Tandojam, Sakrand, and other places, I.M.I. 112871.

T. penicillariae Brefeld.—In the ovaries of *Pennisetum typhoideum* Rich., Tandojam and other places, I.M.I. 112582.

Ustilago (Pers.) Roussel

Ustilago cynodontis P. Henn.—In the inflorescence of *Cynodon dactylon* (L) Pers., Tandojam, I.M.I. 118512 (S. Parwaiz).

U. hordei (Pers.) Lagerh.—In the spikes of *Hordeum vulgare* L., Tandojam and other places, I.M.I. 106043.

U. nuda (Jens.) Rostr.—In the floral parts and leaves of *Triticum vulgare* Vill., Tandojam and other places, I.M.I. 112868. According to Ainsworth and Sampson (1950) *U. nuda* and *U. tritici* (Pers.) Rostrup are morphologically indistinct.

U. scitaminea Syd.—In the inflorescence of *Saccharum officinarum* L., Tandojam and other places, I.M.I. 112867.

Family: TILLETIACEAE

Tilletia Tul:

Tilletia barclayana (Bref.) Sacc. and Syd.—In the ovaries of *Oryza sativa* L., Dokri, I.M.I. 112594, (S. A. Khan and Riaz Ahmad Khan). *Neovossia horrida* (Tak.) Padw. and Azmat Ullah is a synonym of *T. barclayana*.

T. tumefaciens Syd.—In the axillary buds and scales of *Panicum antidotale* Retz., Tandojam, I.M.I. 86802.

Graphiola Poit:

Graphiola phoenicis (Moug.) Poit.—In the leaves of *Phoenix sylvestris* Roxb., Tandojam, Mirpur Khas, and other places, I.M.I. 93448.

Sub-Class: HOMOBASIDIOMYCETES

Series: HYMENOMYCETES

Family: THELEPHORACEAE

Corticium Pers. ex Fr:

Corticium solani (Prill and Delacr.) Bourd. and Galz.—From roots of *Gossypium hirsutum* Cav., Tandojam, Mirpur Khas and Sakrand, I.M.I. 125084 (Khamis Khan).

Family: AGARICACEAE

Schizophyllum Fr:

Schizophyllum radiatum Fr.—From roots of *Gossypium arboreum* L., Tandojam and Sakrand, I.M.I. 90347.

Class: **Fungi Imperfecti**

Order: MONILIALES

Family: MONILIACEAE

Hansfordia Hughes:

Hansfordia canescens (Speg.) Hughes.—Overgrowing colonies of *Cercospora salvadorae* Maire on *Salvadora oleoides* Decne, Tandojam, I.M.I. 92888 (b), (S. Tahir).

H. ugandensis (Hansf.) Hughes.—Overgrowing colonies of *Cladosporium roesleri* Cattán, and *Stigmia esfandiarii* Petrak, on *Vitis vinifera* L., Tandojam, I.M.I. 98259 (a); and *Cercospora* sp. on *Zizyphus jujuba* Lam., Mirpur Bathoro, I.M.I. 123895 (a). According to Mr. F. C. Deighton of the C.M.I. Kew it is a common and wide spread hyperparasite especially of tropical *Cercospora* sp. and has many synonyms.

Hyalostachybotrys Srinivasan:

Hyalostachybotrys sacchari Srinivasan.—From seeds of *Linum usitatissimum* L., Tandojam, I.M.I. 114745.

Paecilomyces Bain.

Paecilomyces varioli Bainier.—On the fruit of *Carica papaya* L., Tandojam, I.M.I. 92724.

Ramularia Sacc.

Ramularia carthami Zaprometov.—On leaves of *Carthamus tinctorius* L., Tandojam, I.M.I. 73623.

R. pakistanica S. A. Khan and Kamal.—On leaves of *Rumex dentatus* L., Tandojam, I.M.I. 106198.

Trichoconis Clem.

Trichoconis padwickii Ganguly.—On seeds of *Oryza sativa* L., Dokri, I.M.I. 104329 and 114734.

Family: DEMATIACEAE

Alternaria Nees ex Wallr.

Alternaria brassicae (Berk.) Sacc.—On leaves of *Eruca sativa* Mill., Tandojam, I.M.I. 104693; and *Raphanus sativus* L., Tandojam, I.M.I. 86801.

A. cassiae Jurair and Azmat Ullah Khan.—On leaves of *Cassia holosericea* Fresen., Tandojam, I.M.I. 90784.

A. cheiranthi (Fr.) Bolle.—On leaves of *Althaea rosea* (L.) Cav., Tandojam, I.M.I. 112619.

A. cichorii Nattrass.—On leaves of *Cichorium intybus* L., Bedar Farm near Kunri, I.M.I. 118504 (a).

A. crassa (Sacc.) Rands.—On leaves of *Datura metel* L., Tandojam and Thana Bula Khan, I.M.I. 89673, (S. Tahir and S. A. Khan).

A. hordei Sawada.—On leaves of *Hordeum vulgare* L., Tandojam, I.M.I. 104707. Dr. Ellis of C.M.I. Kew remarks that the range of measurements for conidia is greater than that given by Sawada.

A. longipes (Ell. and Ev.) Mason.—On leaves of *Nicotiana tabacum* L., Tandojam, I.M.I. 112608.

A. porrii (Ell.) Ciferri.—On leaves of *Allium cepa* L., Tandojam, I.M.I. 89245.

A. ricini (Yoshii) Hansford.—On leaves of *Ricinus communis* L., Tandojam and other places, I.M.I. 103554.

A. solani (Ellis and Mart) Jones and Grout.—On leaves of *Solanum tuberosum* L., Tandojam, I.M.I. 93449.

A. tenuissima (Nees ex Fr.) Wiltshire.—On leaves of *Albizia lebbek* Benth., Kisan Mori near Tandojam, I.M.I. 123904; *Arachis hypogaea* L., Tandojam, I.M.I. 103557; *Cajanus indicus* Spreng., Tandojam, I.M.I. 103553; on leaves and fruits of *Capsicum frutescens* L., Tandojam, I.M.I. 90785 (S. Tahir); on leaves of *Convolvulus arvensis* L., Tandojam, I.M.I. 104327; *Cyamopsis psoralioides* (Lam.) DC, Tandojam, I.M.I. 103556; *Digera arvensis* Forsk., Tandojam, I.M.I. 91431; *Glycine max* (L) Merrill, Tandojam, I.M.I. 103555 (a); *Hibiscus esculentus* L., Tandojam, I.M.I. 113934; on leaves and inflorescence of *Linum usitatissimum* L., Tandojam, I.M.I. 91443 and 112603 (a); on leaves of *Luffa aegyptiaca* Mill., Tandojam, I.M.I. 103552; *Musa sapientum* L., Tandojam, I.M.I. 125076; on seeds of *Oryza sativa* L., Dokri, I.M.I. 104329; on leaves of *Physalis minima* L., Tando Mohd. Khan, I.M.I. 123899; *Sonchus oleraceus* L., Tandojam, I.M.I. 106042 (a); *Spinacea oleracea* L., Tandojam, I.M.I. 112615,* and on leaves and glumes of *Triticum vulgare* Vill., Tandojam, I.M.I. 112613 and 112614.

A. zinniae Pape.—On leaves of *Volutarella divaricata* (DC) Benth and Haok. f., Tandojam, I.M.I. 90786 (S. Tahir).

Cercospora Fres:

Cercospora abelmoschi Ell. and Ev.—On leaves of *Hibiscus cannabinus* L., Umarkot and Jati, I.M.I. 123898. Mr. F. C. Deighton remarks that this "species" needs sorting as several taxa are involved including some as yet undescribed.

C. achyranthina Thirumalachar and Chupp.—On leaves of *Achyranthes aspera* L., Tandojam and Mirpur bathoro, I.M.I. 91435.

C. atromarginalis Atk.—On leaves of *Solanum nigrum* L., Tandojam and Dokri, I.M.I. 90781.

C. avicennae Chupp.—On leaves of *Abutilon indicum* (L.) Swt., Tandojam, I.M.I. 90185.

C. beticola Sacc.—On leaves of *Chenopodium murale* L., Tandojam, I.M.I. 90122; and *Spinacea*

*Dr. Ellis remarks that this may be the species described by Allescher and Noack as *Alternaria spinaciae* but it is hardly distinct from *A. tenuissima*.

oleracea L, Tandojam, Jheruk, Tando Mohd. Khan, and other places, I.M.I. 90121 and 112605.

C. blumeicola S. Das.—On leaves of *Blumea amplexans* DC, Dokri and Jati, near Sujawal, I.M.I. 107262 and 124354.

C. bombacicola Munjal, Lall and Chona.—On leaves of *Bombax malabaricum* DC, Tandojam, I.M.I. 90120, (S. Tahir).

C. cajani P. Henn.—On leaves of *Cajanus indicus* Spreng., Tandojam, I.M.I. 86536.

C. calotropidis Ell. and Ev.—On leaves of *Calotropis procera* (Willd.) R. Br., Tandojam and other places, I.M.I. 90118.

C. canescens Ell. and Mart.—On leaves of *Artocarpus integrifolia* L, Tandojam, I.M.I. 91430 (a) and 104694; *Bauhinia variegata* L, Tandojam, I.M.I. 90854 and 98484; *Crotalaria juncea* L, Tandojam, I.M.I. 90783;* *Cyamopsis psoraloides* (Lam.) DC, Tandojam, I.M.I. 89015†; *Dolichos lablab* L, Tandojam, I.M.I. 91432; *Phaseolus aureus* Roxb., Tandojam, I.M.I. 90193; *P. mungo* L, Tandojam, I.M.I. 90194; *Rhynchosia aurea* DC., Tandojam, I.M.I. 90187; and *R. minima* (L) DC, Tandojam, I.M.I. 90186.

C. cavayae P. and D. Saccardo.—On leaves of *Glycyrrhiza glabra* L, Tandojam, I.M.I. 86800 (b).

C. celosiae Syd.—On leaves of *Celosia argentea* L, Tandojam, I.M.I. 90119, (S. Tahir).

C. cichorii J. J. Davis.—On leaves of *Cichorium intybus* L, Tandojam, I.M.I. 90192.

C. citrullina Cooke.—On leaves of *Citrullus vulgaris* Schrdd., Tandojam, I.M.I. 90190; *Lagenaria vulgaris* Ser., Tandojam, I.M.I. 89249; and *Momordica charantia* L, Tandojam, I.M.I. 112616, (Talib Hussain).

C. coccinea Munjal, Lall and Chona.—On leaves of *Coccinia indica* W. and A., Mirpur bathoro, I.M.I. 124350. Mr. Deighton remarks that it is doubtful if this could be distinguished from *C. citrullina* Cooke and considers the collection as *Cercospora citrullina* Cooke.

C. cocculi Syd.—On leaves of *Cocculus hirsutus* (L) Diels., Tandojam, I.M.I. 91434.

C. corchori Sawada.—On leaves of *Corchorus trilocularis* L, Tandojam, I.M.I. 90198.

C. cruenta Sacc.—On leaves of *Dolichos lablab* L, Tandojam, I.M.I. 86799; and *Vigna catjang* Endl., Tandojam, I.M.I. 90124.

C. dalbergiae—latifoliae Chiddarwar.—On leaves of *Dalbergia sissoo* Roxb., Tandojam, I.M.I. 91429. Mr. Deighton doubts if this could be distinguished from *C. canescens* Ell. and Mart.

C. dicanthii S. A. Khan and Kamal.—On leaves of *Dichanthium annulatum* (Forsk.) Stapf, Dokri, I.M.I. 104699 and 106207 (S. A. Khan and Riaz Ahmad Khan).

C. erythrinicola Tharp.—On leaves of *Erythrina suberosa* Roxb., Tandojam, I.M.I. 90188.

C. ficina Thrap.—On leaves of *Ficus carica* L, Tandojam, I.M.I. 90191 (b); and *F. religiosa* L, Tandojam, I.M.I. 90125 (S. Tahir).

C. furturella Speg.—On leaves of *Boerhaavia diffusa* L, Tandojam, I.M.I. 90782 and 91476.

C. glycyrrhiza—echinatae (Savul. and Sandu.) Chupp.—On leaves of *Glycyrrhiza glabra* L, Tandojam, I.M.I. 98482 and 86800 (a).

C. gossypina Cooke.—On leaves of *Gossypium arboreum* L, I.M.I. 90123; and *G. hirsutum* Cav., Tandojam and Mirpur Bathoro, I.M.I. 89672.

C. helianthicola Chupp and Viegas.—On leaves of *Helianthus annuus* L, Tandojam, I.M.I. 90189.

C. ipomoeae Wint.—On leaves of *Convolvulus arvensis* L, Tandojam and Mirpur Bathoro, I.M.I. 104327 (a).

C. lathyri—aphacae Lall, Gill and Munjal.—On leaves of *Lathyrus aphaca* L, Hyderabad, I.M.I. 118514.

C. lepidagathidis Govindu and Thirumalachar.—On leaves of *Lepidagathis hyalina* Nees, Tandojam, I.M.I. 91433.

C. lippiae Ell. and Ev.—On leaves of *Lippia nodiflora* (Lam) Michaux, Dokri, I.M.I. 107266.

C. macutensis Syd.—On leaves of *Corchorus trilocularis* L, Tandojam, I.M.I. 78462.

C. malayensis Stev. and Solh.—On leaves of *Hibiscus esculentus* L, Tandojam, I.M.I. 90183.

*Mr. Deighton informs that he does not see how *C. crotalariae* Sacc. differs from *C. canescens*.

†Mr. Deighton informs that it is preferable to call it *C. canescens* rather than *C. psoraleae* Ray.

- C. mali* Ell. and Ev.—On leaves of *Pyrus malus* L, Tandojam and Hyderabad, I.M.I. 89014.
- C. mitteriana* Syd.—On leaves of *Dodonaea viscosa* (L) Jacq., Tandojam, I.M.I. 90182.
- C. pakistanica* S. A. Khan and Kamal.—On leaves of *Phyllanthus niruri* L, Tandojam, I.M.I. 98168.
- C. papavericola* Chupp.—On leaves of *Argemone mexicana* L, Tandojam, I.M.I. 90184.
- C. pentatropidis* S. A. Khan.—On leaves of *Pentatropis cynanchoides* R. Br., Tandojam and Mirpur Khas, I.M.I. 78464.
- C. phyllanthicola* S. A. Khan and Kamal.—On leaves of *Phyllanthus niruri* L, Tandojam, I.M.I. 89669 and 90199 (a).
- C. punicae* P. Henn.—On leaves of *Punica granatum* L, Mirpur Khas, I.M.I. 90855, (S. Tahir).
- C. ricinella* Sacc. and Berl.—On leaves of *Ricinus communis* L, Tandojam, I.M.I. 90180 (S. Tahir and S. A. Khan).
- C. runicis* Pavgi and Singh.—On leaves of *Rumex dentatus* L, Hyderabad, Dokri, and Tandojam, I.M.I. 104696.
- C. salvadorae* Maire.—On leaves of *Salvadora oleoides* Decne, Mirpur Khas, I.M.I. 76525; and *S. persica* L, Tandojam, I.M.I. 76525.
- C. sesami* Zimm.—On leaves of *Sesamum indicum* DC, Tandojam, I.M.I. 90181 (S. A. Khan and S. Tahir).
- C. sesbaniae* P. Henn.—On leaves of *Sesbania aegyptiaca* Poir., Tandojam and Tando Mohd. Khan, I.M.I. 90196.
- C. shelliana* Reichert.—On leaves of *Morus alba* L, Tandojam, I.M.I. 90195.
- C. subsessilis* Syd.—On leaves of *Azadirachta indica* Juss., Tandojam, I.M.I. 89248.
- C. tabernaemontanae* H. and P. Sydow.—On leaves of *Tabernaemontana coronaria* Br., Tandojam, I.M.I. 91426 (as *C. peregrina* Chupp). Chupp considers the collection as immature form of *C. tabernaemontanae*.
- C. taurica* Franzschel.—On leaves of *Heliotropium eichwaldi* Steud., Tandojam and Oderolal, I.M.I. 93452 and 104326 (S. Tahir and S. A. Khan).
- C. traversiana* Sacc.—On leaves of *Trigonella foenum—graecum* L, Tandojam, I.M.I. 91427.
- C. withaniae* H. and P. Sydow.—On leaves of *Withania somnifera* (L) Dunal, Tandojam and other places, I.M.I. 104328.
- C. xanthicola* Heald and Wolf.—On leaves of *Xanthium strumarium* L, Tandojam and Rahuki, I.M.I. 90197 (a), (S. Tahir and S. A. Khan).
- C. zebrina* Passer.—On leaves of *Trifolium alexandrinum* L, Tandojam; and *T. resupinatum* L, Tandojam, I.M.I. 87308.
- C. zizyphi* Petch.—On leaves of *Zizyphus nummularia* (Burm. f.) Wt. and Arn., Tandojam, I.M.I. 91428.

Cladosporium Schw:

Cladosporium colocasiae Sawada.—On leaves of *Colocasia antiquorum* Schott., Tandojam, I.M.I. 91448 (S. A. Khan and A. Basit).

C. herbarum (Pers.) Link ex Fr.—On leaves of *Capsicum* sp., Tandojam, I.M.I. 91444; and on inflorescence of *Linum usitatissimum* L, Tandojam, I.M.I. 112603 (b).

C. heterophragmatis S. A. Khan and Kamal.—On leaves of *Heterophragma adenophyllum* Seem., Tandojam, I.M.I. 90787 and 123894.

C. roesleri Cattan.—On leaves of *Vitis vinifera* L, Tandojam, I.M.I. 79797 (a) and 83452.

C. sphaerospermum Penzig.—On pods of *Albizia lebbek* Benth., Tando Mohd. Khan, I.M.I. 123902; on leaves of *Gossypium arboreum* L, Tandojam, I.M.I. 103549; *Hordeum vulgare* L, Tandojam, I.M.I. 112610; *Luffa aegyptiaca* Mill., Tandojam I.M.I. 103550; and on sterile ear-heads of *Oryza sativa* L, Tandojam, I.M.I. 103551.

C. variable (Cooke) De Vries.—On leaves of *Spinacea oleracea* L, Tandojam, I.M.I. 98483.

Cladosporium sp.—On leaves of *Celosia cristata* L, Tandojam, I.M.I. 91436 (a), and *Glycine max* (L) Merrill, Tandojam, I.M.I. 103555 (c).

Clasterosporium Schw:

Clasterosporium scirpicola (Fuckel) Sacc.—On leaves of *Scirpus tuberosus* Desf., Dokri, I.M.I. 107261. Dr. Ellis remarks that this may be the imperfect state of *Pleospora scirpicola* (DC) Karst.

Curvularia Boedijn:

Curvularia lunata (Wakker) Boedijn.—On leaves of *Glycine max* (L) Merrill, Tandojam, I.M.I. 103555 (e).

C. penniseti (Mitra) Boedijn.—On leaves of *Pennisetum typhoideum* Rich., Tandojam, I.M.I. 89671 and 90151 (b). (S. A. Khan and S. Tahir).

C. spizifera (Bainier) Boedijn.—On leaves of *Glycine max* (L) Merrill, Tandojam, I.M.I. 103555 (d).

C. verruculosa Tandon and Bilgrami.—On seeds of *Oryza sativa* L, Dokri, I.M.I. 114740 (G. R. Solangi).

Fumago Pers. ex Sacc:

Fumago vagans Pers.—On insect secretions on the leaves of *Gossypium hirsutum* Cav., Kisan Mori near Tandojam, I.M.I. 123903.

Hadrotrichum Fuckel:

Hadrotrichum phragmitis Fuckel.—On leaves of *Phragmites karka* (Retz.) Trin., Tandojam, Hyderabad, and other places, I.M.I. 91440.

Helminthosporium Link. ex Fr.

Helminthosporium avenae Eidam.—On leaves of *Avena sativa* L, Denisar Farm, Mirpur Khas, I.M.I. 91447. This is the imperfect state of *Pyrenophora avenae* Ito.

H. hawaiiense Bugnicourt.—On leaves of *Glycine max* (L) Merrill, Tandojam, I.M.I. 103555 (b); *Musa sapientum* L, Tandojam, I.M.I. 125077, (Talib Husain); and *Pennisetum typhoideum* Rich., Tandojam, I.M.I. 90151 (a) and 89670 (S. Tahir and S. A. Khan).

H. sorghicola Lefebvre and Sherwin.—On leaves of *Sorghum* sp. (an exotic grass from U.S.A.—a cross between Johnson × 4n Sudan), Tandojam, I.M.I. 88667.

H. teres Sacc.—On leaves of *Hordeum vulgare* L, Tandojam, I.M.I. 87309 and 91442. This is the imperfect state of *Pyrenophora teres* Drechsler.

H. turcicum Pass.—On leaves of *Sorghum vulgare* Pers., Tandojam, I.M.I. 90150. This is the imperfect state of *Trichometasphaeria turcica* Luttrell.

Nigrospora Zimm:

Nigrospora oryzae (Berk and Br.) Petch.—On

leaves of *Colocassia antiquorum* Schott., Tandojam, I.M.I. 93436.

Passalora Fr. and Mont:

Passalora foeniculi Kamal and S. A. Khan.—On leaves, peduncles, and stems of *Foeniculum vulgare* Maill., Tandojam, I.M.I. 80141, (A. Hamid and S. A. Khan). Mr. Deighton remarks that the present collection has been wrongly identified in many herbaria (including New Delhi) as *Cercospora foeniculi* P. Magnus, but is quite different from the fungus which Magnus described and figured, and is a *Passalora*.

P. personata (Berk. and Curt.) S. A. Khan and Kamal.—On leaves of *Arachis hypogaea* L, Tandojam, I.M.I. 83610. This is a new combination. Mr. Deighton remarks that *Cercospora personata* (B. and C.) Ellis and Ever. is not a good *Cercospora* and resembles several species which have been placed in *Passalora*.

P. tephrosiae S. A. Khan and Kamal.—On leaves of *Tephrosia tenuis* Wall., Tandojam, I.M.I. 78465.

Polythrincium Kze. and Schm. ex Fr.

Polythrincium trifolii Kze.—On leaves of *Trifolium resupinatum* L, Tandojam, I.M.I. 93453 (as *Dothidella trifolii* Bayliss—Elliott and Stansfield). This is the imperfect state of *Dothidella trifolii*.

Pseudocercospora Spegazzini

Pseudocercospora vitis (Lev.) Speg. Syn. *Cercospora viticola* (Ces.) Sacc.—On leaves of *Vitis vinifera* L, Tandojam and Mirpur Khas, I.M.I. 79887. In a few conidia longitudinal septa have also been seen.

Stemphylium Wallr:

Stemphylium dendriticum Sousa da Camara.—On seeds of *Triticum vulgare* Vill., Tandojam, I.M.I. 100989.

Stigmina Sacc:

Stigmina esfandiarü Petrak.—On leaves of *Vitis vinifera* L, Tandojam, I.M.I. 73622 and 104708 (a).

Family: TUBERCULARIACEAE

Fusarium Link ex Fr:

Fusarium coeruleum (Lib.) Sacc.—From roots of *Arachis hypogaea* L, Tandojam, I.M.I. 85593.

F. dimerum Penzig.—On seeds of *Gossypium hirsutum* Cav., Tandojam, I.M.I. 100979.

F. moniliforme Sheld.—On fruits of *Musa sapientum* L., Tandojam, I.M.I. 94516.

F. oxysporum Schlecht. ex Fr.—From roots of *Cuminum cyminum* L., Tandojam, I.M.I. 92723; *Gossypium hirsutum* Cav., I.M.I. 92718; *Lathyrus sativus* L., I.M.I. 92717; and from tubers of *Solanum tuberosum* L., Tandojam, I.M.I. 90349.

F. sambucinum Fuckel.—From leaves of *Salvadora oleoides* Decne., Tandojam, I.M.I. 100987 (S. Tahir)

F. semitectum Berk. and Rav.—From bolls of *Gossypium arboreum* L., *G. hirsutum* Cav., Tandojam, I.M.I. 92719 and 92720 (Akbar Khan); and from stalk of *Musa sapientum* L., Tandojam, I.M.I. 125081 (Talib Husain).

F. solani (Mart.) Sacc.—From roots of *Gossypium hirsutum* Cav., Tandojam, I.M.I. 125082 (Khamiso Khan); *Linum usitatissimum* L., Tandojam, I.M.I. 114746; and from tubers of *Solanum tuberosum* L., Tandojam, I.M.I. 90348.

Myrothecium Tode ex Fr.

Myrothecium roridum Tode ex Fr.—On leaves of *Xanthium strumarium* L., Tandojam and Rahuki, I.M.I. 90197 (b) (S. Tahir and S. A. Khan).

Family: STILBACEAE

Trichurus Clem. and Shear:

Trichurus spiralis Hasselbring.—From tubers of *Solanum tuberosum* L., Hyderabad, I.M.I. 85590 (S. Tahir).

Order: MELANCONIALES

Family: MELANCONIACEAE

Ahmadia Petr:

Ahmadia pentatropidis Syd.—On leaves of *Pentatropis cynanchoides* R. Br., Sakrand and Dhoro Naro, I.M.I. 113937.

Colletogloeum Petr:

Colletogloeum sissoo (Ahmad) Sutton.—On leaves and pods of *Dalbergia sissoo* Roxb., Tandojam, I.M.I. 90789 (b). *Cercospora dalbergiae* (Ahmad) Petr., *C. sissoo* Syd., and *Septogloeum dalbergiae* Ahmd. are synonyms of *Colletogloeum sissoo*.

Colletotrichum Corda:

Colletotrichum capsici (Syd.) Bult. and Bisby.—

On fruits of *Capsicum annum* L., Tandojam, I.M.I. 93451.

C. dematium (Pers. ex Fr.) Grove.—On fruits of *Carica papaya* L., Tandojam and Mirpur Khas, I.M.I. 93437 (G. R. Solangi). Mr. Sutton remarks that the isolate is more typical of *C. dematium* than *C. capsici* (Syd.) Bult. and Bisby.

C. graminicola (Cés) Wilson.—On leaves of *Echinochloa colonum* (L) Link., Tandojam, I.M.I. 90788 (S. Tahir).

C. indicum Dastur.—On leaves of *Gossypium hirsutum* Cav., Tandojam, I.M.I. 90146. Mr. Sutton remarks that the taxonomy of curved spored *Colletotricha* on Malvaceae is very confused at the moment and until further work is done they are maintaining the name *C. indicum*.

Microstroma Niessl:

Microstroma cadabae Thirumalachar and Narasimhan.—On leaves of *Cadaba fruticosa* (L) Druce, Tandojam, I.M.I. 91445.

M. cassicola S. A. Khan and Kamal.—On leaves of *Cassia holosericea* Fres., Thana Bula Khan and Tandojam, I.M.I. 115306.

Ramulispora Miura:

Ramulispora sorghicola Harris.—On leaves of *Sorghum vulgare* Pers., Tandojam, I.M.I. 112599 (S. A. Khan and Akhlaq Rasool). Recorded in the sclerotial state.

Order: SPHAEROPSIDALES

Family: SPHAEROPSIDACEAE

Botryodiplodia Sacc:

Botryodiplodia theobromae Pat.—From roots of *Arachis hypogaea* L., Tandojam, I.M.I. 85592; and fruits of *Citrus aurantifolia* Sw., I.M.I. 125079 (Talib Husain).

Dendrophoma Sacc:

Dendrophoma sissoo (Died) ined.— On leaves of *Dalbergia sissoo* Roxb., Tandojam, I.M.I. 90789 (a).

Dendrophoma sp.—On leaves of *Vitis vinifera* L., Tandojam, I.M.I. 90790.

Dothiorella Sacc:

Dothiorella jaapiana Petrak.—On leaves of *Nerium indicum* Mill., Dao, near Thana Bulla Khan,

I.M.I. 115305. According to Dr. Mordue the collection shows some characters intermediate between *Phyllosticta nerii* West and *Dothiorella jaapiana* Pet. In a further communication he informs that it is probable that it is *D. jaapiana*, but suspects that if it were described for the first time today, it might be placed in *Phyllostictina* rather than either *Phyllosticta* or *Dothiorella*.

Macrophomina Petrak:

Macrophomina phaseoli (Maubl.) Ashby.—From roots of *Corchorus olitorius* L, Tandojam, I.M.I. 122120; stem of *Glycine max* (L) Merrill, I.M.I. 112249 (Talib Husain); roots of *Gossypium hirsutum* Cav., I.M.I. 122119, (Khamiso Khan); stem of *Kochia indicum* Wight, I.M.I. 125078; and roots of *Sesamum indicum* DC., Tandojam, I.M.I. 122118.

Phyllosticta Pers. ex Desm.

Phyllosticta sp.—On leaves of *Gossypium hirsutum* Cav., Tandojam, I.M.I. 90152.

Septoria Sacc:

Septoria eclipterae Sawada.—On leaves of *Eclipta alba* (L) Hassk., Tandojam, I.M.I. 90149 (S. Tahir).

S. launae S. A. Khan and Kamal.—On leaves of *Launaea nudicaulis* (L) Hk. f., Tandojam, I.M.I. 87307.

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- Phaseolus aureus* Roxb.
Cercospora canescens Ell. and Mart.
- Phaseolus mungo* L.
Cercospora canescens Ell. and Mart.
Erysiphe polygmi DC.
- Phaseolus trilobus* (L.) Ait.
Oidium sp.
- Phoenix sylvestris* Roxb.
Graphiola phoenicis (Moug.) Poit.
- Phragmites karka* (Retz.) Trin.
Hadrotrichum phragmitis Fuckel
Puccinia trabutii Roum. and Sacc.
- Phyllanthus niruri* L.
Cercospora pakistanica S. A. Khan and Kamal
Cercospora phyllanthicola S. A. Khan and Kamal
Leveillula taurica (Lev.) Arnaud
- Physalis minima* L.
Alternaria tenuissima (Nees ex Fr.) Wiltshire
Oidium sp.
- Pisum sativum* L.
Erysiphe polygmi DC.
- Portulaca oleracea* L.
Albugo portulacae (DC) Kunze
- Prosopis glandulosa* Torr.
Oidium sp.
- Prunus persica* S. and Z.
Tranzschelia discolor (Fackl.) Trawz and Litv.
- Punica granatum* L.
Cercospora punicae P. Henn.
- Pyrus malus* L.
Cercospora mali Ell. and Ev.
Podosphaera leucotricha (Ellis and Everh.) Salm.
Venturia inaequalis (Cooke) Wint.
- Raphanus sativus* L.
Alternaria brassicae (Berk.) Sacc.
Peronospora parasitica (Pers. ex Fr.) Fr.
- Rhynchosia aurea* DC.
Cercospora canescens Ell. and Mart.
- Rhynchosia minima* (L) DC.
Cercospora canescens Ell. and Mart.
Leveillula taurica (Lev.) Arnaud
- Ricinus communis* L.
Alternaria ricini (Yoshii) Hansford
Cercospora ricinella Sacc. and Berl.
Leveillula taurica (Lev.) Arnaud
- Rosa damascena* Tourn.
Sphaerotheca pannosa (Wallr.) Lev.
- Rumex dentatus* L.
Cercospora rumicis Pavgi and Singh
Ramularia pakistanica S. A. Khan and Kamal
Uromyces rumicis (Schum) Wint.
- Saccharum Officinarum* L.
Cochliobolus spicifer Nelson
Ustilago scitamineae Syd.
- Saccharum spontaneum* L.
Puccinia kuehnii Butl.
- Salvadora oleoides* Decne
Cercospora salvadorae Maire
Fusarium sambucinum Fuckel
Hansfordia canescens (Speog.) Hughes
- Salvadora persica* L.
Cercospora salvadorae Maire
Glomerella cingulata (Stonem.) Spauld, and Sch.
Leveillula taurica (Lév.) Arnaud
- Scirpus maritimus* auctt.
Uromyces lineolatus (Desm.) Schroet.
- Scirpus tuberosus* Desl.
Clasterosporium scirpicola (Fuckel) Sacc.
Puccinia scirpi DC.
- Sesamum indicum* DC.
Botryosphaeria ribis Grossenb. and Dagg.
Cercospora sesami Zimm.
Leveillula taurica (Lév.) Arnaud
Macrophomina phaseoli (Maubl.) Ashby
Oidium sp.
- Sesbania aegyptiaca* Poir
Cercospora sesbaniae P. Henn.
- Setaria verticillata* (L) Beauv.
Uromyces setariae-italicae Yosh

- Solanum melongena* L.
Leveillula taurica (Lev.) Arnaud
- Solanum nigrum* L.
Cercospora atromarginalis Atk.
Leveillula taurica (Lev.) Arnaud
- Solanum tuberosum* L.
Alternaria solani (Elli. and Mart.) Jones and Grout.
Fusarium oxysporum Schlecht. ex Fr.
Fusarium solani (Mart.) Sacc.
Trichurus spiralis Hasselbring
- Sonchus oleraceus* L.
Alternaria tenuissima (Nees ex Fr.) Wiltshire
Bremia lactucae Rogel.
Leveillula taurica (Lev.) Arnaud
- Sorghum halepense* (L.) Pers.
Cochliobolus heterostrophus (Drechsler) Dreschler
- Sorghum vulgare* Pers.
Helminthosporium turcicum Pass.
Ramulispora sorghicola Harris
Sphacelotheca cruenta (Kuehn) Potter
Sphacelotheca sorghi (Link.) Clinton
Tolyposporium ehrenbergii (Kuehn.) Pat.
- Sorghum* sp.
Helminthosporium sorghicola Lefebvre and Sherwin
- Spinacea oleracea* L.
Alternaria tenuissima (Nees ex Fr.) Wiltshire
Cercospora beticola Sacc.
Cladosporium variabile (Cooke) De Vries
Oidium sp.
- Sporobolus glaucifolius* Hochst. ex Steud.
Phyllachora vulgata Theiss and Syd.
- Suaeda fruticosa* (L.) Forsk.
Peronospora vistulensis Wrob.
Uromyces giganteus Speg.
- Tabernaemontana coronaria* Br.
Cercospora tabernaemontanae H. and P. Sydow
- Tagetes erecta* L.
Leveillula taurica (Lév.) Arnaud
- Tephrosia tenuis* Wall.
Passalora tephrosiae S. A. Khan and Kamal
- Tribulus terrestris* L.
Peronospora tribulina Passerini
- Trifolium alexandrinum* L.
Cercospora zebrina Passer.
Physoderma sp
Uromyces trifolii (Hedw.) Lév.
- Trifolium resupinatum* L.
Cercospora zebrina Passer.
Oidium sp.
Peronospora trifoliorum de Bary
Polythrincium trifolii Kze.
Uromyces trifolii (Hedw.) Lév.
- Trigonella foenum-graecum* L.
Cercospora traversiana Sacc.
Leveillula taurica (Lév.) Arnaud
Peronospora trifoliorum de Bary
- Triticum vulgare* Vill.
Alternaria tenuissima (Nees ex Fr.) Wiltshire
Cochliobolus spicifer Nelson
Puccinia graminis Pers.
Puccinia recondita Rob. ex Desm.
Puccinia striiformis Westend
Stemphylium dendriticum Sousa da Camara
Ustilago nuda (Jens.) Rostr.
- Tropaeolum majus* L.
Leveillula taurica (Lév.) Arnaud
- Verbena laciniata* (L.) Briq.
Leveillula taurica (Lév.) Arnaud
- Vicia sativa* L.
Peronospora viciae (Berk.) Casp
- Vigna catjang* Endl.
Cercospora cruenta Sacc.
- Vitis vinifera* L.
Cladosporium roesleri Cattan
Dendrophoma sp.
Hansfordia ugandensis (Hansf.) Hughes
Pseudocercospora vitis (Lév.) Speg.
Stigmia esfandiarii Petrak
- Volutarella divaricata* (DC) Benth and Haok. f.
Alternaria zinniae Pape
- Withania somnifera* (L.) Dunal
Cercospora withaniae H. and P. Sydow
- Xanthium strumarium* L.
Cercospora xanthicola Heald and Wolf
Myrothecium roridum Tode ex Fr.
Oidium sp.
- Zea mays* L.
Puccinia sorghi Schw.
- Zinnia elegans* Jacq.
Erysiphe cichoracearum DC.
- Zizyphus jujuba* Lam.
Hansfordia ugandensis (Hansf.) Hughes
Phakopsora zizyphi-vulgaris (P. Henn.) Diet.

- Zizyphus nummularia* (Burm. f.) W. and A.
Cercospora zizyphi Petch.
Oidium p.
Phakopsora zizyphi-vulgaris (P. Henn.) Diet.

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