A Host Index of Fungi of the Malay Peninsula. II.

HEPTAPLEURUM, sp. (Araliaceae).

In the Singapore Gardens, C. F. Baker, collected *Lembosia heptapleuri*, Sacc. sp. nov. (*Hysteriaceae*) on the leaves of this plant.

HEVEA BRASILIENSIS, Muell. (*Euphorbiaceae*). Para Rubber Tree.

A list of the fungi found on this tree was published in "The Garden's Bulletin," Vol. II, No. 6.

HIBISCUS ROSA-SINENSIS, L. (*Malvaceae*).

A. Sharples found that the fungus causing the "die-back," which often affects an ornamental Hibiscus hedge after it has been pruned, is due to a species of *Fusarium* (*Tuberculariaceae*). Spraying with Bordeaux mixture after pruning is recommended as a preventative.

HIBISCUS SABDARIFFA, L. Jamaica or Red Sorrel. The Rozelle.

C. F. Baker records two fungi on the dying stems of this plant. *Dothiorella rugulosa*, Sacc. sp. nov. (*Sphaerioidaceae*) causing black warty excrescenses to appear, and *Diplodia hibiscina*, C. and Ell. var. *subdariffae* Sacc. var. nov. (*Sphaerioidaceae*), which appears as minute black pimples.

HIBISCUS, spp.

Brooks records this as one of the many hosts on which he has found Pink Disease, *Corticium salmonicolor*.

ICHNANTHUS PALLENS, Munro. (*Gramineae*).

Recorded by Bancroft as having its inflorescence attacked by *Balansia asperata*, Massee. (*Hypocreaceae*).

Another species of the same genus was similarly attacked by *Balansia sessilis*, Massee.

IMPERATA ARUNDINACEA, Cyr. (*Gramineae*). Lalang grass.

A rust, *Uredo imperatae*, P. Magn. (*Uredinaceae*) is recorded by Bancroft as being found on this grass.

INDIGOFERA ARRECTA, Hochst. (*Leguminosae*) Otaheite Chestnut.

Three fungi are recorded by Baker on the rotting fruits of this plant in the Singapore Gardens. *Phoma inocarpi*, Sacc. sp. nov., *Diplodia inocarpi*, Sacc. sp. nov., and *Gloeosporium inocarpi* Sacc. sp. nov. (*Sphaerioidaceae*).

JUSTICIA GENDARUSSA, L. (*Acanthaceae*).

Brown discoloured areas on the leaves of this plant were found to be caused by a smut, *Ustilago Thwaitesii*, Berkl. (*Ustilaginaceae*), *Herb. Singapore*.

KOOMPASSIA MALACCENSIS, Maing. (*Leguminosae*).

Mentioned by Bancroft as a well known jungle host of *Fomes lignosus*.

KORTHALSIA GRANDIS, Ridl. (*Palmaceae*).

Baker records *Melanconium melanoxanthum* B. and Br. (*Melanconiaceae*) as being found on dead petioles and rachises at Singapore.

LANSIUM DOMESTICUM, Jack. (*Meliaceae*). Langsat.

Recorded by Brooks amongst the hosts of Pink Disease.

LASIA HETEROPHYLLA, Schott (*Aroideae*).

Baker records *Sphaerella lasiana,* Sacc. sp. nov. as occurring on the leaves of this plant. It causes grey brown circular blisters, the fungus fructifications appearing as black specks.

LICUALA, spp. (*Palmaceae*).

Several species of fungi were found on the leaves and rachises of these palms by Baker at Singapore. *Melanconium melanoxanthuum* B. and Br. (*Melanconiaceae*), *Sepedonium dubium* Sacc. sp. nov. (*Moniliaceae*), *Coniosporium vacuolatum* Sacc. sp. nov. (*Dematiaceae*), and *Cercospora virens* Sacc. sp. nov. (*Dematiaceae*), all appear as small black excrescenses on the rachises. *Helminthosporium macrurum* Sacc. sp. nov. (*Dematiaceae*) appears as black dots on the leaves.

LIVISTONA COCHIN-CHINENSIS, Blume (*Palmaceae*). Serdang.

Mentioned by Bancroft as being one of the jungle hosts of *Fomes lignosus*. *Melanconium melanoxanthum* B. and Br. (*Melanconiaceae*) and *Winterina Bakeriana,* Sacc. sp. nov. (*Sphaeriaceae*) are recorded by Baker from Singapore as being found on the dead leaves and rachises.

LYCOPERSICUM ESCULENTUM, Mill. (*Solanaceae*). The Tomato.

In Bancroft's list of diseases published in 1911 he mentions as having found two fungi on locally grown tomato plants. *Bacillus solanacearum* (*Bacteriaceae*) which causes a wilting of the plants and a brown colouring of the stem occurs so badly in some parts as to render the successful growing of these plants almost impossible. A mildew, *Erysiphe Polygoni*, D. C. (*Erysiphaceae*) was also found on plants growing at Taiping.

MACARANGA GRIFITHIANA, Muell.-Arg. (*Euphorbiaceae*).

Ridley records a specimen of this tree which had been used for bridging as bearing *Eutypa caulivora,* Mass. (*Sphaeriaceae*). He considered it had attacked the plant after it had been cut down. It appears as black asphalt—like fructifications on the stem.

MALLOTUS sp. (*Euphorbiaceae*).

Specimens in the Singapore herbarium show leaves of this plant as being attacked by a species of *Sphaerella* (*Sphaeriaceaae*) and *Pestalozzia* (*Melanconiaceae*). Both fungi cause light brown circular spots on the leaves.

MANGIFERA INDICA, Linn. (*Anacardiaceae*). Mango.

Only three fungi have so far been definitely recorded on locally grown trees for this species. *Gloeosporium mangiferae* Noack, (*Melanconiceae*) which Bancroft describes as developing black spots on the fruit. These spots increase in size and run together until sometimes the whole surface is affected, the pulp becoming soft. Baker found two leaf fungi, one the common black leaf mildew, *Meliola mangiferae*, Earle, (*Perisporiaceae*) the other *Zimmermanniella trispora*, P. Henn. (*Dothideaceae*), occurring as raised black knobs on the leaves.

MANIHOT UTILISSIMA, Pohl. (*Euphorbiaceae*). Tapioca. Cassava.

Bancroft records *Cercospora Cearae*, Petch, (*Dematiaceae*) as causing leaf spots on this plant, and also a curious occurrence of *Fomes lignosus* on the tuberous roots, this latter fungus being admittedly a wood destroyer.

MUSA, sp. (*Scitamineae*). Banana.

The fact that only one fungus has been definitely recorded for this plant in Malaya, is without doubt, only due to the fact that it has so far not received much attention locally. *Gloeosporium musarum* Cke. and Massee (*Melanconiaceae*) is included in Bancroft's list, as occurring on the ripe fruits.

NEPHELIUM LAPPACEUM, Linn. (*Sapindaceae*). Rambutan.

A black mould, *Meliola nephelii*, Sacc. sp. nov. (*Perisporiaceae*) was collected on the leaves of this species by Baker, at Singapore. It is rather surprising that hitherto no other fungi have been recorded for this popular fruit.

ONCOSPERMA FILAMENTOSUM, Blume (*Palmaceae*). Nibong.

Bancroft quotes this as one of the jungle hosts of *Fomes lignosus*.

ORMOSIA SUMATRANA, (Leguminosae).

Baker collected specimens of *Lembosia hormosiana* Sacc. sp. nov. (*Hysteriaceae*) on the leaves of this plant.

ORYZA SATIVA, Linn. (*Gramineae*). Rice.

Only one fungus disease can so far be found definitely recorded for this important crop in Malaya. A smut, *Ustilago virens* Cke. (*Ustilaginaceae*) is mentioned by Bancroft as being parasitic on grains of rice in Perak.

PALAQUIUM OBLONGIFOLIUM, Burck. (*Sapotaceae*) Gutta percha. Taban.

Bancroft records *Laestadia palaquii,* Banc. (*Sphaeriaceae*) as causing a leaf spot disease of this plant, which in the seedling stage often proves fatal.

PANDANUS PENANGENSIS, Ridl. and

PANDANUS UTILIS, Bory. (*Pandanaceae*). Screw Pine.

On the leaves of both of the species Baker found *Lembosia pandani* Sheiss, (*Hysteriaceae*).

PASPALUM, sp. (*Gramineae*).

Ridley collected a specimen of this grass with its lateral branches distorted by *Hypocrella panici,* Mass. (*Hypocreaceae*).

PASPALUM, sp. (*Gramineae*).

Chaetostroma cladosporioides, Sacc. (*Tuberculariaceae*) was collected by Baker in Singapore on the dead fruits of this grass.

PINANGA, sp. (*Palmaceae*).

In a part of the Garden's Jungle at Singapore, that is being devastated by a fungus a species of *Rosellinia* (*Sphaeriaceae*) that was found on a dead stem of this palm seems chiefly responsible. The species cannot be determined at present, but is near *R. parasitica* E. and Ev.

PIPER, sp. (*Piperaceae*). Pepper.

The various species of pepper in local cultivation have not received much attention at the hands of the pathologists. Only two fungi are recorded for them. *Colleototrichum necator* Mass. (*Melanconiaceae*) was found by Ridley attacking the fruiting spikes and causing them to blacken and fall off. A species of *Diplodia* (*Sphaerioidaceae*) was at the same time observed growing on the roots.

PISCIDIA ERYTHRINA, Linn. (*Leguminosae*). Fish Poison Tree.

Baker records two fungi as growing on the dead limbs of this tree. *Dothiorella stratosa,* Sacc. (*Sphaerioidaceae*) causing black excrescences, and *Hymenula socia* Sacc. (*Tuberculariaceae*).

PLECTOCOMIA, sp. (*Palmaceae*).

Four fungi were found by Baker all appearing as black specks on the dead leaves and rachises of this Rotan.

Graphiola macrospora, Penz. and Sacc. *Melanconium melanoxanthum,* B. and Br. (*Melanconiaceae*) *Arthrobotryum socium,* Sacc. (*Stilbaceae*) and *Exosporium macrurum,* Sacc. (*Tuberculariaceae*).

POLYTRIAS PRAEMORSA, Hack.

A smut, *Ustilago polytriadis* Mass (*Ustilaginaceae*) is recorded on the ovaries of this plant.

PTEROCARPUS INDICUS, Willd. (*Leguminosae*).

Owing to the loss of so many famous avenues of this tree in the country it has received more attention than other ornamental trees. Consequently six fungi have so far been reported as having been found growing on it, although except the leaf fungi all were collected on dead stumps. It is possible however, that some may be responsible for hastening its death, the fungus fructifications only appearing at a later stage when the damage is done, and in this connection the shiny chocolate brown bracket fungus, sometimes appearing with a false stalk, *Ganodermus lucidus* (*Polyporaceae*) is more than suspected. Other Polyporaceous bracket fungi recorded are *Polystictus hirsutus* Fr., and *Polystictus floridanus,* Sacc. The small white tomentose fan shaped *Schizophyllum commune* Fr. (*Agaricaceae*) is commonly found on dead wood but doubtless as a saprophyte only. Leaf fungi recorded are *Dothidella pterocarpi,* Mass. (*Dothideaceae*) and *Helminthosporium obovatum,* Mass. (*Dematiaceae*).

RHODOMYRTUS TOMENTOSA, Wight, (*Myrtaceae*). Kamunting.

Two fungi are recorded by Baker for this shrub *Dimerium singaporense* Sacc. (*Perisporiaceae*) and *Podosporium penicillium* Speg. (*Stilbaceae*).

ROSA, sp. (*Rosaceae*) Rose.

Only one fungus *Sphaerostilbe cinnabarina,* Tul. (*Hypocreaceae*) is recorded for our cultivated roses. It causes the branches to blacken and die.

SACCHARIUM OFFICINARUM, Linn. (*Gramineae*). Sugar Cane.

The fact that only one fungus is recorded for the Sugar Cane can only be attributed to the fact, that the cane had ceased to be cultivated locally as a first class crop, before the study of diseases was seriously attempted here. A red smut fungus, *Trichosphoeria sacchari* Mass. (*Sphaeriaceae*) is the only record we have.

SARACA, sp. (*Leguminosae*).

Microthyrium browneanum, Sacc. (*Microthyriaceae*) was collected by Baker at Singapore on the leaves of this shrub.

SELOSIA SUMATRENSIS, (*Gramineae*).

Singapore material in the herbarium shows the fruits of this grass to be infected with a smut *Ustilago flavo-nigrescens,* B. and C. (*Ustilaginaceae*).

SHOREA, sp. (*Dipterocarpaceae*), Meranti.

Bancroft's list of jungle hosts of Pink Disease includes this tree.

SOLANUM TUBEROSUM, Linn. (*Solanaceae*). Potato.

The bacterial disease *Bacillus solanacearum* was found on potato plants at Taiping by Bancroft.

STERCULIA, sp. (*Sterculiaceae*).

Dimerosporium albomarginatum, Sacc. (*Perisporiaceae*) was found by Baker on the leaves of this tree.

STROBILANTHES, sp. (*Acanthaceae*).

Recorded by Ridley as a host for Pink Disease.

TABERNAEMONTANA, sp. (*Apocynaceae*).

A brown leaf spot disease *Cercospora tabernaemontana* Syd. (*Dematiaceae*) is found on specimens in the Singapore herbarium from Taiping.

TEPHROSIA HOOKERIANA, Wight and Arn. (*Leguminosae*).

Sharples records a patch of this plant growing under rubber as being badly attacked by Pink Disease, and providing a centre of infection for the rubber.

THEA SINENSIS, Linn. (*Ternstroemiaceae*). Tea.

The "copper blight" *Laestadia Theae*, Rac. (*Sphaeriaceae*) is the only fungus actually on record, although instances of the blister blight *Pestalozzia* sp. (*Melanconiaceae*) are undoubtedly common.

THEOBROMA CACAO, Linn. (*Sterculiaceae*). Cocoa.

Another example of a host of Pink Disease, recorded by Brooks.

TRISTANIA GRIFITHII, Kurz. (*Myrtaceae*).

Brown circular leaf spots on the leaves of this shrub recently collected were found by Wakefield to be caused by a new species *Sphaerella Tristaniae* Wakf. (*Sphaeriaceae*).

WORMIA SUFFRUTICOSA, Griff. (*Dilleniaceae*).

A black leaf mildew *Meliola malaccensis* Sacc. sp. nov. (*Perisporiaceae*) is recorded by Baker as having been found on the leaves of this shrub.

ZALACCA EDULIS, Bl. (*Palmaceae*). Buah Salak.

Micropeltis marginata, Mont. (*Microthyriaceae*) causing brown discoloured area on the leaves, and also *Melanconium melanoxanthum* B. and Br. (*Melanconiaceae*) were collected by Baker in Singapore.

ZALACCA WALLICHIANA, Mart. (*Palmaceae*). Kumbak.

Micropeltis marginata is also recorded by Baker for the leaves of this species.

ZEA MAYS, Linn. (*Gramineae*). Indian Corn.

The smut *Ustilago Maydis* (*Ustilaginaceae*) is the only record for this crop. It destroys the cobs turning them into a sooty mass.

ZINGIBER, sp. (*Scitamineae*). Ginger.

Hypocrella zinziberis, Mass. (*Hypocreaceae*) was found by Ridley on the petioles of this plant. The fungus has a bright orange coloured stroma.

The above brings to a conclusion the summary of fungus diseases of plants in Malaya as hitherto definitely recorded. The list is small and many of our best known farm and garden plants have but a small record against them. This no doubt is due to the fact that the main crops, such as rubber, have hitherto engaged the attention of the few pathologists that have worked out here. As this work increases more attention will be able to be given to other plants quite important in themselves but not ranking with the main crops of the country. When the next revision of this list takes places it is certain to be considerably increased. In the meantime additions will be published in this Bulletin from time to time as they occur.

———— T. F. CHIPP.

Castor Oil as A Crop.

The Castor-oil plant (*Ricinus communis*), seems so far, to have attracted little notice in Malaya, and yet, when looked into its cultivation appears to offer fairly good prospects for the small planter, while the industry of mechanical expression of the oil offers a promising opening for the establishment of up-to-date mills.

It brings prompt returns to the cultivator and its product, whether in seed, or oil, or cake is in increasing demand from home at steadily advancing prices.

According to the Chemist and Druggist 28th February, 1920, the prices quoted by the pressers in Hull were £114 per ton for pharmaceutical oil—£111 for first pressing—£109, for second pressing. For medicinal French oil, the price was 120/- per cwt. in cases.

The present price (1st May, 1920) of Castor-oil in Singapore, obligingly supplied by the Secretaries of the Chamber of Commerce is quoted at $50 per case of 74 to 75 catties packed in 4 tins, or 0.66 per catty.

The Blue Book states that 861927 gallons of lubricating oils were imported into the Straits Settlements in 1918, the value being $1,036,943.

We cannot apportion the amount for which Castor-oil enters in this aggregate, but we know that being a heavy-bodied oil and the most viscous of all fatty oils, it occupies a large place among lubricants for machinery, especially for the oiling of fast moving machines.