A SYNOPSIS OF FOREST FUNGI OF SIGNIFICANCE IN NEW ZEALAND.

By T. T. C. BIRCH.

INTRODUCTION:

The object of this synopsis is to record, in readily available and condensed form, the fungi found to be of significance in the silviculture and utilization of New Zealand forests, indigenous and exotic.

References in literature to these fungi are, in the main, numerous and widely scattered; no attempt has been made to record a complete bibliography, but published work having a bearing on New Zealand conditions has been given preference.

As further evidence accumulates, additions and amendments will be necessary, particularly in the case of mycorrhizal fungi, a preliminary list of which is appended.

I am indebted to the Director of Forestry for permission to publish this synopsis.

AGARICACEAE.

ARMILLARIA MELLEA.


Distribution: Europe, America, India, Australia, New Zealand.


SCHIZOPHYLLUM COMMUNE.

Hosts (N.Z.) *Edwardsia microphylla, Salix sp., Acacia sp. Myoporum laetum, Beilschmiedia tawa.*

Distribution: Europe, Asia, America, New Zealand.


PHOLIOTA ADIPOSA.

Hosts (N.Z.) Hoheria angustifolia.
Distribution: Europe, America, New Zealand.
A common heart-rot of forest trees in America.

POLYPORACEAE.

FOMES ZEALANDICUS.

Distribution: New Zealand and Java.
Notes: An indigenous heart-rot on red beech (Coll. T.C.B. 1934) and on other hosts. Coll. and Iden. G.H.C. 1919, on fallen trees.

FOMES ROBUSTUS.

Hosts (N.Z.) Nothofagus fusca, N. menziesii, Eucalyptus spp.
Distribution: Britain, Europe, North America, Australia, New Zealand.

FOMES HEMITEPHRUS.

Hosts (N.Z.) Nothofagus menziesii, N. truncata, and N. fusca.
Distribution: Australia, and throughout New Zealand.

FOMES AUSTRALIS.

Distribution: Tropical Asia and America, Australia, New Zealand.
Notes: An indigenous fungus causing a serious heart-rot (white pocket) of beech, matai, and rimu. “It is perhaps, the largest fungus in the Dominion, for one specimen the writer has examined was 90 cm. in width.” (G.H.C.) Coll. and Iden. G.H.C. 1921.
FOMES APPLANATUS.
Hosts (N.Z.) *Podocarpus spicatus*, *Dacrydium cupressinum*.
Distribution: Europe, Asia, America, Australia and New Zealand.

POLYPORUS EUCALYPTORUM.
Hosts (N.Z.) *Nothofagus fusca*, *N. truncata*.
Distribution: Australia; New Zealand.
Notes: An indigenous fungus causing heart-rot of living red beech in Wellington and Rotorua districts. Coll. and Iden. G.H.C. 1921.
Fructifications, known in North as “Putawa” or “Hutu,” formerly used in dry condition by Maoris as tinder.

POLYPORUS BERKELEYI.
Hosts (N.Z.) *Nothofagus sp.*, *Dacrydium sp*.
Distribution: North America; Japan; Australia; New Zealand.
Notes: An indigenous fungus; Coll. and Iden. G.H.C. 1927, “at bases of trees growing in rich humus.”
Hubert (1927) records fungus as root and butt rot on a wide host range in N. America.

POLYPORUS VERSICOLOR.
(Syn. *Polystictus versicolor*)
Hosts (N.Z.) Timber of *Pinus radiata*, *Acacia spp*, *Nothofagus sp*, *Eucalyptus spp.*, *Quercus spp*.
Distribution: World-wide.
PORIA FERRUGINOSA.

(Syn. Fomes ferruginosus).


Distribution: Britain, New Zealand.


PORIA VAILLANTII.

Hosts (N.Z.) Timber of Pinus spp, Dacrydium cupressinum.

Distribution: Britain and New Zealand.

Notes: An indigenous fungus causing decay of timber in contact with moist soil. (Causes extensive decay of timber in mines in Britain.)


MERULIUS LACRYMANS.

Hosts (N.Z.) Timber of Pinus radiata, Podocarpus dacrydioides, Dacrydium cupressinum.

Distribution: Universal.

Notes: An indigenous fungus causing decay of timber. Coll. and Iden. T.C.B. in forest on kahikatea log, Ongarue, 1933.


TRAMETES CINNABARINA.

Hosts (N.Z.) Knightia excelsa, Cordyline australis, Dacrydium cupressinum.

Distribution: Europe, Siberia, New Zealand.


THELEPHORACEAE.

THELEPHORA TERRESTRIS.

Hosts (N.Z.) _Pinus radiata_ and nursery stock, generally.
Distribution: America, Europe, New Zealand.
Notes: This indigenous (?) "smother fungus" is not parasitic but grows upon the stems of seedlings and may smother less vigorous plants. Coll. and Iden. G.H.C., Weraroa, 1919.

STEREUM SANGUINOLENTUM.

Distribution: New Zealand and North America.
Notes: This indigenous fungus is one of the commonest causes of decay of wood in timber yards: attacks fillets and sawn timber in wet sites; sap decay of eucalpt power-poles. Coll. T.C.B. Iden. G.H.C. 1936. Also sapwood decay of slash and felled timber in pine plantations. Coll. and Iden. T.C.B., Rotorua, 1937.

UREDINEAE.

UROMYCLADIUM ROBINSONI.

Host (N.Z.) _Acacia melanoxylon._
Distribution: Australia, Tasmania, New Zealand.
Notes: An introduced rust fungus; does not produce galls and rarely causes fatal injuries. Coll. and Iden. G.H.C., Auckland province.
Reference: Cunningham, G. H. (1931) "Rust fungi of New Zealand." Dunedin.

UROMYCLADIUM ACACIAE.

Hosts (N.Z.) _Acacia dealbata, A. decurrens._
Distribution: Australia, Tasmania, New Zealand.
Notes: An introduced rust fungus; does not produce galls and rarely causes fatal injuries. Coll. and Iden. G.H.C., Auckland; Hawke's Bay.
Reference: Cunningham, G. H. (1931) "Rust fungi of New Zealand." Dunedin.

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UROMYCLADIUM NOTABILE.

Hosts (N.Z.) *Acacia dealbata*, *A. decurrens*, *A. verticillata*, *A. bayleyana*.

Distribution: Australia, Tasmania, New Zealand.


UROMYCLADIUM TEPPERIANUM.

Hosts (N.Z.) *Acacia armata*.

Distribution: Australia, Tasmania, Java, New Zealand.

Notes: An introduced gall-forming rust fungus causing damage to prickly acacia; Coll. and Iden. G.H.C., Auckland.

Reference: Cunningham, G. H. (1931) "Rust fungi of New Zealand." Dunedin.

UROMYCES EDWARDSIAE.

Hosts (N.Z.) *Edwardsia microphylla*.

Distribution: Endemic.

Notes: A rust fungus forming conspicuous "witches'-brooms" on branches of host; and attacks pods shortly after flowering. Type locality, Tahakopa, Coll. C.M.S. Iden. G.H.C.

Reference: Cunningham, G. H. (1931) "Rust fungi of New Zealand." Dunedin.

AECIDIUM MYOPORI.

Hosts (N.Z.) *Myoporum laetum*.

Distribution: Endemic and widespread.

Notes: This rust-fungus forms large swellings on branches and stems of the host, forming "witches'-brooms." Type locality, Palmerston North, Coll. and Iden. G.H.C.

Reference: Cunningham, G. H. (1931) "Rust fungi of New Zealand." Dunedin.

UREDO KONINI.

Hosts (N.Z.) *Fuchsia excorticata*.

Distribution: New Zealand.

Notes: An endemic rust-fungus. Type locality, Hutt Valley, Coll. T.K. Iden. G.H.C.

Reference: Cunningham, G. H. (1931) "Rust fungi of New Zealand." Dunedin.
PUCCINIA PLAGIANTHI.

Distribution: Tasmania, New Zealand.
Notes: A rust-fungus on stem and leaf.
Reference: Cunningham, G. H. (1931) "Rust fungi of New Zealand.” Dunedin.

SPHAERIACEAE.

CERATOSTOMELLA PILIFERA.

(Syn. Graphium sp.)

Distribution: Universal.
Notes: The taxonomy of the genus Ceratostomella, as occurring in New Zealand, has not been worked out and consequently the old combination C. pilifera (which includes a number of new species) is temporarily retained. That the N.Z. Graphium is a conidial stage of Ceratosmella has been confirmed by cultural work (T.C.B. 1935). The fungus causes sap-stain of sawn timber, spreading by prolific spore production. Coll. and Iden. T.C.B., Palmerston North, 1932.

ENDOTHIA Sp. Undet.

Hosts (N.Z.) Castanea vesca.
Distribution: Asia, America, New Zealand.
Notes: This introduced fungus conforms to American descriptions of Endothia parasitica, except in size of spores. Coll. T.C.B., Pelorus River, 1931.

ROSELLINIA RADICIPERDA.

Hosts (N.Z.) Pinus stróbus, Eucalyptus spp., Chamaecyparis lawsoniana, Castanea vesca.
Distribution: New Zealand.
Notes: An indigenous fungus causing root-rot primarily of fruit trees, but commonly associated with forest trees in the Auckland province. Coll. and Iden. G.H.C., Whakarewarewa, 1922.

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CYTARRIACEAE.

CYTARIA GUNNII.
(Syn. Cytaria purdiei.)


Distribution: Australia, New Zealand.

Notes: An indigenous parasite which does considerable damage to silver beech, especially saplings and poles; forms large cankers or burrs on stem and branch. Degree of virulence probably correlated with vigour of growth as effected by overstocking, site, etc.
Buchanan in 1885 recorded the fungus on red beech, but verification of this host is wanting. Coll. and Iden. T.C.B., Woodlaw Forest, 1930; Mt. Ruapehu, 1935, on silver beech.


PHACIDIAEAE.

KEITHIA THUJINA.

Hosts (N.Z.) Thuja plicata.

Distribution: Europe, America, New Zealand.

Notes: An introduced needle-spot parasite which has, as yet, caused little damage in N.Z. Coll. and Iden. T.C.B., Waiotapu, 1931.


NECTRIA CINNABARINA.

Hosts (N.Z.) Pinus spp., Edwardsia tetraperta, Prunus sp.

Distribution: Europe, America, New Zealand.

Notes: An introduced facultative parasite on stag-headed pines; of little economic importance in N.Z. Coll. and Iden. T.C.B., Hanmer, 1933.

EXASCAEAE.

TAPHRINA AUREA.

**Hosts (N.Z.)** *Populus tremula, P. eugenii.*

**Distribution:** Europe (?), America, New Zealand.

**Notes:** An introduced leaf disease, causing blistering and yellow discoloration of the lower leaf surface. Of little economic importance in N.Z.

Coll. and Iden. T.C.B., Palmerston N., 1933. *(Populus tremula).*

Coll. J.P. McE. Iden. T.C.B. Reefton, 1937. *(Populus eugenii).*

**Reference:** Hubert, E. E. (1931) "Outline of Forest Pathology." New York.

HYSTERYIACEAE.

LOPHODERMUIM PINASTRI.

**Hosts (N.Z.)** *Pinus radiata.*

**Distribution:** Europe, America, New Zealand.

**Notes:** An introduced needle disease. In N.Z. recorded only on dead needles. Coll. and Iden. T.C.B., Manawatu, 1931.


HYPODERMA AMPLUM.

**Hosts (N.Z.)** *Pinus banksiana.*

**Distribution:** America, New Zealand.

**Notes:** An introduced needle disease. Not causing serious damage in N.Z.

Coll. C.M.S., Kaingaroa, 1932. Iden. T.C.B.

**References:** Hubert, E. E. (1931) “Outline of Forest Pathology.” New York.

HELOTIACEAE.

CHLOROPLLENIUM AERUGINOSUM.

**Hosts (N.Z.)** Timber of *Larix decidua, Nothofagus spp.*

**Distribution:** Universal.

**Notes:** Generally a forest saprophyte on decayed wood; occasionally associated with stained timber, characterised by deep green discoloration.

Coll. and Iden. T.C.B., Golden Downs, 1933.

CORYNELIACEAE.

Corynelia Tropica.

Hosts (N.Z.) Podocarpus hallii; P. totara.
Distribution: America, Africa, Asia, New Zealand.
Notes: An indigenous leaf parasite.
Coll. and Iden. G.H.C., Mt. Waiopehu, 1919 (P. hallii).

PHOMATACEAE.

Phomopsis Juniperovora.

Hosts (N.Z.) Cupressus macrocarpa, Chamaecyparis lawsoniana.
Distribution: South Africa, America, New Zealand.
Notes: An introduced wound parasite causing "gummosis" on stem and branch; particularly destructive to lined-out nursery stock. Coll. and Iden. T.C.B., Bulls, 1932.

Phomopsis Strobi.

Distribution: Europe, America, New Zealand.
Notes: An introduced facultative parasite of economic importance only in localities where severe unseasonable frosts occur. Believed to have been introduced from North America by seed. Coll. T.C.B., Karioi, 1931. Iden. G.H.C.

Cytospora Chrysosperma.

Hosts (N.Z.) Populus nigra.
Distribution: Europe, America, New Zealand.
Notes: An introduced parasite rarely of economic significance in New Zealand. Poplar cuttings are occasionally attacked and killed. Coll. and Iden. T.C.B., Palmerston North, 1934.

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Fig. 5 A veteran kauri—"Te Matua Ngahere"—Waipoua State Forest, North Auckland. Basal girth, 53 feet; Centre girth, 50.5 feet; Height to first limb, 32 feet; Volume, 6,500 cubic feet.
DIPLODIA PINEA.
(Syn. Botryodiaprodia pinea).

Hosts (N.Z.) Pinus spp.
Distribution: America, Europe, South Africa, Australia, New Zealand.

Notes: The facultative parasitism of this introduced fungus is dependant upon such predisposing factors as overmaturity, frost injury with terminal hypertrophy, hail injury, drought, adverse soil conditions. Also causes a dark sap-stain in Pinus logs if not converted and seasoned soon after felling. Coll. T.C.B., Rotorua, 1931. Iden. G.H.C.


MELANCHONIAEAE.

PESTALOZZIA FUNEREA.

Hosts (N.Z.) Pinus radiata, Cupressus macrocarpa, Cupressus lusitanica, Chamaecyparis lawsoniana, Agathis australis.
Distribution: Universal.

Notes: An introduced (?) facultative parasite causing damping-off of seedlings. Has been isolated from living seed of C. macrocarpa and A. australis. Causes stem and branch lesions on cypresses of all ages. Coll. and Iden. T.C.B. 1932.


MYXOSPORIUM Sp. Undet.

Hosts (N.Z.) Hoheria lyallii, H. populnea.
Distribution: Endemic ?


NAEMOSPORA Sp. Undet.

Hosts (N.Z.) Timber of Pinus radiata.
Distribution: Universal ?


CORYNEUM CARDINALE.

Hosts (N.Z.) Cupressus macrocarpa, C. sempervirens, Chamaecyparis lawsoniana, Thuja plicata.

Distribution: California, New Zealand.

Notes: An introduced parasite causing "gummosis" on seemingly healthy trees. Spreads by wind-borne spores which germinate at upper junction of lateral and stem. Heavily infected trees often suppress stem lesions but are subsequently deformed.

Coll. T.C.B., Manawatu, 1933. Iden. G.H.C.


TUBERCULARIACEAE.

FUSARIUM Spp. Undet.


Distribution: Universal.

Notes: Species of this genus frequently cause of "damping-off" in forest nurseries. The taxonomy of the genus Fusarium has not been worked out in N.Z. Associated with the dying-off of young tawa regeneration. Coll. C.M.S., Urewera, 1937. Iden. T.C.B.


MONILIACEAE.

HYPHOSOMA HYPOXYLOIDES.


Distribution: New Zealand.


TRICHODERMA KONINGI.

**Hosts (N.Z.)** Timber of *Podocarpus dacrydioides*.

**Distribution:** Universal.

**Notes:** Causes stain of white pine box timber. Coll. and Ident. J.C.N., Palmerston North, 1935.

**Reference:**

TRICHODERMA LIGNORUM.

**Hosts (N.Z.)** Timber of *Podocarpus dacrydioides*.

**Distribution:** Universal.

**Notes:** Causes stain of white pine box timber. Coll. and Ident. J.C.N., Palmerston North, 1935.


BOTRYTIS CINEREAE.

**Hosts (N.Z.)** *Pinus radiata, Cupressus macrocarpa, Eucalyptus spp., Thuja plicata.*

**Distribution:** Universal.

**Notes:** A facultative parasite attacking weakened seedlings during warm humid periods in spring or autumn. Coll. C.M.S., Motupiko, 1931. Iden. G.H.C.

**Reference:**

PENICILLIUM THOMII.

**Hosts (N.Z.)** Timber of *Podocarpus dacrydioides*.

**Distribution:** North Africa, North America, New Zealand.


PENICILLIUM EXPANSUM.

**Hosts (N.Z.)** Timber of *Podocarpus dacrydioides*.

**Distribution:** Universal.

**Notes:** Causes spotting and staining of white pine box timber. Coll. and Ident. J.C.N., Palmerston North, 1935.

PENICILLIUM PUTTERILLII.

Hosts (N.Z.) Timber of Beilschmiedia tawa, Nothofagus menziesii.

Distribution: South Africa, New Zealand.


TOLYPOMYRIA Sp. Undet.

Hosts (N.Z.) Timber of Beilschmiedia tawa.

Distribution: Universal.


CEPHALOSPORIUM Sp. Undet.

Hosts (N.Z.) Timber of Beilschmiedia tawa.

Distribution: Universal.


DEMATIACEAE.

HELICOSPORIUM Sp. Undet.

Hosts (N.Z.) Timber of Nothofagus menziesii.

Distribution: Universal.


MACROSPORIUM Sp. Undet.

Hosts (N.Z.) Timber of Pinus radiata.

Distribution: Universal.


PULLULARIA NIGRA.

Hosts (N.Z.) Timber of Podocarpus dacrydioides.

Distribution: Universal.


PULLULARIA PULLULANS.
(Syn. Dematium sp.)

Hosts (N.Z.) Timber of Podocarpus dacrydioides.
Distribution: Universal.

ALTERNARIA Sp. Undet.

Distribution: Universal.

CLADOSPORIUM HERBARUM.
(Syn. Hormodendrum cladosporioides).

Hosts (N.Z.) Timber of Podocarpus dacrydioides, Dacrydium cupressinum.
Distribution: Universal.

TORULA Sp. Undet.

Hosts (N.Z.) Timber of Beilschmiedia tawa.
Distribution: Universal.
STILBACEAE.

TILACHLIDIIUM Sp. Undet.

**Hosts (N.Z.)** Timber of *Nothofagus menziesii.*

**Distribution:** Universal.

**Notes:** A mould causing stain of timber. Coll. and Ident. J.C.N., Palmerston North, 1936.


MYCORRHIZA.

The following is a preliminary list of fungi proved to be, or suspected of being, mycorrhizal symbionts with forest trees in New Zealand.

1. **LYCOPERDON PERLATUM.**

**Hosts (N.Z.)** *Pinus laricio.*

**Notes:** Coll. T.C.B., Rotorua, 1932. Ident. G.H.C. Field observational evidence only.

2. **SCLERODERMA BOVISTA.**

**Hosts (N.Z.)** *Pinus radiata, Pseudotsuga taxifolia.*


3. **OMPHALIA Sp. Undet.**

**Hosts (N.Z.)** *Nothofagus solanderi.*

**Notes:** Coll. and Iden. T.C.B., Palmerston North, 1931. Field observational evidence only.

4. **RHIZOPOGON RUBESCENS.**

**Hosts (N.Z.)** *Pinus radiata, Cupressus macrocarpa, Pinus caribaea.*


5. **BOLETUS LUTEUS.**

**Hosts (N.Z.)** *Pinus* spp.


6. **MARIASMIUS OREADES.**

**Hosts (N.Z.)** *Pinus ponderosa.*

**Notes:** Coll. T.C.B., Kaingaroa, 1933. Iden. G.H.C. Field observational evidence only.

7. **AMANITA MUSCARIA.**

**Hosts (N.Z.)** *Pinus radiata, Betula alba.*

**Notes:** Coll. and Iden. T.C.B., Rotorua, 1934. Field observational evidence only.


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**ABBREVIATIONS.**

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<th>Abbreviation</th>
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<td>F.P.R. Lab.</td>
<td>Forest Products Research Laboratory, Princes Risborough, England.</td>
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<td>P.R.S. Queensland</td>
<td>Proceedings of Royal Society of Queensland.</td>
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<td>E.H.A.</td>
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