V. DISEASES OF TREES AND SHRUBS

ACER - Maple

Leaf Spot (Cylindrosporium pennsylvanicum E. & E. (Septoria acerina Peck) was found on A. pennsylvanicum at Beauceville (Fr. Anselme) and Abbotsford, Que.; specimens on A. pennsylvanicum and A. spicatum, collected in 1938 at Mount Orford, Que., were received from Pere Leopold.

Leaf Spot (Phleospora Aceris (Lib.) Sacc.) on A. rubrum was found at Mt. Rolland and Beauceville, Que. (Fr. Anselme; det. I.L. Connors). Not previously reported in the Survey.

Leaf Spot (Phyllosticta spp.). A study was made of the leaf spots occurring on maples in Canada, as a result of some points that arose from a study of recent collections. P. minima (P. acericola C. & E.) was collected on A. rubrum at Abbotsford, Que., A. saccharinum at Westboro, Ont., and A. tataricum at Ottawa. These specimens, with spores 6.5-9.5 x 5.5-7 microns, agree exactly with E. & E. F. Columb. 660, Barth. F. Columb. 3830 and 4246, and Roum. F. Gall. 3485; but not with E. & E. F. Columb. 140, which is a Gloeosporium (perhaps G. saccharinum) on A. saccharum; they also agree with the description given in Saccardo (Syll. 3:115), but are quite different from the description of Seaver (N. Am. Flora 6:50), who gives the spore size as 2 x 6 microns, occasionally 10 microns long. We also have specimens of the same fungus on A. saccharinum, A. spicatum and A. platanoides. All our specimens on A. saccharum received under this name are a Gloeosporium indistinguishable from E. & E. F. Columb. 140. It is to be noted that Phyllosticta minima (B. & C.) Underw. & Earle (Ala. Agr. Sta. Bull. 80:168, Apr. 1897) antedates Ellis & Everhart's publication of this combination (North American Phyllostictas, 1900). P. minutissima was found in early September at Rupert, Que., causing moderate damage to A. saccharum and serious damage to A. spicatum, small trees of the latter species being almost completely defoliated. Represented in the herbarium from B.C. and Alta. on A. glabrum. The microconidial stage of Cylindrosporium consociatum Dearn. has been referred to P. minutissima, but there is no trace of Cylindrosporium on these specimens. (D.B.O. Savile, I.L. Conners)

Leaf Spot (Piggotia Negundinis) was heavy locally, but generally slight in a hedge of A. Negundo at Morden, Man. (W.L. Gordon)

Leaf Spot (Septoria Negundinis) was light but general in a hedge of A. Negundo at Morden, Man. (W.L. Gordon)

AESCULUS - Horsechestnut

Leaf Spot (Guignardia Aesculi (Phyllosticta Paviae) on Ae. Hippocastanum was received from Angus, Ont. (R. Macrae). It was abundant on many trees at Charlottetown, P.E.I. (R.R. Hurst)

Leaf Spot (Septoria ?Aesculi (Lib.) West.) was severe on some leaves of Ae. Hippocastanum at Morden, Man. Coniothyrium sp. was also present in the lesions (W.L. Gordon). S. Hippocastani Berk. & Br. and S. aesculina Thum. do not seem to be distinct. Represented in the herbarium by one collection from Owen Sound, Ont. (I.L. Conners, D.B.O. Savile)

ALNUS - Alder

Leaf Spot (Septoria Alni Sacc.) was heavy on one small tree of A. nitida and light on another in the Arboretum, Ottawa. Spores are somewhat narrower than in Saccardo's description, but the specimen fits this species much more closely than any other. Roumegere's F. Gall. 7274 is entirely distinct; it is probably Gloeosporium cylindrospermum. (D.B.O. Savile)

AMELANCHIER

Leaf Spot (Entomosporium maculatum) was general and caused yellowing in a hedge at Morden, Man. (W.L. Gordon)

Fire Blight (Erwinia amylovora). A light infection occurred on A. alnifolia at Morden, Man. (W.L. Gordon)

Rust (Gymnosporangium spp.). A light infection of G. clavipes occurred at Falmouth, N.S. (G.W. Hope). G. corniculans was very heavy on a bush of A. alnifolia at Brandon, Man., planted 20 feet from Juniperus virginiana bearing galls. (W.L. Gordon)

Branch Canker (Valsa sp.) caused slight damage at Edmonton, Alta. Organism probably close to V. ambiens. (W.C. Broadfoot, I.L. Conners)

BETULA - Birch

Leaf Spot (Septoria Betulae(Lib.)West.) was general and heavy in a hedge of B. pumila at Morden, Man. (W.L. Gordon). It was heavy on young growth of B. papyrifera at Rupert, Que. (D.B.O. Savile, I.L. Conners). A specimen on B. sp. was received from Mt. Rolland, Que. (Fr. Anselme; det. I.L. Conners)

Die-Back (cause unknown). Large stands of B. lutea and B. papyrifera in N.B. are succumbing to a progressive die-back of the crowns of the trees. Affected trees have sparse, chlorotic foliage, many dead buds, and greatly reduced terminal growth. Although commonest in overmature trees, this condition is also seen in young ones. Affected trees often, but not always, are infested by the bronze birch borer. Sections of affected twigs and branches often show abundant mycelium in and between the vessels and wood fibers. No fruiting structures have been found constantly associated with the disease. (J.L. Howatt)

CORNUS - Dogwood

Leaf Spot (Septoria cornicola). Infection was moderate in a hedge of C. alba at Morden, Man. (W.L. Gordon)

CORYLUS - Filbert

Leaf Spot (Gloeosporium Coryli). A heavy infection caused moderate damage to C. cornuta at Uplands, Ont. Previously reported in P.D.S. from N.S. and recorded by Bisby et al. from Man. Specimens in herbarium from Ont. and Que. Examination of material and of the literature fails to show significant or constant differences between G. Coryli and Labrella Coryli reported (P.D.S. 22:92) from B.C.; nor does there seem to be good reason for the exclusion of L. Coryli from Gloeosporium. In addition to many round lesions in the body of the leaf blade, in which acervuli were mainly epiphyllous, there was a prominent marginal scorching, probably due to hydathode infection, and the acervuli were almost equally distributed on both leaf surfaces; the same condition was noted in the B.C. specimen. (D.B.O. Savile, I.L. Conners)

Leaf Spot (Gnomoniella Coryli) was moderately heavy on C. cornuta at Canaan, N.S. (R.M. Lewis)

Leaf Spot (Septoria corylina) was moderate to severe in a hedge of C. americana at Morden, Man. (W.L. Gordon)

COTONEASTER

Die-Back (?Erwinia amylovora). Fire blight was suspected of causing the death of some branches at Morden, Man., but the pathogen could not be isolated; Polyporus tulipiferae was found on the bases of affected branches. (W.L. Gordon)

CRATAEGUS - Hawthorn

Scald (Fabraea maculata) was general and caused some defoliation in parks and gardens at Brentwood, B.C. (W. Jones)

Rust (Gymnosporangium spp.). A slight infection of G. Betheli occurred on leaves and fruit of C. rotundifolia in a hedge 75 yards from rusted Juniperus scopulorum at Morden, Man. A trace occurred in a hedge of C. succulenta the same distance from the Juniperus, but a bush 15 feet from it had every leaf killed. Both are new host records for Man. (W.L. Gordon). G. clavipes infected about 10% of the fruits and a scattering of twigs and pedunc-les of Crataegus sp. at Ottawa. (D.B.O. Savile)

Powdery Mildew (Podosphaera Oxyacanthae) was generally light, but locally heavy, in a hedge of C. succulenta at Morden, Man. First record in Man. on this host (W.L. Gordon). Mildew was moderately heavy on C. sp. in Queens Co., P.E.I. (R.R. Hurst)

ELAEAGNUS

Leaf Spot (Septoria Elaeagni). A trace occurred at Morden, Man., much less than in 1942 (W.L. Gordon). Inadvertently reported as on E. commutata in P.D.S. 22: p. 100.

FRAXINUS - Ash

Leaf Spot (Piggotia Fraxini) was moderate to severe in a hedge of F. pennsylvanica var. lanceolata at Morden, Man. (W.L. Gordon)

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HIPPOPHAE - Sea-Buckthorn

Rust (Puccinia coronata). Pycnia, presumably of this species, were seen on this shrub at Winnipeg, Man.; it was growing close to plots of infec-ted Calamagrostis inexpansa. (A.M. Brown)

JUGLANS

Leaf Spot (Marssonina Juglandis) on J. cinerea was received from Mt. Rolland, Que. (Fr. Anselme). It had caused considerable defoliation of all butternuts at Abbotsford, Que., by July 24. Most trees show much dead wood, perhaps partly due to this disease, which has been seen there for many years. (D.B.O. Savile)

Bacterial Blight (Xanthomonas Juglandis) was general and caused considerable damage to leaves and nuts of J. regia at the Experimental Station, Sidney, B.C. (W. Jones)

JUNIPERUS

Rust (Gymnosporangium spp.) Galls of G. Betheli were common on a hedge of J. scopulorum at Morden, Man.; new host record for Man. Galls of G. corniculans were found on J. virginiana at Brandon, Man.; new host record for Man. (W.L. Gordon)

Twig Blight (Phoma sp.) caused moderate damage to J. scopulorum at Morden, Man.; new host record for Man. (W.L. Gordon)

MALUS

Leaf Spot (Coniothyrium pirinum) lightly infected a hedge of M. baccata at Morden, Man. (W.L. Gordon)

Fire Blight (Erwinia amylovora) affected a few branches of M. baccata and M. transitoria at Morden, Man.; the latter is a new host record for Man. (W.L. Gordon)

OSTRYA - Hop-Hornbeam

Leaf Spot (Cylindrosporium Dearnessii) lightly infected a large tree at Brandon, Man. (W.L. Gordon). Previously reported from Ont. only.

PICEA - Spruce

Rust (Chrysomyxa ledicola) was common in a hedge of P. glauca at Winnipeg, Man. (A.M. Brown). A light infection was seen in King's Co., P.E.I. (R.R. Hurst)

Witches' Broom (Peridermium coloradense) caused slight damage to P. rubra at Coldbrook, N.S. (R.M. Lewis)

PINUS - Pine

Needle Blight. Many needles of P. mugo at Morden, Man., turned yellow. Isolations yielded Pullularia pullulans and Phoma glomerata. (W.L. Gordon)

Rust (Coleosporium Solidaginia). A few affected needles of P. Banksiana were received from H.A. Richmond, Sandilands Forest Reserve, Man. The rust was found to agree with Peridermium montanum Arth. & Kern on Pinus contorta, rather than with P. acicola (acicolum) Underw. & Earle described on P. rigida but common in Ont. & Que. on P. resinosa. The Peridermium on jack pine is represented in the herbarium from Sask., Man., Ont. and Que. Examination of the uredinia on Solidago indicates that spores in collections from the Rocky Mts. region tend to be finely marked, while some of the eastern material is very coarse; but intermediate markings are common in collections across Canada. While it is easy to distinguish P. delicatulum on Pinus rigida from the other peridermia mentioned, the uredinia on Euthamia (a segregate of Solidago) differ little. Euthamia growing in the goldenrod plots in the Arboretum, Ottawa, remained free from C. Solidaginis, while most of the true goldenrods were heavily rusted. See under Goldenrod. A shoot of P. resinosa moderately infected with C. Solidaginis was received from Shawville, Que. (I.L. Conners)

Blister Rust (Cronartium ribicola). Specimens of infected P. strobus were received from Yarmouth Co., N.S., where some damage was reported. (J.F. Hockey)

Needle Cast (Hypodermella ampla (Davis) Dearn.) was received from H.A. Richmond, Sandilands Forest Reserve, Man.; he reports that it is prevalent in the Reserve, many trees having lost all needles 2 years or more of age. G.D. Darker (Contrib. Arnold Arb. 1.1932) states that it is destructive. (I.L. Conners)

PLATANUS - Plane Tree

Anthracnose (Gnomonia veneta) was general on trees in the park at Sidney, B.C., causing slight damage to twigs and leaves. (W. Jones)

POPULUS - Poplar

Limb Galls (Cucurbitaria staphula). A moderate infection was found on several trees of P. tacamahaca in a coulee near Indian Head, Sask. (H.W. Mead)

Leaf Blight (Linospora tetraspora). Heavy infection of P. tacamahaca occurred in many sections of central Alta. (M.W. Cormack). The same species was heavily infected, with moderate damage, at Uplands, Ont. (I.L. Conners)

Rust (Melampsora spp.) M. Abieti-canadensis severely damaged P. grandidentata in Prince Co., P.E.I. (R.R. Hurst). M. medusae was severe on P. canadensis var. Northwest, at Morden, Man. (W.L. Gordon). The following spp. were rusted in varying degrees at Montreal Botanical Garden: P. Andrewsii, P. balsamifera, P. candicans, P. generosa, P. Kanjilaliana, P. laurifolia, P. Petrowskyana, P. robusta, P. Simonii, P. szechuanica, P. trichocarpa, and P. sp. (J.E. Jacques)

Leaf Spot (Phyllosticta brunnea). A trace occurred on P. sp. at Morden, Man. (W.L. Gordon)

Leaf Spot (Septoria spp.). A moderate infection of S. musiva occurred at Morden, Man., on "Russian Poplar" (W.L. Gordon). S. populicola caused considerable damage to P. sp. at Comox, B.C. (W.Jones, I.L. Conners)

PRUNUS

Shot Hole (Cylindrosporium spp.). P. Cerasus was heavily and P. pennsylvanica moderately infected by C. hiemale in hedges at Morden, Man. The lower leaves of a hedge of P. nana at Morden, were heavily infected by C. prunophorae. (W.L. Gordon)

Powdery Mildew (Podosphaera oxyacanthae) was severe on a hedge of P. Cerasus at Morden, Man. (W.L. Gordon)

Blossom & Twig Blight (Sclerotinia spp.). S. fructicola caused cankers on P. glandulosa at Liverpool, N.S. (J.F. Hockey). S. laxa caused considerable damage to the blossoms of a few shrubs of P. triloba at Brentwood, B.C. (W. Jones)

Leaf Curl (Taphrina insititiae). The leaves of one branch of a bush of P. pennsylvanica planted for ornament at Ponemah, Man., were severely infected (W.L. Gordon). In the herbarium, on wild P. pennsylvanica from Man., Ont., Que., and N.S.

PYRUS

Leaf Spot (Coniothyrium pirinum). A hedge of P. pashia (Kashmir pear) at Morden, Man., was moderately infected. First record on this host. (W.L. Gordon)

QUERCUS - Oak

Leaf Spot (Marssonina Martini) was found on Q. macrocarpa at Ottawa, Ont. (H.T. Gussow; det. I.L. Conners)

Powdery Mildew (Microsphaera Alni) occurred sparingly in a hedge of Q. macrocarpa at Morden, Man. (W.L. Gordon)

Leaf Spot (Taphrina caerulescens). A scattered infection was found on Q. borealis on Mt. Yamaska, near Abbotsford, Que. (D.B.O. Savile)

RHAMNUS - Buckthorn

Rust (Puccinia coronata) was common on bushes of R. alnifolia and R. cathartica on June 18 at Winnipeg, Man. (A.M. Brown). R. alnifolia was slightly to severely damaged in Victoria and Carleton Counties, N.B.; material sent to Winnipeg was identified by B. Peturson as P. coronata var. Calamagrostidis. R. cathartica was severely rusted in York Co., where aeciospores were being liberated by July 2. Rust caused slight to moderate damage on R. Frangula in York Co..; no infection could be obtained on oats at Fredericton, or at Winnipeg by B. Peturson, or on various grasses commonly attacked by P. coronata at Fredericton; these results are in agreement with inoculations and field observations made during that last three years (S.F. Clarkson). Rust was heavy in a hedge of R. cathartica at Summerside, P.E.I. (R.R. Hurst)

SALIX - Willow

Anthracnose (Gloeosporium Salicis) severely affected the lower leaves of S. alba var. vitellina in a hedge at Morden, Man.; found on this host in 1927, but not reported (W.L. Gordon). Also known from P.D.S. or Herbarium from Alta., Ont., Que., and N.S. on S. spp.

Blight or Canker (Marssonina Kriegeriana) was found to be widespread in the Vancouver, B.C., district on S. babylonica. (A.F. Barss and H.T. Gussow; det. I.L. Conners)

Rust (Melampsora Abieti-capraearum). A slight infection occurred on S. purpurea var. gracilis in a hedge at Morden, Man.; first record on this host in Man. (W.L. Gordon). It was heavy on a tree of S. rubra in the Arboretum, Ottawa, although none could be found on adjacent Salix spp. (D.B.O. Savile; det. I.L. Conners).

Tar Spot (Rhytisma salicinum) was slight on Salix sp. at Morden, Man. (W.L. Gordon)

SORBUS - Mountain Ash

Leaf Spot (Entomosporium maculatum) was moderately heavy on S. americana at Brandon, Man., causing considerable yellowing. (W. L. Gordon)

Rust (Gymnosporangium aurantiacum) was heavy on the leaves of young trees planted at Clearwater Bay, Ont. (W.L. Gordon)

ULMUS - Elm

Black Spot (Gnomonia ulmea) was severe in a hedge and moderate elsewhere on U. americana at Morden, Man. A slight infection occurred in a hedge of U. pumila at the University of Manitoba, Winnipeg (W.L. Gordon). Black spot is so prevalent on U. americana in the Ottawa district that it generally escapes comment; it did not appear to be unusually severe in 1943 despite the wet season (D.B.O. Savile). Five trees out of several hundred in a hedge of U. pumila at Montreal Botanical Garden were attacked. (J.E. Jacques)

Leaf Spot (Phyllosticta ulmicola Sacc.) moderately affected some leaves in a hedge of U. americana at Morden, Man.; mature spores 4.7-7.5 x 2.7-3.3 microns, olivaceous, ends rounded, immature spores hyaline, narrower, pointed at ends (W.L. Gordon). Not previously reported in P.D.S. Our only Canadian specimen is

a collection by J. Dearness, July, 1890, at London, Ont., on U. fulva, and assigned by him and Ellis to P. ulmicola; the spores run 4-5.7 x 2.4-3.3 microns, against 6 x 3 microns given by Saccardo, but agree in varying from hyaline to olivaceious. (D.B.O. Savile)

Coral Spot (Nectria cinnabarina) made so much progress in hedges of U. pumila at the Montreal Botanical Garden and elsewhere in Montreal, Que., that annual pruning and frequent inspections are clearly inadequate to control the disease. Since no other control measures seem economically possible, the growing of this tree in hedges will have to be discontinued. (J.E. Jacques)

VIBURNUM

Leaf Spot (Cercospora varia) was moderately heavy on and caused slight damage to two shrubs of Viburnum Opulus nanum in the Arboretum, Ottawa, Ont. No infections could be found on other species near by, and it is thought that the low, dense habit of this plant encouraged spread of the disease by hindering aeration. (D.B.O. Savile)

Rust (Coleosporium Viburni) caused some defoliation of V. cassinoides in Cumberland Co., N.S. (J.F. Hockey). A light to moderate infection of V. Lentago occurred in the Ottawa district. (I.L. Conners, D.B.O. Savile)

Powdery Mildew (Microsphaera Alni) was light in a hedge of V. dentatum at Morden, Man.; first record on this host in Man. (W.L. Gordon)

Leaf Spot (Phyllosticta ?punctata Ell. & Dearn.). A moderate infection occurred in a hedge of V. pubescens at Morden, Man.; spores 5-10 x 3 microns (W.L. Gordon). P. Lentaginis (spores 4-5 x 2.5-3 microns, brownish) is reported from Man. (Bisby et al.) on V. pubescens. Two early collections from near Ottawa on V. acerifolium are labelled P. Lentaginis; one is sterile but the other is fruiting sparsely and the spores agree with the description. We have no record of P. punctata from anywhere but the type location, London, Ont.; of four specimens, all collected by J. Dearness on V. Opulus, two in the general collection (Aug. 1892 and Sept. 1898) appear to be sterile; of the other two collections, one, E. & E. Fungi Columb. 1245 (Sept. 1896), bears few pycnidia with spores none or 4.3-6.7 x 1.7-3 microns, apparently immature; the other, E. & E. N.A. Fungi 2832 (Aug. 15, 1892), yielded a large-spored Hendersonia (spores 12-27.5 x 4.5-6.5 microns, 5 to 7 septa, chestnut brown), which does not agree with H. Viburni, H. foliorum var. Viburnum, or H. Tini. (D.B.O. Savile)

Downy Mildew (Plasmopara Viburni Pk.) was abundant on V. spp. at Ottawa, Ont. A survey was made of the main planting in the Aboretum, after carefully checking the identity of every plant. As all species are growing close together, the following table may give some idea of relative susceptibility as the disease occurred locally in 1943:

Species	No. of Plants	Rate of Infection
V. cassinoides	1	Nil
dentatum	3	Nil
Lantana	2	Slight to mod.
Lantana rugosum	4	Slight to mod.
Lentago	6	Nil

Species	No. of Plants	Rate of Infection
nudum	1	Nil
Opulus	3	Slight to mod.
Opulus nanum	2	Mod. to v. severe
Opulus roseum	2	Slight to severe
Opulus variegatum	1	Slight
Opulus xanthocarpum	2	Nil to mod.
prunifolium	1	Nil
pubescens	2	Nil
pubescens Canbyi	5	Nil
pubescens Deamii	1	Nil
pubescens longifolium	1	Nil
Sargenti	3	Nil to trace
Sargenti calvescens	3	Nil
trilobum	3	Trace to mod.

There is evidently biological specialization in the pathogen for downy mildew has been recorded on V. dentatum, V. nudum and V. pubescens. Names are in accordance with Rehder's Manual of Cultivated Trees and Shrubs. (D.B.O. Savile)

Rust (Puccinia Linkii Klotzsch) was found at Forest Home, King's Co., N.S., on V. trilobum (R.M. Lewis). It was first found in 1942, but the report was delayed pending positive identification of the host. The rate of infection was light but the affected areas are greatly disfigured; for, although infection of the leaf blades causes small, black, amphigenous sori, the sori on the veins, petioles and young twigs are large and elongate and may cause considerable hypertrophy and distortion. This well-known rust has previously been known only from V. pauciflorum, a quite distinct species in the same section of the genus. (D.B.O. Savile)

Leaf Spot (Ramularia Viburni E. & E.). A trace was found in October on V. Lentago at Ottawa, Ont. Numerous sterile spots suggest that the fungus had been more abundant earlier. Previously unreported in P.D.S., but recorded by Bisby et al. from Man., on V. Opulus. (D.B.O. Savile)

INSECTS

Empusa sp. again killed considerable numbers of potato aphids throughout N.B. (J.L. Howatt)