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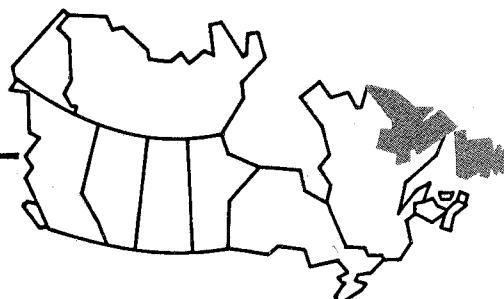
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Reference list of diseases of forest trees and shrubs in Newfoundland and Labrador

G. C. Carew



Information Report N-X-240

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**REFERENCE LIST OF DISEASES OF FOREST TREES AND SHRUBS
IN NEWFOUNDLAND AND LABRADOR**

by G.C. Carew

INFORMATION REPORT N-X-240
1986

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CANADIAN FORESTRY SERVICE

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ABSTRACT

This report provides detailed information on the distribution of recorded diseases and causal agents of forest trees and shrubs occurring in Newfoundland and Labrador. The information was gathered from 37 years of reference material accumulated by the Canadian Forestry Service and the Newfoundland Forest Protection Association. Many samples of the diseases are maintained in the forest pathology herbarium.

RÉSUMÉ

Ce rapport vous fourni de l'information détaillée sur la distribution des maladies connues et des agents néfastes qui se manifestent dans les arbres et arbustes dans la province de Terre-Neuve et du Labrador. Cette information provient de matériel de référence accumulé pendant 37 ans par le Service Canadien de la Forêt et l'Association Protectrice de la Forêt de Terre-Neuve. Plusieurs échantillons d'arbres et arbustes malades sont entretenus dans un herbier réservé aux pathologistes forestiers.

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REFERENCE LIST OF DISEASES OF FOREST TREES AND SHRUBS
IN NEWFOUNDLAND AND LABRADOR

by

G.C. Carew

INTRODUCTION

Diseases of trees and shrubs caused by fungi, and other micro-organisms, as well as damage caused by animals and abiotic factors such as snow, ice and frost affect all plant parts including roots, stem and foliage. Diseases may kill or disfigure trees and cause a loss in net merchantable volume or destroy their aesthetic value. During the past five decades, the Canadian Forestry Service and the Newfoundland Forest Protection Association have accumulated considerable information on the distribution of most of the diseases of forest trees and shrubs occurring on the Island. There are some herbaceous plants listed in this report because they are alternate hosts to some of the diseases. To date a total of over 4000 records of diseases and injuries or damage have been made. These records include 114 host species and 209 species of fungi, one phanerogamic parasite (dwarf mistletoe), five animals (moose, snow-shoe hare, goat, squirrel, horse) and numerous records of frost, snow and ice, winter drying, frost heaving, heat injury, late spring leaf scorch, weather damage, wind damage, chemicals, salt, excessive water, lichens, physical injury, roadside damage and unknown factors. The above diseases are arranged in three indices: disease index, host index and general index. Instructions for the use of these indices and information pertaining to their contents are provided as a preface to each index. Representative samples of most of these diseases are deposited in the Newfoundland Forestry Centre Mycological Herbarium (Singh 1969; Singh and Carew 1971; Singh and Carew 1973; Singh 1974).¹

This report provides a readily accessible inventory of the recorded diseases and injuries of forest trees and shrubs in Newfoundland and Labrador. It also contains maps showing their distribution and a list of published and unpublished reports for more detailed information.

¹Singh, Pritam. 1969. A list of specimens deposited in the Mycological Herbarium of the Forest Research Laboratory, St. John's, Newfoundland. Inform. Rept. N-X-31. 72 p.

Singh, Pritam and G.C. Carew. 1971. A supplement to the list of specimens deposited in the Mycological Herbarium of the Forest Research Laboratory, St. John's, Newfoundland. Inform. Rept. N-X-62. 53 p.

Singh, Pritam and G.C. Carew. 1973. Reference list of diseases of forest trees and shrubs in Newfoundland. Inform. Rept. N-X-87. 100 p.

Singh, Pritam. 1974. A list of specimens deposited in the Mycological Herbarium of the Newfoundland Forest Research Centre, St. John's, Newfoundland. Inform. Rept. N-X-123. 109 p.

PREFACE TO DISEASE INDEX

In this index, the diseases, including all types of abiotic damage, are classified into groups on the basis of the most common name of the disease or the damage, or major symptoms on the affected plant part. Examples of the groups are root and butt rots, stem rots of heartwood, stem rots of sapwood, stem cankers, needle rusts, leaf spots, animal and frost damage. The pathogens and other causal agents are grouped alphabetically under their appropriate groups. In addition, common name of the disease and scientific name of the host or hosts are provided for each causal agent. The numbers outside parenthesis under each host indicate the position on the maps (Figs. 1 to 22) and refer to the names of localities (Appendix I and II); latitudes and longitudes of 331 of the localities are given in Appendix I. The numbers within parenthesis indicate the publication in which the disease or the damage was reported (Appendix III).

DISEASE INDEX
INFECTIOUS DISEASES

Root and Butt Rots

Pathogen	Disease	Host
<u>Armillaria mellea</u> (Vahl ex Fr.) Kummer	Armillaria or shoe-string root rot	<u>Abies balsamea</u> (L.) Mill. 1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 17, 18, 19, 24, 27, 37, 52, 56, 72, 84, 89, 92, 95, 109, 120, 124, 125, 149, 165, 166, 167, 168, 169, 170, 175, 295, 296, 308, 583, 584, 585, 591, 592, 627 (1, 2, 3, 8, 9, 14, 16, 17, 18, 19, 21, 43, 45, 46, 47, 48, 49, 51, 69, 70, 75, 78, 80, 81, 83, 84, 85, 87, 91, 97, 99, 100, 101, 102, 103, 104, 111, 135, 147, 158, 160, 162).
		<u>Abies holophylla</u> Maxim 5, 8, 9, 583 (14, 41, 43, 100, 103, 111, 113, 150, 162, 165).
		<u>Abies homolepis</u> Sieb. and Zucc. 5, 8, 9, 583 (14, 41, 100, 103, 111, 150, 162, 165).
		<u>Abies marièsii</u> Mast. 5, 8, 9, 583 (14, 41, 100, 103, 111, 150, 162, 165).
		<u>Abies mayriana</u> Miyabe and Kudo 5, 8, 9, 583 (14, 41, 100, 103, 111, 150, 162, 165).
		<u>Abies sachalinensis</u> Mast. 5, 8, 9, 583 (14, 41, 100, 103, 111, 150, 162, 165).
		<u>Abies species</u> 583, 584, 585 (12).

Pathogen	Disease	Host
<u>Armillaria mellea</u> (Vahl ex Fr.) Kummer (Cont'd.)		<u>Abies veitchii</u> Lindl. 5, 8, 9, 583 (14, 41, 100, 103, 111, 113, 150, 162, 165).
		<u>Betula papyrifera</u> Marsh. 11, 16, 250 (71, 150).
		<u>Larix laricina</u> (Du Roi) K. Koch 6, 17, 583, 584, 585 (16, 18, 45, 48, 78, 80, 83, 84, 85, 150, 160).
		<u>Larix leptolepis</u> (Sieb. and Zucc.) Gord. 6, 583 (15, 43, 44, 98, 100, 150, 154, 161, 165).
		<u>Picea abies</u> (L.) Karst. 1, 4, 6, 7, 583 (14, 15, 44, 98, 100, 103, 150, 154, 155, 158, 160, 161, 163, 165, 166).
		<u>Picea glauca</u> (Moench) Voss 6, 7, 9, 10, 37, 120, 167, 168, 583, 584, 585 (11, 12, 14, 15, 18, 43, 44, 48, 84, 98, 100, 103, 108, 113, 150, 154, 158, 160, 163, 165).
		<u>Picea mariana</u> (Mill.) B.S.P. 2, 6, 7, 9, 12, 13, 14, 15, 16, 17, 24, 26, 37, 95, 113, 120, 122, 149, 157, 167, 168, 171, 172, 173, 174, 175, 196, 237, 295, 296, 308, 583, 584, 585, 591, 592, 593, 627 (1, 2, 4, 5, 8, 9, 11, 12, 14, 16, 18, 19, 20, 23, 24, 25, 32, 45, 48, 49, 50, 53, 56, 57, 58, 68, 70, 75, 78, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 100, 104, 108, 113, 150, 153, 160, 161, 163, 165, 167, 171, 172).

Pathogen	Disease	Host
<u>Armillaria mellea</u> (Vahl ex Fr.) Kummer (Concl'd.)		<u>Picea rubens</u> Sarg. 4, 7, 583 (14, 100, 103, 150, 165).
		<u>Picea sitchensis</u> (Bong.) Carr. 1, 4, 6, 7, 157, 196, 583, 584, 585 (5, 8, 9, 11, 12, 14, 15, 41, 43, 44, 69, 75, 80, 81, 98, 100, 103, 108, 113, 150, 153, 154, 155, 158, 160, 161, 163, 165, 166).
		<u>Picea sitchensis</u> x <u>glauca</u> 6 (44, 98, 154).
		<u>Picea</u> species 14, 26, 582, 584, 585 (12, 21, 23, 51).
		<u>Pinus resinosa</u> Ait. 1, 583 (14, 100, 103, 150, 155, 165).
		<u>Pinus strobus</u> L. 16 (150).
		<u>Pinus sylvestris</u> L. 22, 584 (4, 69, 72).
		<u>Prunus pensylvanica</u> L.f. 250 (71).
		<u>Pseudotsuga menziesii</u> (Mirb.) Franco (= <u>Pseudotsuga taxifolia</u> (Poir.) Britton) 6, 583 (15, 44, 98, 100, 150, 154, 158, 165).
<u>Coniophora puteana</u> (Schum. ex Fr.) Karst.	Brown cubical root and butt rot	<u>Abies balsamea</u> (L.) Mill. 4, 77, 583, 592 (30, 46, 97).
		<u>Salix</u> species

Pathogen	Disease	Host
<u>Odontia bicolor</u> (A. and S.) Bres.	White stringy butt rot	<u>Abies balsamea</u> (L.) Mill. 4, 583 (46, 97).
<u>Polyporus balsameus</u> Pk.	Brown cubical butt rot	<u>Abies balsamea</u> (L.) Mill. 4, 583, 584, 585 (10, 40, 97, 117).
<u>Polyporus schweinitzii</u> Fr.	Brown or red brown cubical butt rot	<u>Picea glauca</u> (Moench) Voss 153. <u>Picea mariana</u> (Mill.) B.S.P.
<u>Polyporus tomentosus</u> Fr. (= <u>Polyporus circinatus</u> auct. non Fr.)	Red root and butt rot or white pocket rot of conifers	<u>Picea glauca</u> (Moench) Voss 158, 582 (62, 95). <u>Picea mariana</u> (Mill.) B.S.P. 582 (9, 39, 95).
<u>Polyporus tomentosus</u> var. <u>circinatus</u> (Fr.) Sartory and Maire	Red butt rot	<u>Pinus strobus</u> L. 82 (82).

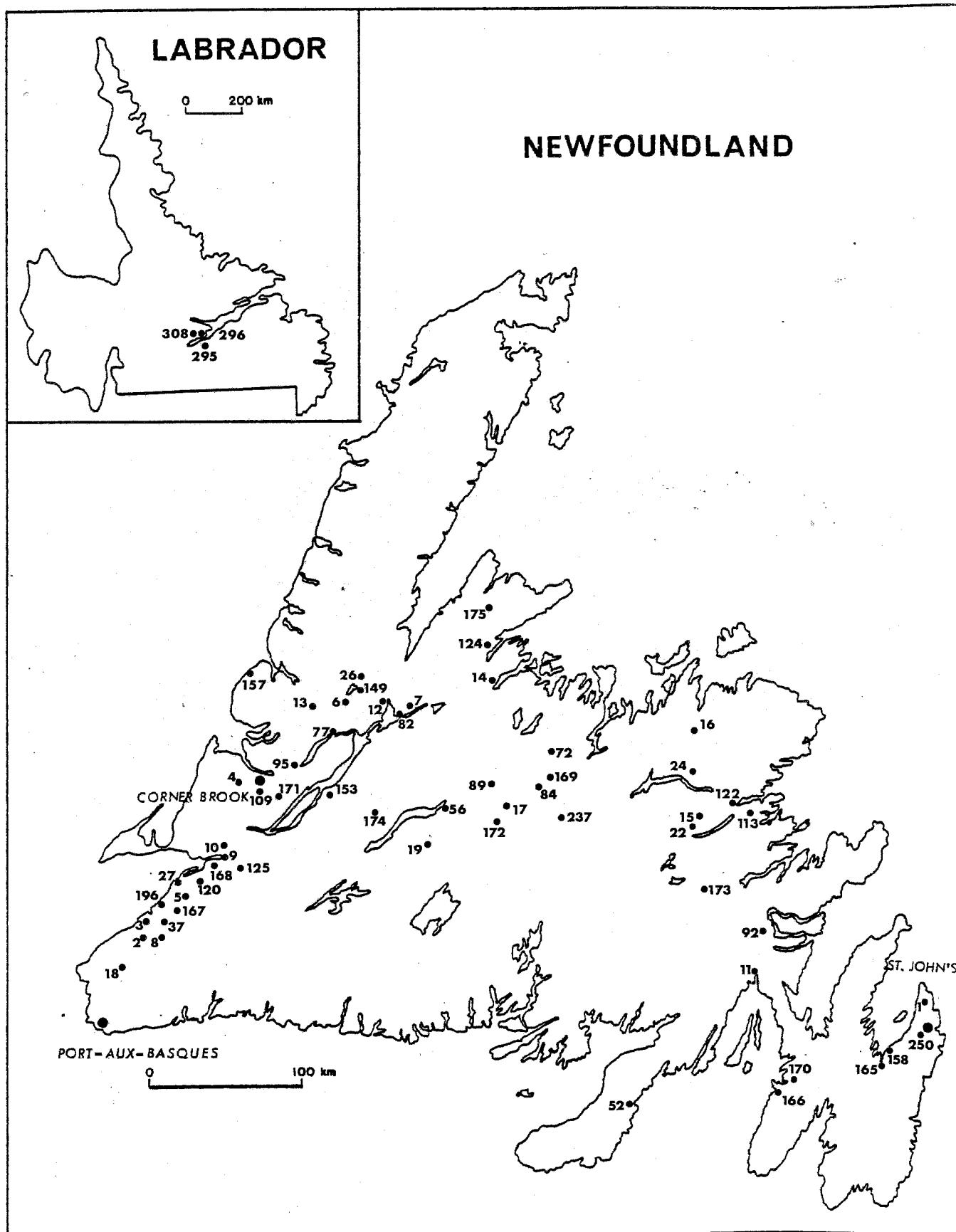


Fig. 1. Map showing 60 locations where root and butt rots were collected.

Stem Rots of Heartwood

Pathogen	Disease	Host
<u>Corticium galactinum</u> (Fr.) Burt	White or yellow stringy root and butt rot	<u>Abies balsamea</u> (L.) Mill. 4 (97). <u>Picea</u> species
<u>Daedalea unicolor</u> Bull. ex Fr.	White spongy rot or canker rot	<u>Betula papyrifera</u> Marsh. 159.
<u>Fomes fomentarius</u> (L. ex Fr.) Kickx	White mottled rot of heartwood and sapwood	<u>Betula alleghaniensis</u> Britt. 4, 18 (92, 94). <u>Betula papyrifera</u> Marsh. 4, 10, 57, 94 (94).
		<u>Prunus pensylvanica</u> L.f. 14 (88).
<u>Fomes igniarius</u> (L. ex Fr.) Kickx	White stringy or spongy heart rot	<u>Betula alleghaniensis</u> Britt. 109, 110, 151 (29). <u>Betula papyrifera</u> Marsh. 109, 110, 156, 175, 584 (14, 15, 29, 82, 104).
		<u>Populus tremuloides</u> Michx. 56, 77, 93, 96 (20, 50, 86).
		<u>Salix</u> species 24, 109, 110 (29).
<u>Fomes igniarius</u> var. <u>laevigatus</u> (Fr.) Overh.	White spongy rot	<u>Populus balsamifera</u> L. 502 (36, 94).
<u>Fomes pini</u> (Brot. ex Fr.) Karst.	Red ring rot or white pocket rot of conifers	<u>Abies balsamea</u> (L.) Mill. 14, 19, 64, 77, 86, 87, 92, 110, 116, 119, 121, 501, 583, 584, 585 (9, 10, 30, 39, 95, 104, 117).

Pathogen	Disease	Host
<u>Fomes pini</u> (Brot. ex Fr.) Karst. (Concl'd.)		<u>Picea glauca</u> (Moench) Voss 14, 19, 64, 77, 86, 87, 92, 110, 116, 119, 121, 501, 583, 584, 585 (9, 10, 30, 39, 40, 95).
		<u>Picea mariana</u> (Mill.) B.S.P. 14, 19, 20, 64, 77, 86, 87, 92, 110, 116, 119, 121, 156, 501, 583, 584, 585 (30, 95, 104).
		<u>Picea species</u> 94 (30).
<u>Fomes pinicola</u> (Sw. ex Fr.) Cké.	Brown cubical rot of heartwood and sapwood	<u>Abies balsamea</u> (L.) Mill. 4, 37, 148, 151 (102).
		<u>Betula papyrifera</u> Marsh. 18, 57 (92).
		<u>Picea glauca</u> (Moench) Voss 4 (94).
		<u>Picea mariana</u> (Mill.) B.S.P. 57, 156.
<u>Fomes robustus</u> Karst.	White spongy heart rot and occasional sap rot	<u>Betula papyrifera</u> Marsh.
<u>Fomes species</u>	Heart rot	<u>Betula papyrifera</u> Marsh.
<u>Ganoderma applanatum</u> (Pers. ex Wallr.) Pat.	White mottled rot	<u>Picea mariana</u> (Mill.) B.S.P.
		<u>Betula papyrifera</u> Marsh. 133.
		<u>Picea mariana</u> (Mill.) B.S.P.
		<u>Populus balsamifera</u> L.
<u>Lenzites saepiaria</u> (Wulf. ex Fr.) Fr.	Brown cubical or pocket rot	<u>Abies balsamea</u> (L.) Mill. 9, 77, 148 (30, 31, 81).
		<u>Picea mariana</u> (Mill.) B.S.P. 20, 57 (82, 104).
		<u>Picea species</u> 19, 149.

Pathogen	Disease	Host
<u>Lenzites species</u>	Brown cubical rot	<u>Abies balsamea</u> (L.) Mill. <u>Picea mariana</u> (Mill.) B.S.P.
<u>Peniophora polygonia</u> (Pers. ex Fr.) Bourd. and Galz.	White spongy rot	<u>Populus</u> species 90. <u>Populus tremuloides</u> Michx. 77, 93 (36).
<u>Peniophora septentrionalis</u> Laurila	Red heart rot	<u>Picea mariana</u> (Mill.) B.S.P. 160.
<u>Polyporus borealis</u> Fr.	White mottled rot of conifers	<u>Picea</u> species 153.
<u>Stereum sanguinolentum</u> (Alb. and Schw. ex Fr.) Fr.	Red heart rot	<u>Abies balsamea</u> (L.) Mill. 4, 57, 77, 110, 157, 172, 583 (9, 10, 30, 31, 39, 40, 46, 97, 99, 117). <u>Picea</u> species 20, 77.

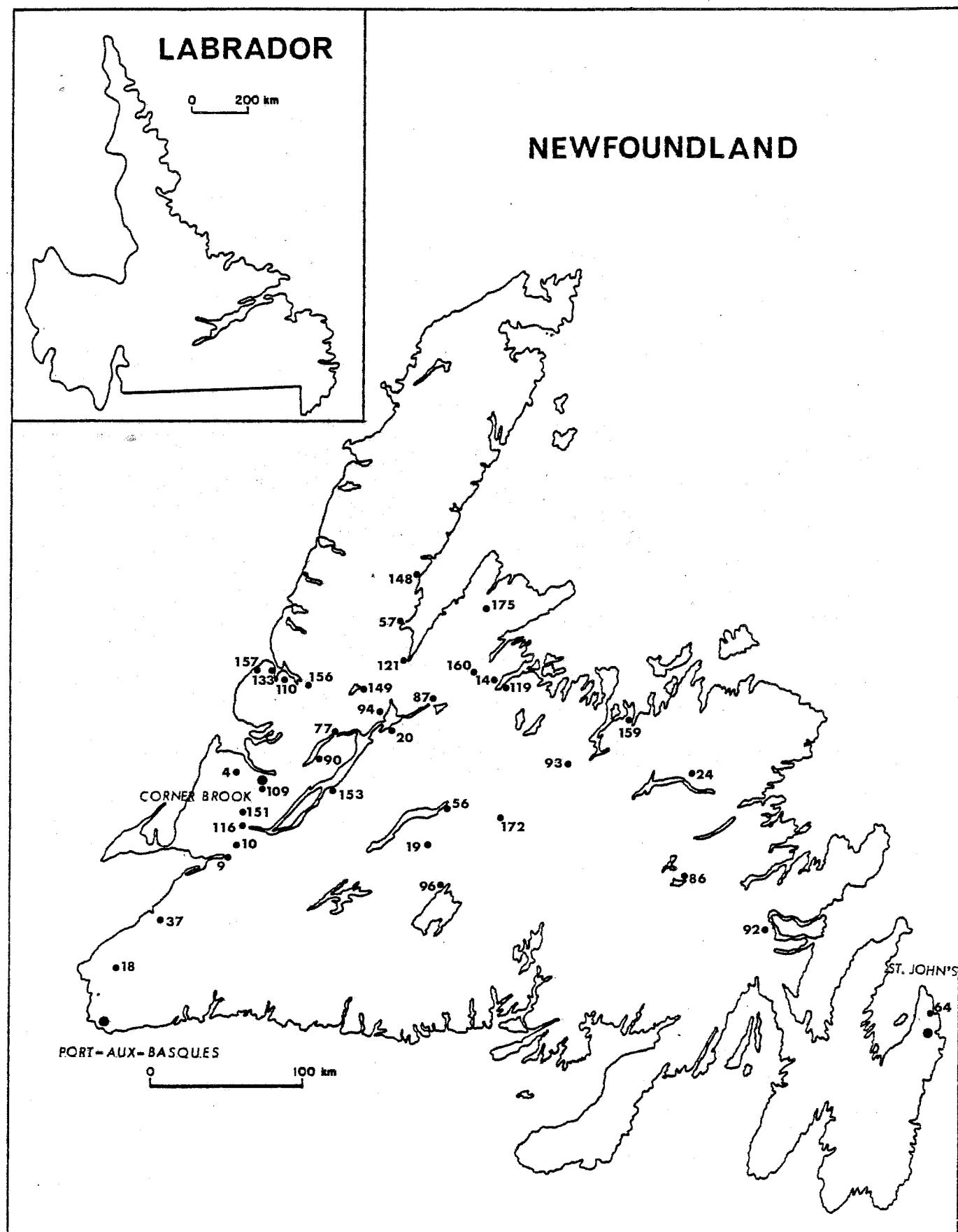


Fig. 2. Map showing 36 locations where stem rots of heartwood were collected.

Stem Rots of Sapwood

Pathogen	Disease	Host
<u>Ceratocystis</u> species	Sapwood stain	<u>Abies balsamea</u> (L.) Mill. 4, 37, 124 (102).
<u>Daedalea confragosa</u> Bolt. ex Fr.	White spongy sap rot	<u>Sorbus decora</u> (Sarg.) Schneid.
<u>Daedalea</u> species	Sap rot	<u>Abies balsamea</u> (L.) Mill. 164.
<u>Daedalea unicolor</u> Bull. ex Fr.	White spongy rot or canker rot	<u>Betula papyrifera</u> Marsh. 159.
<u>Fomes fomentarius</u> (L. ex Fr.) Kickx	White mottled rot of heartwood and sapwood	<u>Betula alleghaniensis</u> Britt. 4, 18 (92, 94). <u>Betula papyrifera</u> Marsh. 4, 10, 57, 94 (94).
<u>Fomes pinicola</u> (Sw. ex Fr.) Cke.	Brown cubical rot of heartwood and sapwood	<u>Prunus pensylvanica</u> L.f. 14 (88). <u>Abies balsamea</u> (L.) Mill. 4, 37, 148, 151 (102). <u>Betula papyrifera</u> Marsh. 18, 57 (92).
<u>Fomes</u> species	Heart rot	<u>Picea glauca</u> (Moench)Voss 4 (94). <u>Picea mariana</u> (Mill.) B.S.P. 57, 156.
<u>Ganoderma applanatum</u> (Pers. ex Wallr.) Pat.	White mottled rot	<u>Betula papyrifera</u> Marsh. <u>Picea mariana</u> (Mill.) B.S.P. <u>Betula papyrifera</u> Marsh. 133. <u>Picea mariana</u> (Mill.) B.S.P. <u>Populus balsamifera</u> L.

Pathogen	Disease	Host
<u>Lenzites saeparia</u> (Wulf. ex Fr.) Fr.	Brown cubical or pocket sap rot	<u>Abies balsamea</u> (L.) Mill. 9, 77, 148 (30, 31, 81).
		<u>Picea mariana</u> (Mill.) B.S.P. 20, 57 (82, 104).
		<u>Picea</u> species 19, 149.
<u>Lenzites</u> species	Brown cubical rot	<u>Abies balsamea</u> (L.) Mill.
		<u>Picea mariana</u> (Mill.) B.S.P.
<u>Peniophora gigantea</u> (Fr.) Massee	White sap rot	<u>Picea</u> species 94.
<u>Pleurotus</u> species	White flaky rot	<u>Aesculus hippocastanum</u> L. 25 (72).
<u>Polyporus abietinus</u> Dicks. ex Fr.	White pocket rot or pitted sap rot of conifers	<u>Abies balsamea</u> (L.) Mill. 4, 37, 77, 94, 124, 149, 163, 583 (30, 46, 102).
		<u>Picea mariana</u> (Mill.) B.S.P. 20.
		<u>Picea</u> species 19, 94, 133, 149.
<u>Polyporus adustus</u> Willd. ex Fr.	White mottled rot	<u>Picea mariana</u> (Mill.) B.S.P.
		<u>Populus</u> species 77.
		<u>Populus tremuloides</u> Michx. 162.
<u>Polyporus albellus</u> Pk.	White spongy rot	<u>Alnus</u> species 119.
		<u>Betula alleghaniensis</u> Britt. 151.

Pathogen	Disease	Host
<u>Polyporus albellus</u> Pk. (Concl'd.)		<u>Betula papyrifera</u> Marsh. 84.
		<u>Prunus pensylvanica</u> L.f. 150.
<u>Polyporus arcularis</u> Batsch ex Fr.	White rot of broadleaved trees	<u>Betula papyrifera</u> Marsh. 152.
<u>Polyporus betulinus</u> Bull. ex Fr.	Brown cubical sap rot	<u>Betula papyrifera</u> Marsh. 19, 94, 127, 155, 177, 584 (15, 84, 90).
<u>Polyporus biformis</u> Klotsch ex Fr.	Yellowish rot	<u>Abies balsamea</u> (L.) Mill. 162.
<u>Polyporus brumalis</u> Pers. ex Fr.	White rot of broadleaved trees	<u>Betula papyrifera</u> Marsh. 154.
		<u>Populus tremuloides</u> Michx. 162.
		<u>Prunus pensylvanica</u> L.f. 152.
<u>Polyporus elegans</u> Bull. ex Fr.	White rot	<u>Populus</u> species 84, 119.
		<u>Salix</u> species 24.
<u>Polyporus fibril-</u> <u>losus</u> Karst.	Brown rot of conifers	<u>Picea</u> species 151.
<u>Polyporus hirsutus</u> Wulf. ex Fr.	White spongy rot of sapwood of broadleaved trees; rarely on coniferous trees	<u>Populus tremuloides</u> Michx. 19, 160 (30).

Pathogen	Disease	Host
<u>Polyporus mollis</u> Pers. ex Fr.	Brown rot of coniferous trees	<u>Abies balsamea</u> (L.) Mill. 151.
<u>Polyporus nidulans</u> Fr.	White sap rot	<u>Salix</u> species 39.
<u>Polyporus pargamenus</u> Fr.	White spongy or white pocket sap rot	<u>Betula papyrifera</u> Marsh. <u>Populus</u> species 94.
		<u>Populus tremuloides</u> Michx. 51, 123.
<u>Polyporus pubescens</u> Schum. ex Fr.	White spongy sap rot of broadleaved trees	<u>Betula papyrifera</u> Marsh. 109.
		<u>Betula</u> species 126.
<u>Polyporus semipileatus</u> Pk.	White rot	<u>Picea</u> species 119.
<u>Polyporus</u> species	Sapwood rot	<u>Abies balsamea</u> (L.) Mill. 172 (92).
		<u>Picea mariana</u> (Mill.) B.S.P.
		<u>Pinus strobus</u> L.
<u>Polyporus velutinus</u> Fr.	White spongy rot of broadleaved trees	<u>Betula papyrifera</u> Marsh. 161.
		<u>Populus tremuloides</u> Michx. 7, 162.
<u>Polyporus versicolor</u> L. ex Fr.	Soft white spongy rot of broadleaved trees	<u>Alnus rugosa</u> (Du Roi) Spreng. <u>Betula papyrifera</u> Marsh. 9 (81).

Pathogen	Disease	Host
<u>Polyporus versicolor</u> L. ex Fr. (Concl'd.)		<u>Betula</u> species 6.
		<u>Populus</u> species 94.
		<u>Prunus pensylvanica</u> L.f. 109.
<u>Pycnoporus cinnabarinus</u> (Jacq. ex Fr.) Karst. (= <u>Polyporus cinnabarinus</u> Jacq. ex Fr.)	White rot of broadleaved trees	<u>Betula papyrifera</u> Marsh. 151.
		<u>Betula</u> species 6 (30).
		<u>Sorbus</u> species 156.
<u>Schizophyllum commune</u> Fr.	White spongy sap rot	<u>Abies balsamea</u> (L.) Mill. 77, 95 (30).
		<u>Alnus rugosa</u> var. <u>americana</u> (Regel) Fern.
		<u>Betula papyrifera</u> Marsh.
		<u>Populus</u> species
		<u>Populus tremuloides</u> Michx.
<u>Stereum hirsutum</u> (Willd. ex Fr.) S.F. Gray	White sap rot	<u>Betula papyrifera</u> Marsh. 7, 160.
		<u>Prunus pensylvanica</u> L.f.
<u>Trametes</u> species	Stem decay	<u>Abies balsamea</u> (L.) Mill. 9 (81).

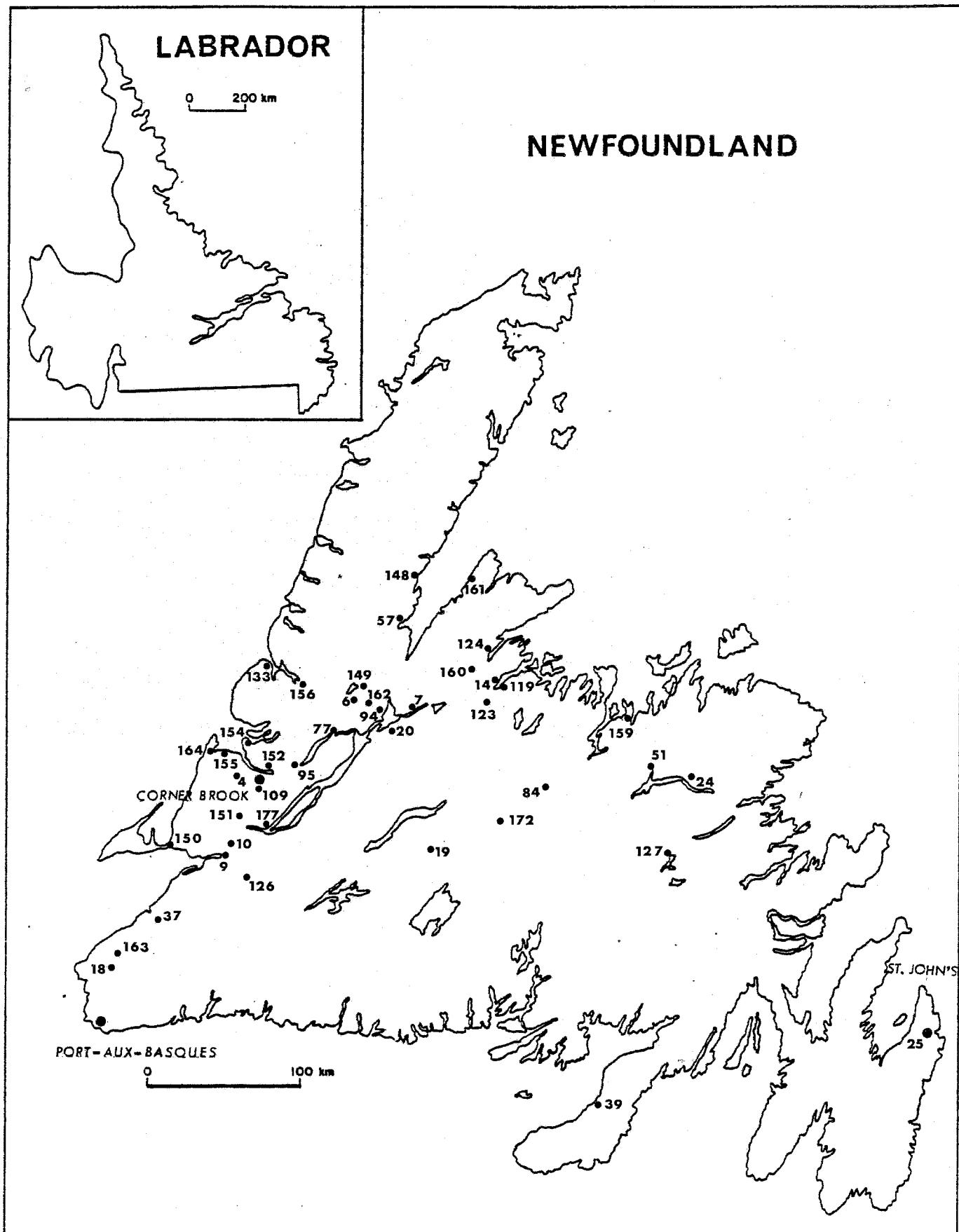


Fig. 3. Map showing 42 locations where stem rots of sapwood were collected.

Stem Rots - Miscellaneous

Pathogen	Disease	Host
<u>Alternaria tenuis</u> auct. sensu. Wiltshire	Sapwood stain	<u>Abies balsamea</u> (L.) Mill. 583, 584, 585 (99).
<u>Cephalosporium</u> species	Sapwood stain	<u>Abies balsamea</u> (L.) Mill. 583, 584, 585 (99).
<u>Coriolellus</u> <u>heteromorphus</u> (Fr.) Bond. and Singer	Brown cubical rot of conifers	<u>Abies balsamea</u> (L.) Mill.
<u>Coriolellus</u> species (? <u>heteromorphus</u> or <u>variiformis</u>)	Brown cubical rot	<u>Abies balsamea</u> (L.) Mill.
<u>Coriolellus</u> <u>variiformis</u> (Pk.) Sarkar	Light brown cubical rot	<u>Picea mariana</u> (Mill.) B.S.P.
<u>Corticium galactinum</u> (Fr.) Burt	White and yellow stringy root and butt rot	<u>Abies balsamea</u> (L.) Mill. 4 (97). Coniferous wood
		<u>Picea</u> species
<u>Corticium laeve</u> Pers. ex Fr.	White spongy rot	<u>Picea</u> species 24.
<u>Corticium</u> <u>leucoxanthum</u> Bres.		<u>Alnus</u> species 7.
<u>Corticium notabile</u> Jackson	Decay of wood and bark	<u>Picea mariana</u> (Mill.) B.S.P. 7.
<u>Corticium pelliculare</u> Karst.		<u>Picea</u> species 119.
<u>Corticium</u> <u>pini-canadensis</u> (Schw.) Jacks. and Rogers	Stem decay of old wood and bark	<u>Abies balsamea</u> (L.) Mill. 90.

Pathogen	Disease	Host
<u>Corticium sulphureum</u> (Pers. ex Fr.) Fr.	Decay	Coniferous wood and slash 160.
<u>Kirschsteiniella thujina</u> (Pk.) Pomerleau and Etheridge (= <u>Amphisphaeria thujina</u> (Pk.) Sacc.)	Blue stain of the sapwood	<u>Abies balsamea</u> (L.) Mill. 4, 37, 124, 583, 584, 585 (99, 102).
<u>Panus laevis</u> Berk. and Curt.		<u>Betula papyrifera</u> Marsh.
<u>Panus stipticus</u> (Bull. ex Fr.) Fr.	Decay of logs	<u>Alnus</u> species <u>Betula papyrifera</u> Marsh.
		<u>Populus tremuloides</u> Michx.
<u>Peniophora aspera</u> (Pers.) Sacc.	Decay of logs and dead wood	<u>Betula papyrifera</u> Marsh. 77. <u>Prunus</u> species 35.
<u>Peniophora aurantiaca</u> (Bres.) Höhn. and Litsch.	White rot	<u>Alnus rugosa</u> (Du Roi) Spreng. 20. <u>Alnus rugosa</u> var. <u>americana</u> (Regel) Fern. 172 (92). <u>Alnus</u> species 119.
<u>Peniophora populnea</u> (Pk.) Burt		<u>Populus tremuloides</u> Michx. 147.
<u>Peniophora rufa</u> (Fr.) Boid. (= <u>Stereum rufum</u> Fr.)		<u>Populus tremuloides</u> Michx. 84, 160, 574 (30).

Pathogen	Disease	Host
<u>Peniophora separans</u> Burt	Decay	<u>Picea</u> species 148.
<u>Peniophora</u> species	Decay	<u>Alnus crispa</u> (Ait.) Pursh <u>Alnus rugosa</u> (Du Roi) Spreng. <u>Betula papyrifera</u> Marsh. <u>Populus tremuloides</u> Michx.
<u>Phlebia strigosozonata</u> (Schw.) Lloyd	White spongy rot	<u>Populus</u> species
<u>Polyporus pocula</u> (Schw.) Berk. and Curt.		<u>Prunus pensylvanica</u> L.f. 109.
<u>Poria candidissima</u> (Schw.) Cke.	White rot	<u>Abies balsamea</u> (L.) Mill. 148. <u>Picea mariana</u> (Mill.) B.S.P. 20.
<u>Poria ferrea</u> (Pers.) Bourd. and Galz.	White rot	<u>Alnus</u> species 93. <u>Sorbus americana</u> Marsh 160.
<u>Poria prunicola</u> (Murr.) Sacc. and Trott.	Associated with white rot	<u>Prunus</u> species 160.
<u>Poria</u> species	Decay	<u>Alnus</u> species <u>Picea glauca</u> (Moench) Voss <u>Picea mariana</u> (Mill.) B.S.P. <u>Populus tremuloides</u> Michx.

Pathogen	Disease	Host
<u>Stereum chailletii</u> (Pers. ex Fr.) Fr. (= <u>Amylostereum</u> <u>chailletii</u> (Pers. ex Fr.) Boid.)	White stringy rot	<u>Abies balsamea</u> (L.) Mill. 4, 37, 77, 84, 89, 90, 95, 124, 125, 126, 583 (21, 30, 31, 43, 46, 51, 99, 101, 102).
<u>Stereum</u> <u>ochraceoflavum</u> (Schw.) Ell.		<u>Alnus</u> species
<u>Stereum ostrea</u> Blume and Nees ex Fr.	White crumbly rot	<u>Betula papyrifera</u> Marsh. 94.
<u>Stereum purpureum</u> (Pers. ex Fr.) Fr.	Silver leaf	<u>Betula papyrifera</u> Marsh. 24, 77, 109 (93).
		<u>Populus</u> species
		<u>Populus tremuloides</u> Michx. 160 (30).
<u>Stereum rugosum</u> Fr.		<u>Alnus</u> species 133.
		<u>Betula papyrifera</u> Marsh. 24, 57, 77.
<u>Stereum</u> species	Brown streaks	<u>Abies balsamea</u> (L.) Mill. 84 (87).
<u>Trechispora</u> <u>brinkmanni</u> (Bres.) Rogers and Jacks. (= ? <u>Sistotrema</u> <u>brinkmanni</u> (Bres.) John Erikss.)	White stringy rot	<u>Populus tremuloides</u> Michx.

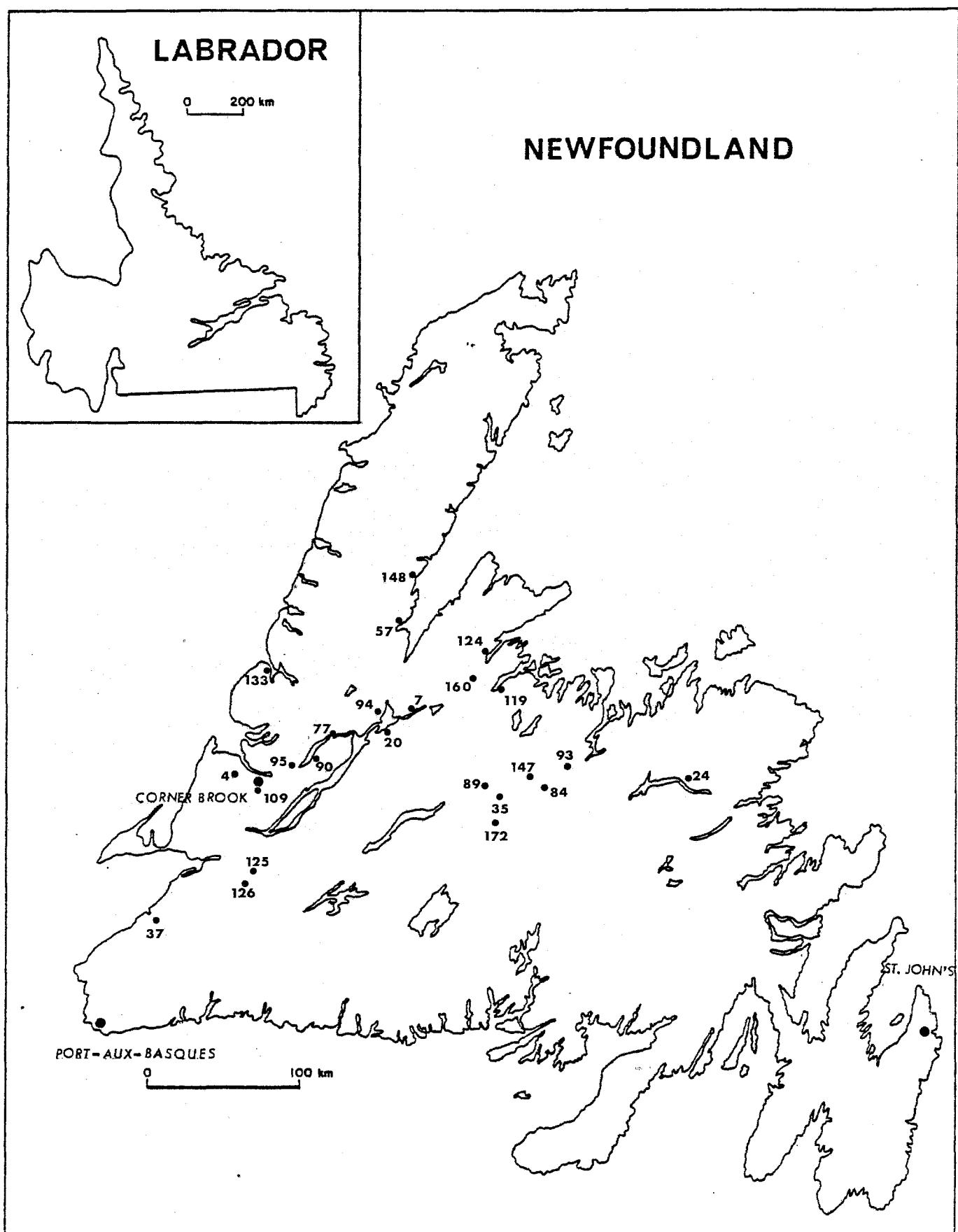


Fig. 4. Map showing 24 locations where miscellaneous stem rots were collected.

Stem Cankers

Pathogen	Disease	Host
<u>Aleurodiscus amorphus</u> (Pers. ex Fr.) Schroet.	Canker	<u>Abies balsamea</u> (L.) Mill.
<u>Creonectria cucurbitula</u> (Sacc.) Seav. (= <u>Nectria cucurbitula</u> Sacc.)	Canker	<u>Abies balsamea</u> (L.) Mill. 77 (30).
<u>Cytospora chrysosperma</u> (Pers. Fr.)	Stem and branch canker	<u>Populus balsamifera</u> L. 272 (73).
		<u>Populus nigra</u> var. <u>italica</u> Muenchh. 25, 68, 77, 84, 93, 109, 595 (7, 36).
		<u>Populus</u> species 25, 77, 84, 109, 251, 595 (76).
		<u>Populus tremuloides</u> Michx. 84, 90, 249, 250, 584 (5, 6, 36).
		<u>Prunus pensylvanica</u> L.f. 25, 84, 249, 250 (6).
		<u>Salix</u> species 98, 291 (104).
<u>Cytospora kunzei</u> Sacc.	Canker	<u>Picea pungens</u> Engelm. 25 (7).
<u>Cytospora salicis</u> (Cda.) Rabh.	Associated with dieback	<u>Salix discolor</u> Muhl. 14, 84, 101, 272, 582 (5, 8, 75).
		<u>Salix</u> species 6, 14, 38, 51, 84, 98, 101, 109, 272, 291, 308, 582, 583, 584 (5, 6, 36, 71, 72, 73, 73A, 91, 125, 134).

Pathogen	Disease	Host
<u>Cytospora</u> species	Dieback and canker	<u>Acer rubrum</u> L. <u>Acer spicatum</u> Lam. 90 (5, 132).
		<u>Alnus rugosa</u> (Du Roi) Spreng.
		<u>Populus balsamifera</u> L. 250 (72).
		<u>Salix babylonica</u> L. 25, 98, 109, 325, 545, 604 (6, 72, 73A, 132).
<u>Dothichiza populea</u> Sacc. and Briard	Stem and branch canker	<u>Populus nigra</u> var. <u>italica</u> Muenchh. 24, 25, 64, 68, 77, 84, 94, 109, 128, 180, 231, 250, 260, 266, 318, 319, 320, 321, 583, 584, 585, 595 (1, 2, 4, 5, 6, 7, 33, 34, 35, 36, 37, 69, 70, 71, 72, 73, 73A, 74, 104, 122, 123, 125, 126, 127, 128, 131, 132, 134, 135, 137, 138, 139, 167, 169).
<u>Encoelia</u> <u>fascicularis</u> fide Groves	Canker	<u>Populus tremuloides</u> Michx. 160 (30).
<u>Gremmeniella</u> <u>abietina</u> (Lagerb.) Morelet (= <u>Scleroderris</u> <u>lagerbergii</u> Gremmen)	Stem and branch canker	<u>Pinus banksiana</u> Lamb. 25, 78, 199, 301 (32, 68, 143, 144). <u>Pinus nigra</u> Arn. 1, 25, 78, 301 (4, 33, 69, 70, 71, 135, 137, 138, 139, 143, 145, 148, 169, 172).
		<u>Pinus resinosa</u> Ait. 1, 25, 78, 199, 250 (1, 2, 32, 33, 68, 69, 70, 138, 139, 143, 144).

Pathogen	Disease	Host
<u>Gremmeniella</u> <u>abietina</u> (Lagerb.) Morelet (Concl'd.)		<u>Pinus sylvestris</u> L. 1, 25, 78, 199, 250, 301, 316 (32, 33, 68, 69, 70, 139, 143, 144, 169).
<u>Hymenochaete</u> <u>tabacina</u> (Sow. ex Fr.) Lév.	Canker and rot	<u>Abies balsamea</u> (L.) Mill. <u>Acer spicatum</u> Lam. <u>Alnus rugosa</u> var. <u>americana</u> (Regel) Fern. 503 (94). <u>Alnus</u> species <u>Betula papyrifera</u> Marsh. <u>Picea</u> species <u>Populus tremuloides</u> Michx. 123 (93). <u>Prunus</u> species 160 (30). <u>Salix</u> species
<u>Hypoxyton fuscum</u> Pers. ex Fr.	Canker	<u>Alnus rugosa</u> (Du Roi) Spreng. 7 (30).
<u>Hypoxyton mammatum</u> (Wahl.) Miller (= <u>Hypoxyton blakei</u> Berk. and Curt.) (= <u>Hypoxyton morsei</u> Berk. and Curt.)	Stem canker	<u>Alnus rugosa</u> (Du Roi) Spreng. 7, 17, 101 (30). <u>Alnus</u> species 20. <u>Salix</u> species 90 (30).
<u>Hypoxyton multiforme</u> Fr.	Stem canker	<u>Acer spicatum</u> Lam. 90, 109 (5).

Pathogen	Disease	Host
<u>Hypoxyylon multiforme</u> Fr. (Concl'd.)		<u>Betula alleghaniensis</u> Britt. 163.
		<u>Betula papyrifera</u> Marsh. 133.
		<u>Sorbus</u> species 90.
<u>Nectria cinnabarinus</u> Tode ex Fr.	Dieback and coral spot (canker)	<u>Acer pseudoplatanus</u> L. 25 (69, 70).
		<u>Acer rubrum</u> L. 109, 583, 584, 585 (18).
		<u>Acer saccharinum</u> L.
		<u>Acer saccharum</u> Marsh. 25 (70).
		<u>Acer</u> species 109 (19, 85).
		<u>Acer spicatum</u> Lam. 583, 584, 585.
		<u>Aesculus hippocastanum</u> L. 583, 584, 585.
		<u>Laburnum anaguroides</u> Medic. 583, 584, 585.
		<u>Prunus pensylvanica</u> L.f. 25.
		<u>Rosa</u> species 25 (69).
		<u>Sambucus pubens</u> Michx.
		<u>Sambucus</u> species 583, 584, 585.
		<u>Sorbus decora</u> (Sarg.) Schneid.

Pathogen	Disease	Host
<u>Nectria cinnabrina</u> Tode ex Fr. (Concl'd.)		<u>Tilia</u> species 583, 584, 585.
		<u>Ulmus parvifolia</u> Jacq. 109 (18, 19, 20, 21, 22, 51, 53, 85, 86).
<u>Nectria coccinea</u> (Pers. ex Fr.) Fr.	A saprobe associated with canker	<u>Alnus crispa</u> (Ait.) Pursh. <u>Taxus brevifolia</u> Nutt. 25, 251, 595 (7).
<u>Nectria galligena</u> Bres.	Canker	<u>Acer pseudoplatanus</u> L. 25, 251, 595 (7, 37, 73A, 129).
<u>Nectria</u> species	Canker	<u>Abies balsamea</u> (L.) Mill. <u>Acer rubrum</u> L. 25.
		<u>Acer saccharinum</u> L. 25.
		<u>Acer spicatum</u> Lam. 25.
		<u>Aesculus hippocastanum</u> L. 25.
		<u>Fagus</u> species
		<u>Picea pungens</u> Engelm. 25 (7).
<u>Retinocyclo</u> <u>abietis</u> (Crouan) Groves and Wells	Dieback and canker	<u>Abies balsamea</u> (L.) Mill. 583, 584, 585 (99).
<u>Tymanis pithya</u> (Fr.) Karst.	Canker	<u>Pinus strobus</u> L.
<u>Tymanis</u> <u>spermaticiospora</u> (Nyl.) Nyl.	Canker	<u>Populus</u> species 22, 90 (30). <u>Populus tremuloides</u> Michx.
		<u>Prunus</u> species 7 (30).

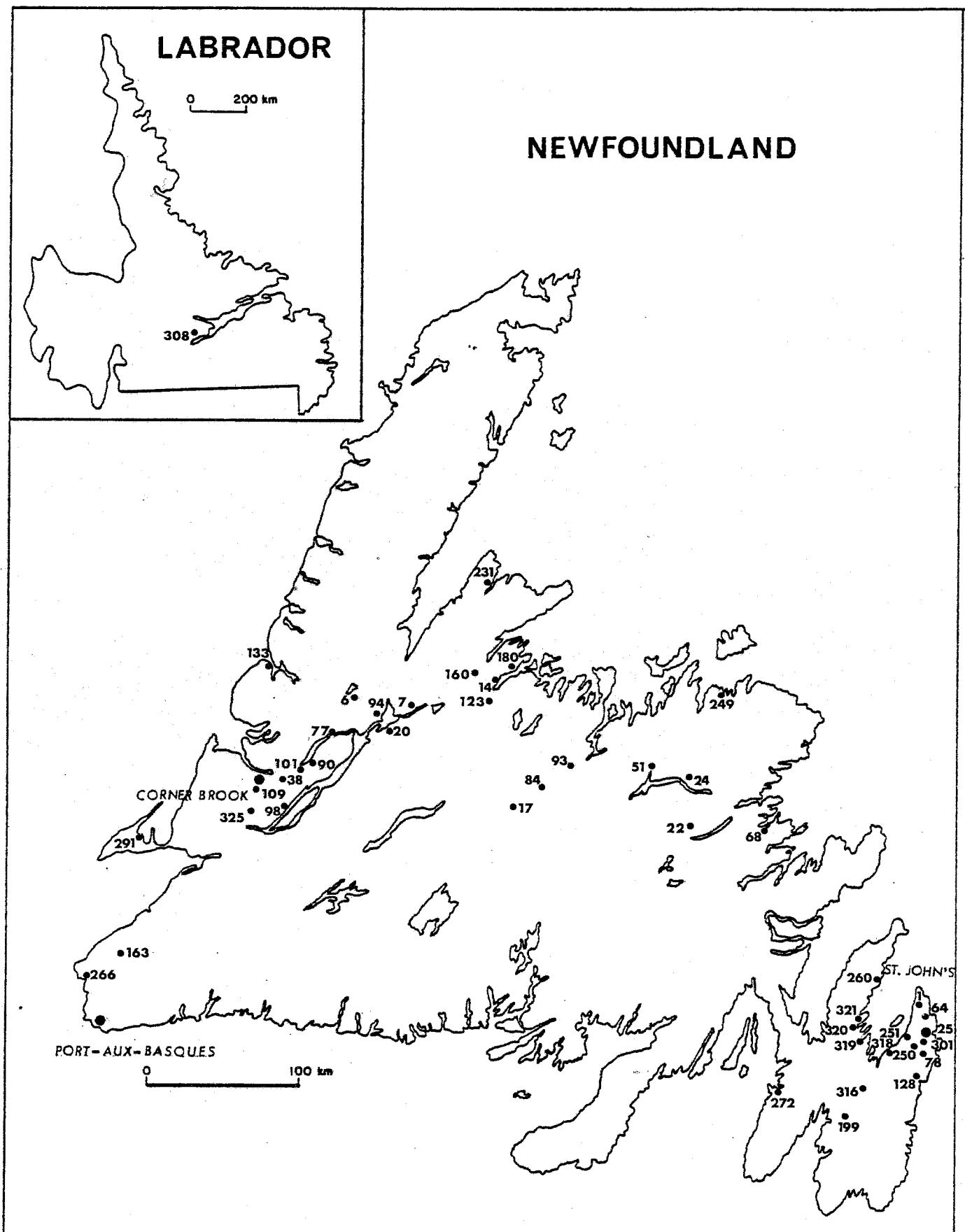


Fig. 5. Map showing 45 locations where stem cankers were collected.

Stem Rusts

Pathogen	Disease	Host
<u>Chrysomyxa</u> <u>arctostaphyli</u> Diet. (= <u>Peridermium</u> <u>coloradense</u> (Diet.) Arth. and Kern)	Yellow witches' broom	<u>Picea glauca</u> (Moench) Voss 35, 39, 54 (22).
		<u>Picea mariana</u> (Mill.) B.S.P. 14, 24, 35, 39, 53, 54, 89, 92, 122, 155, 199, 296, 308, 313, 580, 581, 582, 583, 584, 585, 619, 627 (1, 4, 5, 6, 18, 33, 35, 36, 37, 53, 68, 69, 70, 72, 73, 73A, 82, 84, 85, 86, 88, 89, 105, 123, 124, 125, 127, 128, 131, 132, 134, 143, 159, 167).
<u>Cronartium</u> <u>coleosporioides</u> Arth.	Blister rust	<u>Pinus banksiana</u> Lamb. 265 (8, 75).
<u>Cronartium ribicola</u> J.C. Fischer	Blister or stem rust of eastern white pine	<u>Pinus strobus</u> L. 7, 9, 10, 12, 19, 20, 21, 22, 23, 24, 25, 26, 35, 38, 55, 67, 84, 86, 87, 90, 93, 110, 113, 121, 122, 131, 151, 162, 172, 180, 181, 182, 183, 251, 290, 507, 508, 559, 583, 584, 585, 589, 590, 591, 592, 602 (1, 2, 4, 5, 6, 8, 9, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24, 30, 43, 44, 56, 57, 65, 66, 67, 69, 70, 71, 73A, 75, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 92, 94, 95, 104, 134, 139, 169, 172).
		<u>Ribes glandulosum</u> Grauer (alternate host) 9, 10, 303 (6, 8, 9, 72, 75).
		<u>Ribes hirtellum</u> Michx. (alternate host)
		<u>Ribes lacustre</u> (Pers.) Poir. (alternate host) 583, 584, 585.

Pathogen	Disease	Host
<u>Cronartium ribicola</u> J.C. Fischer (Concl'd.)		<u>Ribes</u> species 4, 13, 77, 90, 121, 149, 156, 583, 584, 585 (30, 65).
<u>Gymnosporangium clavipes</u> (Cke. and Pk.) Cke. and Pk.	Quince rust	<u>Amelanchier</u> species 11, 25, 56, 260, 596 (5, 73, 73A, 136, 149).
		<u>Juniperus communis</u> L. 11, 25, 260 (136, 149).
<u>Gymnosporangium</u> species	Stem rust	<u>Amelanchier bartramiana</u> (Tausch) Roem.
		<u>Amelanchier laevis</u> Wieg.
		<u>Amelanchier sanguinea</u> (Pursh) D.C.
<u>Melampsorella caryophyllacearum</u> Schroet. (= <u>Melampsorella cerastii</u> Schroet.)	Yellow witches' broom	<u>Abies balsamea</u> (L.) Mill. 6, 24, 25, 27, 34, 35, 39, 47, 52, 54, 63, 67, 79, 84, 96, 101, 107, 109, 113, 149, 178, 179, 183, 197, 199, 223, 249, 296, 300, 307, 309, 504, 505, 506, 540, 575, 580, 582, 583, 584, 585, 588, 597, 610 (1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 16, 17, 18, 19, 20, 21, 22, 30, 33, 34, 36, 37, 38, 48, 53, 69, 70, 71, 72, 73, 73A, 74, 75, 76, 78, 82, 83, 84, 85, 86, 87, 88, 104, 121, 123, 124, 125, 127, 128, 131, 132, 134, 135, 137, 139, 143, 159).
<u>Pucciniastrum goeppertianum</u> (Kühn) Kleb.	Witches' broom rust	<u>Abies balsamea</u> (L.) Mill. 37, 84, 172, 583, 584, 585 (10, 77).
	Witches' broom	<u>Vaccinium cespitosum</u> Michx.

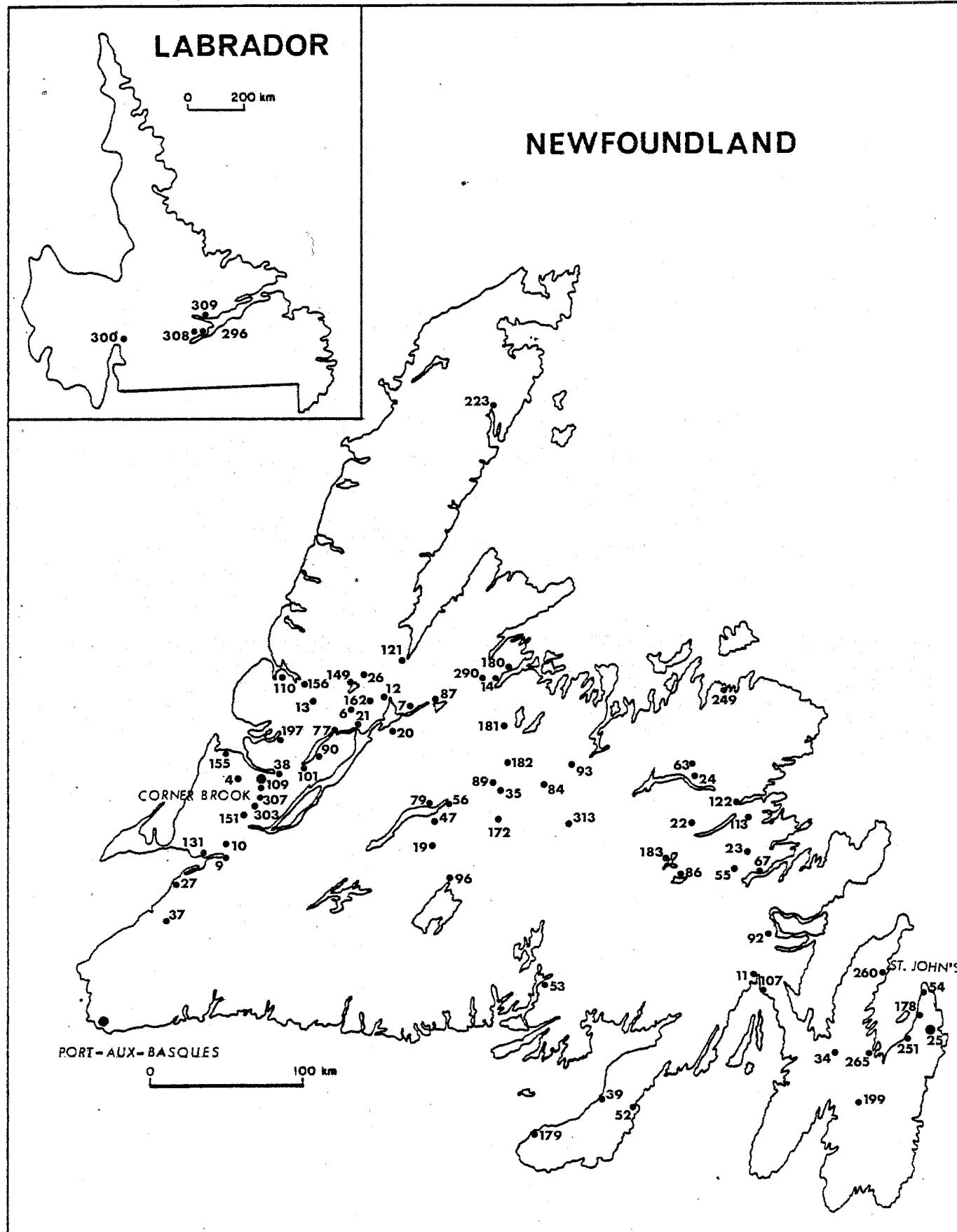


Fig. 6. Map showing 76 locations where stem rusts were collected.

Stem Diseases - Miscellaneous

Pathogen	Disease	Host
<u>Apiosporina</u> <u>collinsii</u> (Schw.) Höhn. (= <u>Dimerosporium</u> <u>collinsii</u> (Schw.) Thüm.)	Witches' broom	<u>Amelanchier</u> species 11, 35, 97, 231 (69, 71, 74).
		<u>Pyrus</u> species 103 (88).
		<u>Viburnum cassinoides</u> L. 97, 231 (69).
<u>Apiosporina morbosa</u> (Schw.) Arx	Black knot	<u>Prunus avium</u> (L.) L. 583, 584, 585 (172).
		<u>Prunus domestica</u> L. 583, 584, 585 (172).
		<u>Prunus insititia</u> L. 66, 511, 512, 513, 514, 583, 584, 585 (86, 87, 88, 89, 95).
		<u>Prunus pensylvanica</u> L.f. 2, 3, 6, 11, 20, 22, 24, 25, 27, 35, 38, 51, 55, 62, 72, 77, 81, 83, 89, 90, 91, 109, 122, 123, 128, 133, 141, 164, 172, 177, 184, 185, 186, 322, 510, 583, 584, 585, 586, 588, 589, 590, 591, 592, 593, 594, 619 (4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 24, 43, 44, 53, 57, 68, 70, 72, 73A, 74, 75, 76, 78, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 92, 104, 125, 137, 139, 169, 172).
		<u>Prunus</u> species 2, 14, 109, 252, 576, 583, 584, 585, 623, 628, 638 (6, 8, 20, 21, 22, 53, 65, 75, 85, 86, 87, 88, 90, 95, 125, 171).
		<u>Prunus virginiana</u> L. 583, 584, 585 (18, 86).

Pathogen	Disease	Host
<u>Chlorosplenium aeruginosum</u> (Oed. ex S.F. Gray) de Not.	Stain - green	<u>Abies balsamea</u> (L.) Mill.
<u>Cucurbitothis pityophila</u> (Fr.) Petrak (= <u>Cucurbitaria pityophila</u> (Fr.) de Not.)	Stem girdle	<u>Pinus strobus</u> L. 9, 187 (69, 88).
<u>Cytidia salicina</u> (Fr.) Burt	Stem canker	<u>Alnus</u> species
<u>Dermea balsamea</u> (Pk.) Seav.	Dieback	<u>Abies balsamea</u> (L.) Mill. 19, 56 (18, 49).
<u>Diatrypella betulina</u> Pk.	On branches and twigs	<u>Betula papyrifera</u> Marsh.
<u>Polyporus picipes</u> Fr.	On decaying wood	<u>Picea glauca</u> (Moench) Voss 126.

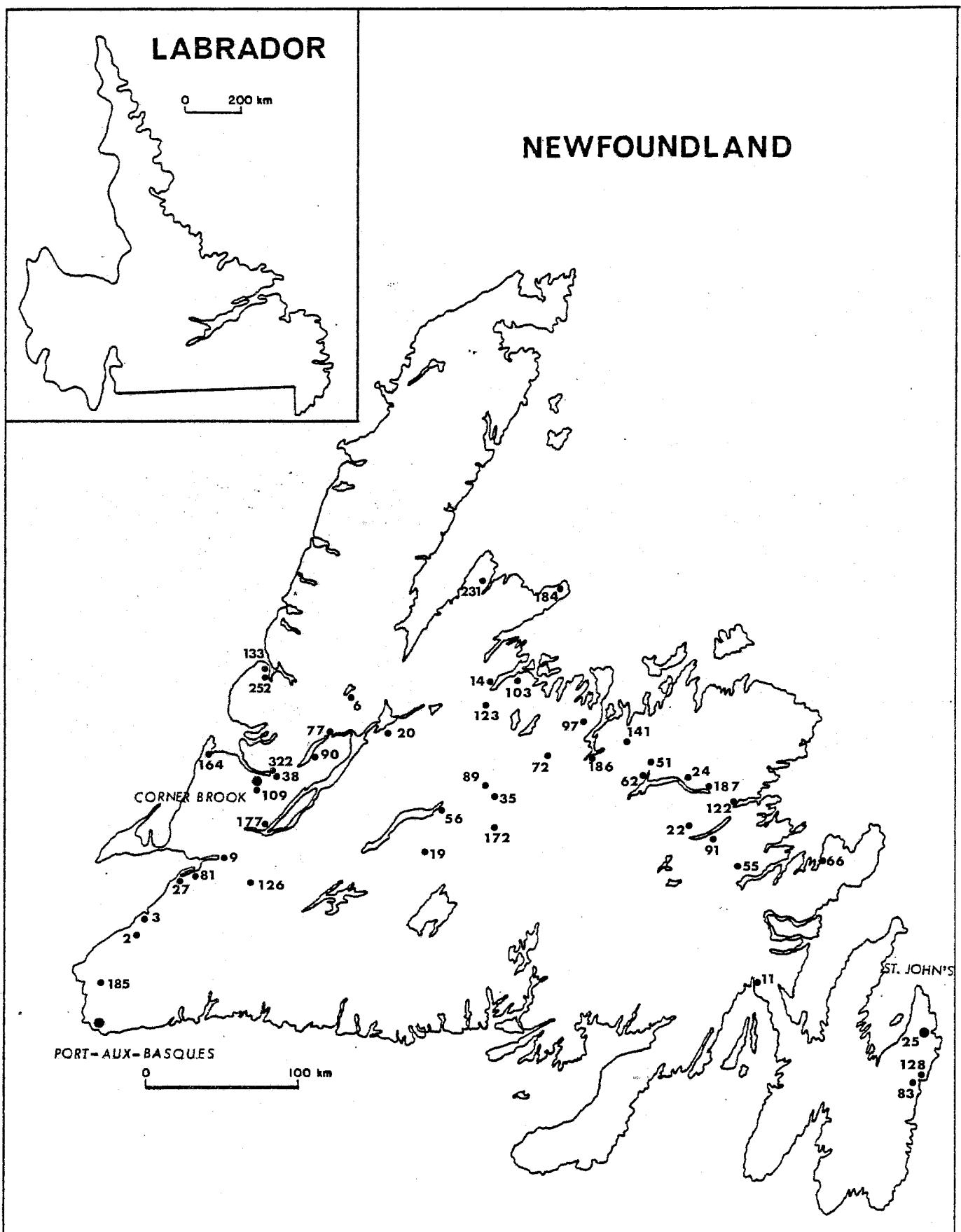


Fig. 7. Map showing 45 locations where miscellaneous stem diseases were collected.

Foliage Diseases of Coniferous Trees, Shrubs or Herbaceous Plants - Needle
Rusts

Pathogen	Disease	Host
<u>Chrysomyxa empetri</u> Schroet. ex Cummins	Needle rust	<u>Picea glauca</u> (Moench) Voss 5, 25, 49, 168, 196, 208, 215, 244, 306, 582, 583, 584, 628 (4, 8, 9, 37, 60, 74, 75).
		<u>Picea mariana</u> (Mill.) B.S.P. 10, 57, 77, 162, 584 (172).
		<u>Picea</u> species 582, 583, 584, 585 (28, 167, 171).
<u>Chrysomyxa ledi</u> de Bary	Needle rust	<u>Picea glauca</u> (Moench) Voss 4, 7, 11, 20, 21, 34, 35, 42, 43, 48, 52, 54, 56, 67, 92, 104, 106, 122, 131, 165, 171, 175, 179, 188, 191, 196, 199, 202, 203, 206, 207, 520, 569, 578, 579, 580, 583, 584, 585 (3, 4, 16, 17, 18, 19, 24, 45, 47, 48, 57, 83, 84, 85, 88, 89, 90, 104, 123, 132).
		<u>Picea mariana</u> (Mill.) B.S.P. 4, 7, 11, 12, 14, 19, 20, 21, 24, 25, 34, 35, 37, 42, 46, 47, 48, 51, 52, 53, 55, 56, 58, 67, 77, 84, 89, 92, 104, 106, 119, 122, 127, 131, 159, 160, 171, 172, 173, 175, 179, 183, 188, 191, 196, 199, 200, 202, 204, 205, 206, 207, 248, 518, 520, 569, 578, 579, 580, 581, 582, 583, 584, 585, 591, 592, 593, 627 (1, 2, 4, 17, 18, 19, 24, 30, 33, 38, 39, 40, 47, 48, 50, 57, 70, 75, 77, 82, 83, 84, 85, 87, 88, 89, 90, 91, 104, 121, 132, 137, 138, 139, 144).
		<u>Picea</u> species 200, 201, 583, 584, 585 (25, 49, 82).

Pathogen	Disease	Host
<u>Chrysomyxa ledicola</u> Lagerh.	Needle rust	<u>Picea glauca</u> (Moench) Voss 4, 7, 11, 20, 21, 25, 34, 35, 40, 44, 48, 49, 50, 52, 53, 54, 57, 67, 92, 104, 106, 122, 131, 139, 165, 171, 175, 179, 188, 191, 196, 202, 203, 206, 207, 303, 520, 569, 578, 579, 580, 581, 582, 583, 584, 585, 628 (1, 2, 4, 9, 10, 11, 12, 14, 17, 18, 19, 24, 29, 30, 47, 48, 49, 57, 60, 78, 80, 83, 84, 85, 88, 90, 95, 104, 142, 171).
		<u>Picea mariana</u> (Mill.) B.S.P. 3, 4, 7, 11, 14, 19, 20, 21, 22, 24, 25, 31, 34, 35, 37, 40, 42, 44, 45, 46, 47, 48, 51, 52, 53, 55, 56, 57, 58, 61, 66, 67, 69, 77, 84, 88, 89, 92, 104, 106, 119, 122, 127, 131, 139, 157, 159, 160, 162, 165, 171, 172, 175, 179, 183, 188, 189, 191, 196, 200, 202, 204, 205, 206, 207, 208, 209, 216, 248, 251, 259, 303, 308, 324, 518, 520, 521, 522, 569, 578, 579, 580, 581, 582, 583, 584, 585, 591, 592, 593, 603, 606, 619 (1, 2, 4, 5, 8, 9, 13, 14, 15, 16, 17, 18, 19, 24, 30, 32, 33, 38, 40, 42, 43, 44, 45, 47, 48, 49, 50, 57, 70, 71, 73, 75, 76, 77, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 95, 105, 116, 135, 137, 142, 171, 172).
		<u>Picea pungens</u> Engelm. 25, 159, 581, 582, 584 (1, 2, 123, 139, 142, 171).
		<u>Picea sitchensis</u> (Bong.) Carr. 83 (171).

Pathogen	Disease	Host
<u>Chrysomyxa ledicola</u> Lagerh. (Concl'd.)		<u>Picea</u> species 200, 201, 582, 583, 584, 585 (25, 28, 82).
<u>Chrysomyxa pirolata</u> Wint.	Cone rust	<u>Picea glauca</u> (Moench) Voss 25, 576, 582, 583, 584 (32, 105, 144, 151, 167).
		<u>Picea mariana</u> (Mill.) B.S.P. 323, 581, 582, 583, 584, 585, 619 (32, 68, 141, 144, 151, 167, 171, 172).
<u>Chrysomyxa</u> species	Needle rust	<u>Picea glauca</u> (Moench) Voss 24, 53, 55, 69, 92, 188, 582, 583 (22, 53, 62, 86).
		<u>Picea mariana</u> (Mill.) B.S.P. 24, 53, 55, 69, 92, 188, 583 (20, 22, 53, 86, 87, 104).
		<u>Picea</u> species 24, 53 (21, 51).
<u>Coleosporium asterum</u> (Diet.) Syd.	Needle rust	<u>Pinus banksiana</u> Lamb. 188, 253 (10, 77, 138).
		<u>Pinus resinosa</u> Ait. 10, 20, 38, 84, 253, 580, 582 (9, 20, 50, 76).
		<u>Pinus strobus</u> L. 20, 38, 84, 253, 580, 582 (9, 76).
		<u>Pinus sylvestris</u> L. 20, 38, 84, 253, 580, 582 (9, 69, 76).
<u>Melampsora medusae</u> Thüm.	Needle rust	<u>Larix laricina</u> (Du Roi) K. Koch 592 (11, 12, 78).
<u>Milesia fructuosa</u> Faull	Needle rust	<u>Abies balsamea</u> (L.) Mill. 39, 156, 271 (9, 71, 104).

Pathogen	Disease	Host
<u>Milesia</u> species	Needle rust	<u>Abies balsamea</u> (L.) Mill. 4, 5, 8, 21, 24, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 81, 84, 114, 151, 171, 175, 191, 206, 207, 519, 580, 581, 582, 583, 584, 585, 591, 592, 594 (14, 15, 16, 17, 18, 19, 22, 24, 43, 44, 45, 47, 48, 49, 50, 53, 57, 65, 82, 83, 84, 85, 90, 95, 116, 135).
<u>Pucciniastrum</u> <u>epilobii</u> Otth (= <u>Pucciniastrum</u> <u>pustulatum</u> (Pers.) Diet.)	Needle rust	<u>Abies balsamea</u> (L.) Mill. 4, 5, 6, 8, 9, 14, 19, 21, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 51, 52, 57, 81, 84, 87, 88, 90, 114, 122, 151, 152, 165, 171, 173, 175, 191, 197, 201, 206, 207, 210, 211, 264, 289, 296, 308, 309, 317, 331, 332, 517, 519, 568, 576, 580, 581, 582, 583, 584, 585, 591, 592, 594, 600, 603, 614, 619, 627, 638, 640, 641, 646 (4, 5, 6, 8, 9, 13, 14, 15, 16, 17, 18, 19, 22, 24, 30, 32, 34, 35, 37, 42, 43, 44, 45, 47, 48, 49, 50, 53, 57, 65, 68, 69, 70, 71, 72, 73, 73A, 75, 76, 79, 80, 81, 82, 83, 84, 85, 95, 100, 104, 116, 125, 144, 167, 171, 172).
<u>Uredinopsis</u> species	Needle rust	<u>Epilobium angustifolium</u> L. (alternate host) 93 (30).
		<u>Abies balsamea</u> (L.) Mill. 4, 519 (90).

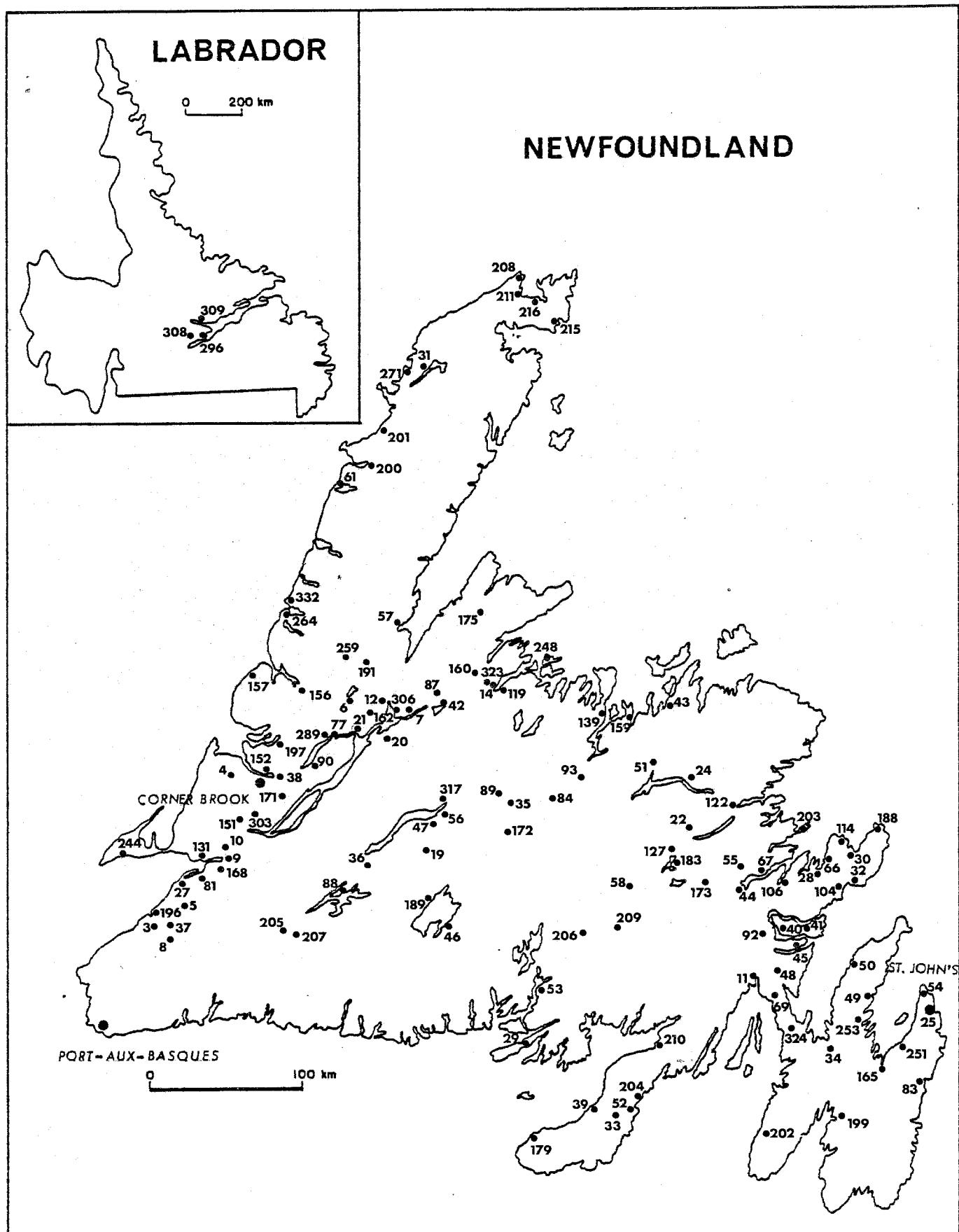


Fig. 8. Map showing 123 locations where needle rusts were collected.

Foliage Diseases of Coniferous Trees (Including Seedlings), Shrubs or
Herbaceous Plants - Needle Casts

Pathogen	Disease	Host
<u>Hypodermella laricis</u> Tub.	Needle cast	<u>Larix laricina</u> (Du Roi) K. Koch 5, 14, 16, 18, 19, 20, 21, 22, 27, 33, 35, 56, 64, 67, 77, 79, 80, 81, 82, 83, 84, 85, 86, 118, 120, 122, 167, 188, 197, 303, 503, 515, 516, 580, 582, 583, 584, 585, 609 (4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 34, 42, 43, 44, 48, 70, 72, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 90, 104, 120, 123, 132, 134).
		<u>Larix leptolepis</u> (Sieb. and Zucc.) Gord. 22.
<u>Hypodermella</u> species	Needle cast	<u>Larix leptolepis</u> (Sieb. and Zucc.) Gord. 22.
<u>Isthmiella</u> <u>crepidiformis</u> (Darker) Darker (= <u>Bifusella</u> <u>crepidiformis</u> Darker)	Needle cast	<u>Picea glauca</u> (Moench) Voss 151, 506, 580, 582, 583, 584, 585 (9, 13, 14, 15, 24, 44, 81, 90).
		<u>Picea mariana</u> (Mill.) B.S.P. 22, 27, 40, 43, 45, 56, 59, 65, 66, 67, 74, 75, 76, 77, 78, 92, 111, 122, 152, 162, 189, 190, 191, 223, 308, 506, 531, 540, 569, 576, 580, 582, 583, 584, 585 (4, 9, 15, 24, 25, 34, 43, 44, 69, 73, 75, 76, 79, 80, 81, 90, 104, 122, 132, 172).
		<u>Picea</u> species 583, 584, 585 (23, 56).

Pathogen	Disease	Host
<u>Isthmiella faullii</u> (Darker) Darker (= <u>Bifusella faullii</u> Darker)	Needle cast	<u>Abies balsamea</u> (L.) Mill. 1, 2, 4, 5, 6, 7, 8, 9, 13, 21, 30, 35, 37, 44, 47, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 79, 83, 98, 106, 111, 124, 133, 138, 153, 154, 155, 165, 171, 192, 193, 194, 240, 262, 308, 309, 317, 517, 519, 576, 581, 582, 583, 584, 585, 587, 588, 619, 621, 626 (1, 2, 7, 8, 9, 11, 12, 14, 15, 18, 24, 37, 39, 43, 44, 48, 68, 69, 71, 73A, 74, 75, 76, 78, 80, 81, 82, 83, 84, 88, 90, 100, 104, 120, 122, 123, 135, 139, 171, 172).
<u>Lirula macrospora</u> (Hartig) Darker (= <u>Lophodermium</u> <u>filiforme</u> Darker)	Needle cast	<u>Picea glauca</u> (Moench) Voss 6, 10, 22, 59, 67, 77, 78, 506, 580, 582, 584 (8, 15, 43, 44, 80, 81, 100, 104).
		<u>Picea mariana</u> (Mill.) B.S.P. 6, 22, 27, 40, 45, 56, 59, 65, 66, 67, 74, 75, 76, 78, 80, 92, 111, 189, 190, 297, 308, 506, 580, 582, 583, 584, 585 (4, 8, 9, 13, 14, 15, 34, 43, 44, 72, 75, 76, 79, 80, 81, 100, 104, 120, 121).
<u>Lirula nervata</u> (Darker) Darker (= <u>Hypoderella</u> <u>nervata</u> Darker)	Needle cast	<u>Abies balsamea</u> (L.) Mill. 23, 63, 67, 86, 110, 584 (8, 9, 30, 75, 104).
<u>Lophodermium nitens</u> Darker	Needle cast	<u>Pinus strobus</u> L. 7.
<u>Lophodermium</u> <u>pinastri</u> (Schrad. ex Fr.) Chev.	Needle cast	<u>Pinus banksiana</u> Lamb. 25, 90, 199, 253, 581, 582, 585 (1, 2, 6, 68, 69, 138, 139).

Pathogen	Disease	Host
<u>Lophodermium</u> <u>pinastri</u> (Schrad. ex Fr.) Chev. (Concl'd.)		<u>Pinus resinosa</u> Ait. 1, 25, 35, 581, 582, 583, 585, 595 (1, 2, 9, 14, 43, 70, 80, 100, 137, 139, 172).
		<u>Pinus</u> species 22.
		<u>Pinus strobus</u> L. 20, 22, 23, 35, 84, 86, 87, 136, 178, 237, 582, 583, 585, 629 (76, 171, 172).
		<u>Pinus sylvestris</u> L. 1, 25, 35, 67, 84, 136, 178, 199, 253, 272, 582, 583, 585, 595, 629 (5, 6, 7, 8, 9, 39, 68, 69, 70, 71, 73, 75, 76, 104, 120, 121, 122, 127, 137, 172).
<u>Lophodermium</u> species	Needle cast	<u>Abies balsamea</u> (L.) Mill. 2, 5, 8, 9, 20, 32, 37, 44, 47, 61, 62, 63, 65, 66, 67, 68, 69, 70, 71, 72, 88, 111, 114, 195, 196, 197, 198, 583, 584, 585, 587, 588 (8, 9, 15, 17, 18, 19, 44, 48, 75, 81, 83, 84, 85, 138).
		<u>Picea glauca</u> (Moench) Voss 90.
		<u>Picea</u> species 22 (5).
		<u>Pinus</u> species 22.
		<u>Pinus sylvestris</u> L. 25 (13).
<u>Rhizothyrium</u> <u>abietis</u> Naum.	Needle cast	<u>Abies balsamea</u> (L.) Mill. 156 (28).

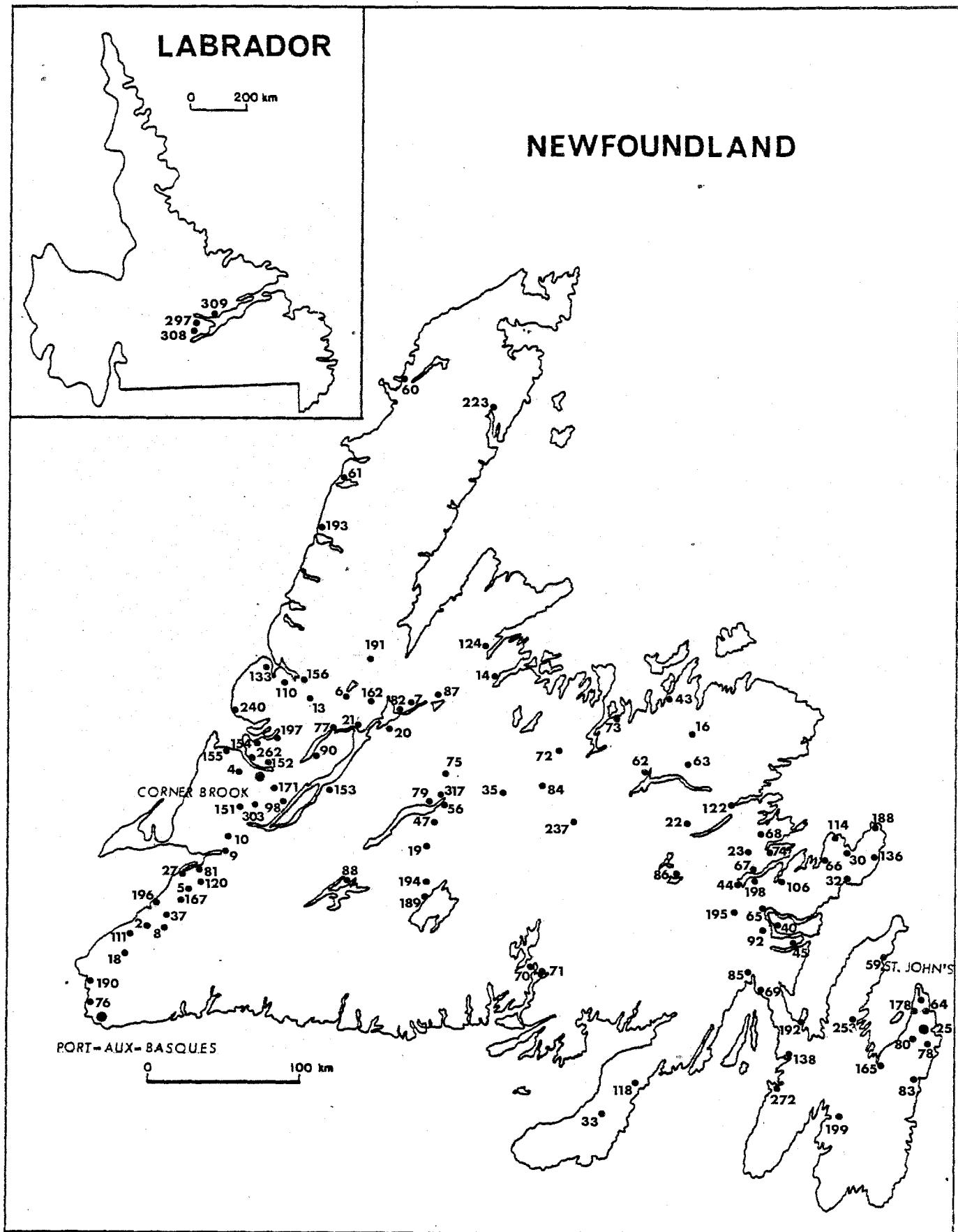


Fig. 9. Map showing 109 locations where needle casts were collected.

Foliage Diseases of Coniferous Trees (Including Seedlings), Shrubs or
Herbaceous Plants - Miscellaneous

Pathogen	Disease	Host
<u>Bothrodiscus pinicola</u> Shear	Twig blight	<u>Abies balsamea</u> (L.) Mill.
<u>Diplodia pinea</u> (Desm.) Kickx	Tip blight	<u>Pinus nigra</u> Arn. 25, 308 (7, 37, 123).
<u>Dothistroma pini</u> Hulb.	Red-banded needle blight	<u>Pinus banksiana</u> Lamb. 22 (169). <u>Pinus nigra</u> Arn. 25, 326 (1, 18, 171).
		<u>Pinus resinosa</u> Ait. 9, 68, 113, 199 (68, 82, 105, 169, 171).
		<u>Pinus sylvestris</u> L. 9, 68, 199 (68, 171).
<u>Fusicoccum abietinum</u> (Hartig) Prill. and Del.	Red flag	<u>Abies balsamea</u> (L.) Mill. 2, 17, 40, 51, 55, 56, 65, 67, 88, 89, 134, 213, 214, 215, 216, 577, 582, 583, 584, 585 (8, 9, 15, 16, 18, 19, 45, 49, 75, 76, 82, 83, 85, 104).
<u>Meliola pinicola</u> Dearn.	Sooty mold	<u>Abies balsamea</u> (L.) Mill. 199, 582 (8, 9, 75). <u>Picea glauca</u> (Moench) Voss 78, 199.
		<u>Picea mariana</u> (Mill.) B.S.P. 582 (8, 9, 75).
<u>Phacidium infestans</u> Karst.	Snow blight	<u>Picea mariana</u> (Mill.) B.S.P. 22, 84. <u>Picea species</u> 22.
<u>Phacidium</u> species	Snow blight	<u>Picea mariana</u> (Mill.) B.S.P. 217, 523 (18, 84).

Pathogen	Disease	Host
<u>Phaeocryptopus nudus</u> (Pk.) Petrak (= <u>Adelopus</u> <u>balsamicola</u> (Pk.) Theiss.)	Needle blight	<u>Abies balsamea</u> (L.) Mill. 54, 81, 86, 92, 110 (30).
<u>Phomopsis juniperovora</u> Hahn.	Twig blight	<u>Thuja occidentalis</u> L. 25, 90 (5, 133, 157).
<u>Rehmiellopsis balsameae</u> Waterman	Tip blight	<u>Abies balsamea</u> (L.) Mill. 18, 25, 37, 45, 51, 60, 81, 84, 101, 116, 153, 199, 212, 214, 287, 308, 506, 552, 571, 581, 582, 583, 584, 585, 619, 621, 622, 642 (1, 3, 4, 5, 6, 15, 18, 19, 37, 48, 49, 69, 70, 73, 73A, 74, 75, 83, 84, 85, 104, 123, 137, 143, 167, 172).
<u>Rhizosphaera abietis</u> Mang. and Har.	Needle blight	<u>Abies balsamea</u> (L.) Mill. 5 (8, 9).
<u>Sirococcus strobilinus</u> Preuss	Shoot blight	<u>Picea mariana</u> (Mill.) B.S.P. 72, 326, 584 (1, 32, 38, 68, 144, 171).
<u>Sphaerulina taxicola</u> (Pk.) Berl.	Leaf spot	<u>Taxus canadensis</u> Marsh.

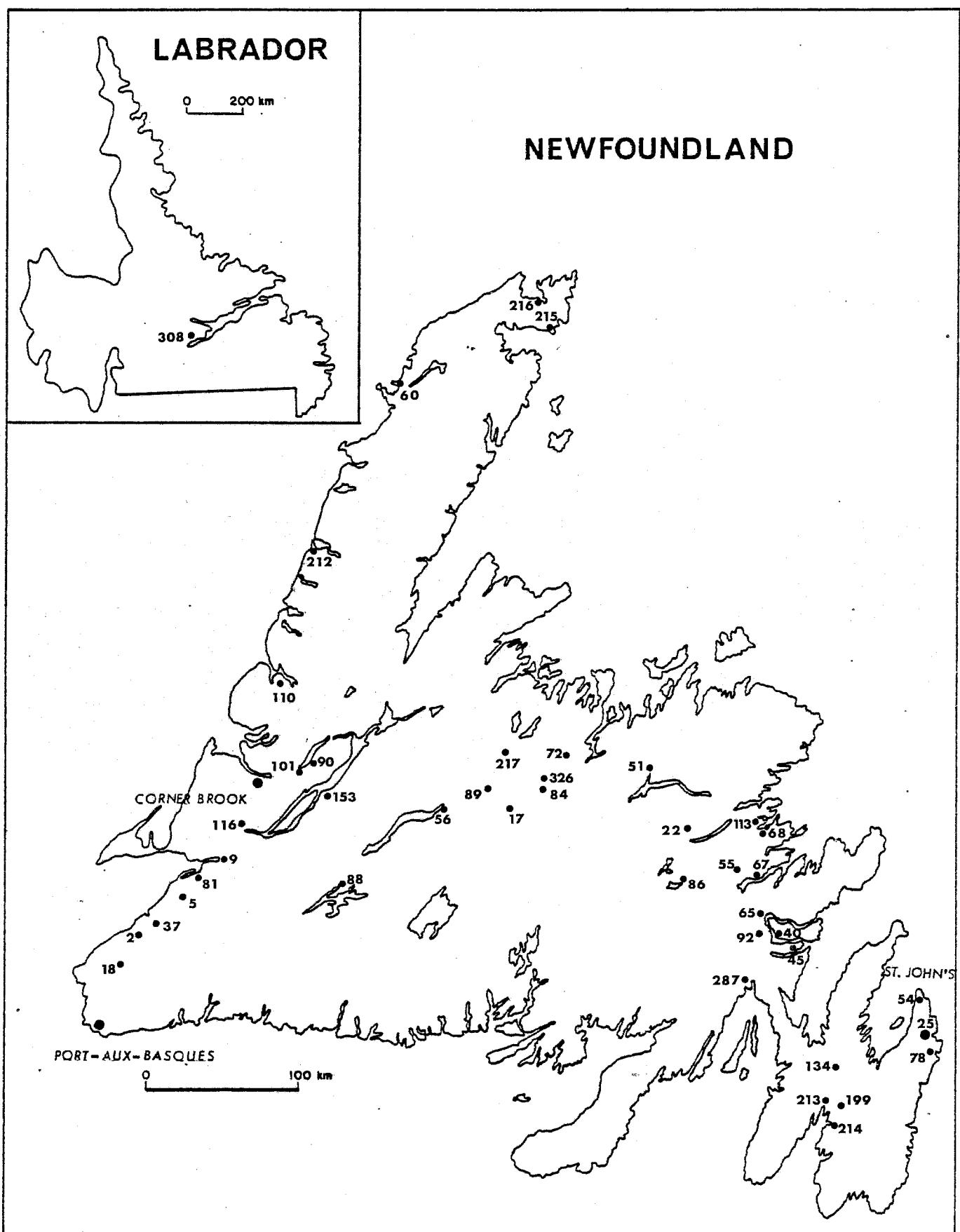


Fig. 10. Map showing 43 locations where miscellaneous foliage diseases of coniferous trees, shrubs or herbaceous plants were collected.

Foliage Diseases of Broadleaved Trees, Shrubs or Herbaceous Plants - Leaf
Rusts

Pathogen	Disease	Host
<u>Coleosporium</u> <u>asterum</u> (Diet.) Syd. (= <u>Coleosporium</u> <u>solidaginis</u> Thüm.)	Leaf rust	<u>Solidago</u> species 573 (30).
<u>Gymnoconia peckiana</u> (Howe) Trott.	Orange rust (on leaves)	<u>Rubus canadensis</u> L. <u>Rubus</u> species
<u>Gymnosporangium</u> <u>cornutum</u> Arth. and Kern (= <u>Gymnosporangium</u> <u>aurantiacum</u> Chev.)	Rust gall (on leaves)	<u>Acer spicatum</u> Lam. 31, 105, 107 (81, 82). <u>Sorbus americana</u> Marsh 14, 29, 32, 35, 40, 44, 48, 51, 53, 56, 66, 69, 70, 83, 92, 104, 105, 106, 107, 110, 111, 115, 121, 122, 139, 141, 188, 223, 227, 231, 239, 247, 250, 260, 305, 537, 580, 581, 582, 583, 584, 585, 608, 621, 627 (5, 6, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 30, 70, 71, 72, 73, 73A, 75, 76, 78, 80, 81, 82, 83, 84, 85, 88, 93, 104, 128).
		<u>Sorbus decora</u> (Sarg.) Schneid. 14, 108.
		<u>Sorbus</u> species 108, 583, 584, 585 (167).
<u>Gymnosporangium</u> species	Rust gall (on leaves)	<u>Amelanchier</u> species 35 (82). <u>Sorbus americana</u> Marsh 5, 228 (82, 90).
		<u>Sorbus aucuparia</u> L. 109.
		<u>Sorbus decora</u> (Sarg.) Schneid. 57 (90).

Pathogen	Disease	Host
<u>Melampsora</u> <u>abietis-canadensis</u> Ludwig ex Arth.	Leaf rust	<u>Populus tremuloides</u> Michx. 11, 14, 24, 35, 81, 90, 93, 103, 123, 290, 583, 584, 585, 636 (30, 69, 88, 167, 172).
<u>Melampsora</u> <u>abieti-capraearum</u> Tub.	Leaf rust	<u>Salix bebbiana</u> Sarg. 173, 300, 625 (4).
		<u>Salix discolor</u> Muhl. 24, 51, 77, 173, 300, 625 (11, 12, 71, 72, 73A, 75, 78, 104, 121).
		<u>Salix</u> species 14, 29, 35, 57, 77, 110, 122, 188, 199, 296, 308, 506, 573, 582, 583, 584, 585, 621, 625 (8, 11, 12, 30, 37, 71, 72, 73A, 75, 78, 92, 104, 121, 167).
<u>Melampsora</u> <u>epitea</u> Thüm.	Rust	<u>Populus tremuloides</u> Michx. 84, 524, 538 (81, 104).
		<u>Pyrola</u> species 133 (30).
		<u>Salix discolor</u> Muhl.
		<u>Salix</u> species 29, 35, 84, 122, 152, 199, 229, 296, 308, 503, 506, 524, 533, 538, 582 (4, 6, 8, 75, 81, 91).
<u>Melampsora</u> <u>paradoxa</u> Diet. and Holw.	Leaf rust	<u>Salix</u> species 122 (10).
<u>Melampsora</u> species	Leaf rust	<u>Populus tremuloides</u> Michx. 35, 67, 84, 93, 103, 122, 149, 251, 572, 577, 584, 585 (13, 42, 79, 139).
		<u>Salix</u> species 149, 251, 572 (90).

Pathogen	Disease	Host
<u>Melampsoridium betulinum</u> (Fr.) Kleb.	Leaf rust	<u>Betula papyrifera</u> Marsh. 53, 188, 214, 278, 531 (8, 10, 11, 12, 75, 77, 78, 121).
<u>Puccinia coronata</u> Cda.	Crown rust (on leaves)	<u>Rhamnus alnifolia</u> L'Hér.
<u>Puccinia porphyrogenita</u> Curt.	Leaf rust	<u>Cornus canadensis</u> L.
<u>Puccinia recondita</u> Rob. ex Desm.	Leaf rust	<u>Thalictrum polygamum</u> Muhl.
<u>Puccinia sparganioides</u> Ell. and Barth.	Leaf rust	<u>Amelanchier</u> species 78, 565 (81).

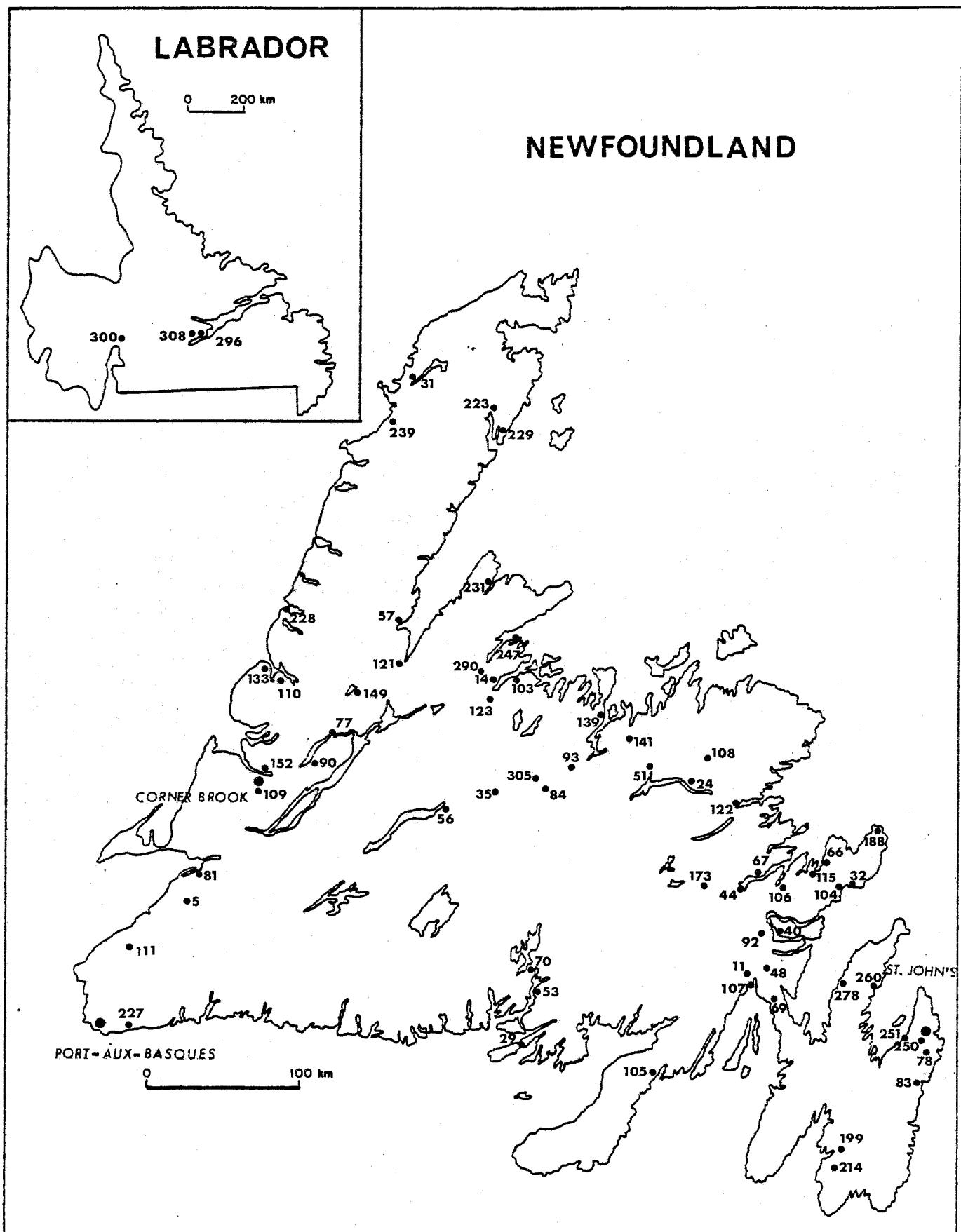


Fig. 11. Map showing 65 locations where leaf rusts of broadleaved trees, shrubs or herbaceous plants were collected.

Foliage Diseases of Broadleaved Trees, Shrubs or Herbaceous Plants - Leaf Spots

Pathogen	Disease	Host
<u>Cercospora salicina</u> Ell. and Ev.	Leaf spot	<u>Salix discolor</u> Muhl. <u>Salix species</u> 6, 524, 570, 583, 584, 585 (8, 9, 15, 44, 73A, 75, 81).
<u>Ciborinia whetzelii</u> (Seav.) Seav. (= <u>Ciborinia bifrons</u> (Whetz.) Whetz.)	Ink spot	<u>Populus tremuloides</u> Michx. 7, 12, 14, 26, 35, 57, 63, 67, 68, 74, 84, 93, 95, 96, 97, 98, 99, 100, 101, 102, 103, 122, 139, 160, 161, 169, 175, 218, 219, 220, 254, 290, 504, 517, 571, 577, 579, 583, 584, 585, 590, 601, 607, 619, 620, 621, 625, 628 (1, 3, 4, 5, 6, 8, 9, 10, 13, 15, 16, 17, 18, 19, 20, 22, 26, 29, 34, 35, 36, 42, 44, 45, 47, 48, 50, 53, 68, 69, 70, 72, 73, 73A, 75, 76, 77, 79, 82, 83, 84, 85, 86, 88, 92, 104, 125, 127, 128, 131, 132, 137, 139, 167, 172).
<u>Cladosporium humile</u> Davis (= <u>Venturia acerina</u> Plakidas nom. nud.)	Leaf spot	<u>Acer rubrum</u> L. 112 (81).
<u>Cladosporium subsessile</u> Ell. and Barth.	Leaf spot	<u>Populus tremuloides</u> Michx. 14, 567 (27, 93).
<u>Coccomyces hiemalis</u> Higgins	Shot hole	<u>Prunus pensylvanica</u> L.f. 18, 25, 35, 83, 90, 112, 197, 221, 250, 308, 583, 584, 619 (4, 5, 6, 8, 69, 71, 73, 73A, 74, 75, 82, 83, 137). <u>Prunus species</u> 583, 584, 585 (22).
		<u>Prunus virginiana</u> L. 93, 222 (18, 84).

Pathogen	Disease	Host
<u>Cyldrosporium</u> <u>betulae</u> Davis	Leaf spot	<u>Betula papyrifera</u> Marsh. 18, 81, 88, 90, 116, 127, 212, 223, 525, 526, 576, 583, 584, 585, 594 (4, 8, 9, 15, 18, 44, 75, 76, 81, 82, 83, 84, 90, 104, 139).
<u>Cyldrosporium</u> species	Leaf spot	<u>Prunus pensylvanica</u> L.f. 93, 109, 275, 583 (90, 93).
<u>Elsinoë corni</u> Jenk. and Bot.	Leaf spot or anthracnose	<u>Cornus</u> species 120 (81).
<u>Gloeosporium</u> species	Leaf spot	<u>Betula papyrifera</u> Marsh. 533 (91).
<u>Gnomonia ulmea</u> (Schw.) Thüm.	Leaf spot	<u>Ulmus</u> species 77 (30).
<u>Gnomoniella coryli</u> (Batsch ex Fr.) Sacc.	Leaf spot	<u>Corylus cornuta</u> Marsh.
<u>Kabatiella apocrypta</u> (Ell. and Ev.) Arx (= <u>Gloeosporium</u> <u>apocryptum</u> Ell. and Ev.)	Large leaf spot or anthracnose	<u>Acer rubrum</u> L. 14, 16, 32, 36, 44, 48, 52, 56, 61, 66, 67, 74, 90, 97, 98, 104, 105, 110, 113, 114, 117, 118, 119, 120, 141, 155, 168, 224, 225, 263, 267, 307, 325, 528, 531, 532, 580, 581, 583, 584, 585, 628, 630 (4, 6, 8, 9, 15, 16, 17, 18, 32, 34, 44, 47, 48, 69, 70, 72, 75, 81, 82, 83, 84, 131, 132, 137, 144, 167).
		<u>Acer</u> species 583, 584, 585 (45).
		<u>Acer spicatum</u> Lam. 14, 16, 32, 36, 44, 48, 52, 56, 61, 66, 67, 74, 82, 84, 90, 96, 97, 98, 104, 105, 110, 113, 114, 117, 118, 119, 120, 121, 141, 155, 168, 188, 224, 225, 255, 263, 267, 307, 325, 514, 528, 529, 530,

Pathogen	Disease	Host
<u>Kabatiella apocrypta</u> (Ell. and Ev.) Arx (= <u>Gloeosporium</u> <u>apocryptum</u> Ell. and Ev.) (Concl'd.)		531, 532, 571, 580, 581, 583, 584, 585, 598, 602, 605, 615, 628 (5, 6, 9, 11, 12, 15, 16, 17, 18, 21, 22, 32, 34, 44, 47, 48, 69, 70, 71, 72, 73, 73A, 74, 75, 76, 78, 81, 82, 83, 84, 86, 87, 131, 132, 134, 137, 144, 167).
		<u>Betula papyrifera</u> Marsh. 188 (12, 78).
<u>Marssonina brunnea</u> (Ell. and Ev.) Sacc.	Leaf spot	<u>Populus nigra</u> var. <u>italica</u> Muenchh. 25 (69, 140).
<u>Mycosphaerella</u> <u>colorata</u> (Pk.) Earle	Leaf spot	<u>Kalmia angustifolia</u> L. 35 (75).
<u>Mycosphaerella</u> species	Leaf spot	<u>Acer rubrum</u> L. 273, 600, 620 (73).
		<u>Epilobium angustifolium</u> L. 101, 273, 303, 600, 620 (69, 72, 73).
		<u>Fraxinus</u> species 35, 53 (81).
		<u>Ledum</u> species 80 (76).
		<u>Populus tremuloides</u> Michx. 35, 47, 53, 152, 273, 580, 583, 584, 585, 600, 620 (15, 44, 73A, 81).
		<u>Sorbus americana</u> Marsh 107 (73, 81).
		<u>Sorbus aucuparia</u> L. 113, 582 (8, 9, 75).
		<u>Sorbus</u> species 599, 621 (71).

Pathogen	Disease	Host
<u>Phleospora aceris</u> (Lib.) Sacc.	Small leaf spot	<u>Acer spicatum</u> Lam. 110 (30, 104).
<u>Phleospora ulmi</u> (Fr.) Wallr.	Leaf spot	<u>Ulmus glabra</u> var. <u>camperdownii</u> Rehd. 135 (28).
<u>Phyllosticta minima</u> (Berk. and Curt.) Underw. and Earle	Leaf spot or purple eye spot	<u>Acer rubrum</u> L. 9, 12, 13, 14, 15, 22, 24, 25, 43, 44, 51, 53, 61, 67, 90, 97, 101, 109, 111, 112, 113, 114, 115, 120, 122, 125, 133, 152, 167, 168, 173, 187, 223, 226, 240, 258, 267, 268, 274, 281, 289, 291, 303, 531, 542, 566, 583, 584, 604, 621 (4, 5, 6, 8, 11, 12, 13, 14, 15, 18, 32, 34, 69, 71, 72, 73, 73A, 74, 75, 76, 78, 79, 81, 82, 83, 104, 123, 127, 132, 134, 139, 144, 172).
		<u>Acer spicatum</u> Lam. 22, 51, 61, 90, 101, 111, 114, 120, 125, 133, 152, 168, 173, 187, 223, 240, 258, 267, 291, 303, 312, 531, 583, 584, 585, 604, 621, 628 (4, 5, 6, 9, 18, 34, 71, 72, 73, 74, 75, 76, 123, 127, 132, 144, 167).
		<u>Sorbus americana</u> Marsh 44, 69 (84).
<u>Phyllosticta</u> species	Leaf spot	<u>Populus nigra</u> var. <u>italica</u> Muenchh. 25 (69).
<u>Ramularia effusa</u> Pk.	Leaf spot	<u>Vaccinium</u> species
<u>Rhytidisma acerinum</u> (Pers.) Fr.	Tar spot	<u>Acer rubrum</u> L. 53 (8, 75).
		<u>Acer</u> species 583 (86, 87).

Pathogen	Disease	Host
<u>Rhytisma acerinum</u> (Pers.) Fr. (Concl'd.)		<u>Acer spicatum</u> Lam. 14, 120, 583, 584, 585 (18, 19, 20, 21, 22, 53, 85).
<u>Rhytisma punctatum</u> (Pers.) Fr.	Speckled tar spot	<u>Acer</u> species 583 (87).
		<u>Acer spicatum</u> Lam. 4, 6, 24, 51, 110, 116, 535, 536, 583, 584, 585 (8, 9, 15, 18, 19, 21, 22, 44, 53, 75, 85, 90, 91, 93, 104).
<u>Rhytisma salicinum</u> (Pers.) Fr.	Tar spot	<u>Salix discolor</u> Muhl. 51, 571(6).
		<u>Salix</u> species 35, 109, 180, 527, 534, 570, 583, 584, 585, 628 (4, 18, 19, 20, 71, 81, 85, 90, 137, 144, 167).
<u>Rhytisma</u> species	Tar spot	<u>Sambucus</u> species 583 (4).
<u>Septoria betulae</u> (Lib.) West.	Leaf spot	<u>Betula papyrifera</u> Marsh. 34, 71, 94, 101, 121, 133, 152, 168, 191, 503, 582, 583 (5, 6, 27, 69, 73, 81, 90, 91, 93, 128).
<u>Septoria musiva</u> Peck.	Leaf spot	<u>Populus balsamifera</u> L. 18 (146).

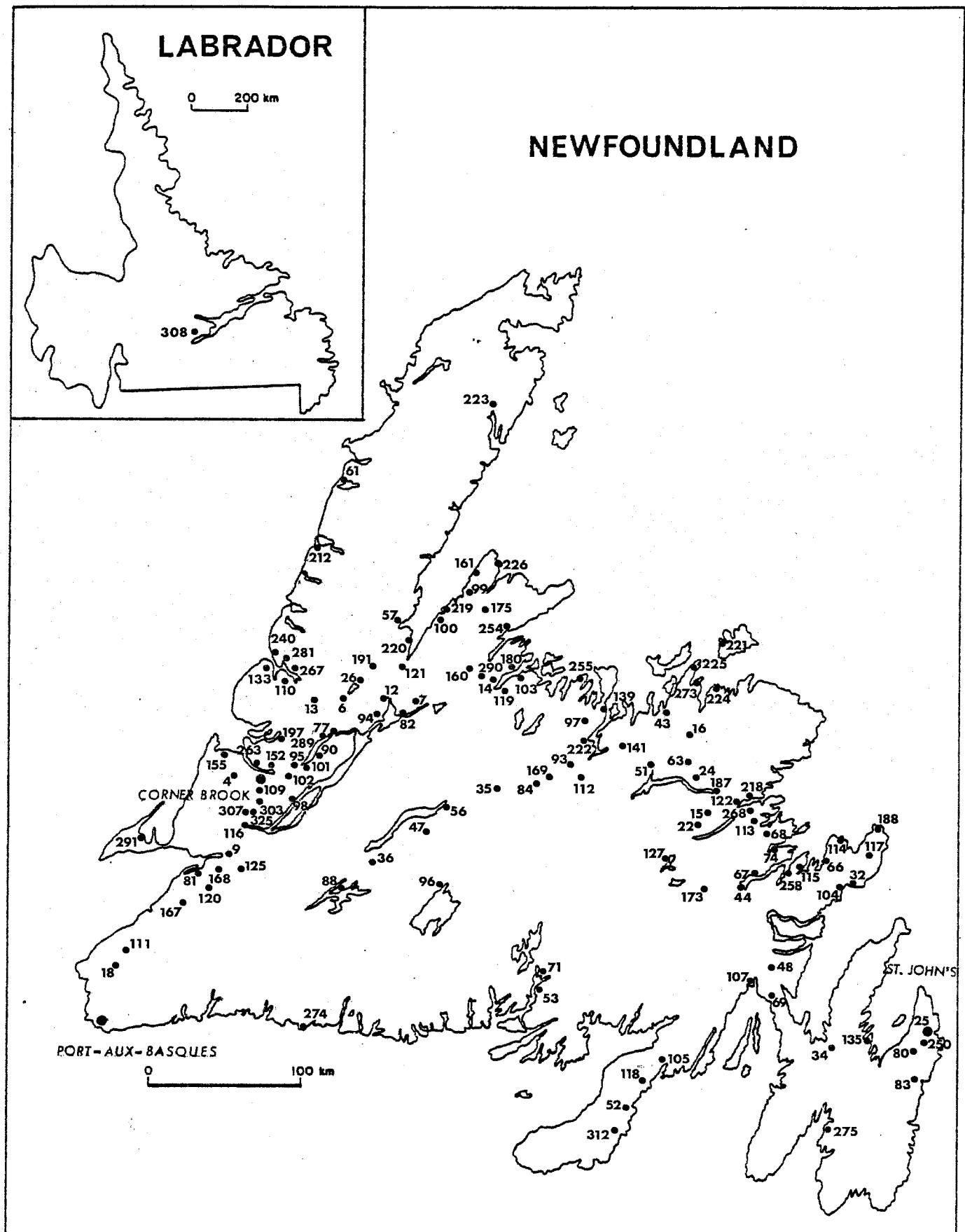


Fig. 12. Map showing 121 locations where leaf spots of broadleaved trees, shrubs or herbaceous plants were collected.

Foliage Diseases of Broadleaved Trees, Shrubs or Herbaceous Plants - Leaf
Blisters

Pathogen	Disease	Host
<u>Taphrina carnea</u> Johans.	Yellow to red leaf blister	<u>Betula alleghaniensis</u> Britt. 101, 110 (32, 69, 81, 104, 144). <u>Betula papyrifera</u> Marsh. 110, 168, 190, 502 (32, 71, 144).
<u>Taphrina cerasi</u> (Fckl.) Sadeb. (= <u>Taphrina</u> <u>wiesneri</u> (Rathay) Mix)	Witches' broom	<u>Prunus pensylvanica</u> L.f. 11, 25, 139, 250, 257, 308, 581, 582, 619, 621 (4, 69, 70, 71, 134, 137).
<u>Taphrina confusa</u> (Atk.) Gies.	Pockets	<u>Prunus</u> species 583, 584, 585 (22). <u>Prunus virginiana</u> L. 3, 93 (18, 83).
<u>Taphrina populina</u> Fr. (= <u>Taphrina</u> <u>aurea</u> Fr.)	Yellow leaf blister	<u>Populus nigra</u> L. 249 (9). <u>Populus nigra</u> var. <u>italica</u> Muenchh. 25 (7, 69, 70, 71). <u>Populus</u> species 11, 250 (4, 42, 72, 73A).
		<u>Populus tremuloides</u> Michx. 84, 90, 93, 621 (5, 9, 18, 35, 128).
<u>Taphrina</u> <u>robinsoniana</u> Giesenb.	Catkin blister	<u>Alnus rugosa</u> (Du Roi) Spreng. 38, 44, 51, 93, 114, 179, 230, 521, 525, 532, 583, 584, 585 (17, 18, 30, 82, 83, 85, 104). <u>Alnus rugosa</u> var. <u>americana</u> (Regel) Fern.

Pathogen	Disease	Host
<u>Taphrina</u> <u>robinsoniana</u> Giesenh. (Concl'd.)		<u>Alnus</u> species 55, 195, 583, 584, 585 (19, 84, 85).
		<u>Betula alleghaniensis</u> Britt. 38° (83).
<u>Taphrina</u> species	Leaf blister	<u>Betula alleghaniensis</u> Britt. 539 (81).
		<u>Betula papyrifera</u> Marsh. 154.
		<u>Populus tremuloides</u> Michx. 308, 620, 621 (73).
<u>Taphrina</u> species prob. <u>americana</u> Mix	Leaf blister	<u>Betula papyrifera</u> Marsh. 84 (95).

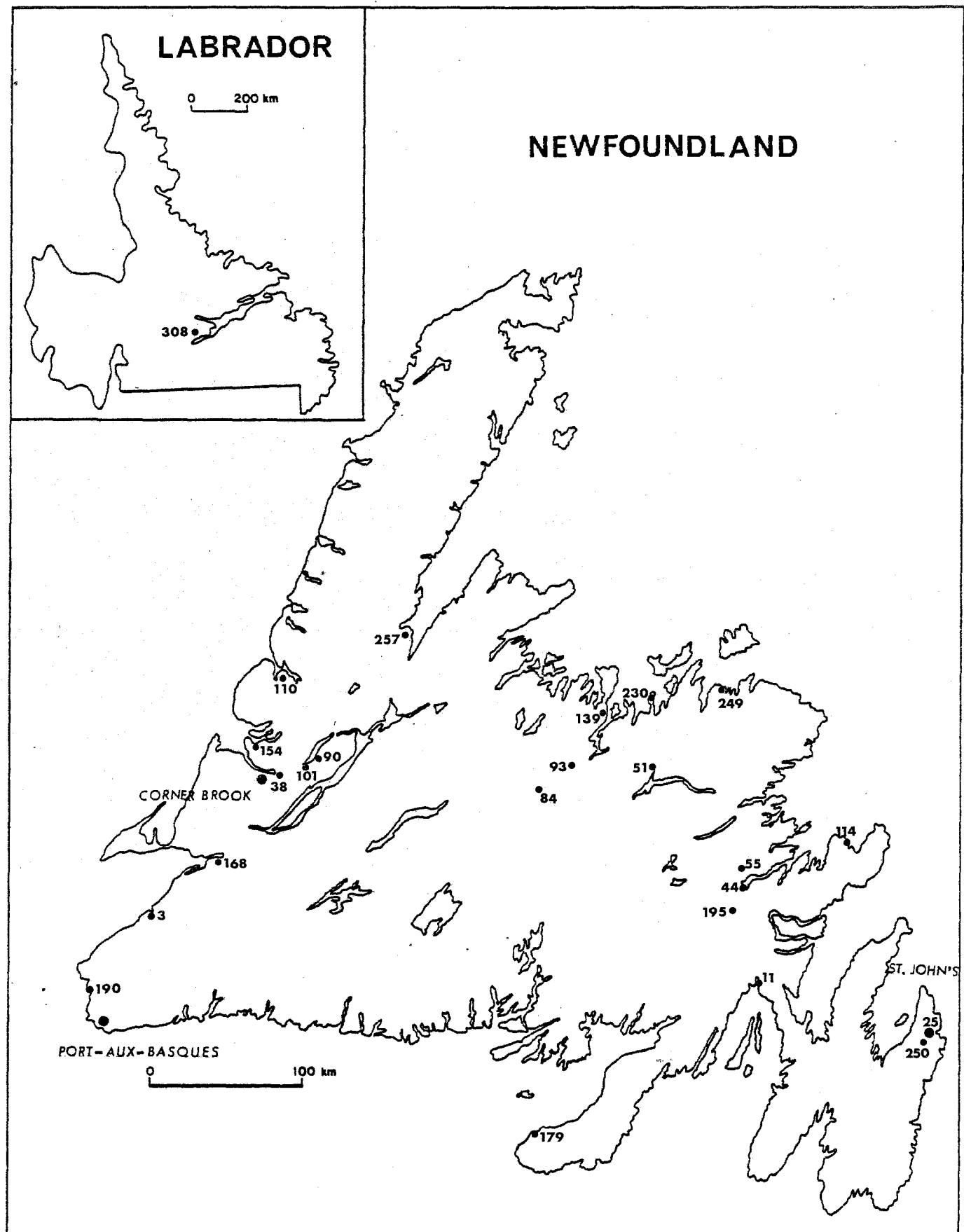


Fig. 13. Map showing 24 locations where leaf blisters of broadleaved trees, shrubs or herbaceous plants were collected.

Foliage Diseases of Broadleaved Trees, Shrubs or Herbaceous Plants - Mildews

Pathogen	Disease	Host
<u>Phyllactinia guttata</u> (Fr.) Lév.	Powdery mildew	<u>Alnus</u> species <u>Salix discolor</u> Muhl.
<u>Podosphaera</u> <u>clandestina</u> (Wallr. ex Fr.) Lév.	Powdery mildew	<u>Amelanchier</u> species
<u>Uncinula salicis</u> (D.C. ex Mérat) Wint.	Powdery mildew	<u>Salix discolor</u> Muhl.

**Foliage Diseases of Broadleaved Trees, Shrubs or Herbaceous Plants -
Miscellaneous**

Pathogen	Disease	Host
<u>Fusicladium</u> <u>saliciperdum</u> (All. and Tub.) Lind. (= <u>Pollacia</u> <u>saliciperda</u> (All. and Tub.) Arx)	Willow blight (scab)	<u>Salix</u> species 10, 25, 34, 77, 90, 120, 121, 160, 297, 308, 580, 583, 584, 585, 621 (4, 19, 25, 71, 82, 85, 134, 143, 167, 169, 171).
<u>Guignardia</u> <u>aesculi</u> V.B. Stewart	Leaf blotch	<u>Aesculus hippocastanum</u> L. 25 (31).
<u>Physalospora</u> <u>miyabeana</u> Fukushi	Willow blight (black canker)	<u>Salix pentandra</u> L. 25 (169, 171).
		<u>Salix</u> species 10, 25, 297, 308, 580, 582, 583, 621 (1, 4, 71).
<u>Pollacia elegans</u> Serv.	Leaf and shoot blight	<u>Populus alba</u> L. 25, 583, 584 (171, 172).
		<u>Populus balsamifera</u> L. 24, 25, 84, 92, 109, 116, 250, 291, 582, 583, 584 (1, 10, 23, 72, 77, 172).
		<u>Populus</u> species 24, 25, 84, 90, 92, 93, 109, 167, 583, 584, 585 (5, 13, 17, 45, 82).
		<u>Populus tremuloides</u> Michx. 11, 12, 14, 15, 16, 22, 24, 28, 44, 54, 55, 63, 66, 68, 77, 84, 91, 92, 93, 104, 109, 113, 122, 133, 139, 159, 165, 168, 176, 180, 226, 511, 517, 532, 540, 541, 542, 563, 564, 583, 584, 585, 590 (4, 8, 13, 15, 17, 18, 42, 44, 47, 48, 53, 65, 78, 79, 81, 82, 83, 84, 112, 115, 116).

Pathogen	Disease	Host
<u>Venturia macularis</u> (Fr.) Müll. and Arx (= <u>Pollacia radios</u> a (Lib.) Bald. and Cif.)	Leaf and shoot blight	<u>Populus balsamifera</u> L. 121, 141, 159, 540 (19, 85). <u>Populus species</u> 7, 14, 56, 66, 68, 77, 84, 92, 93, 94, 97, 101, 109, 121, 146, 153, 156, 159, 167, 176, 180, 296, 300, 517, 580, 583, 584, 585, 621, 628, 647 (9, 13, 17, 45, 77, 82, 167, 171, 172).
		<u>Populus tremuloides</u> Michx. 7, 11, 12, 14, 15, 16, 21, 22, 24, 26, 28, 35, 44, 47, 51, 54, 55, 62, 63, 66, 67, 68, 77, 82, 84, 87, 90, 91, 92, 93, 94, 103, 104, 109, 113, 121, 122, 123, 124, 125, 133, 139, 152, 153, 158, 159, 165, 168, 169, 172, 175, 176, 180, 185, 195, 226, 231, 269, 270, 281, 285, 296, 299, 302, 304, 308, 328, 504, 511, 517, 532, 540, 541, 542, 552, 563, 564, 577, 580, 582, 583, 584, 585, 590, 611, 612, 619, 621, 625, 637 (1, 4, 5, 6, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 27, 28, 29, 32, 33, 34, 35, 36, 37, 40, 42, 44, 47, 48, 53, 62, 65, 68, 69, 70, 71, 72, 73, 73A, 75, 76, 77, 78, 79, 81, 82, 83, 84, 85, 86, 87, 88, 91, 92, 93, 95, 104, 112, 115, 116, 117, 119, 121, 122, 123, 128, 131, 132, 134, 135, 137, 138, 139, 144, 169, 171).

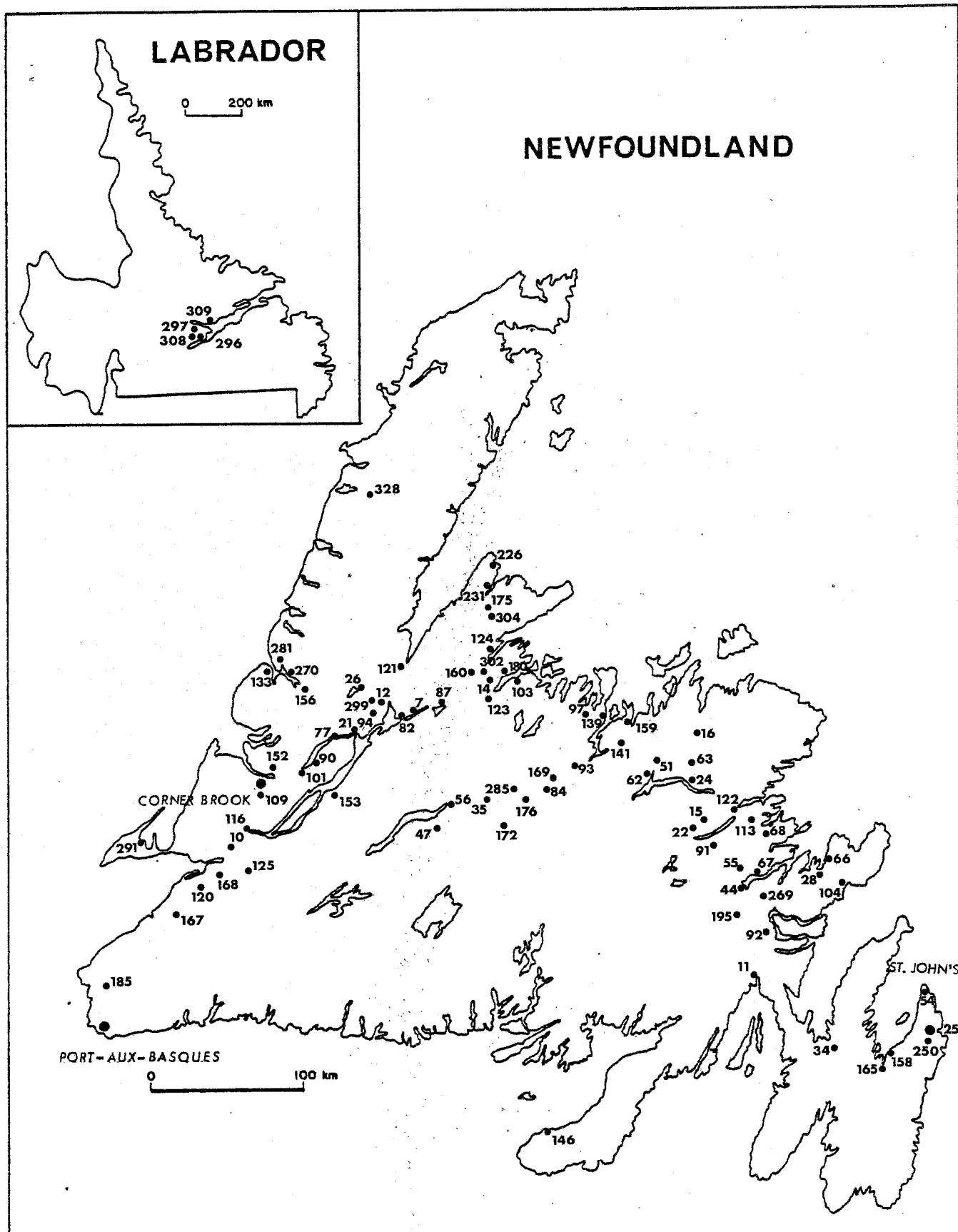


Fig. 14. Map showing 84 locations where miscellaneous foliage diseases of broadleaved trees, shrubs or herbaceous plants were collected.

Phanerogamic Parasites - Dwarf Mistletoe

Pathogen	Disease	Host
<u>Arceuthobium</u> <u>pusillum</u> Peck.	Dwarf mistletoe	<u>Picea mariana</u> (Mill.) B.S.P. 10, 14, 21, 22, 35, 37, 53, 77, 81, 84, 87, 89, 95, 98, 122, 125, 153, 155, 180, 191, 197, 282, 283, 313, 502, 504, 544, 545, 576, 583, 584, 585 (1, 2, 3, 4, 5, 6, 16, 17, 18, 19, 20, 21, 23, 24, 29, 32, 33, 34, 35, 36, 37, 48, 49, 51, 53, 57, 59, 68, 69, 70, 71, 72, 73, 73A, 83, 84, 85, 86, 87, 88, 90, 91, 92, 104, 125, 126, 127, 130, 131, 132, 134, 135, 137, 139, 143, 144, 152, 167, 171).

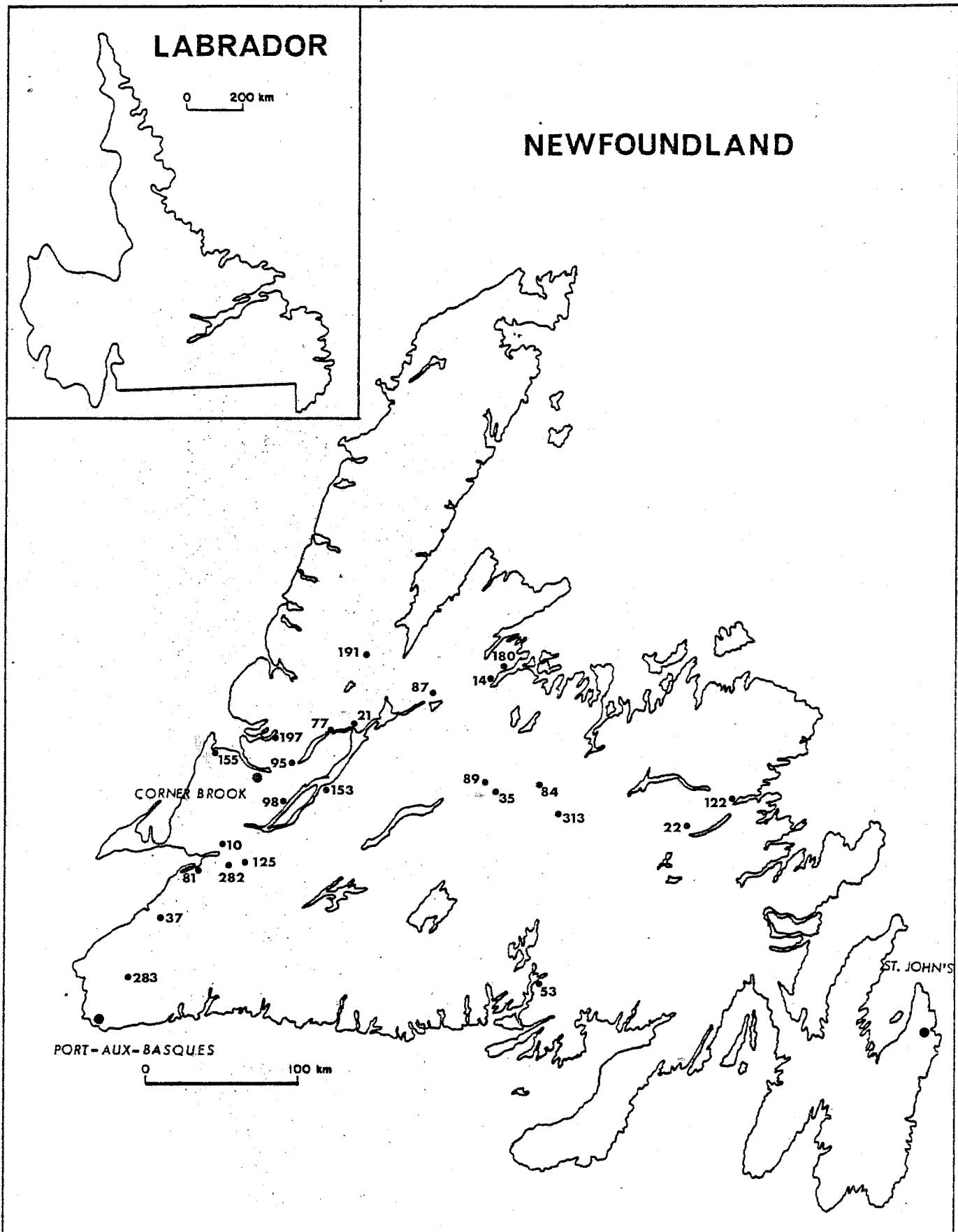


Fig. 15. Map showing 24 locations where dwarf mistletoe was collected.

NON-INFECTIOUS DISEASES

Causal Agent	Damage	Host
Animal	Animal damage - browsing, breaking and deformation	<u>Abies balsamea</u> (L.) Mill. 2, 7, 12, 19, 20, 21, 23, 35, 53, 55, 56, 57, 67, 77, 79, 81, 87, 93, 94, 96, 98, 109, 113, 116, 122, 124, 127, 133, 138, 149, 153, 160, 162, 169, 172, 189, 191, 197, 200, 231, 232, 233, 234, 235, 236, 237, 546, 547, 548, 549, 550, 561, 562, 576, 582 (52, 54, 55, 61, 63, 64, 68, 83, 89, 90, 93, 104, 109).
		<u>Abies</u> species 5, 9.
		<u>Acer spicatum</u> Lam. 7, 20, 94, 127, 149, 172, 547, 562 (63).
		<u>Amelanchier</u> species 7, 20, 94, 127, 149, 172, 547, 562 (63).
		<u>Betula papyrifera</u> Marsh. 2, 7, 12, 19, 20, 21, 23, 35, 53, 55, 56, 57, 77, 79, 81, 87, 93, 94, 96, 98, 109, 113, 116, 124, 127, 133, 138, 149, 153, 160, 162, 169, 172, 189, 191, 197, 199, 200, 231, 232, 233, 234, 235, 236, 237, 546, 547, 548, 549, 550, 561, 562, 576, 582 (54, 55, 61, 63, 64, 89, 90, 93, 104, 164).
		<u>Cornus</u> species 7, 20, 94, 127, 149, 172, 547, 562 (63).
		<u>Larix leptolepis</u> (Sieb. and Zucc.) Gord. 6.

Causal Agent	Damage	Host
Animal (Cont'd.)		<u>Nemopanthus mucronata</u> (L.) Trel. 7, 20, 94, 127, 149, 172, 547, 562 (63).
		<u>Picea abies</u> (L.) Karst. 1, 4, 6, 49, 136, 143, 144, 145, 146.
		<u>Picea glauca</u> (Moench) Voss 7, 10, 20, 94, 127, 149, 172, 547, 562 (63).
		<u>Picea mariana</u> (Mill.) B.S.P. 7, 20, 55, 56, 67, 94, 122, 127, 149, 172, 311, 547, 562, 583, 584, 619 (3, 63, 68, 70).
		<u>Picea sitchensis</u> (Bong.) Carr. 1, 4, 6.
		<u>Pinus banksiana</u> Lamb. 49, 56, 65, 122, 136, 143, 144, 145, 146 (68, 164).
		<u>Pinus resinosa</u> Ait. 1, 49, 55, 136, 143, 144, 145, 146, 172, 583, 584, 619 (3, 70).
		<u>Pinus species</u> 560 (95).
		<u>Pinus sylvestris</u> L. 49, 136, 143, 144, 145, 146, 179 (164).
		<u>Populus tremuloides</u> Michx. 7, 20, 84, 94, 127, 149, 172, 547, 562 (10, 63, 77).
		<u>Prunus pensylvanica</u> L.f. 7, 20, 94, 127, 149, 172, 547, 562 (63).

Causal Agent	Damage	Host
Animal (Concl'd.)		<u>Pseudotsuga menziesii</u> (Mirb.) Franco 6.
		<u>Salix</u> species 7, 20, 94, 127, 149, 172, 547, 562 (63).
		<u>Sorbus americana</u> Marsh 7, 20, 94, 127, 149, 172, 189, 237, 547, 562 (63, 90).
		<u>Sorbus</u> species
		<u>Taxus canadensis</u> Marsh. 7, 20, 94, 127, 149, 172, 547, 562 (63).
		<u>Viburnum cassinoides</u> L. 7, 20, 94, 127, 149, 172, 547, 562 (63).
Chemical	Fume damage	<u>Abies balsamea</u> (L.) Mill. 10, 138, 583 (39, 75, 76, 118, 120).
		<u>Alnus rugosa</u> var. <u>americana</u> (Regel) Fern. 10, 138 (75).
		<u>Betula papyrifera</u> Marsh. 10, 138 (75).
		<u>Larix</u> species 138 (76).
		<u>Picea glauca</u> (Moench) Voss 138 (39, 76, 118, 120).
		<u>Picea mariana</u> (Mill.) B.S.P. 10, 138, 583 (39, 75, 76, 118, 120).

Causal Agent	Damage	Host
Chemical (fumes)	Fumes from pulp and paper mill - death of foliage and young shoots	<u>Betula papyrifera</u> Marsh. (on trees) 84, 109, 169 (19, 20, 49, 50, 85, 86).
		<u>Larix laricina</u> (Du Roi) K. Koch (on trees) 84, 169 (20, 50, 85, 86).
		<u>Populus balsamifera</u> L. 84 (85).
Chemical (herbicide)	Chemical damage - wilting of needles	<u>Abies balsamea</u> (L.) Mill. 83 (69).
Chemical (insecticide) - Aldrin	Chemical damage - browning of foliage and death of seedlings	<u>Picea omorika</u> (Pantić) Purkyne (on seedlings) 90.
		<u>Picea sitchensis</u> (Bong.) Carr. (on seedlings) 90.
		<u>Populus alba</u> L. 25 (69).
		<u>Populus tremuloides</u> Michx. 25 (69).
Frost	Frost damage - browning and death in late spring	<u>Abies alba</u> Mill. (on seedlings) 22.
	Frost damage - browning and death in spring and summer	<u>Abies balsamea</u> (L.) Mill. (on seedlings) 8, 9, 16, 303, 583 (8, 14, 69, 71, 72, 73, 80, 100, 105, 114, 120, 134, 144).
	Frost damage - browning and death in spring, summer, fall and winter	<u>Abies balsamea</u> (L.) Mill. (on trees) 4, 5, 11, 16, 17, 19, 22, 24, 25, 35, 47, 48, 52, 54, 56, 67, 77, 84, 95, 96, 98, 99, 104, 109, 121, 122, 124, 127, 128, 133,

Causal Agent	Damage	Host
Frost (Cont'd.)		162, 172, 193, 194, 214, 223, 238, 240, 241, 269, 288, 296, 303, 308, 309, 316, 330, 504, 516, 517, 520, 571, 580, 582, 583, 584, 585, 592, 595, 613, 616, 619, 621, 636, 643 (4, 6, 7, 9, 10, 11, 12, 19, 24, 25, 33, 35, 36, 39, 49, 57, 58, 68, 69, 70, 73, 73A, 74, 75, 76, 77, 78, 79, 85, 86, 87, 88, 89, 90, 91, 93, 104, 112, 114, 118, 121, 122, 123, 125, 127, 128, 131, 132, 135, 137, 138, 139, 171, 172).
	Frost damage - browning and death in late spring	<u>Abies</u> species (on seedlings and trees) 8, 9, 19, 22, 96, 172, 194, 583, 584, 636 (14, 80, 100, 114, 169).
	Frost damage - browning and death in late spring	<u>Abies veitchii</u> Lindl. 9 (100, 114).
	Frost damage - browning and death in early summer	<u>Acer spicatum</u> Lam. (on trees) 2, 37, 602 (82, 104).
	Frost cracks	<u>Aesculus hippocastanum</u> L. 25 (72).
	Frost damage - browning and death in early summer	Coniferous and deciduous trees and shrubs 24, 25, 43, 84, 90, 109, 232, 250, 329, 330, 583, 584, 585, 595, 644 (169, 171, 172).
	Frost damage - browning and death in late spring	<u>Fagus</u> species (on trees) 25.
	Frost damage - browning and death in late spring	<u>Larix laricina</u> (Du Roi) K. Koch (on seedlings) 24, 84, 90, 580, 582, 583, 584 (4, 6, 42, 73A).

Causal Agent	Damage	Host
Frost (Cont'd.)	Frost damage - browning and death in late spring, summer, fall and winter	<u>Larix laricina</u> (Du Roi) K. Koch (on trees) 11, 25, 35, 52, 56, 122, 127, 128, 520 (36, 71, 85, 91, 125).
	Frost damage - browning and death in late spring	<u>Larix leptolepis</u> (Sieb. and Zucc.) Gord. (on seedlings) 22.
	Frost damage - browning and death in spring and late summer	<u>Larix occidentalis</u> Nutt. (on seedlings) 22, 131 (13, 42, 79).
	Frost damage - browning and death in spring and late summer	<u>Larix</u> species (on seedlings) 24, 25, 34, 67, 152.
	Frost damage - browning and death in late spring	<u>Picea abies</u> (L.) Karst. (on seedlings) 6, 90 (9, 35, 39, 42, 76, 119).
	Frost damage - browning and death in summer, fall and winter	<u>Picea glauca</u> (Moench) Voss (on trees) 4, 6, 19, 35, 53, 56, 77, 84, 90, 95, 96, 109, 121, 133, 172, 194, 223, 241, 583, 584, 585 (9, 24, 35, 39, 57, 76, 85, 86, 90, 93, 114, 119).
	Frost damage - browning and death in late spring	<u>Picea jezoensis</u> (Sieb. and Zucc.) Carr. (on seedlings) 22.
	Frost damage - browning and deformation in late summer	<u>Picea mariana</u> (Mill.) B.S.P. (on cones) 6, 191, 323 (170).
	Frost damage - browning and death in late spring	<u>Picea mariana</u> (Mill.) B.S.P. (on seedlings) 22, 24, 84, 133, 326 (6, 33, 73, 104, 105, 134, 171).

Causal Agent	Damage	Host
Frost (Cont'd.)	Frost damage - browning and death in spring and summer	<u>Picea mariana</u> (Mill.) B.S.P. (on trees) 6, 17, 18, 19, 25, 26, 35, 56, 84, 96, 122, 127, 128, 172, 194, 580, 582, 583, 584, 636 (4, 5, 10, 33, 35, 36, 39, 68, 70, 73, 73A, 74, 75, 76, 77, 79, 85, 86, 88, 93, 114, 118, 121, 122, 125, 127, 128, 137, 139, 169, 171).
	Frost damage - browning and death in late spring	<u>Picea sitchensis</u> (Bong.) Carr. (on seedlings) 6, 35, 90, 617 (5, 9, 39, 42, 73, 76, 119, 128).
	Frost damage - browning and death in late spring	<u>Picea</u> species (on seedlings) 22.
	Frost damage - browning and death in late spring	<u>Picea</u> species (on trees) 19, 24, 25, 35, 47, 53, 56, 67, 96, 122, 127, 128, 133, 172, 180, 269, 296, 504, 520, 571, 580, 582, 583, 584, 585, 593, 613, 616, 619, 621, 636 (25, 88, 91, 100, 169).
	Frost damage - browning and death in late spring	<u>Pinus banksiana</u> Lamb. (on seedlings) 90 (42).
	Frost damage - browning and death in late fall	<u>Pinus nigra</u> var. <u>poiretiana</u> (Ant.) Aschers. and Graebn. (on seedlings) 22.
	Frost damage - browning and death in summer	<u>Populus nigra</u> var. <u>italica</u> Muenchh. (on trees) 64 (71).
	Frost damage - cracks, browning and death in summer	<u>Populus tremuloides</u> Michx. (on trees) 24, 84, 580, 582, 584, 585 (6).

Causal Agent	Damage	Host
Frost (Concl'd.)	Frost damage - browning and death in late summer	<u>Prunus pensylvanica</u> L.f. (on trees) 47, 56, 57, 67, 83, 133, 285, 293 (73).
	Frost damage - browning and death in late spring	<u>Thuja occidentalis</u> L. (on seedlings) 90 (42).
	Frost damage - browning and death in late spring	<u>Thuja plicata</u> D. Don (on seedlings) 90.
Heat Injury	Heat damage	<u>Acer rubrum</u> L. 25, 584 (6, 36, 69, 71). <u>Acer saccharinum</u> L. 25 (69). <u>Acer spicatum</u> Lam. 584 (6, 36). <u>Aesculus hippocastanum</u> L. 25 (69). <u>Alnus rugosa</u> var. <u>americana</u> (Regel) Fern. 9, 268, 584 (6, 36, 71, 123). Coniferous and deciduous trees and shrubs 25, 67, 84, 580, 583, 584, 585 (123, 135). <u>Larix</u> species 67, 185, 272 (73, 74, 123). <u>Populus alba</u> L. 25 (69). <u>Populus nigra</u> var. <u>italica</u> Muenchh. 25 (69).

Causal Agent	Damage	Host
Heat Injury (Concl'd.)		<u>Populus tremuloides</u> Michx. 87 (73A, 123, 135).
		<u>Sorbus</u> species 24, 25.
Heaving	Heaving-uprooting and death of seedlings	<u>Abies nordmanniana</u> (Stev.) Spach. 22.
		<u>Larix leptolepis</u> (Sieb. and Zucc.) Gord. 22.
		<u>Larix</u> species 551 (96).
		<u>Picea mariana</u> (Mill.) B.S.P. 69, 582 (96, 107).
		<u>Picea</u> species 551 (96).
		<u>Pinus densiflora</u> Sieb. and Zucc. 22.
		<u>Pinus</u> species 551 (96).
Late Spring Leaf Scorch		<u>Acer spicatum</u> Lam. 25, 583, 585 (39, 118, 120, 122).
		<u>Prunus pensylvanica</u> L.f. 112 (73).
		<u>Sorbus aucuparia</u> L. 583, 585 (39, 74, 118, 122).
Lichens		<u>Abies balsamea</u> (L.) Mill. 223 (69).
		<u>Acer pseudoplatanus</u> L. 25 (70).

Causal Agent	Damage	Host
Lichens (Concl'd.)		<u>Acer rubrum</u> L. 25 (70).
		<u>Aesculus hippocastanum</u> L. 25 (70).
		<u>Picea glauca</u> (Moench) Voss 90 (69).
		<u>Prunus pensylvanica</u> L.f. 25 (70).
Physical Injury	Improperly braced trees	<u>Populus nigra</u> var. <u>italica</u> Muenschh. 25 (69).
Roadside Damage		<u>Abies balsamea</u> (L.) Mill. 63, 67, 125, 576, 583, 584 (36, 37, 75).
		<u>Alnus rugosa</u> var. <u>americana</u> (Regel) Fern. 298, 576, 583, 584 (37, 73, 75).
		<u>Betula alleghaniensis</u> Britt. 63, 125 (36, 75).
		<u>Betula papyrifera</u> Marsh. 25, 63, 67, 125, 576, 583, 584 (36, 37, 70, 75).
		<u>Picea mariana</u> (Mill.) B.S.P. 63, 67, 125, 576, 583, 584 (36, 37, 75).
		<u>Pinus sylvestris</u> L. 25.
		<u>Populus tremuloides</u> Michx. 583, 584 (75).
Salt	Salt injury	<u>Juniperus</u> species 59.
		<u>Picea mariana</u> (Mill.) B.S.P. 59, 595 (104).

Causal Agent	Damage	Host
Salt (Concl'd.)		<u>Pinus sylvestris</u> L. 583, 584 (75).
Snow and Ice	Snow and ice damage - breakage and killing	<u>Abies balsamea</u> (L.) Mill. 21, 25, 34, 35, 38, 48, 69, 77, 80, 90, 92, 107, 109, 116, 131, 134, 137, 138, 140, 153, 176, 242, 314, 315, 551, 552, 553, 554, 577, 580, 581, 582, 583, 584, 631, 632, 635 (20, 21, 50, 51, 78, 79, 86, 87, 100, 110, 112, 168, 169).
		<u>Betula papyrifera</u> Marsh. 21, 25, 34, 38, 69, 77, 90, 97, 109, 129, 130, 141, 142, 552, 555, 557, 558, 633, 634 (18, 48, 78, 84, 104, 110, 112, 168).
		<u>Fraxinus nigra</u> Marsh. 582, 584.
		<u>Larix laricina</u> (Du Roi) K. Koch 21, 25, 34, 38, 69, 77, 80, 90, 92, 107, 109, 129, 130, 137, 138, 141, 142, 314, 315, 551, 552, 557, 558, 580, 581, 582, 583, 584, 631, 632, 635 (18, 21, 48, 51, 78, 79, 84, 87, 104, 110, 112, 168).
		<u>Picea mariana</u> (Mill.) B.S.P. 21, 25, 34, 38, 48, 69, 77, 80, 90, 92, 97, 107, 109, 129, 130, 138, 140, 141, 142, 314, 315, 551, 552, 555, 557, 558, 577, 580, 581, 582, 583, 584, 631, 632, 635 (18, 48, 78, 79, 84, 110, 112, 168, 169).
		<u>Picea sitchensis</u> (Bong.) Carr. 4, 6, 25 (100).

Causal Agent	Damage	Host
Snow and Ice (Concl'd.)		<u>Picea</u> species 25, 34, 48, 69, 92, 107, 138 (21, 51, 87, 100, 110).
		<u>Pinus banksiana</u> Lamb. 582, 584.
		<u>Pinus resinosa</u> Ait. 1, 25, 113 (100).
		<u>Pinus</u> species 25, 135, 136, 253 (168).
		<u>Pinus sylvestris</u> L. 582, 584.
		<u>Populus tremuloides</u> Michx. 25, 34, 69, 97, 109, 129, 130, 141, 142, 552, 555, 557, 558, 577 (18, 48, 84, 104, 110, 112, 168).
Unknown Factor	Purple foliage	<u>Larix laricina</u> (Du Roi) K. Koch 90.
Water Excess	Water excess injury - asphyxiation	<u>Picea glauca</u> (Moench) Voss 10 (100).
Weather Damage		<u>Acer spicatum</u> Lam. 583, 585.
		Coniferous and deciduous trees and shrubs 583, 584, 585.
		<u>Sorbus americana</u> Marsh 583, 585.
Wind Damage		Coniferous and deciduous trees and shrubs 583, 584 (33, 70, 73A, 137).

Causal Agent	Damage	Host
Winter	Winter drying	<i>Abies balsamea</i> (L.) Mill. 6, 10, 14, 20, 25, 34, 38, 39, 44, 48, 53, 63, 64, 66, 77, 79, 83, 84, 86, 88, 90, 92, 94, 96, 101, 104, 106, 109, 110, 116, 119, 123, 131, 132, 133, 134, 135, 138, 151, 153, 156, 164, 166, 171, 176, 182, 185, 188, 193, 196, 197, 198, 199, 223, 228, 240, 243, 244, 245, 246, 256, 261, 270, 271, 275, 276, 277, 278, 279, 280, 284, 286, 289, 293, 294, 308, 309, 310, 327, 502, 506, 509, 516, 519, 541, 543, 556, 576, 580, 581, 582, 583, 584, 585, 594, 602, 612, 639 (1, 3, 4, 5, 6, 7, 8, 9, 10, 18, 19, 20, 24, 32, 33, 34, 37, 38, 39, 48, 49, 50, 57, 58, 68, 69, 70, 71, 72, 73, 73A, 74, 75, 76, 77, 84, 85, 86, 88, 90, 91, 104, 106, 118, 120, 121, 122, 123, 125, 127, 132, 137, 138, 139, 143, 144, 171, 172).
		<i>Acer spicatum</i> Lam. 90, 292, 293, 299, 622, 623 (73A).
		<i>Betula papyrifera</i> Marsh. 24, 29, 79, 110, 193, 583, 584, 585 (37, 122).
		<i>Betula pendula</i> Roth. 6, 20, 196, 240, 284.
		Coniferous and deciduous trees and shrubs 25, 238, 645 (167, 172).
		<i>Juniperus</i> species 25 (171).

Causal Agent	Damage	Host
Winter (Cont'd.)		<u>Larix laricina</u> (Du Roi) K. Koch 44, 92, 138, 198, 543, 581, 582, 583, 584, 585, 612 (6, 36, 73A, 85, 125, 127).
		<u>Larix leptolepis</u> (Sieb. and Zucc.) Gord. 6, 20, 196, 240, 284 (76).
		<u>Larix occidentalis</u> Nutt. 20, 22, 196, 240, 284 (9).
		<u>Picea glauca</u> (Moench) Voss 6, 20, 193, 196, 240, 284 (9, 39, 90, 118).
		<u>Picea mariana</u> (Mill.) B.S.P. (on seedlings and trees) 6, 20, 22, 24, 29, 34, 79, 84, 96, 109, 110, 185, 193, 196, 199, 240, 271, 284, 285, 289, 562, 576, 582, 583, 584, 585, 612 (1, 3, 7, 8, 9, 32, 33, 37, 38, 39, 68, 73A, 75, 76, 104, 118, 119, 120, 122, 137, 144).
		<u>Pinus banksiana</u> Lamb. (on seedlings) 90, 179, 188, 576, 582, 584 (6, 73A, 76, 86, 125).
		<u>Pinus nigra</u> var. <u>poiretiana</u> (Ant.) Aschers. and Graebn. 22.
		<u>Pinus resinosa</u> Ait. 6, 20, 25, 113, 122, 135, 136, 196, 240, 284, 576, 582 (3, 9, 20, 24, 33, 39, 50, 57, 76, 86, 89, 90, 123, 134, 137).
		<u>Pinus species</u> 44, 92, 135, 136, 179, 188, 198, 253, 543 (20, 50, 57, 85, 90).

Causal Agent	Damage	Host
Winter (Concl'd.)		<u>Pinus strobus</u> L. 24, 29, 79, 86, 193, 199, 254, 272, 275, 294, 581, 582, 583, 584, 585 (37, 38, 73, 120, 122, 125, 127, 134).
		<u>Pinus sylvestris</u> L. 6, 20, 25, 35, 84, 86, 109, 135, 136, 188, 196, 199, 240, 272, 284, 506, 576, 581, 582, 583, 584, 585 (1, 3, 8, 9, 24, 32, 33, 38, 39, 68, 70, 73, 73A, 89, 105, 118, 121, 122, 123, 125, 127, 135, 137, 143, 144).
		<u>Populus</u> species 24, 29, 79, 193, 583, 584, 585 (37, 122).
		<u>Populus tremuloides</u> Michx. 90, 292, 293, 299, 622, 623 (73A, 125).
		<u>Prunus pensylvanica</u> L.f. 581, 582 (125).
		<u>Thuja</u> species 25 (171).

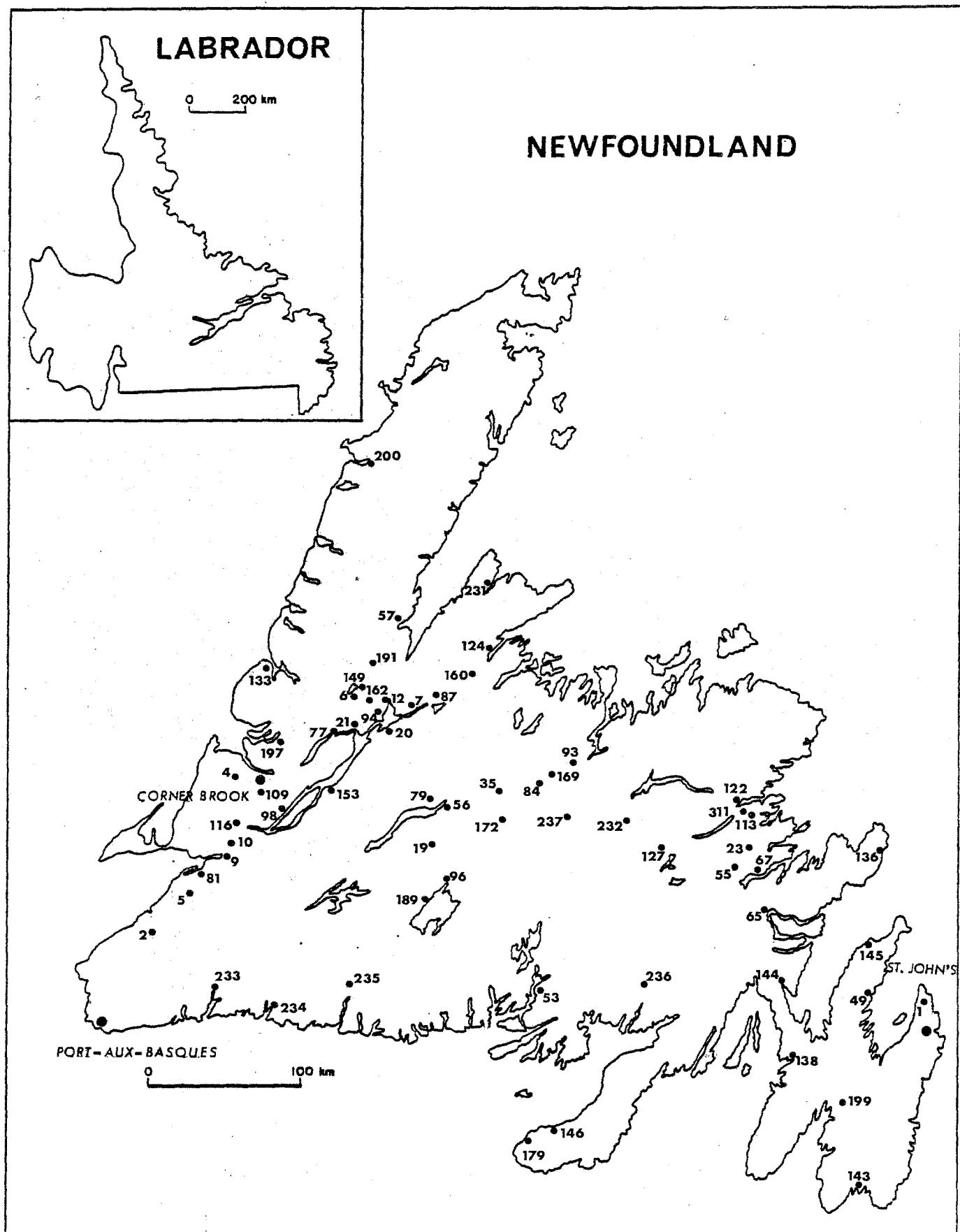


Fig. 16. Map showing 63 locations where animal damage was observed.

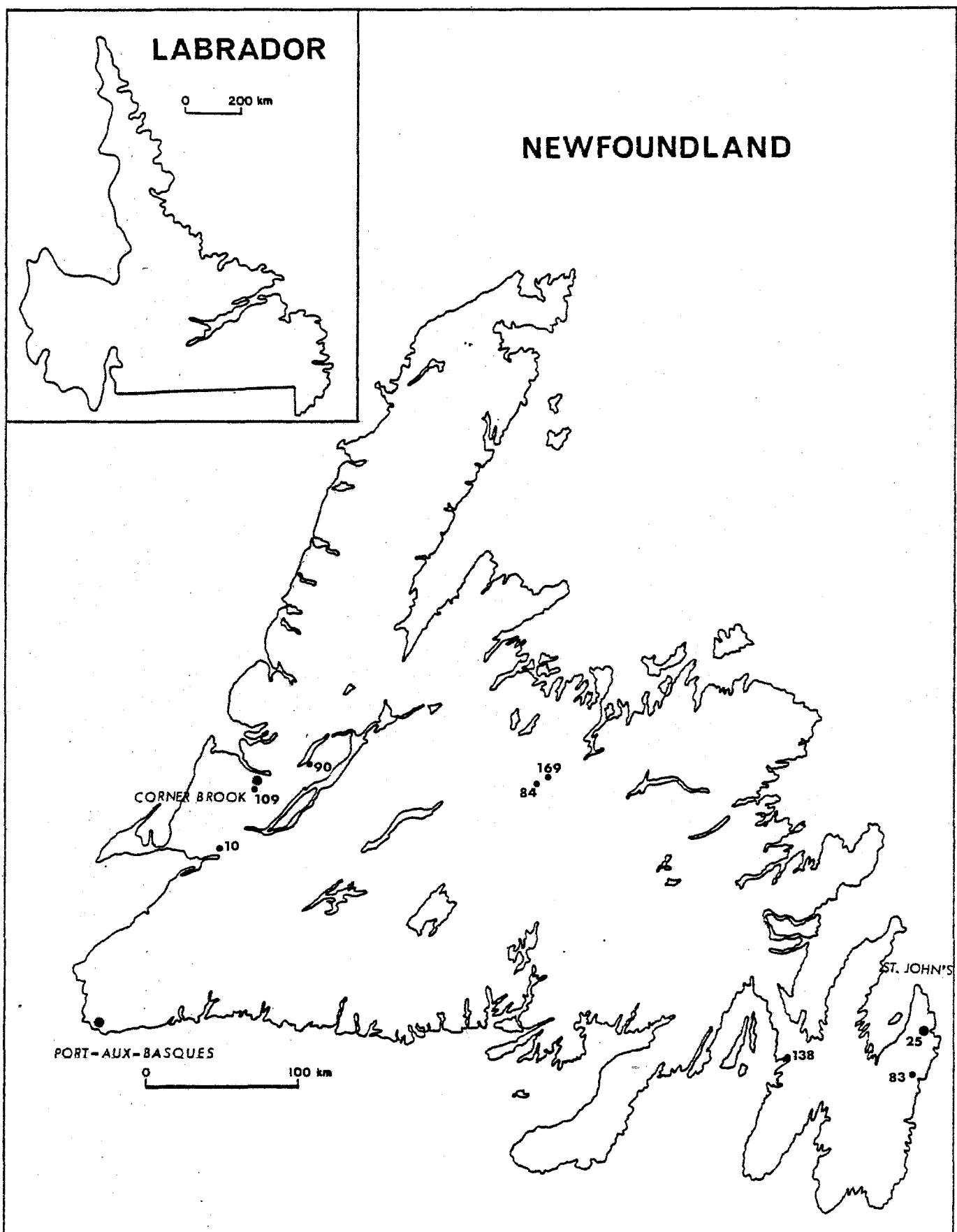


Fig. 17. Map showing eight locations where chemical damage was observed.

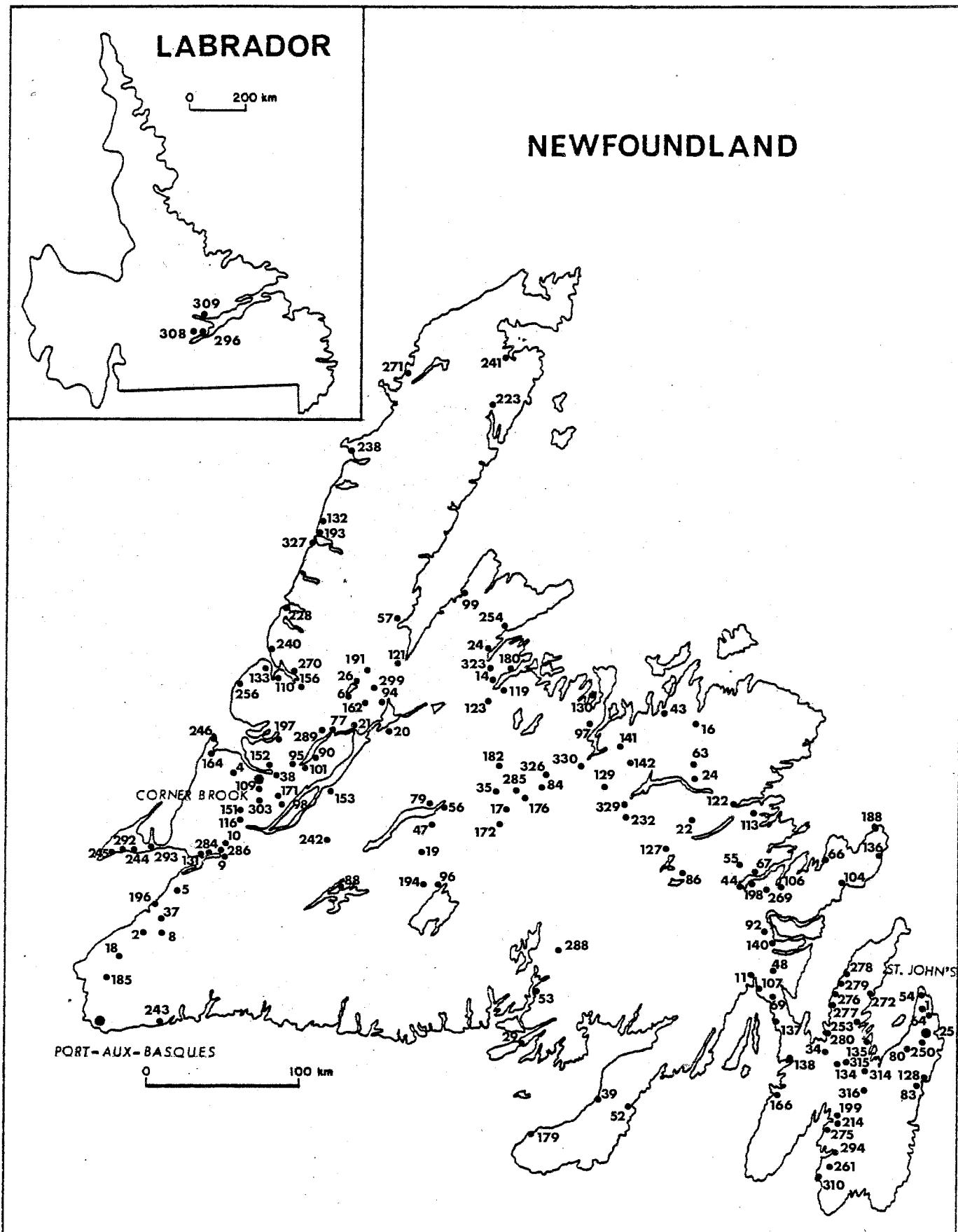


Fig. 18. Map showing 155 locations where frost, heaving, snow and ice, wind damage, weather damage, and winter drying were observed.

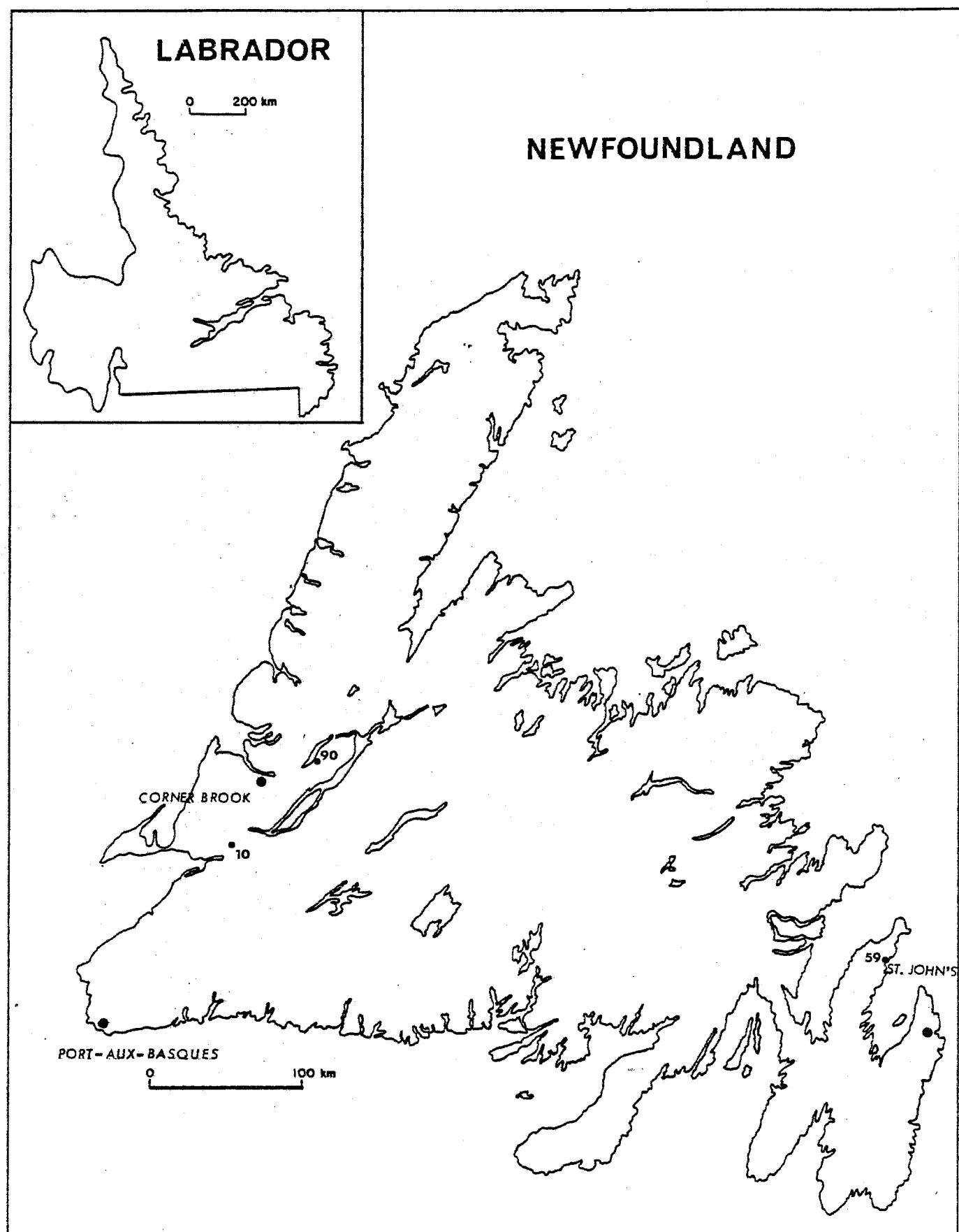


Fig. 19. Map showing three locations where salt, unknown and water excess damage were observed.

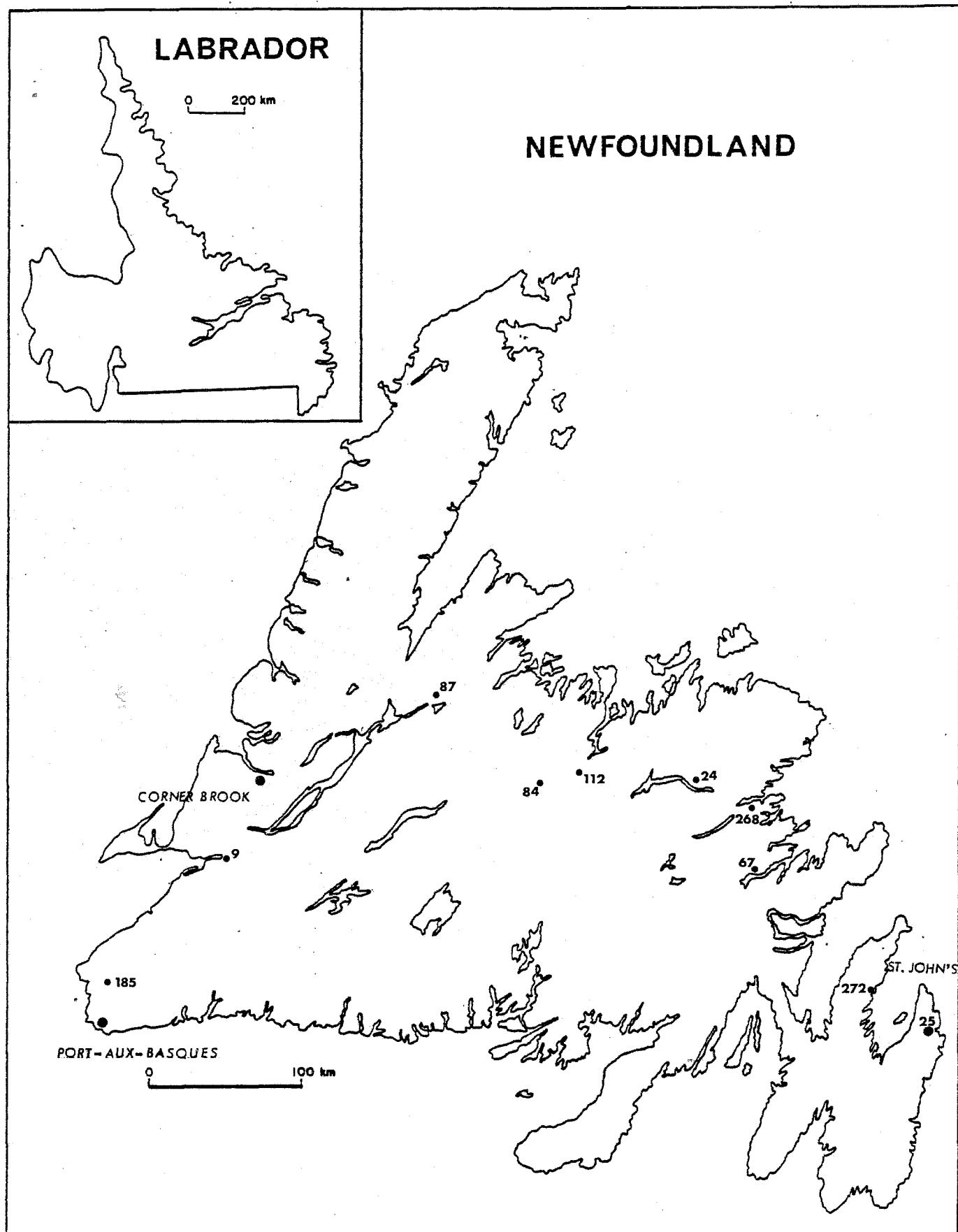


Fig. 20. Map showing 10 locations where late spring leaf scorch and heat damage were observed.

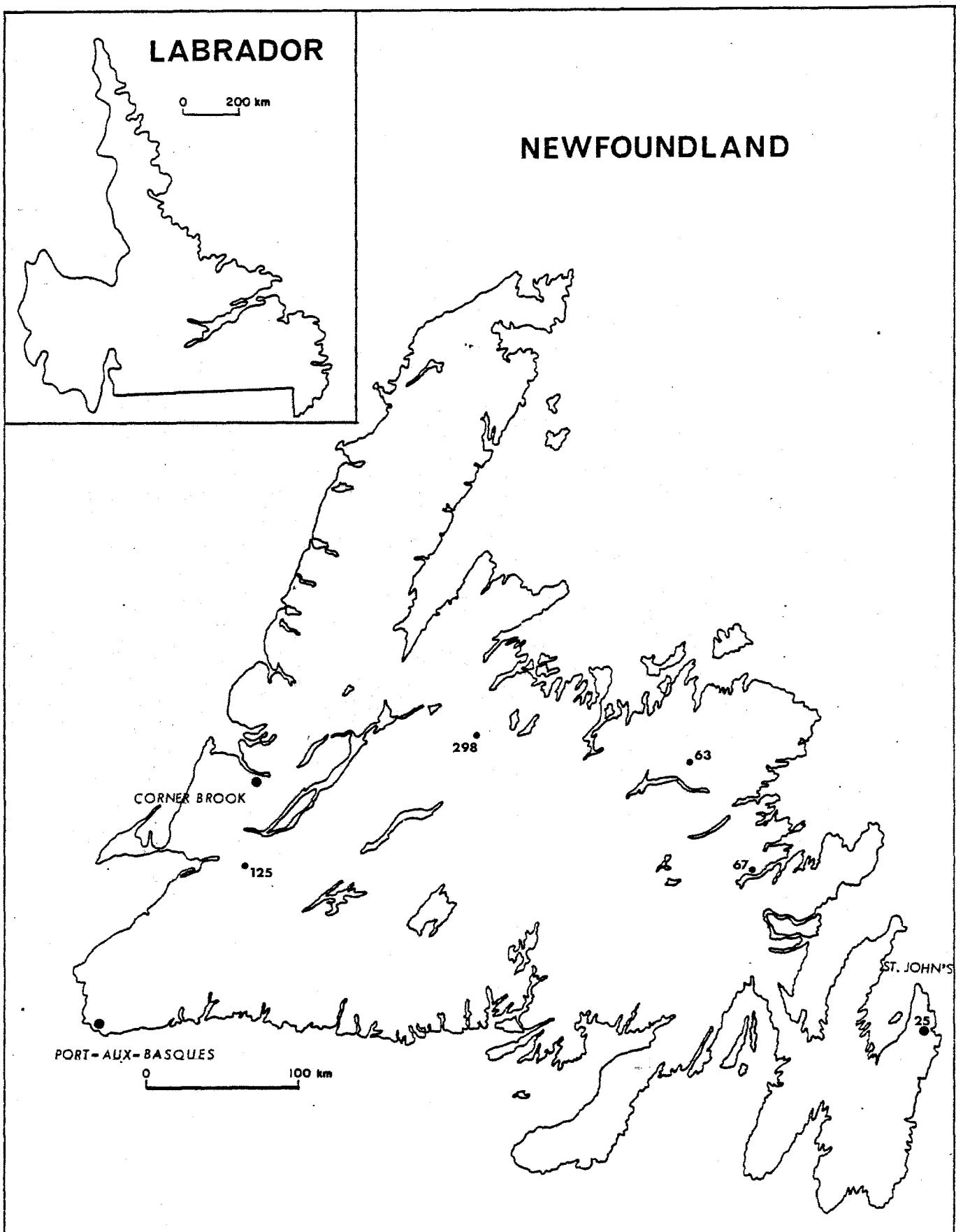


Fig. 21. Map showing five locations where physical injury and roadside damage were observed.

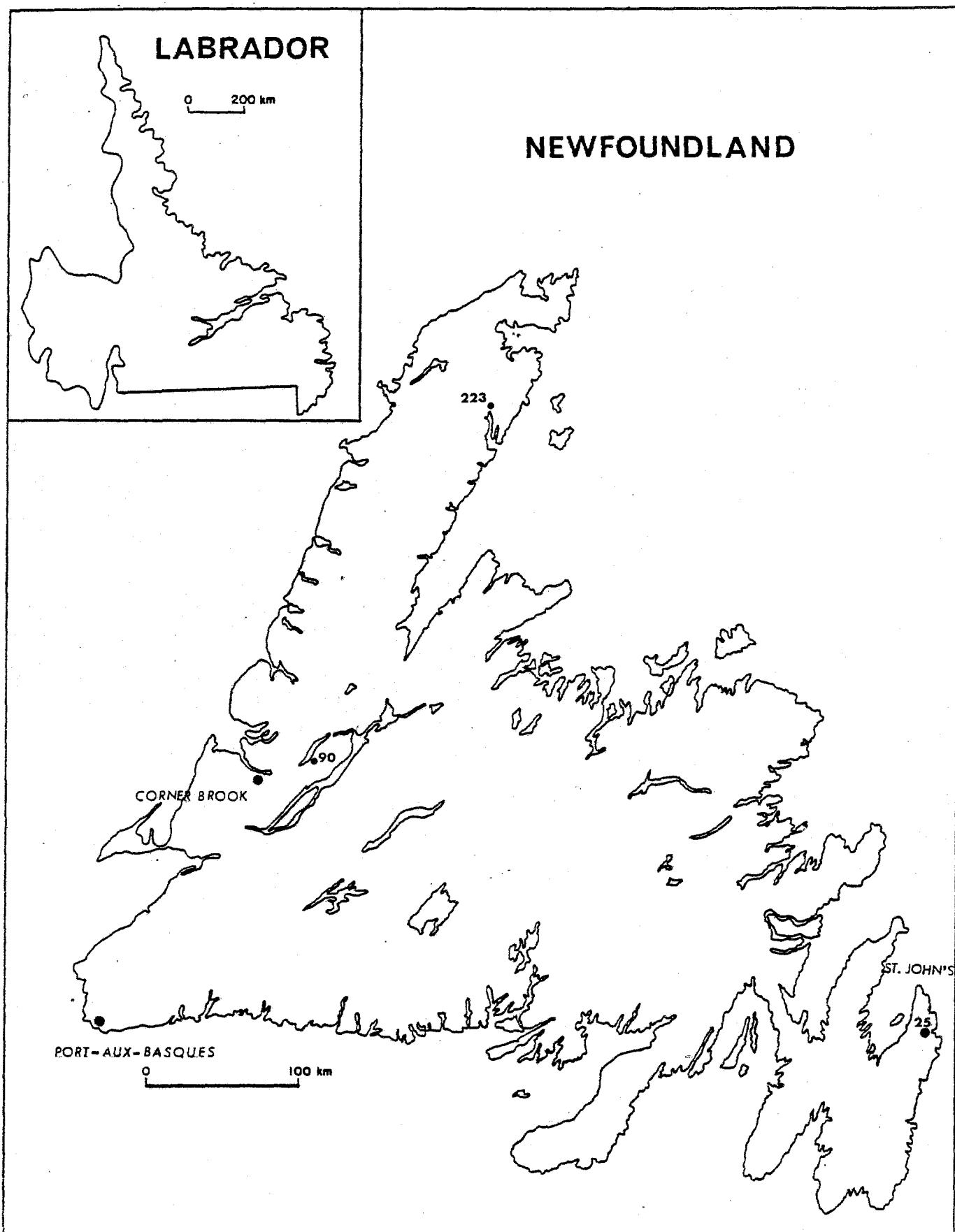


Fig. 22. Map showing three locations where lichens were observed.

PREFACE TO HOST INDEX

In this index, the hosts are arranged alphabetically by their scientific names, followed by the appropriate common name with its abbreviation in parenthesis. The pathogenic fungi, phanerogamic parasites, animals and abiotic factors causing different types of damage are also arranged alphabetically under their appropriate hosts regardless of their taxonomic status.

HOST INDEX

ABIES ALBA Mill., silver fir (sF)

Frost

On seedlings (in late spring)

ABIES BALSAMEA (L.) Mill., balsam fir (bF)

Aleurodiscus amorphus (Pers. ex Fr.) Schroet.

Alternaria tenuis auct. sensu. Wiltshire

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Bothrodiscus pinicola Shear

Cephalosporium species

Ceratocystis species

Chemical

Fume damage

Herbicide

Chlorosplenium aeruginosum (Oed. ex S.F. Gray) de Not.

Coniophora puteana (Schum. ex Fr.) Karst.

Coriolellus heteromorphus (Fr.) Bond. and Singer

Coriolellus species (? heteromorphus or variiformis)

Corticium galactinum (Fr.) Burt

Corticium pini-canadensis (Schw.) Jacks. and Rogers

Creonectria cucurbitula (Sacc.) Seav.

Daedalea species

Dermea balsamea (Pk.) Seav.

Fomes pini (Brot. ex Fr.) Karst.

Fomes pinicola (Sw. ex Fr.) Cke.

Frost

On seedlings (in spring and summer)

On trees (in spring, summer, fall and winter)

Fusicoccum abietinum (Hartig) Prill. and Del.

Hymenochaete tabacina (Sow. ex Fr.) Lév.

Isthmiella faullii (Darker) Darker
Kirschsteiniella thujina (Pk.) Pomerleau and Etheridge
Lenzites saepiaria (Wulf. ex Fr.) Fr.
Lenzites species
Lichens
Lirula nervata (Darker) Darker
Lophodermium species
Melampsorella caryophyllacearum Schroet.
Meliola pinicola Dearn.
Milesia fructuosa Faull
Milesia species
Nectria species
Odontia bicolor (A. and S.) Bres.
Phaeocryptopus nudus (Pk.) Petrank
Polyporus abietinus Dicks. ex Fr.
Polyporus balsameus Pk.
Polyporus biformis Klotsch ex Fr.
Polyporus mollis Pers. ex Fr.
Polyporus species
Poria candidissima (Schw.) Cke.
Pucciniastrum epilobii Otth
Pucciniastrum goeppertianum (Kühn) Kleb.
Rehmiellopsis balsameae Waterman
Retinocyclus abietis (Crouan) Groves and Wells
Rhizosphaera abietis Mang. and Har.
Rhizothyrium abietis Naum.
Roadside damage
Schizophyllum commune Fr.
Snow and ice
Stereum chailletii (Pers. ex Fr.) Fr.

Stereum sanguinolentum (Alb. and Schw. ex Fr.) Fr.

Stereum species

Trametes species

Uredinopsis species

Winter

ABIES HOLOPHYLLA Maxim, needle fir

Armillaria mellea (Vahl ex Fr.) Kummer

ABIES HOMOLEPIS Sieb. and Zucc., Nikko fir

Armillaria mellea (Vahl ex Fr.) Kummer

ABIES MARIESII Mast., Maries fir

Armillaria mellea (Vahl ex Fr.) Kummer

ABIES MAYRIANA Miyabe and Kudo

Armillaria mellea (Vahl ex Fr.) Kummer

ABIES NORDMANNIANA (Stev.) Spach., caucasian or Nordmann's fir

Heaving

ABIES SACHALINENSIS Mast., Saghalin fir

Armillaria mellea (Vahl ex Fr.) Kummer

ABIES SPECIES, fir (F)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Frost

On seedlings and trees (in late spring)

ABIES VEITCHII Lindl., Veitch's silver fir or Veitch fir

Armillaria mellea (Vahl ex Fr.) Kummer

Frost

On seedlings (in late spring)

ACER PSEUDOPLATANUS L., sycamore maple (-M)

Lichens

Nectria cinnabarina Tode ex Fr.

Nectria galligena Bres.

ACER RUBRUM L., red maple (rM)

Cladosporium humile Davis

Cytospora species

Heat injury

Kabatiella apocrypta (Ell. and Ev.) Arx

Lichens

Mycosphaerella species

Nectria cinnabarina Tode ex Fr.

Nectria species

Phyllosticta minima (Berk. and Curt.) Underw. and Earle

Rhytisma acerinum (Pers.) Fr.

ACER SACCHARINUM L., silver maple (siM)

Heat injury

Nectria cinnabarina Tode ex Fr.

Nectria species

ACER SACCHARUM Marsh, sugar maple (sM)

Nectria cinnabarina Tode ex Fr.

ACER SPECIES, maple (M)

Kabatiella apocrypta (Ell. and Ev.) Arx

Nectria cinnabarina Tode ex Fr.

Rhytisma acerinum (Pers.) Fr.

Rhytisma punctatum (Pers.) Fr.

ACER SPICATUM Lam., mountain maple (mOM)

Animal

Cytospora species

Frost

On trees (in early summer)

Gymnosporangium cornutum Arth. and Kern

Heat injury

Hymenochaete tabacina (Sow. ex Fr.) Lév.

Hypoxyylon multififorme Fr.

Kabatiella apocrypta (Ell. and Ev.) Arx

Late spring leaf scorch

Nectria cinnabarina Tode ex Fr.

Nectria species

Phleospora aceris (Lib.) Sacc.

Phyllosticta minima (Berk. and Curt.) Underw. and Earle

Rhytisma acerinum (Pers.) Fr.

Rhytisma punctatum (Pers.) Fr.

Weather damage

Winter

AESCULUS HIPPOCASTANUM L., horse chestnut

Frost cracks

Guignardia aesculi V.B. Stewart

Heat injury

Lichens

Nectria cinnabarina Tode ex Fr.

Nectria species

Pleurotus species

ALNUS CRISPA (Ait.) Pursh, green alder (gAl)

Nectria coccinea (Pers. ex Fr.) Fr.

Peniophora species

ALNUS RUGOSA (Du Roi) Spreng., speckled alder (spAl)

Chlorosplenium aeruginosum (Oed. ex S.F. Gray) de Not.

Cytopsora species

Hypoxylon fuscum Pers. ex Fr.

Hypoxylon mammatum (Wahl.) Miller

Peniophora aurantiaca (Bres.) Höhn. and Litsch.

Peniophora species

Polyporus versicolor L. ex Fr.

Taphrina robinsoniana Giesenh.

ALNUS RUGOSA var. AMERICANA (Regel) Fern., speckled alder (spAl)

Chemical

Fume damage

Heat injury

Hymenochaete tabacina (Sow. ex Fr.) Lév.

Peniophora aurantiaca (Bres.) Höhn. and Litsch.

Roadside damage

Schizophyllum commune Fr.

Taphrina robinsoniana Giesenh.

ALNUS SPECIES, alder (Al)

Corticium leucoxanthum Bres.

Cytidia salicina (Fr.) Burt

Hymenochaete tabacina (Sow. ex Fr.) Lév.

Hypoxylon mammatum (Wahl.) Miller

Panus stipticus (Bull. ex Fr.) Fr.

Peniophora aurantiaca (Bres.) Höhn. and Litsch.

Phyllactinia guttata (Fr.) Lév.

Polyporus albellus Pk.

Poria ferrea (Pers.) Bourd. and Galz.

Poria species

Stereum ochraceoflavum (Schw.) Ell.

Stereum rugosum Fr.

Taphrina robinsoniana Giesenh.

AMELANCHIER BARTRAMIANA (Tausch) Roem., bartram's serviceberry (bSe)

Gymnosporangium species

AMELANCHIER LAEVIS Wieg., allegheny serviceberry (aSe)

Gymnosporangium species

AMELANCHIER SANGUINEA (Pursh) D.C., roundleaf serviceberry (rSe)

Gymnosporangium species

AMELANCHIER SPECIES, serviceberry (Se)

Animal

Apiosporina collinsii (Schw.) Höhn.

Gymnosporangium clavipes (Cke. and Pk.) Cke. and Pk.

Gymnosporangium species

Podosphaera clandestina (Wallr. ex Fr.) Lév.

Puccinia sparganioides Ell. and Barth..

BETULA ALLEGHANIENSIS Britt., yellow birch (yB)

Fomes fomentarius (L. ex Fr.) Kickx

Fomes igniarium (L. ex Fr.) Kickx

Hypoxylon multiforme Fr.

Polyporus albellus Pk.

Roadside damage

Taphrina carneae Johans.

Taphrina robinsoniana Giesenh.

Taphrina species

BETULA PAPYRIFERA MARSH., white birch (wB)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Chemical

Fume damage

Fumes from pulp and paper mill

Cylindrosporium betulae Davis
Daedalea unicolor Bull. ex Fr.
Diatrypella betulina Pk.
Fomes fomentarius (L. ex Fr.) Kickx
Fomes igniarius (L. ex Fr.) Kickx
Fomes pinicola (Sw. ex Fr.) Cke.
Fomes robustus Karst.
Fomes species
Ganoderma appianatum (Pers. ex Wallr.) Pat.
Gloeosporium species
Hymenochaete tabacina (Sow. ex Fr.) Lév.
Hypoxyylon multiforme Fr.
Kabatiella apocrypta (Ell. and Ev.) Arx
Melampsoridium betulinum (Fr.) Kleb.
Panus laevis Berk. and Curt.
Panus stipticus (Bull. ex Fr.) Fr.
Peniophora aspera (Pers.) Sacc.
Peniophora species
Polyporus albellus Pk.
Polyporus arcularis Batsch ex Fr.
Polyporus betulinus Bull. ex Fr.
Polyporus brumalis Pers. ex Fr.
Polyporus pargamenus Fr.
Polyporus pubescens Schum. ex Fr.
Polyporus velutinus Fr.
Polyporus versicolor L. ex Fr.
Pycnoporus cinnabarinus (Jacq. ex Fr.) Karst.
Roadside damage
Schizophyllum commune Fr.
Septoria betulae (Lib.) West.
Snow and ice

Stereum hirsutum (Willd. ex Fr.) S.F. Gray

Stereum ostrea Blume and Nees ex Fr.

Stereum purpureum (Pers. ex Fr.) Fr.

Stereum rugosum Fr.

Taphrina carnea Johans.

Taphrina species

Taphrina species prob. americana Mix

Winter

BETULA PENDULA Roth., weeping birch

Winter

BETULA SPECIES, birch (B)

Polyporus pubescens Schum. ex Fr.

Polyporus versicolor L. ex Fr.

Pycnoporus cinnabarinus (Jacq. ex Fr.) Karst.

CONIFEROUS AND DECIDUOUS TREES AND SHRUBS

Frost

On trees and shrubs (in early summer)

Heat injury

Weather damage

Wind damage

Winter

CONIFEROUS WOOD AND SLASH

Corticium galactinum (Fr.) Burt

Corticium sulphureum (Pers. ex Fr.) Fr.

CORNUS CANADENSIS L., bunchberry, dwarf cornel or dwarf dogwood (dDo)

Puccinia porphyrogenita Curt.

CORNUS SPECIES, dogwood (Do)

Animal

Elsinoë corni Jenk. and Bot.

CORYLUS CORNUTA Marsh., beaked hazelnut

Gnomoniella coryli (Batsch ex Fr.) Sacc.

EPILOBIUM ANGUSTIFOLIUM L., great willow herb or fireweed

Mycosphaerella species

Pucciniastrum epilobii Otth

FAGUS SPECIES, beech (Be)

Frost

On trees (in late spring)

Nectria species

FRAXINUS NIGRA Marsh., black ash (bAs)

Snow and ice

FRAXINUS SPECIES, ash (As)

Mycosphaerella species

JUNIPERUS COMMUNIS L., common juniper (-J.)

Gymnosporangium clavipes (Cke. and Pk.) Cke. and Pk.

JUNIPERUS SPECIES, juniper (J)

Salt

Winter

KALMIA ANGUSTIFOLIA L., sheep laurel

Mycosphaerella colorata (Pk.) Earle

LABURNUM ANAGUIROIDES Medic., golden chain

Nectria cinnabarina Tode ex Fr.

LARIX LARICINA (Du Roi) K. Koch, tamarack (tL)

Armillaria mellea (Vahl ex Fr.) Kummer

Chemical

Fumes from pulp and paper mill

Frost

On seedlings (in late spring)

On trees (in late spring, summer, fall and winter)

Hypodermella laricis Tub.

Melampsora medusae Thüm.

Snow and ice

Unknown (purple foliage)

Winter

LARIX LEPTOLEPIS (Sieb. and Zucc.) Gord., Japanese larch (jL)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Frost

On seedlings (in late spring)

Heaving

Hypodermella laricis Tub.

Hypodermella species

Winter

LARIX OCCIDENTALIS Nutt., western larch (wL)

Frost

On seedlings (in spring and late summer)

Winter

LARIX SPECIES, larch (L)

Chemical

Fume damage

Frost

On seedlings (in spring and late summer)

Heat injury

Heaving

LEDUM SPECIES, Labrador tea

Mycosphaerella species

NEMOPANTHUS MUCRONATA (L.) Trel., mountain holly

Animal

PICEA ABIES (L.) Karst., Norway spruce (nS)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Frost

On seedlings (in late spring)

PICEA GLAUCA (Moench) Voss, white spruce (wS)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Chemical

Fume damage

Chrysomyxa arctostaphyli Diet.

Chrysomyxa empetri Schroet. ex Cummins

Chrysomyxa ledi de Bary

Chrysomyxa ledicola Lagerh.

Chrysomyxa pirolata Wint.

Chrysomyxa species

Fomes pini (Brot. ex Fr.) Karst.

Fomes pinicola (Sw. ex Fr.) Cke.

Frost

On trees (in summer, fall and winter)

Isthmiella crepidiformis (Darker) Darker

Lichens

Lirula macrospora (Hartig) Darker

Lophodermium species

Meliola pinicola Dearn.

Polyporus picipes Fr.

Polyporus schweinitzii Fr.

Polyporus tomentosus Fr.

Poria species

Water excess

Winter

PICEA JEZOENSIS (Sieb. and Zucc.) Carr., hondo or yezo spruce

Frost

On seedlings (in late spring)

PICEA MARIANA (Mill.) B.S.P., black spruce (bs)

Animal

Arceuthobium pusillum Peck.

Armillaria mellea (Vahl ex Fr.) Kummer

Chemical

Fume damage

Chrysomyxa arctostaphyli Diet.

Chrysomyxa empetri Schroet. ex Cummins

Chrysomyxa ledi de Bary

Chrysomyxa ledicola Lagerh.

Chrysomyxa pirolata Wint.

Chrysomyxa species

Coriolellus variiformis (Pk.) Sarkar

Corticium notabile Jackson

Fomes pini (Brot. ex Fr.) Karst.

Fomes pinicola (Sw. ex Fr.) Cke.

Fomes species

Frost

On cones (in late summer)

On seedlings (in late spring)

On trees (in spring and summer)

Ganoderma appianatum (Pers. ex Wallr.) Pat.

Heaving

Isthmiella crepidiformis (Darker) Darker

Lenzites saeparia (Wulf. ex Fr.) Fr.

Lenzites species

Lirula macrospora (Hartig) Darker

Meliola pinicola Dearn.

Peniophora septentrionalis Laurila

Phacidium infestans Karst.

Phacidium species

Polyporus abietinus Dicks. ex Fr.

Polyporus adustus Willd. ex Fr.

Polyporus schweinitzii Fr.

Polyporus species

Polyporus tomentosus Fr.

Poria candidissima (Schw.) Cke.

Poria species

Roadside damage

Salt

Sirococcus strobilinus Preuss

Snow and ice

Winter

PICEA OMORIKA (Pančić) Purkyne, Serbian spruce

Chemical

Insecticide - Aldrin

PICEA PUNGENS Engelm., Colorado blue spruce

Chrysomyxa ledicola Lagerh.

Cytospora kunzei Sacc.

Nectria species

PICEA RUBENS Sarg., red spruce (rS)

Armillaria mellea (Vahl ex Fr.) Kummer

PICEA SITCHENSIS (Bong.) Carr., sitka spruce (SS)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Chemical

Insecticide - Aldrin

Chrysomyxa ledicola Lagerh.

Frost

On seedlings (in late spring)

Snow and ice

PICEA SITCHENSIS X GLAUCA

Armillaria mellea (Vahl ex Fr.) Kummer

PICEA SPECIES, spruce (S)

Armillaria mellea (Vahl ex Fr.) Kummer

Chrysomyxa empetri Schroet. ex Cummins

Chrysomyxa ledi de Bary

Chrysomyxa ledicola Lagerh.

Chrysomyxa species

Corticium galactinum (Fr.) Burt

Corticium laeve Pers. ex Fr.

Corticium pelliculare Karst.

Fomes pini (Bröt. ex Fr.) Karst.

Frost

On seedlings (in late spring)

On trees (in late spring)

Heaving

Hymenochaete tabacina (Sow. ex Fr.) Lév.

Isthmiella crepidiformis (Darker) Darker

Lenzites saeparia (Wulf. ex Fr.) Fr.

Lophodermium species

Peniophora gigantea (Fr.) Massee

Peniophora separans Burt

Phacidium infestans Karst.

Polyporus abietinus Dicks. ex Fr.

Polyporus borealis Fr.

Polyporus fibrillosus Karst.

Polyporus semipileatus Pk.

Snow and ice

Stereum sanguinolentum (Alb. and Schw. ex Fr.) Fr.

PINUS BANKSIANA Lamb., jack pine (jP)

Animal

Coleosporium asterum (Diet.) Syd.

Cronartium coleosporioides Arth.

Dothistroma pini Hulb.

Frost

On seedlings (in late spring)

Gremmeniella abietina (Lagerb.) Morelet

Lophodermium pinastri (Schrad. ex Fr.) Chev.

Snow and ice

Winter

PINUS DENSIFLORA Sieb. and Zucc., Japanese red pine

Heaving

PINUS NIGRA Arn., Austrian pine

Diplodia pinea (Desm.) Kickx

Dothistroma pini Hulb.

Gremmeniella abietina (Lagerb.) Morelet

PINUS NIGRA var. POIRETIANA (Ant.) Aschers. and Graebn., corsican pine

Frost

On seedlings (in late fall)

Winter

PINUS RESINOSA Ait., red pine (rP)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Coleosporium asterum (Diet.) Syd.

Dothistroma pini Hulb.

Gremmeniella abietina (Lagerb.) Morelet

Lophodermium pinastri (Schrad. ex Fr.) Chev.

Snow and ice

Winter

PINUS SPECIES, pine (P)

Animal

Heaving

Lophodermium pinastri (Schrad. ex Fr.) Chev.

Lophodermium species

Snow and ice

Winter

PINUS STROBUS L., eastern white pine (ewP)

Armillaria mellea (Vahl ex Fr.) Kummer

Coleosporium asterum (Diet.) Syd.

Cronartium ribicola J.C. Fischer

Cucurbitothis pityophila (Fr.) Petrak

Lophodermium nitens Darker

Lophodermium pinastri (Schrad. ex Fr.) Chev.

Polyporus species

Polyporus tomentosus var. circinatus (Fr.) Sartory and Maire

Tymanis pithya (Fr.) Karst.

Winter

PINUS SYLVESTRIS L., Scots pine (scP)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

Coleosporium asterum (Diet.) Syd.

Dothistroma pini Hulb.

Gremmeniella abietina (Lagerb.) Morelet

Lophodermium pinastri (Schrad. ex Fr.) Chev.

Lophodermium species

Roadside damage

Salt

Snow and ice

Winter

POPULUS ALBA L., silver poplar (sPo)

Chemical

Insecticide - Aldrin

Heat injury

Pollacia elegans Serv.

POPULUS BALSAMIFERA L., balsam poplar (bPo)

Chemical

Fumes from pulp and paper mill

Cytospora chrysosperma (Pers.) Fr.

Cytospora species

Fomes igniarious var. laevigatus (Fr.) Overh.

Ganoderma applanatum (Pers. ex. Wallr.) Pat.

Pollacia elegans Serv.

Septoria musiva Peck.

Venturia macularis (Fr.) Müll. and Arx

POPULUS NIGRA L., black poplar (-Po)

Taphrina populinana Fr.

POPULUS NIGRA var. ITALICA Muenchh., Lombardy poplar (LPo)

Cytospora chrysosperma (Pers.) Fr.

Dothichiza populea Sacc. and Briard

Frost

On trees (in summer)

Heat injury

Marssonina brunnea (Ell. and Ev.) Sacc.

Phyllosticta species

Physical injury

Taphrina populina Fr.

POPULUS SPECIES, poplar (Po)

Cytopsora chrysosperma (Pers.) Fr.

Peniophora polygonia (Pers. ex Fr.) Bourd. and Galz.

Phlebia strigosozonata (Schw.) Lloyd

Pollacia elegans Serv.

Polyporus adustus Willd. ex Fr.

Polyporus elegans Bull. ex Fr.

Polyporus pargamenus Fr.

Polyporus versicolor L. ex Fr.

Schizophyllum commune Fr.

Stereum purpureum (Pers. ex Fr.) Fr.

Taphrina populina Fr.

Tympanis spermatiospora (Nyl.) Nyl.

Venturia macularis (Fr.) Müll. and Arx

Winter

POPULUS TREMULOIDES Michx., trembling aspen (ta)

Animal

Chemical

Insecticide - Aldrin

Ciborinia whetzelii (Seav.) Seav.

Cladosporium subsessile Ell. and Barth.

Cytopsora chrysosperma (Pers.) Fr.

Encoelia fascicularis fide Groves

Fomes igniarius (L. ex Fr.) Kickx

Frost

On trees (in summer)

Heat injury

Hymenochaete tabacina (Sow. ex Fr.) Lév.
Melampsora abietis-canadensis Ludwig ex Arth.
Melampsora epitea Thüm.
Melampsora species
Mycosphaerella species
Panus stipticus (Bull. ex Fr.) Fr.
Peniophora polygonia (Pers. ex Fr.) Bourd. and Galz.
Peniophora populnea (Pk.) Burt
Peniophora rufa (Fr.) Boid.
Peniophora species
Pollacia elegans Serv.
Polyporus adustus Willd. ex Fr.
Polyporus brumalis Pers. ex Fr.
Polyporus hirsutus Wulf. ex Fr.
Polyporus pargamenus Fr.
Polyporus velutinus Fr.
Poria species
Roadside damage
Schizophyllum commune Fr.
Snow and ice
Stereum purpureum (Pers. ex Fr.) Fr.
Taphrina populin Fr.
Taphrina species
Trechispora brinkmanni (Bres.) Rogers and Jacks.
Tympanis spermatoiospora (Nyl.) Nyl.
Venturia macularis (Fr.) Müll. and Arx
Winter
PRUNUS AVIUM (L.) L., sweet cherry
Apiosporina morbosa (Schw.) Arx
PRUNUS DOMESTICA L., common plum
Apiosporina morbosa (Schw.) Arx

PRUNUS INSITITIA L., damson plum

Apiosporina morbosa (Schw.) Arx

PRUNUS PENSYLVANICA L.f., pin cherry (pCh)

Animal

Apiosporina morbosa (Schw.) Arx

Armillaria mellea (Vahl ex Fr.) Kummer

Cocomyces hiemalis Higgins

Cylindrosporium species

Cytospora chrysosperma (Pers.) Fr.

Fomes fomentarius (L. ex Fr.) Kickx

Frost

On trees (in late summer)

Late spring leaf scorch

Lichens

Nectria cinnabarina Tode ex Fr.

Polyporus albellus Pk.

Polyporus brumalis Pers. ex Fr.

Polyporus pocula (Schw.) Berk. and Curt.

Polyporus versicolor L. ex Fr.

Stereum hirsutum (Willd. ex Fr.) S.F. Gray

Taphrina cerasi (Fckl.) Sadeb.

Winter

PRUNUS SPECIES, cherry (Ch)

Apiosporina morbosa (Schw.) Arx

Cocomyces hiemalis Higgins

Hymenochaete tabacina (Sow. ex Fr.) Lév.

Peniophora aspera (Pers.) Sacc.

Poria prunicola (Murr.) Sacc. and Trott.

Taphrina confusa (Atk.) Gies.

Tympinis spermiospora (Nyl.) Nyl.

PRUNUS VIRGINIANA L., choke cherry (cCh)

Apiosporina morbosa (Schw.) Arx

Cocomyces hiemalis Higgins

Taphrina confusa (Atk.) Gies.

PSEUDOTSUGA MENZIESII (Mirb.) Franco, Douglas fir or pine douglas (D)

Animal

Armillaria mellea (Vahl ex Fr.) Kummer

PYROLA SPECIES, pyrola

Melampsora epitea Thüm.

PYRUS SPECIES, pear

Apiosporina collinsii (Schw.) Höhn.

RHAMNUS ALNIFOLIA L'Hér., alder-leaved buckthorn or cascara (-Ca)

Puccinia coronata Cda.

RIBES GLANDulosum Grauer, skunk currant

Cronartium ribicola J.C. Fischer

RIBES HIRTELLUM Michx., bristly gooseberry

Cronartium ribicola J.C. Fischer

RIBES LACUSTRE (Pers.) Poir., black currant

Cronartium ribicola J.C. Fischer

RIBES SPECIES, currant and gooseberry

Cronartium ribicola J.C. Fischer

ROSA SPECIES, rose

Nectria cinnabarina Tode ex Fr.

RUBUS CANADENSIS L., smooth blackberry

Gymnoconia peckiana (Howe) Trott.

RUBUS SPECIES, brambles or blackberries

Gymnoconia peckiana (Howe) Trott.

SALIX BABYLONICA L., weeping willow

Cytospora species

SALIX BEBBIANA Sarg., bebb or long-beaked willow (beW)

Melampsora abieti-capraearum Tub.

SALIX DISCOLOR Muhl., large pussy willow (puW)

Cercospora salicina Ell. and Ev.

Cytospora salicis (Cda.) Rabh.

Melampsora abieti-capraearum Tub.

Melampsora epitea Thüm.

Phyllactinia guttata (Fr.) Lév.

Rhytidisma salicinum (Pers.) Fr.

Uncinula salicis (D.C. ex Mérat) Wint.

SALIX PENTANDRA L., laurel or bay leaf willow

Physalospora miyabeana Fukushi

SALIX SPECIES, willow (W)

Animal

Cercospora salicina Ell. and Ev.

Coniophora puteana (Schum. ex Fr.) Karst.

Cytospora chrysosperma (Pers.) Fr.

Cytospora salicis (Cda.) Rabh.

Fomes igniarius (L. ex Fr.) Kickx

Fusicladium saliciperdum (All. and Tub.) Lind.

Hymenochaete tabacina (Sow. ex Fr.) Lév.

Hypoxyylon mammatum (Wahl.) Miller

Melampsora abieti-capraearum Tub.

Melampsora epitea Thüm.

Melampsora paradoxa Diet. and Holw.

Melampsora species

Physalospora miyabeana Fukushi

Polyporus elegans Bull. ex Fr.

Polyporus nidulans Fr.

Rhytisma salicinum (Pers.) Fr.

SAMBUCUS PUBENS Michx., catberry, red elderberry or scarlet elder (-El)

Nectria cinnabarina Tode ex Fr.

SAMBUCUS SPECIES, elder

Nectria cinnabarina Tode ex Fr.

Rhytisma species

SOLIDAGO SPECIES, goldenrod

Coleosporium asterum (Diet.) Syd.

SORBUS AMERICANA Marsh, American mountain ash or dogberry (aMo)

Animal

Gymnosporangium cornutum Arth. and Kern

Gymnosporangium species

Mycosphaerella species

Phyllosticta minima (Berk. and Curt.) Underw. and Earle

Poria ferrea (Pers.) Bourd. and Galz.

Weather damage

SORBUS AUCUPARIA L., European mountain ash (eMo)

Gymnosporangium species

Late spring leaf scorch

Mycosphaerella species

SORBUS DECORA (Sarg.) Schneid., showy mountain ash (sMo)

Daedalea confragosa Bolt. ex Fr.

Gymnosporangium cornutum Arth. and Kern

Gymnosporangium species

Nectria cinnabarinina Tode ex Fr.

SORBUS SPECIES, mountain ash (Mo)

Animal

Gymnosporangium cornutum Arth. and Kern

Heat injury

Hypoxylon multiforme Fr.

Mycosphaerella species

Pycnoporus cinnabarinus (Jacq. ex Fr.) Karst.

TAXUS BREVIFOLIA Nutt., western yew (-Y)

Nectria cinnabarinina Tode ex Fr.

TAXUS CANADENSIS Marsh., Canada yew or ground hemlock (-Y)

Animal

Sphaerulina taxicola (Pk.) Berl.

THALICTRUM POLYGAMUM Muhl., muskrat weed

Puccinia recondita Rob. ex Desm.

THUJA OCCIDENTALIS L., eastern white cedar (eC)

Frost

On seedlings (in late spring)

Phomopsis juniperovora Hahn.

THUJA PLICATA D. Don, western red cedar (wC)

Frost

On seedlings (in late spring)

THUJA SPECIES, cedar (C)

Winter

TILIA SPECIES, basswood (Ba)

Nectria cinnabarinna Tode ex Fr.

ULMUS GLABRA var. CAMPERDOWNII Rehd., camperdown elm

Phleospora ulmi (Fr.) Wallr.

ULMUS PARVIFOLIA Jacq., Chinese elm (cE)

Nectria cinnabarinna Tode ex Fr.

ULMUS SPECIES, elm (E)

Gnomonia ulmea (Schw.) Thüm.

VACCINIUM CESPITOSUM Michx., English blueberry

Pucciniastrum goeppertianum (Kühn) Kleb.

VACCINIUM SPECIES, cranberries and blueberries

Ramularia effusa Pk.

VIBURNUM CASSINOIDES L., wild raisin

Animal

Apiosporina collinsii (Schw.) Höhn.

PREFACE TO GENERAL INDEX

In this index, the pathogens, animals, abiotic factors and their hosts are listed alphabetically along with their appropriate page numbers in this report.

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APPENDIX I

Names, Latitudes and Longitudes of Localities Cited in
the Maps and in the Disease Index

Locality number	Name of locality	Latitude	Longitude
1	Bauline Line	47° 40' N	52° 48' W
2	Codroy Pond - Codroy Valley	48° 05' N	58° 52' W
3	St. Fintans	48° 11' N	58° 51' W
4	Serpentine Lake	48° 54' N	58° 09' W
5	Middle Brook	48° 20' N	58° 30' W
6	Cormack	49° 22' N	57° 19' W
7	Birchy Lake - Birchy Ridge	49° 20' N	56° 49' W
8	Highlands River	48° 05' N	58° 46' W
9	Bottom Brook	48° 32' N	58° 14' W
10	Stephenville	48° 36' N	58° 15' W
11	Swift Current	47° 53' N	54° 13' W
12	Upper Humber Region	48° 49' N	55° 57' W
13	Bonne Bay Big Pond	49° 21' N	57° 37' W
14	Halls Bay Region	49° 30' N	56° 09' W
15	North Pond Road	48° 42' N	54° 26' W
16	Barry's Brook - Gander Bay Road	49° 10' N	54° 29' W
17	Sandy Lake - Badger (11 km N of)	49° 20' N	56° 23' W
18	South Branch	47° 55' N	59° 02' W
19	Lake Ambrose	48° 34' N	56° 36' W
20	Howley, Sandy Lake Region	49° 10' N	56° 59' W
21	Howley Jct. - Main Dam (Grand Lake)	49° 12' N	57° 14' W
22	North Pond	48° 42' N	54° 33' W
23	Terra Nova Village Road	48° 30' N	54° 10' W
24	Gander	48° 56' N	54° 34' W
25	St. John's	47° 34' N	52° 43' W
26	Adies River	49° 29' N	57° 08' W
27	Flat Bay	48° 24' N	58° 35' W
28	Princeton	48° 25' N	53° 35' W
29	Hermitage	47° 33' N	55° 56' W
30	Knights Cove	48° 32' N	53° 19' W
31	Ten Mile Lake	51° 06' N	56° 37' W
32	Port Rexton	48° 23' N	53° 20' W
33	Marystown - Freshwater Pond - Fortune	47° 08' N	55° 19' W
34	Whitbourne	47° 25' N	53° 32' W
35	Badger	48° 54' N	56° 05' W
36	Long Lake	48° 29' N	57° 04' W
37	Crabbes River	48° 08' N	58° 44' W
38	Steady Brook	48° 57' N	57° 49' W
39	Frenchman's Cove, Burin Peninsula	47° 13' N	55° 24' W

Locality number	Name of locality	Latitude	Longitude
40	Elliotts Cove - Snook's Harbour Jct.	48° 09' N	53° 54' W
41	Britannia, Random Island	48° 09' N	53° 43' W
42	Birchy Lake Road	49° 22' N	56° 33' W
43	Birch Bay	49° 21' N	54° 44' W
44	Port Blandford	48° 21' N	54° 10' W
45	St. Jones Within - Hillview	48° 03' N	53° 45' W
46	Lake Ebbegunbaeg	48° 17' N	56° 23' W
47	Exploits Dam - Lake Ambrose	48° 42' N	56° 38' W
48	Goobies	47° 56' N	53° 58' W
49	Harbour Grace - Carbonear	47° 44' N	53° 13' W
50	Winterton	47° 57' N	53° 20' W
51	Glenwood	49° 00' N	54° 52' W
52	Marystown	47° 10' N	55° 10' W
53	Bay D'Espoir	47° 49' N	55° 47' W
54	Bauline Line - Pouch Cove Road	47° 44' N	52° 48' W
55	Terra Nova	48° 30' N	54° 13' W
56	Millertown	48° 49' N	56° 33' W
57	Sop's Arm, White Bay	49° 47' N	56° 52' W
58	Middle Ridge Pond	48° 16' N	55° 05' W
59	Northern Bay	47° 57' N	53° 04' W
60	Brig Bay	51° 03' N	56° 55' W
61	River of Ponds	50° 32' N	57° 23' W
62	Glenwood Forest Road	48° 12' N	54° 53' W
63	Gander Bay Road	48° 59' N	54° 29' W
64	Torbay	47° 40' N	52° 44' W
65	Milton	48° 13' N	53° 58' W
66	Plate Cove	48° 30' N	53° 30' W
67	Charlottetown Region, T.N.N.P.	48° 26' N	54° 04' W
68	Glovertown	48° 39' N	54° 01' W
69	Come By Chance River Valley	47° 48' N	53° 58' W
70	St. Veronica's	47° 56' N	55° 47' W
71	Morrisville	47° 52' N	55° 46' W
72	New Bay Pond	49° 11' N	55° 36' W
73	Brown's Arm	49° 15' N	55° 10' W
74	Park Harbour, T.N.N.P.	48° 32' N	53° 56' W
75	Millertown (18 km N of)	48° 58' N	56° 37' W
76	Cape Ray	47° 42' N	59° 16' W
77	Deer Lake - Reidville - Jct. Brook	49° 10' N	57° 25' W
78	Goulds	47° 29' N	52° 46' W
79	Buchans - Red Indian Lake	48° 50' N	56° 38' W
80	Paddy's Pond - Cochrane Pond	47° 29' N	52° 52' W
81	St. George's	48° 26' N	58° 29' W
82	Birchy and Sandy Lake Narrows	49° 18' N	56° 52' W
83	Witless Bay - Mobile	47° 17' N	52° 50' W

Locality number	Name of locality	Latitude	Longitude
84	Grand Falls	48° 55' N	55° 42' W
85	North Harbour Road	47° 53' N	54° 06' W
86	Lake St. John	48° 24' N	54° 37' W
87	Sheffield Lake	49° 22' N	56° 36' W
88	Victoria Lake	48° 21' N	57° 19' W
89	Badger - Buchans Road (8 km SW of)	48° 56' N	56° 07' W
90	Pasadena - Midland - South Brook	49° 01' N	57° 36' W
91	Gambo Lake	48° 38' N	54° 22' W
92	Clarenville	48° 10' N	53° 59' W
93	Bishop's Falls	49° 01' N	55° 29' W
94	Big Falls	49° 21' N	57° 10' W
95	Lower Humber Valley	48° 59' N	57° 50' W
96	Noel Paul's Brook	48° 32' N	56° 32' W
97	Phillips Head - Northern Arm - Point Leamington Road	49° 15' N	55° 22' W
98	North Shore, Grand Lake	48° 50' N	57° 45' W
99	Southern Arm	49° 54' N	56° 22' W
100	Western Arm	49° 49' N	56° 47' W
101	South Brook, Humber East District	49° 01' N	57° 38' W
102	Little Rapids	48° 59' N	57° 44' W
103	Robert's Arm Road	49° 27' N	55° 55' W
104	Trinity	48° 23' N	53° 23' W
105	Boat Harbour	47° 25' N	54° 51' W
106	Lethbridge	48° 21' N	53° 52' W
107	Garden Cove	47° 51' N	54° 09' W
108	Indian Bay Road	49° 05' N	54° 21' W
109	Corner Brook	48° 57' N	57° 58' W
110	Lomond - Norris Point	49° 28' N	57° 46' W
111	North Branch	48° 01' N	58° 57' W
112	Bay D'Espoir Road (8 km S of TCH)	48° 58' N	55° 25' W
113	Alexander Bay - Pine Acres	48° 42' N	54° 07' W
114	Kings Cove	48° 34' N	53° 20' W
115	Winter Brook	48° 26' N	53° 45' W
116	Gallants	48° 42' N	58° 14' W
117	Northern Portion, Bonavista Peninsula	48° 30' N	53° 10' W
118	Boat Harbour - Marystown	47° 20' N	55° 00' W
119	South Brook - Wolf Cove	49° 26' N	56° 05' W
120	Flat Bay Brook - Steel Mountain Road	48° 23' N	58° 25' W
121	Hampden -Bayside	49° 32' N	56° 54' W
122	Gambo	48° 46' N	54° 14' W
123	South Pond	49° 21' N	56° 09' W
124	Rattling Brook, Green Bay	49° 38' N	56° 10' W
125	South West Brook	48° 29' N	58° 01' W

Locality number	Name of locality	Latitude	Longitude
126	Little Barachois Brook	48° 27' N	58° 05' W
127	Triton Brook	48° 33' N	54° 47' W
128	Bay Bulls	47° 19' N	52° 49' W
129	Mount Peyton	48° 57' N	55° 06' W
130	South Arm, New Bay	49° 22' N	55° 21' W
131	Stephenville Crossing - Peilleys Brook	48° 32' N	58° 26' W
132	Bellburns	50° 20' N	57° 32' W
133	Bonne Bay	49° 30' N	57° 55' W
134	Markland	47° 23' N	53° 33' W
135	Brigus	47° 32' N	53° 13' W
136	Catalina	48° 31' N	53° 05' W
137	Little Harbour	47° 39' N	53° 56' W
138	Long Harbour	47° 26' N	53° 49' W
139	Point of Bay	49° 15' N	55° 15' W
140	Deep Bight	48° 06' N	53° 57' W
141	Notre Dame Jct.	49° 07' N	55° 05' W
142	Lake O'Brien	49° 03' N	54° 59' W
143	Trepassey	46° 44' N	53° 22' W
144	Sunnyside	47° 52' N	53° 56' W
145	New Melbourne	48° 03' N	53° 09' W
146	Grand Bank	47° 06' N	55° 45' W
147	Oasis, Grand Falls	48° 57' N	55° 46' W
148	Big Coney Arm	50° 00' N	56° 47' W
149	Adies Pond	49° 25' N	57° 14' W
150	Port au Port	48° 34' N	58° 43' W
151	Georges Lake	48° 44' N	58° 13' W
152	Hughes Brook	49° 03' N	57° 50' W
153	Grand Lake	48° 53' N	57° 25' W
154	Cox's Cove - McIvers	49° 07' N	58° 04' W
155	Blow Me Down	49° 03' N	58° 16' W
156	Wiltondale	49° 24' N	57° 37' W
157	Trout River	49° 29' N	58° 08' W
158	Seal Cove	47° 28' N	53° 04' W
159	Lewisporte	49° 15' N	55° 04' W
160	Indian River	49° 28' N	56° 18' W
161	Wild Cove	50° 00' N	56° 20' W
162	Birchy Basin	49° 23' N	57° 11' W
163	Coal Brook	47° 56' N	58° 59' W
164	York Harbour	49° 04' N	58° 23' W
165	Holyrood	47° 23' N	53° 08' W
166	Placentia	47° 15' N	53° 58' W
167	Fischels Brook	48° 17' N	58° 34' W
168	Barachois Pond Provincial Park	48° 28' N	58° 18' W

Locality number	Name of locality	Latitude	Longitude
169	Exploits River	48° 55' N	55° 40' W
170	North East River	47° 18' N	53° 47' W
171	Stag Hill	48° 52' N	57° 54' W
172	Sandy Lake - Sandy Brook, Grand Falls	48° 45' N	56° 00' W
173	N.W. River (11 km W of)	48° 24' N	54° 33' W
174	Glover Island (40 km E of)	48° 45' N	57° 04' W
175	Baie Verte Road	49° 52' N	56° 13' W
176	West Lake, Badger	48° 52' N	55° 08' W
177	Sandy Point, Grand Lake	48° 41' N	57° 54' W
178	Portugal Cove	47° 38' N	52° 51' W
179	Fortune	47° 04' N	55° 50' W
180	Springdale	49° 30' N	56° 04' W
181	Burnt Pond	49° 15' N	56° 04' W
182	Badger Brook	49° 00' N	56° 03' W
183	Deer Pond	48° 30' N	54° 48' W
184	LaScie	49° 57' N	55° 35' W
185	Doyles	47° 50' N	59° 11' W
186	Norris Arm	49° 05' N	55° 16' W
187	Benton - Square Pond Provincial Park	48° 54' N	54° 25' W
188	Bonavista	48° 39' N	53° 08' W
189	Snowshoe Pond	48° 06' N	56° 50' W
190	St. Andrews	47° 47' N	59° 16' W
191	Taylor Brook	49° 37' N	57° 02' W
192	Thornlea	47° 37' N	53° 44' W
193	Daniels Harbour	50° 14' N	57° 35' W
194	Rogerson Lake	48° 33' N	56° 45' W
195	Southwest River	48° 13' N	54° 14' W
196	Jeffreys	48° 14' N	58° 51' W
197	Goose Arm	49° 07' N	57° 55' W
198	Bunyan's Cove	48° 24' N	54° 01' W
199	Salmonier - St. Catherines	47° 12' N	53° 23' W
200	Hawkes Bay	50° 36' N	57° 11' W
201	Doctor's Brook	50° 48' N	57° 04' W
202	Great Barasway River	47° 08' N	54° 02' W
203	Eastport	48° 39' N	53° 45' W
204	John the Bay	47° 13' N	55° 04' W
205	King George IV Lake	48° 12' N	57° 54' W
206	Conne River Pond	48° 10' N	55° 29' W
207	Peter Stride's Lake	48° 09' N	57° 44' W
208	Cooks Harbour	51° 36' N	55° 52' W
209	Mount Sylvester	48° 10' N	55° 05' W
210	Bay L'Argent	47° 33' N	54° 53' W
211	Jct., St. Anthony and Cooks Harbour Road	51° 30' N	55° 54' W

Locality number	Name of locality	Latitude	Longitude
212	Portland Creek	50° 10' N	57° 36' W
213	Colinet	47° 13' N	53° 33' W
214	St. Joseph's - St. Albans	47° 07' N	53° 31' W
215	St. Anthony	51° 22' N	55° 35' W
216	Pistolet Bay	51° 30' N	55° 45' W
217	Crooked Lake	49° 09' N	56° 03' W
218	Middle Brook Provincial Park - David Smallwood Provincial Park	48° 48' N	54° 13' W
219	Bear Cove, White Bay	49° 51' N	56° 33' W
220	Brown's Cove	49° 38' N	56° 49' W
221	Hare Bay	49° 40' N	54° 18' W
222	Botwood	49° 09' N	55° 21' W
223	Roddickton (10 km N of)	50° 57' N	56° 06' W
224	Frederickton	49° 26' N	54° 21' W
225	Port Albert	49° 33' N	54° 32' W
226	Coachman's Cove	50° 04' N	56° 07' W
227	Isle aux Morts	47° 35' N	58° 58' W
228	St. Pauls	49° 51' N	57° 49' W
229	Englee (8 km N of)	50° 49' N	56° 05' W
230	Newstead (3 km S of)	49° 23' N	54° 51' W
231	Baie Verte	49° 56' N	56° 11' W
232	Southwest Gander River	48° 40' N	55° 03' W
233	North Bay, La Poile Bay	47° 48' N	58° 20' W
234	Connoire Bay	47° 42' N	57° 54' W
235	White Bear River	47° 51' N	57° 17' W
236	Long Harbour River	47° 42' N	54° 55' W
237	Great Rattling Brook	48° 45' N	55° 35' W
238	Port Saunders	50° 39' N	57° 18' W
239	Barr'd Harbour	50° 49' N	57° 04' W
240	Rocky Harbour	49° 36' N	57° 55' W
241	Main Brook	51° 11' N	56° 01' W
242	Caribou Lake	48° 41' N	57° 26' W
243	Rose Blanche	47° 37' N	58° 42' W
244	Lower Cove	48° 32' N	59° 00' W
245	March Point	48° 30' N	59° 08' W
246	Lark Harbour	49° 06' N	58° 22' W
247	Jackson's Cove	49° 41' N	56° 00' W
248	Long Island, Notre Dame Bay	49° 36' N	55° 40' W
249	Carmanville	49° 24' N	54° 18' W
250	Mount Pearl - Newtown	47° 31' N	52° 47' W
251	Manuels - Foxtrap	47° 31' N	52° 55' W
252	Woody Point - Birch Head - Shoal Brook	49° 30' N	57° 55' W
253	Tilton - Tilton Barrens	47° 37' N	53° 17' W

Locality number	Name of locality	Latitude	Longitude
254	Burlington	49° 45' N	56° 03' W
255	Leading Tickles	49° 30' N	55° 26' W
256	Sally's Cove	49° 44' N	57° 57' W
257	Woodstock Jct.	49° 57' N	56° 54' W
258	Jamestown	48° 22' N	53° 47' W
259	Silver Mountain	49° 40' N	57° 11' W
260	Salmon Cove - Salmon Cove Sands	47° 47' N	53° 10' W
261	Holyrood Pond Provincial Park	46° 53' N	53° 35' W
262	Summerside	48° 59' N	57° 59' W
263	Gilliams	49° 01' N	58° 04' W
264	Belldowns Point	49° 56' N	57° 46' W
265	Colliers	47° 27' N	53° 12' W
266	Searston	47° 49' N	59° 19' W
267	Dicks Brook	49° 30' N	57° 47' W
268	Mason's Brook	48° 44' N	54° 18' W
269	Cobbler's Brook	48° 25' N	54° 03' W
270	East Arm	49° 29' N	57° 45' W
271	Plum Point	51° 05' N	56° 45' W
272	Freshwater, Avalon Peninsula	47° 45' N	53° 13' W
273	Horwood	49° 28' N	54° 31' W
274	Burgeo	47° 37' N	57° 37' W
275	O'Donnels	47° 09' N	53° 35' W
276	Cavendish	47° 43' N	53° 30' W
277	Whiteway	47° 41' N	53° 30' W
278	Heart's Desire	47° 50' N	53° 26' W
279	Heart's Delight	47° 47' N	53° 27' W
280	Dildo	47° 39' N	53° 34' W
281	Deer Arm - Deer Arm Brook	49° 34' N	57° 51' W
282	Little Barachois Valley	48° 22' N	58° 09' W
283	Mollichignick	47° 53' N	59° 05' W
284	Pelleys Bog	48° 32' N	58° 29' W
285	West Lake - West Branch Road	48° 52' N	55° 51' W
286	Bottle Pond Road	48° 36' N	58° 16' W
287	Black River	47° 58' N	54° 10' W
288	Twillick Brook	48° 04' N	55° 35' W
289	North Lake - North Lake Road	49° 13' N	57° 34' W
290	Indian River Provincial Park	49° 30' N	56° 13' W
291	Picadilly Head Provincial Park	48° 36' N	58° 54' W
292	Sheaves Cove	48° 31' N	59° 03' W
293	Abraham's Cove	48° 32' N	58° 54' W
294	Riverhead	46° 59' N	53° 31' W
295	Mud Lake	53° 18' N	60° 15' W
296	Happy Valley	53° 18' N	60° 17' W
297	Otter Creek	53° 22' N	60° 25' W

Locality number	Name of locality	Latitude	Longitude
298	Gull Bridge Mine Road	49° 07' N	56° 07' W
299	Squires Memorial Provincial Park	49° 21' N	57° 10' W
300	Churchill Falls	53° 31' N	64° 01' W
301	Canada Agriculture Exp. Farm	47° 31' N	52° 47' W
302	Jct. TCH and Springdale Road	49° 29' N	56° 13' W
303	Pinchgut Lake - Logging School Road	48° 51' N	57° 58' W
304	Flatwater Pond - Flatwater Pond Provincial Park	49° 46' N	56° 18' W
305	Beothuk Pond Provincial Park	48° 57' N	56° 41' W
306	White Bay Jct.	49° 22' N	56° 51' W
307	Stag Lake	48° 50' N	58° 01' W
308	Goose Bay	53° 18' N	60° 26' W
309	Northwest River, Labrador	53° 32' N	60° 09' W
310	St. Vincents	46° 48' N	53° 38' W
311	Grant's Siding	48° 43' N	54° 08' W
312	Freshwater Pond Provincial Park	47° 07' N	55° 14' W
313	Miguel Lake Road	48° 43' N	55° 32' W
314	Middle Gull Pond - Gushue Pond Provincial Park	47° 22' N	53° 15' W
315	Ocean Pond	47° 26' N	53° 24' W
316	Salmonier Line (8 km S of TCH)	47° 17' N	53° 15' W
317	Mary March Provincial Park	48° 49' N	56° 35' W
318	Kelligrews	47° 28' N	53° 00' W
319	South River	47° 32' N	53° 15' W
320	Bay Roberts	47° 35' N	53° 15' W
321	Spaniard's Bay	47° 36' N	53° 16' W
322	Shellbird Island, Humber River	48° 57' N	57° 53' W
323	Burnt Berry Pond	49° 27' N	56° 11' W
324	Fair Haven Jct.	47° 35' N	53° 49' W
325	Blue Ponds Provincial Park	48° 46' N	58° 06' W
326	Wooddale Nursery	49° 02' N	55° 36' W
327	Portland Creek - Portland Creek Jct.	50° 10' N	57° 37' W
328	Eastern Blue Pond	50° 29' N	57° 03' W
329	Northwest Gander River	48° 43' N	55° 09' W
330	Jumper's Brook	49° 01' N	55° 24' W
331	Parson's Pond Hill	49° 59' N	57° 43' W

APPENDIX II

Names of Localities Cited in the Disease Index

Locality number	Name of locality
501	Georges Brook, Trinity Bay
502	Trout Brook, St. Georges River, Western Newfoundland
503	Corner Brook Pond, Western Newfoundland
504	Humber Arm, Western Newfoundland
505	Hungry Hill, Red Indian Lake
506	Windsor Lake, Eastern Newfoundland
507	Alderburn, Bay of Exploits
508	Windsor, Central Newfoundland
509	Cooks Brook, Western Newfoundland
510	Bihops Falls - Norris Arm Road, Central Newfoundland
511	Sweet Bay, Bonavista Peninsula
512	Summerville, Bonavista Peninsula
513	Stock Cove, Bonavista Peninsula
514	Petley, Random Island
515	Country Pond, Eastern Newfoundland
516	Port au Port Peninsula
517	White Bay
518	Soulis Pond, Central Newfoundland
519	Frenchman's Cove, Western Newfoundland
520	North Side of Gander Lake, Central Newfoundland
521	Bloomfield Jct., Bonavista Peninsula
522	North End of Sandy Lake, Western Newfoundland
523	Pauls Lake, Central Newfoundland
524	Cottrells Cove Road, Bay of Exploits
525	Burgoyne's Cove, Bonavista Peninsula
526	Boot Brook, West of Sandy Lake, Western Newfoundland
527	Sopers, Humber Arm, Western Newfoundland
528	Michaels Harbour, Notre Dame Bay
529	Aspen Brook, Central Newfoundland
530	St. Davids Road, Western Newfoundland
531	Shoal Harbour River, Central Newfoundland
532	Southern Bay, Bonavista Peninsula
533	Little Sandy Point, Southwest of Grand Lake
534	TCH at Hampden Road
535	Harrys Brook, Western Newfoundland
536	Southeast End of Glover Island
537	Charleston, Bonavista Peninsula
538	Rushy Pond, Central Newfoundland
539	Whites Brook Road, Western Newfoundland
540	Harcourt, Bonavista Peninsula
541	Lockleiven Road in the Codroy Valley, Western Newfoundland
542	Campbellton - Loon Bay Road, Notre Dame Bay

Locality number	Name of locality
543	Random Island
544	Wetstone Point, Grand Lake
545	Robinson's, Western Newfoundland
546	Notre Dame Bay
547	Terra Nova River
548	Northeast End of Glover Island
549	Little Falls, Humber River
550	Lake Douglas, Central Newfoundland
551	Avondale, Eastern Newfoundland
552	Baie Verte Jct.
553	Northern Harbour, Grand Lake
554	Snug Harbour, Deer Lake
555	West Arm - Point Leamington Road, Notre Dame Bay
556	John's Beach, Humber Arm, Western Newfoundland
557	Glovers Harbour, Notre Dame Bay
558	Lockport, Notre Dame Bay
559	Pine Falls, Lake Ambrose, Central Newfoundland
560	Colliers Ridge, Georges Lake, Western Newfoundland
561	Riverside, White Bay
562	Twin Lakes, Central Newfoundland
563	Charles Brook, Bay of Exploits
564	Bakers Brook, North Shore of Grand Lake
565	Wiley Brook, Red Indian Lake
566	Duntara, Bonavista Peninsula
567	Goodyears Cove, Halls Bay
568	Carter's Road, Stephenville Crossing, Western Newfoundland
569	Gales Valley, Western Newfoundland
570	Valley Brook, Victoria Lake
571	McIsaacs Brook, Western Newfoundland
572	Nichols Brook, Western Newfoundland
573	Bishops Highway, Central Newfoundland
574	Kirkland, Eastern Newfoundland
575	Bantalor Portage
576	Northern Peninsula
577	Baie Verte Peninsula
578	Placentia Bay
579	Trinity Bay
580	Bonavista Peninsula
581	Burin Peninsula
582	Avalon Peninsula
583	Western Newfoundland
584	Central Newfoundland
585	Eastern Newfoundland
586	Avalon District

Locality number	Name of locality
587	Bonavista District
588	Gander District
589	Hermitage District
590	Grand Falls District
591	St. Georges District
592	Humber District
593	White Bay District
594	St. Barbe District
595	Topsail
596	Nippers Harbour Road
597	Old Man's Pond
598	Camp 180 Road
599	Island Pond Road
600	Deadwater Brook
601	Flatwater Pond Road
602	Gros Morne National Park
603	Southern Newfoundland
604	Lady Slipper Road, Western Newfoundland
605	Leading Tickles Road
606	Crooked Feeder
607	Winter Tickle
608	Sandy Harbour River
609	Star Lake
610	Whalen's Pond Road
611	Mill Brook
612	Bay D'Espoir Road (Near Route 360)
613	Sandy Pond Jct.
614	Dominion Lake Area, Labrador
615	George's Point
616	Northwest Gander River
617	Baker's Steady
618	Three Island Rock
619	Eastern Labrador
620	Radio Tower Road, Goose Bay
621	Churchill Road - Churchill Falls Road, Labrador
622	Grand Lake - Grand Lake Brook
623	Humber River - Humber Valley
624	West Branch Road
625	Spring Gulch, Labrador
626	Gull Lake, Labrador
627	Northwest River Road, Labrador
628	Labrador
629	Parker's Pond Road
630	Churchill River

Locality number	Name of locality
631	Portugal Cove - Pouch Cove (on Route 21)
632	Gould's Road (Clarke's Beach to TCH)
633	Main Highway, Baie Verte
634	Burlington Road
635	TCH (Gushue's Pond to Roaches Line)
636	Terra Nova National Park (on TCH)
637	Baie Verte Highway, N of TCH
638	Goose River Road, Labrador
639	Southeast Brook, Northern Peninsula
640	Grand Lake Road, Labrador
641	Grand Lake Road
642	Northwest Gander River Road
643	Lethbridge - Southern Bay (on Route 230)
644	Gander - Gander Bay (on Route 330)
645	Bellburn's - Daniel's Harbour (on Route 430)
646	Goose Arm Road
647	Crescent Lake - Robert's Arm Road

APPENDIX III

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