DISTRIBUTION OF ORGANISMS CAUSING IMPORTANT FOREST TREE DISEASES IN ONTARIO

BASED ON COLLECTIONS RECORDED BY THE FOREST INSECT AND DISEASE SURVEY UNIT

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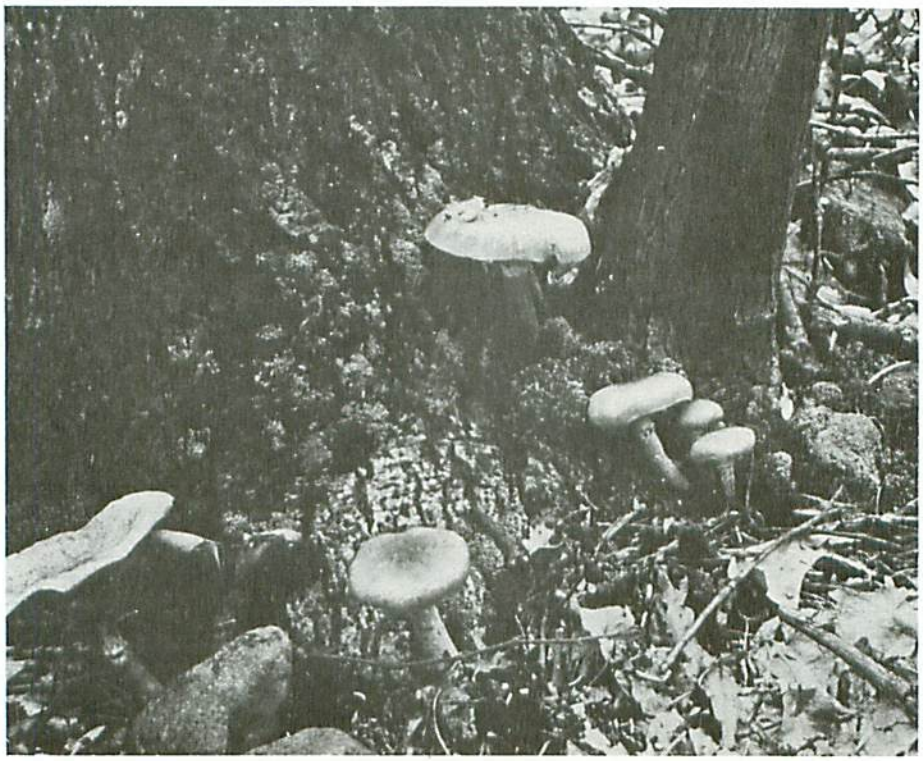

Frontispiece. Sporophores of *Armillaria mellea* growing at the base of a dead oak tree.

ABSTRACT

Maps depicting collection points of 58 fungi and 2 parasitic phanerogams commonly causing or frequently associated with tree diseases in Ontario are presented. The locations of collection points were determined from the records of the Forest Insect and Disease Survey Unit of the Great Lakes Forest Research Centre for the period from 1957 through 1975. Brief notes accompany each map and include such information as the taxonomic position of the organism, the hosts on record, and the collections retained in the Ontario regional herbarium.

RÉSUMÉ

Ce travail présente des cartons pointant 58 espèces de Champignons et 2 Phanérogames parasites qui causent souvent ou sont liés à des maladies des arbres en Ontario. Les lieux de récolte furent déterminés d'après les archives de la Division du Relevé des insectes et maladies des forêts au Centre de recherches forestières des Grands lacs, et couvrent la période de 1957 à 1975. Chacun des cartons est brièvement annoté et contient des renseignements sur la taxonomie de l'organisme, les hôtes observés, et les collections conservées à l'herbier régional (couvrant l'Ontario) sis au dit Centre.

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INTRODUCTION

This report is a compilation of information from the records of the Forest Insect and Disease Survey Unit (FIDS) of the Canadian Forestry Service at the Great Lakes Forest Research Centre and from the records of the regional cryptogamic herbarium concerning the distribution of fungi and parasitic phanerogams causing forest diseases in the province of Ontario. The need for information of this type has become clear as a result of numerous questions from interested individuals about the distribution of disease-causing organisms in Ontario and the lack of easily accessible, pertinent data.

The collection records accumulated by FIDS staff from 1957 to 1975 are the foundation on which this publication is based. Most of these records are compiled from data submitted with disease samples by field staff, and from identifications made by the Unit's Mycologist or Disease Identification Technician. Also included are records from herbarium samples obtained from other sources. In total, 8,576 records have been included in this study.

The number of fungi causing forest diseases in Ontario is of such magnitude that it would have been impractical to include all of them in a report of this nature. Many forest diseases occur only sporadically; others, though quite conspicuous, cause little damage. A great number of fungi infect only dead or dying tissue of hosts weakened by other agencies and are thus of secondary interest. The criteria, then, that were applied in the selection of organisms for inclusion in this report are: the high potential hazard they present to their hosts, their widespread occurence, and/or the significant impact they have on their host plants. Several fungi which we feel are weakly parasitic have been included because of their widespread occurrence and consistent association with dead or dying host plants. Others are included as important even though known distribution at present is restricted to a few locations. The number of collections of many of the more significant decay fungi is low because of the rather unobtrusive nature of these organisms. Consequently, not all of the more important decay fungi are included in this publication and distributional information that is included may be sketchy. The reader is referred to a paper by Basham and Morawski (1964) for a comprehensive study of the wood decay fungi in Ontario and their economic importance.

The recorded occurrences of these diseases are depicted on a series of maps by means of a dot system. Each dot denotes the general area in which one or several collections of an organism were made; hence, the number of dots does not necessarily coincide with the number of collections that are on record, and is usually smaller. It must be recognized that the points on the maps indicate locations in which collections have been made and do not necessarily represent the actual distribution of an organism. The distribution of host-specific pathogens in Ontario usually coincides with the range of the host, and consulting a map dealing with the geographic distribution of

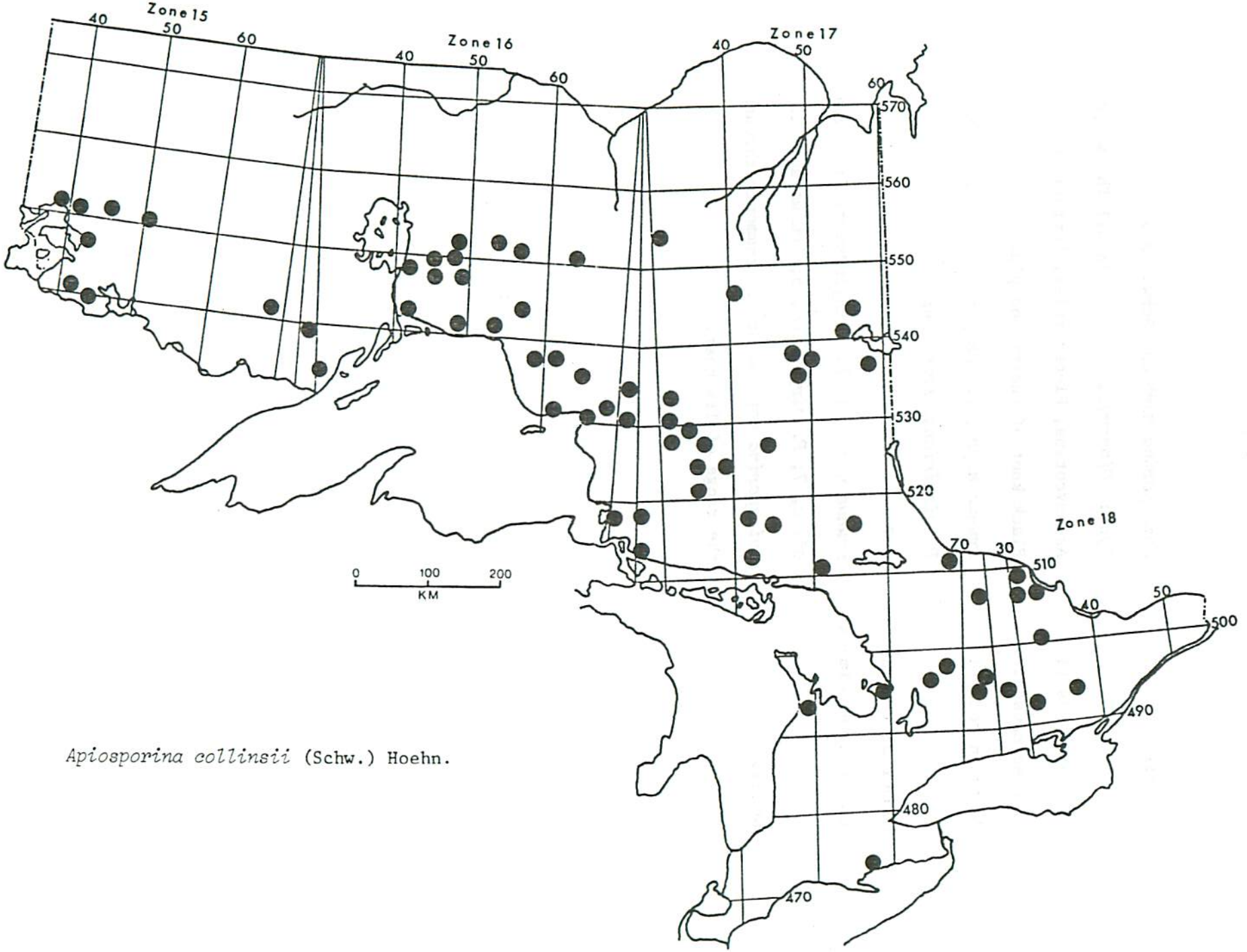
the host may be of some value in determining the true distribution of the fungus. Range maps for the tree hosts can be found in *Native Trees of Canada* by R. C. Hosie (1973). Some information on other hosts can be found in *Gray's Manual of Botany* by M. L. Fernald (1950).

The causal organisms are arranged alphabetically by genus and species, without regard to taxonomic position. A set of brief, explanatory notes provides the Latin binomial, authors, and taxonomic position for each organism. Also presented are the disease caused, recorded hosts, the number of records on which the distribution is based, and the number of samples of the organisms or diseased material collected in Ontario and deposited in the cryptogamic herbarium maintained at the Great Lakes Forest Research Centre (herbarium code - SSMF). Synonyms for each fungus are included where it is felt that a new name or more familiar name should accompany the name selected as a major heading.

The taxonomic positions of fungi in the Ascomycotina were based on the work of Korf (1973), Luttrell (1973) and Müller and von Arx (1973) while Ainsworth (1971) served the same purpose for the remaining fungi. The Index of Plant Diseases in the United States (Anon. 1960) was followed for author abbreviations. Hosie (1973) was followed for the Latin binomials and common names of the host trees, while Gleason and Cronquist (1963) was used for the remaining host plants and their authors, although other sources were referred to occasionally. Fernald (1950), Boyce (1961), Conners (1967), Maini and Cayford (1968), Hepting (1971), and Ziller (1974) served as major sources of information. Other scientific works consulted are listed where appropriate.

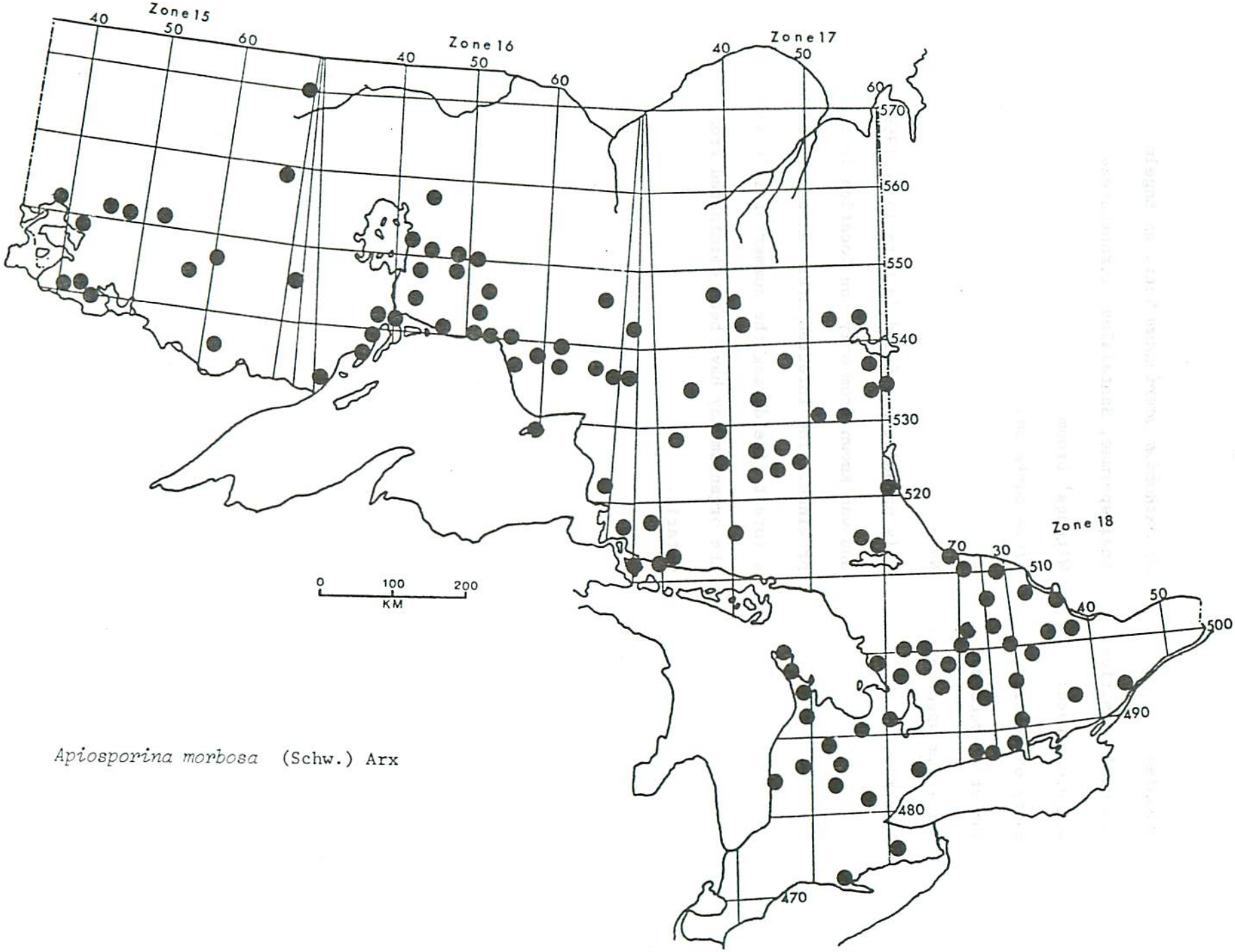
COLLECTION POINTS AND DISEASES

Organism:	*Apiosporina collinsii* (Schw.) Hoehn.
Taxonomic position:	Ascomycotina, Pleosporales, Venturiaceae
Disease caused:	Witches' broom of serviceberry
Hosts on record:	*Amelanchier alnifolia* , *Amelanchier* sp.
Number of records:	80
Herbarium specimens:	*Amelanchier alnifolia*, 4; *Amelanchier* sp., 15
Remarks:	This fungus occurs commonly throughout the range of its host.



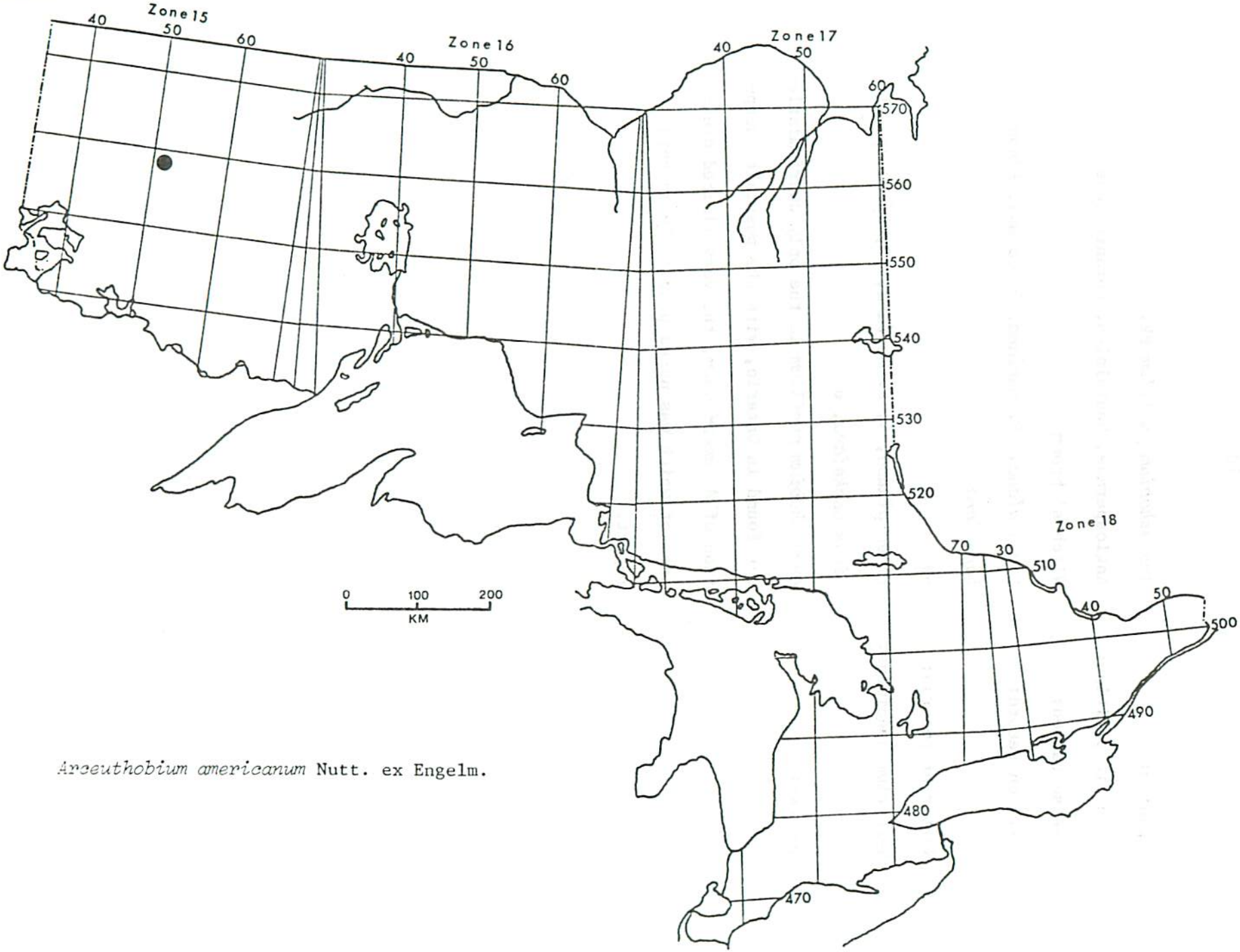
Apiosporina collinsii (Schw.) Hoehn.

Organism:	*Apiosporina morbosa* (Schw.) Arx
	Syn.: *Dibotryon morbosum* (Sch.) Th. & Syd.
Taxonomic position:	Ascomycotina, Pleosporales, Venturiaceae
Disease caused:	Black knot of cherry and plum
Hosts on record:	*Prunus nigra*, *P. pensylvanica*, *P. serotina*, *P. virginiana*, *Prunus* sp.
Number of records:	157
Herbarium specimens:	*Prunus nigra*, 1; *P. pensylvanica*, 7; *P. serotina*, 7; *P. virginiana*, 5; *Prunus* sp., 12
Remarks:	*Apiosporina morbosa* occurs commonly throughout the range of its host.



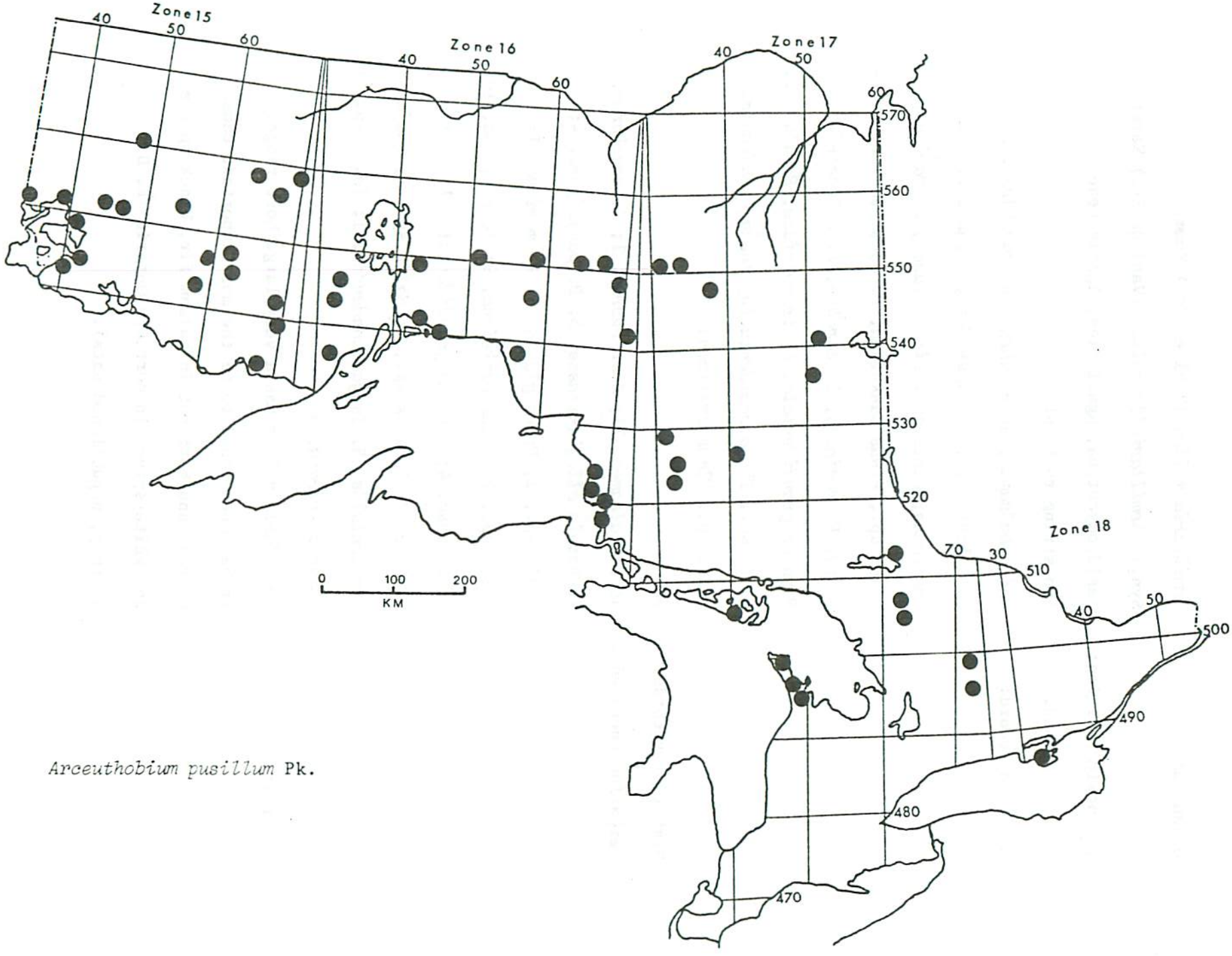
Apiosporina morbosa (Schw.) Arx

Organism:	*Arceuthobium americanum* Nutt. ex Engelm.
Taxonomic position:	Angiospermae, Santalales, Loranthaceae
Disease caused:	Witches' broom
Hosts on record:	*Pinus banksiana*
Number of records:	4
Herbarium specimens:	None
Remarks:	This parasite was found in Ontario in 1969 and was known from only one location in the province. The infected area was destroyed by a forest fire during the summer of 1976 and the organism may have been eliminated from Ontario.



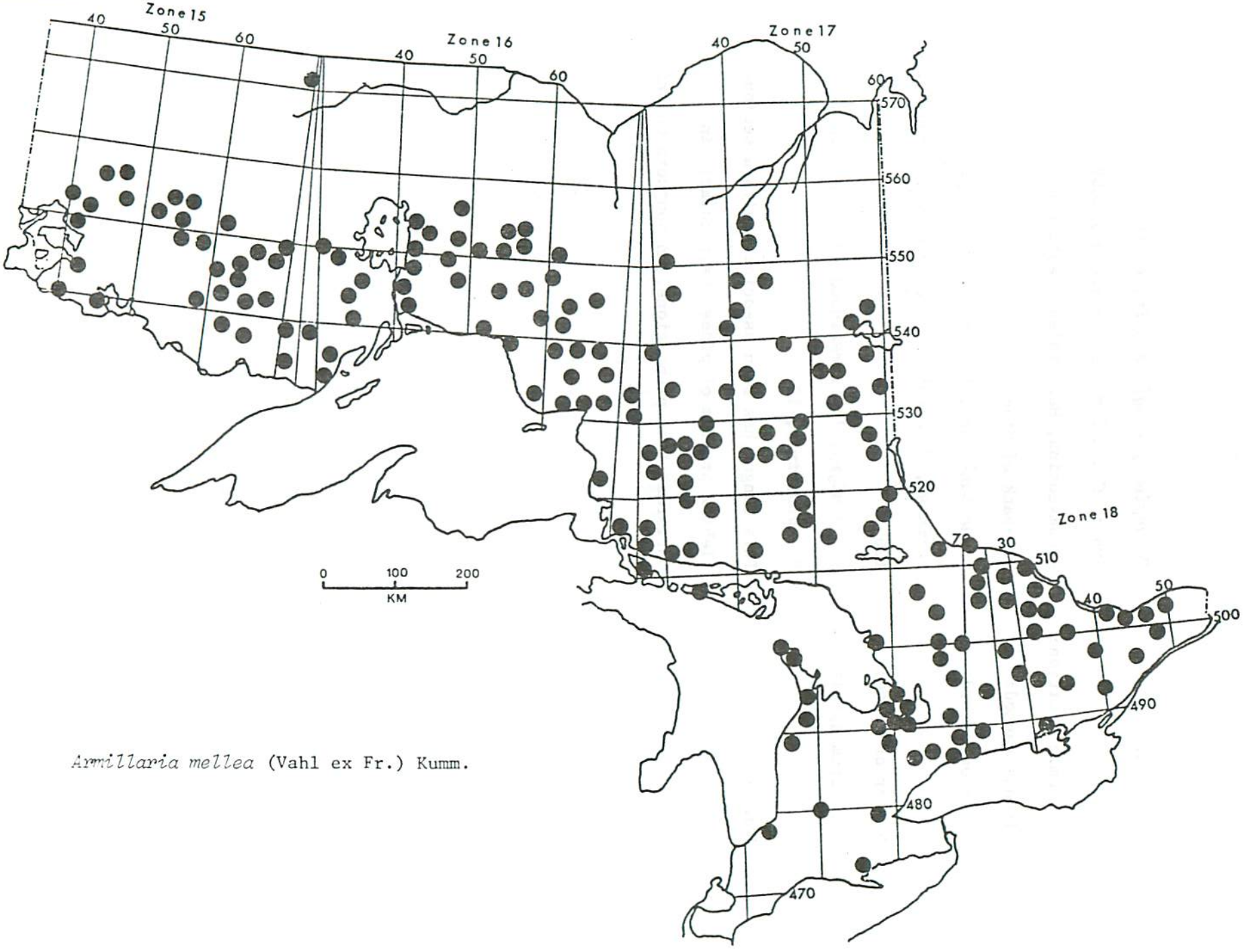
Arceuthobium americanum Nutt. ex Engelm.

Organism:	*Arceuthobium pusillum* Pk.
Taxonomic position:	Angiospermae, Santalales, Loranthaceae
Disease caused:	Witches' broom
Hosts on record:	*Picea glauca, P. mariana, Picea* sp., *Pinus banksiana*
Number of records:	89
Herbarium specimens:	*Picea glauca*, 4; *P. mariana*, 10; *Picea* sp., 1; *Pinus banksiana*, 6
Remarks:	*Arceuthobium pusillum* is the only dwarf mistletoe found in Ontario, with the possible exception of *A. americanum*, the very limited presence of which was noted previously in this report.



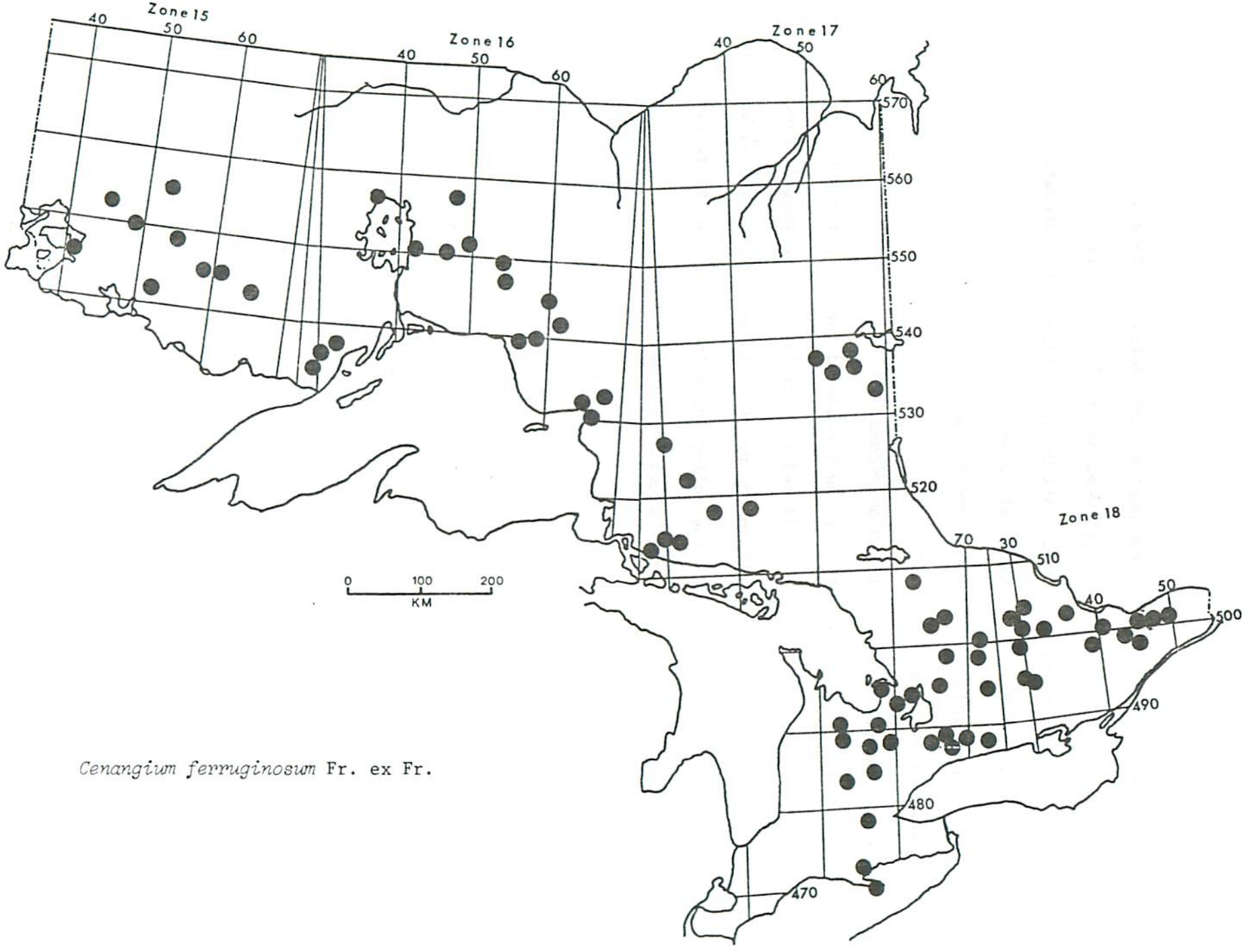
Arceuthobium pusillum Pk.

Organism:	*Armillaria mellea* (Vahl ex Fr.) Kumm.
	Syn.: *Armillariella mellea* (Vahl ex Fr.) Karst.
Taxonomic position:	Basidiomycotina, Agaricales, Agaricaceae
Disease caused:	Shoestring root rot
Hosts on record:	*Abies balsamea, Acer rubrum, A. saccharum, Betula alleghaniensis, B. papyrifera, Fagus* sp., *Fraxinus americana, Larix* sp., *Picea glauca, P. mariana, Picea* sp., *Pinus banksiana, P. contorta* var. *latifolia, P. resinosa, P. strobus, P. sylvestris, Populus grandidentata, P. tremuloides, Populus* sp., *Salix* sp., *Thuja occidentalis, Tsuga canadensis, Tsuga* sp., *Ulmus americana*
Number of records:	566
Herbarium specimens:	*Abies balsamea*, 11; *Acer rubrum*, 1; *A. saccharum*, 7; *Betula alleghaniensis*, 5; *B. papyrifera*, 4; *Larix* sp., 1; *Picea glauca*, 4; *P. mariana*, 1; *Picea* sp., 2; *Pinus banksiana*, 9; *P. resinosa*, 10; *P. strobus*, 4; *Populus grandidentata*, 1; *P. tremuloides*, 2; *Populus* sp., 1; *Salix* sp., 1; *Thuja occidentalis*, 5; *Tsuga canadensis*, 1; *Tsuga* sp., 1; *Ulmus americana*, 3
Remarks:	*Armillaria mellea* has a very large host range. It has been found to be the most important cause of root and butt rot in balsam fir, black spruce and white spruce in northern Ontario (R. D. Whitney, unpublished data).



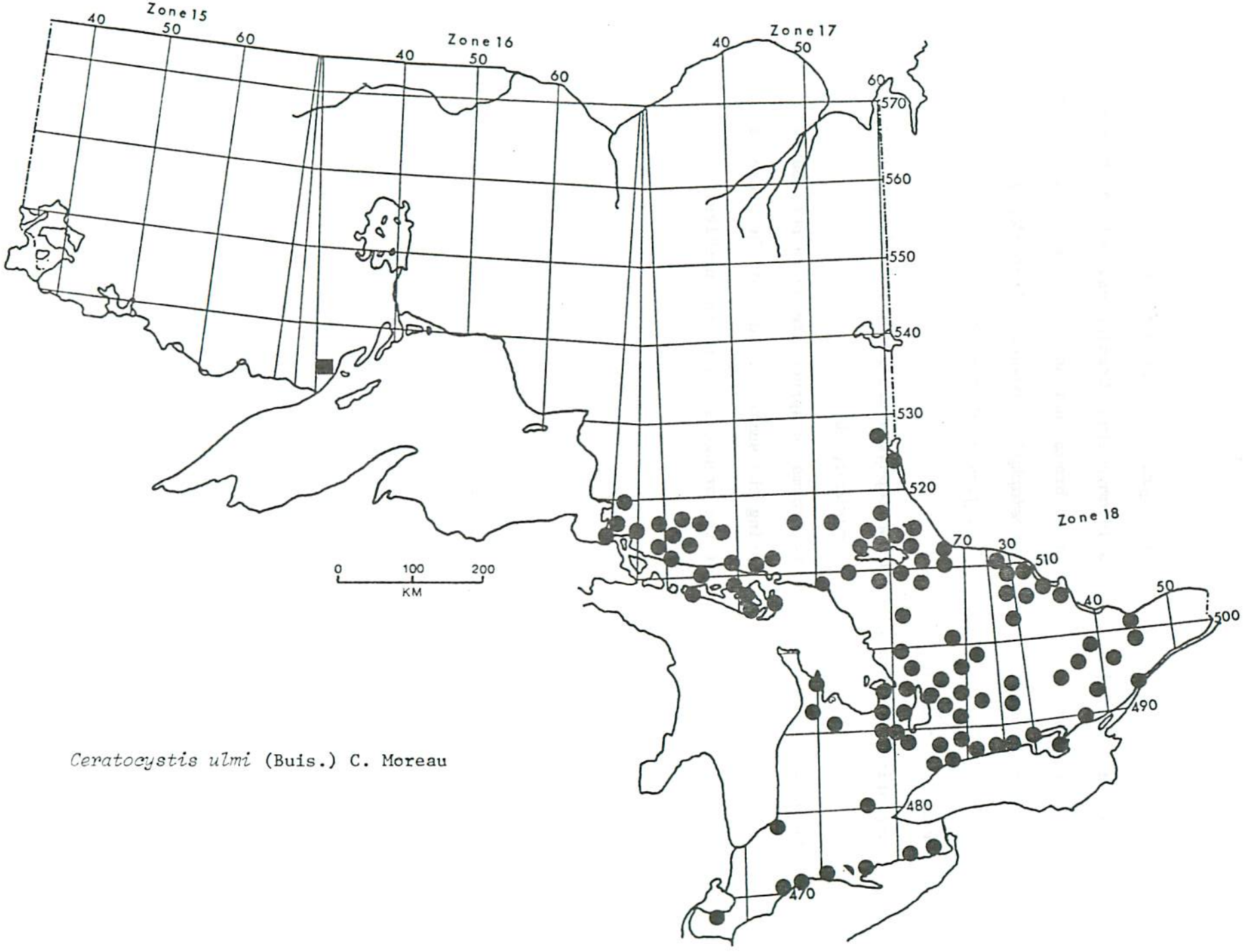
Armillaria mellea (Vahl ex Fr.) Kumm.

Organism:	*Cenangium ferruginosum* Fr. ex Fr.
	Syn.: *Cenangium abietis* (Pers.) Duby
Taxonomic position:	Ascomycotina, Helotiales, Leotiaceae
Disease caused:	Die-back of pine
Hosts on record:	*Pinus banksiana, P. contorta, P. nigra, P. resinosa, P. strobus, P. sylvestris, Pinus* sp.
Number of hosts:	126
Herbarium specimens:	*Pinus nigra*, 1; *P. resinosa*, 2; *P. strobus*, 1; *P. sylvestris*, 12
Remarks:	This fungus has been associated with a serious dieback problem of pines, particularly in Christmas tree plantations, in southern Ontario.



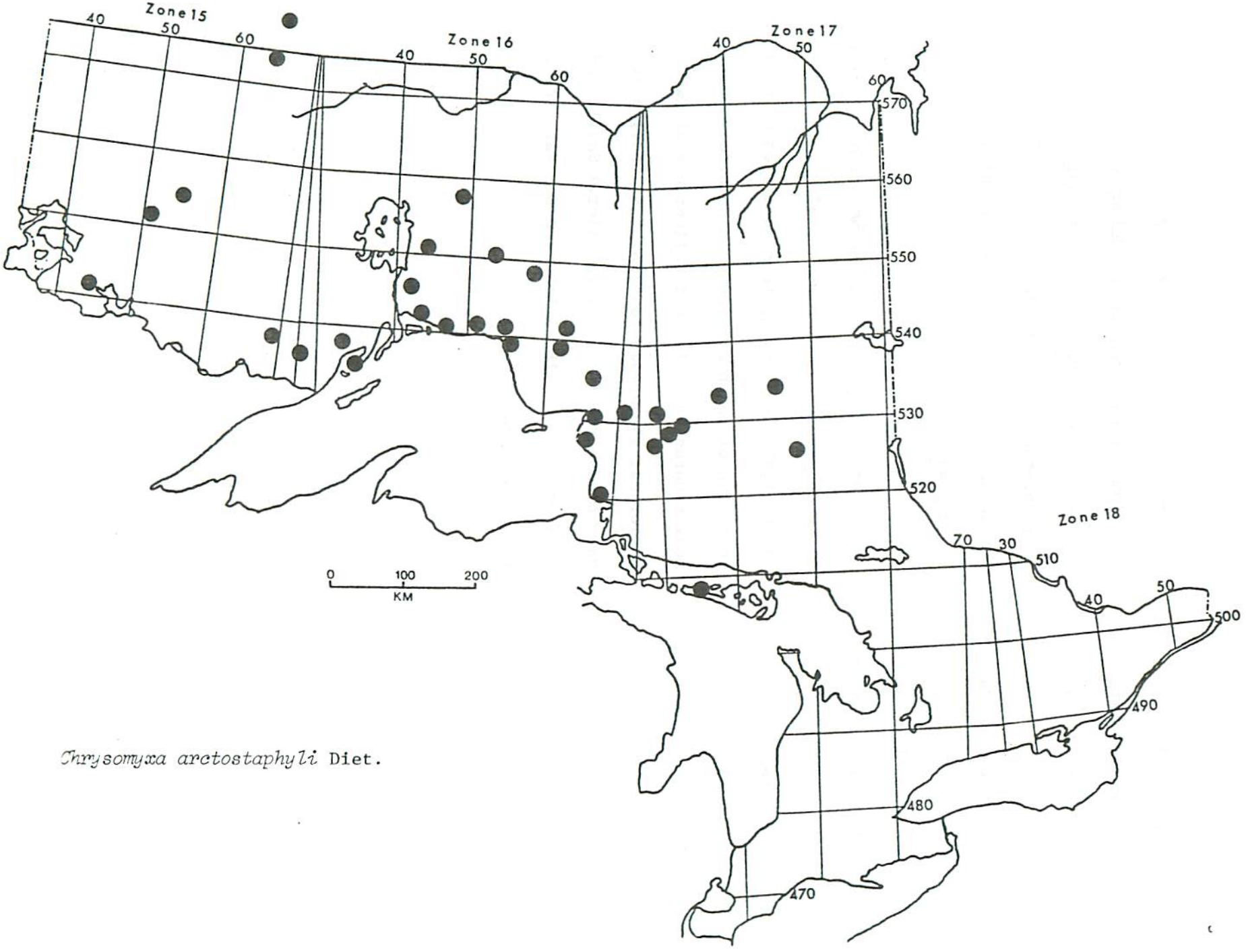
Cenangium ferruginosum Fr. ex Fr.

Organism:	*Ceratocystis ulmi* (Buis.) C. Moreau
	Syn.: *Ceratostomella ulmi* Buis.
Taxonomic position:	Ascomycotina, Sphaeriales, Ophiostomataceae
Disease caused:	Dutch elm disease
Hosts on record:	*Ulmus americana, U. thomasii, Ulmus* sp.
Number of records:	210
Herbarium specimens:	*Ulmus americana*, 17
Remarks:	This is an introduced fungus that has become established in Ontario. Its geographic range within the province is expanding. The square on the collection point map (Zone 16) represents a collection made in 1976.



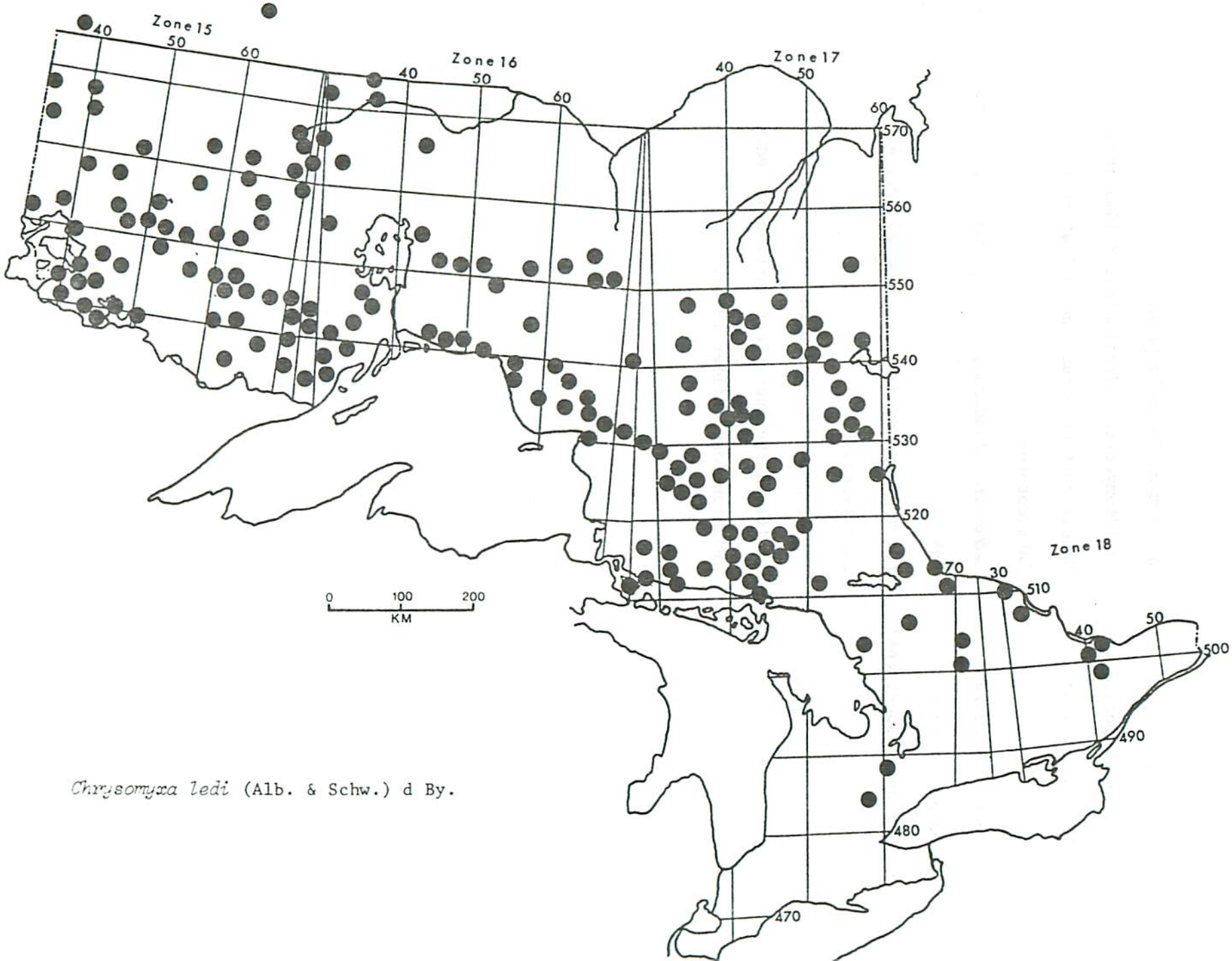
Ceratocystis ulmi (Buis.) C. Moreau

Organism:	*Chrysomyxa arctostaphyli* Diet.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Spruce broom rust and leaf rust of bearberry
Hosts on record:	*Arctostaphylos uva-ursi*, *Arctostaphylos* sp., *Picea glauca*, *P. mariana*
Number of records:	42
Herbarium specimens:	*Arctostaphylos uva-ursi*, 3; *Picea glauca*, 2; *P. mariana*, 16
Remarks:	The brooms on spruce are quite noticeable during the summer because of the presence of the orange aecia on the needles.



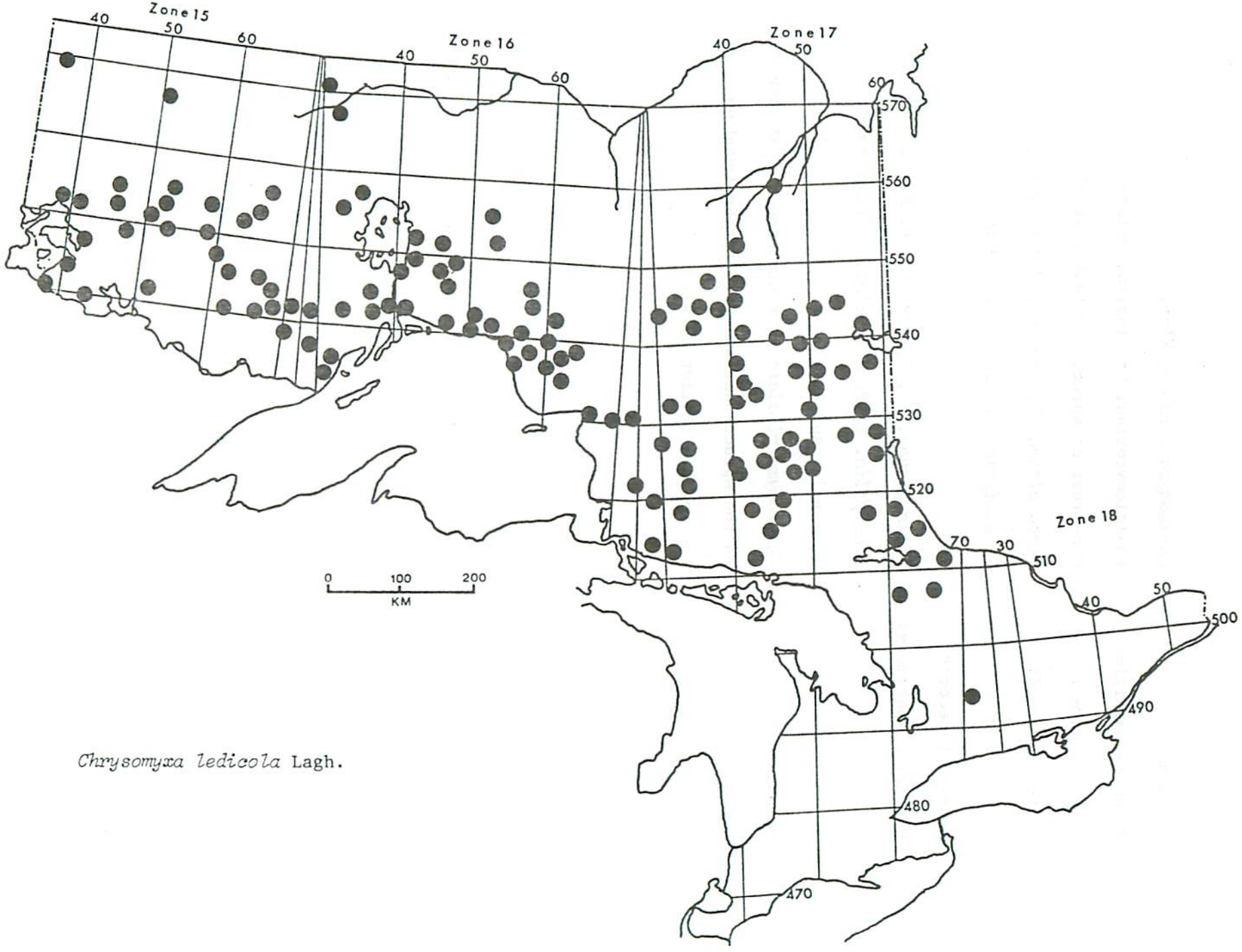
Chrysomyxa arctostaphyli Diet.

Organism:	*Chrysomyxa ledi* (Alb. & Schw.) d By.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Needle rust of spruce and a leaf rust of labrador-tea and leatherleaf
Hosts on record:	*Chamaedaphne calyculata, Ledum groenlandicum, Picea glauca, P. mariana*
Number of records:	366
Herbarium specimens:	*Chamaedaphne calyculata*, 2; *Ledum groenlandicum*, 4; *Picea glauca*, 1; *P. mariana*, 32
Remarks:	Ziller (1974) recognizes four varieties of this rust, two of which are found in Ontario. Our host records indicate that collections of two varieties, *Chrysomyxa ledi* (Alb. & Schw.) d By. var. *cassandrae* (Pk. & G. W. Clint.) Savile and *Chrysomyxa ledi* (Alb. & Schw.) d By. var. *ledi*, have been made.



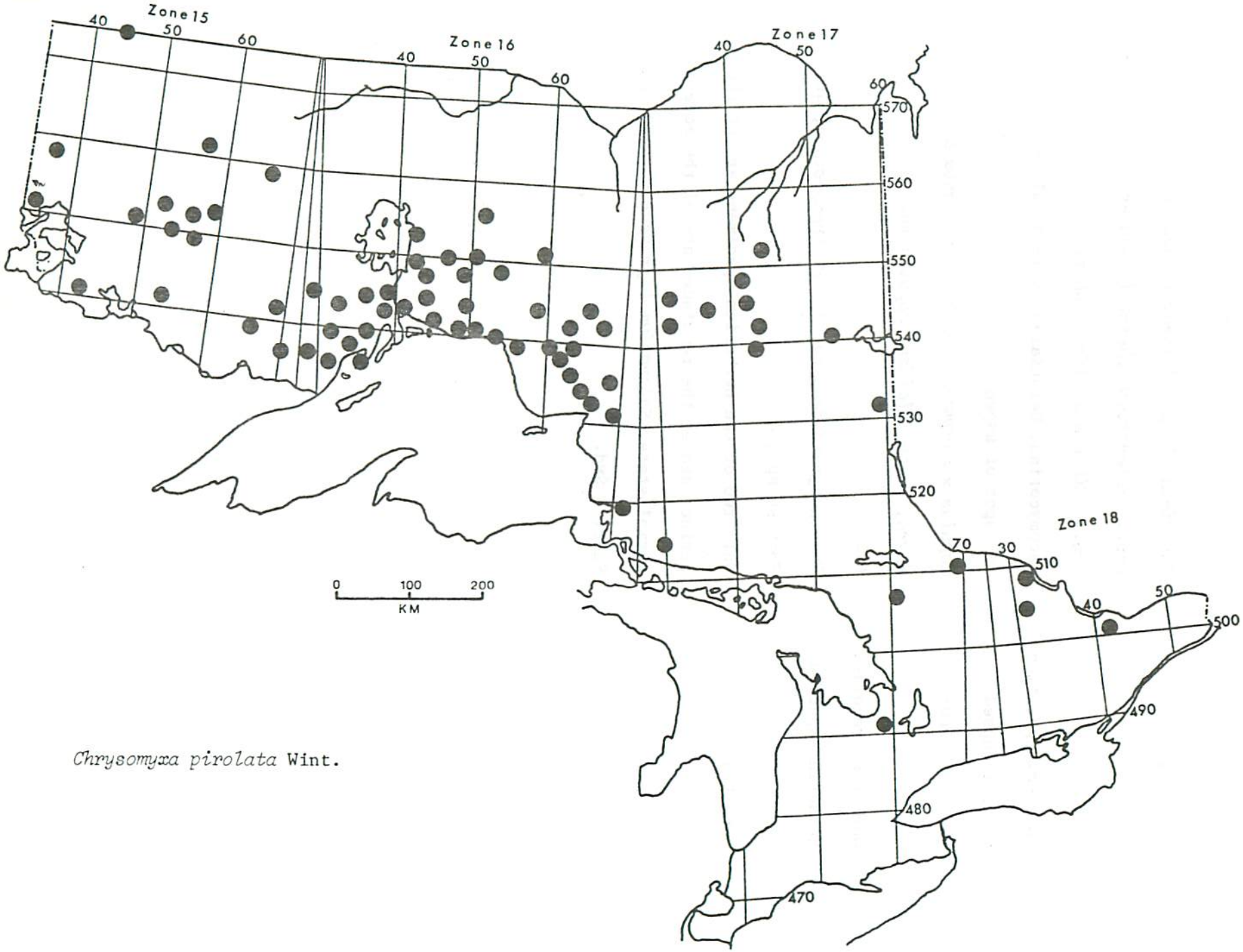
Chrysomyxa ledi (Alb. & Schw.) d By.

Organism:	*Chrysomyxa ledicola* Lagh.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Needle rust of spruce and a leaf rust of labrador-tea
Hosts on record:	*Ledum groenlandicum*, *Picea glauca*, *P. mariana*
Number of records:	284
Herbarium specimens:	*Ledum groenlandicum*, 7; *Picea glauca*, 4; *P. mariana*, 8
Remarks:	*Chrysomyxa ledicola* is the only rust that fruits on the upper leaf surface of *Ledum groenlandicum* (Ziller 1974).



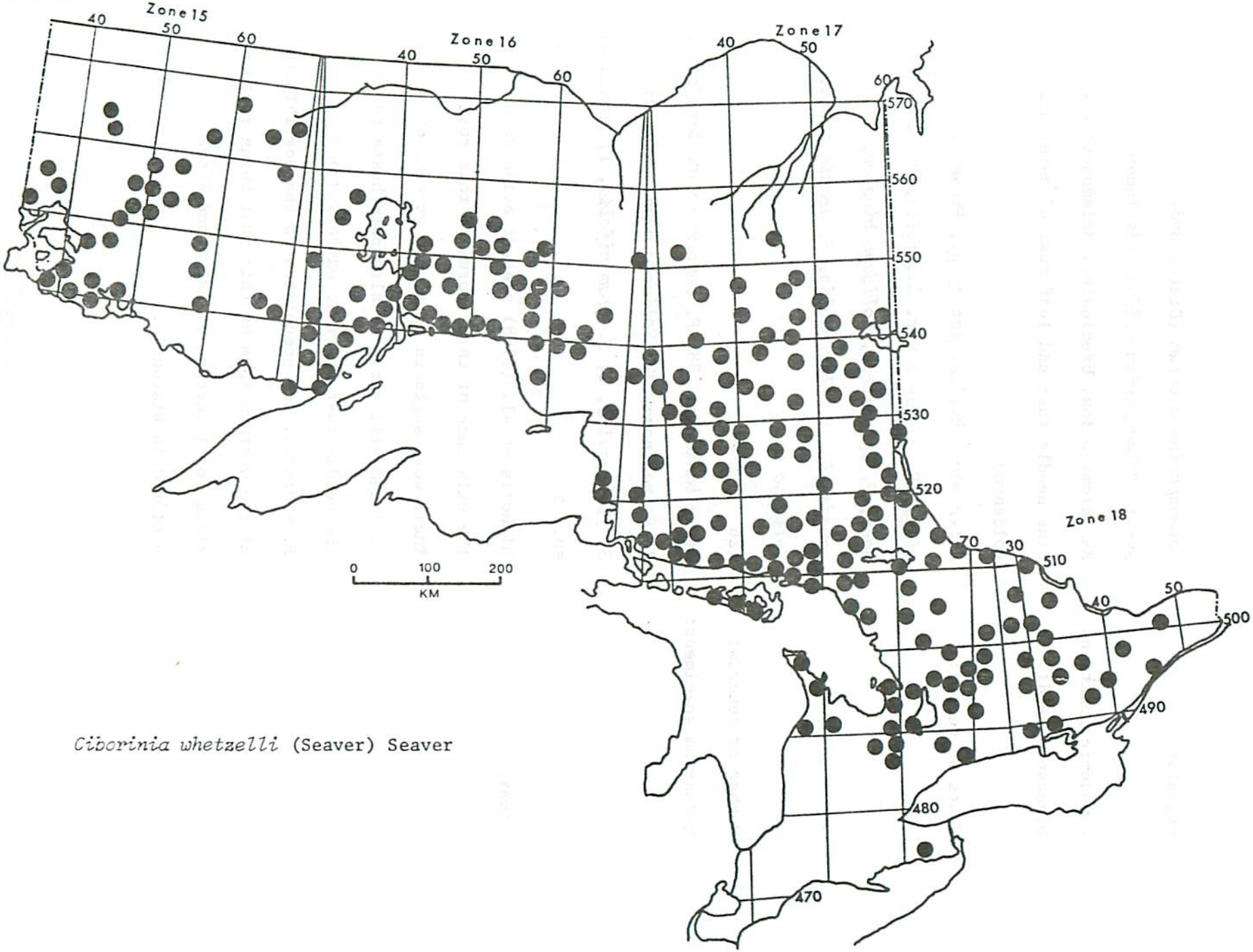
Chrysomyxa ledicola Lagh.

Organism:	*Chrysomyxa pirolata* Wint.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Cone rust of spruce and leaf rust of pyrola
Hosts on record:	*Picea glauca, P. mariana, Pyrola asarifolia, P. elliptica, P. secunda, Pyrola* sp.
Number of records:	105
Herbarium specimens:	*Picea glauca*, 27; *P. mariana*, 6; *Pyrola asarifolia*, 1; *P. elliptica*, 2; *P. secunda*, 1; *Pyrola* sp. 2
Remarks:	*Chrysomyxa pirolata* is restricted to the cones on the spruce host and will not be found on the foliage (Ziller 1974).



Chrysomyxa pirolata Wint.

Organism:	*Ciborinia whetzelii* (Seaver) Seaver
	Syn.: *Sclerotinia whetzelii* Seaver
	Syn.: *Ciborinia bifrons* Whet.
Taxonomic position:	Ascomycotina, Helotiales, Sclerotiniaceae
Disease caused:	Ink spot of aspen
Hosts on record:	*Populus* x *euramericana*, *P. grandidentata*, *P. nigra*, *P. tremuloides*, *Populus* sp.
Number of records:	664
Herbarium specimens:	*Populus grandidentata*, 2; *P. tremuloides*, 40; *Populus* sp., 4
Remarks:	Only two of the herbarium specimens are of the perfect state; the remainder are of the sclerotial state, *Sclerotium bifrons* Ell. & Ev. ex Sacc. & Syd.



Ciborinia whetzelli (Seaver) Seaver

Organism: *Coleosporium asterum* (Diet.) Syd.

Syn.: *Coleosporium solidaginis* Thuem.

Taxonomic position: Basidiomycotina, Uredinales, Melampsoraceae

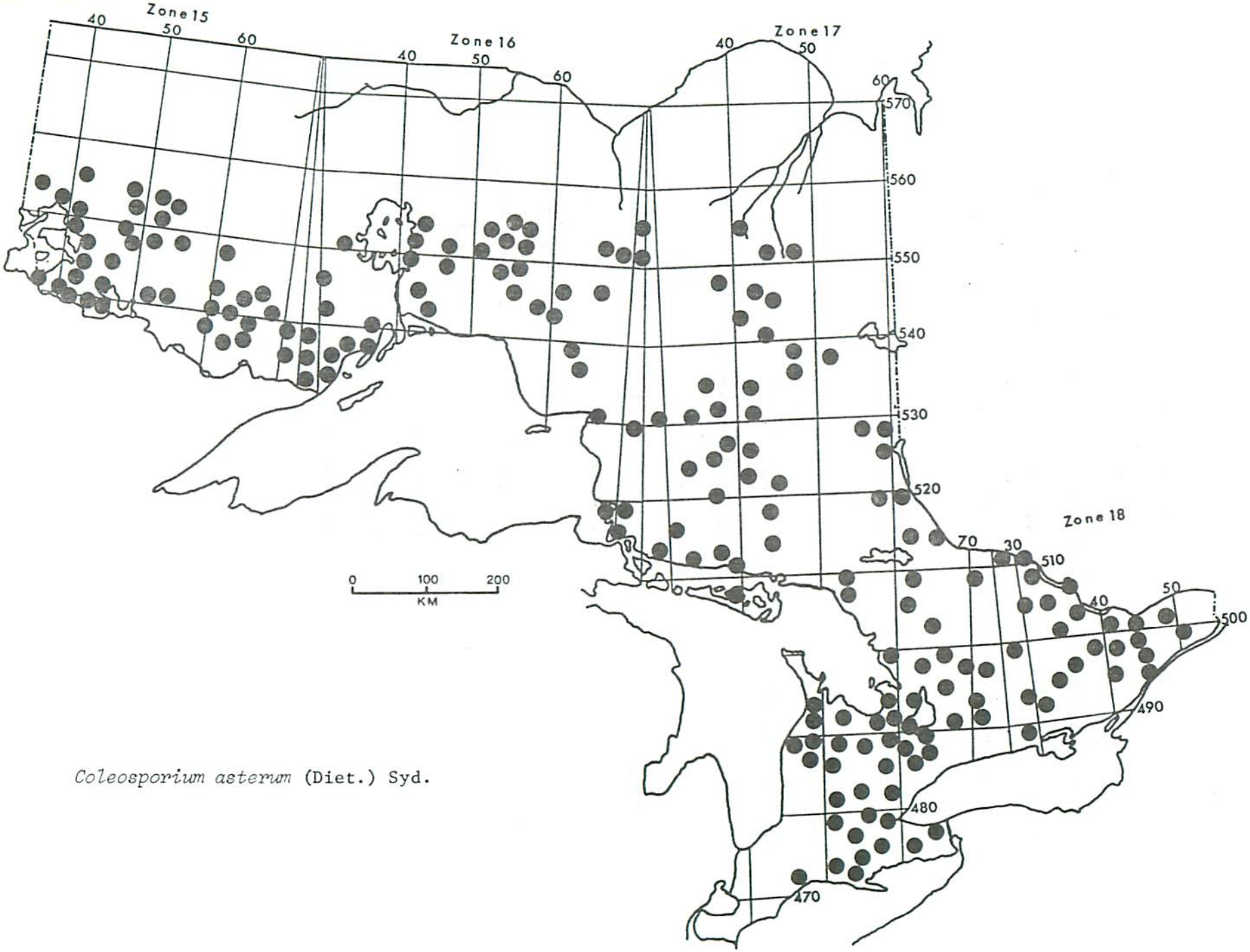
Disease caused: Pine needle rust and leaf rust of aster and goldenrod

Hosts on record: *Aster macrophyllus, Aster* sp., *Pinus banksiana, P. contorta* var. *latifolia, P. resinosa, P. sylvestris, Solidago bicolor, S. canadensis, S. flexicaulis, S. graminifolia, Solidago* sp.

Number of records: 426

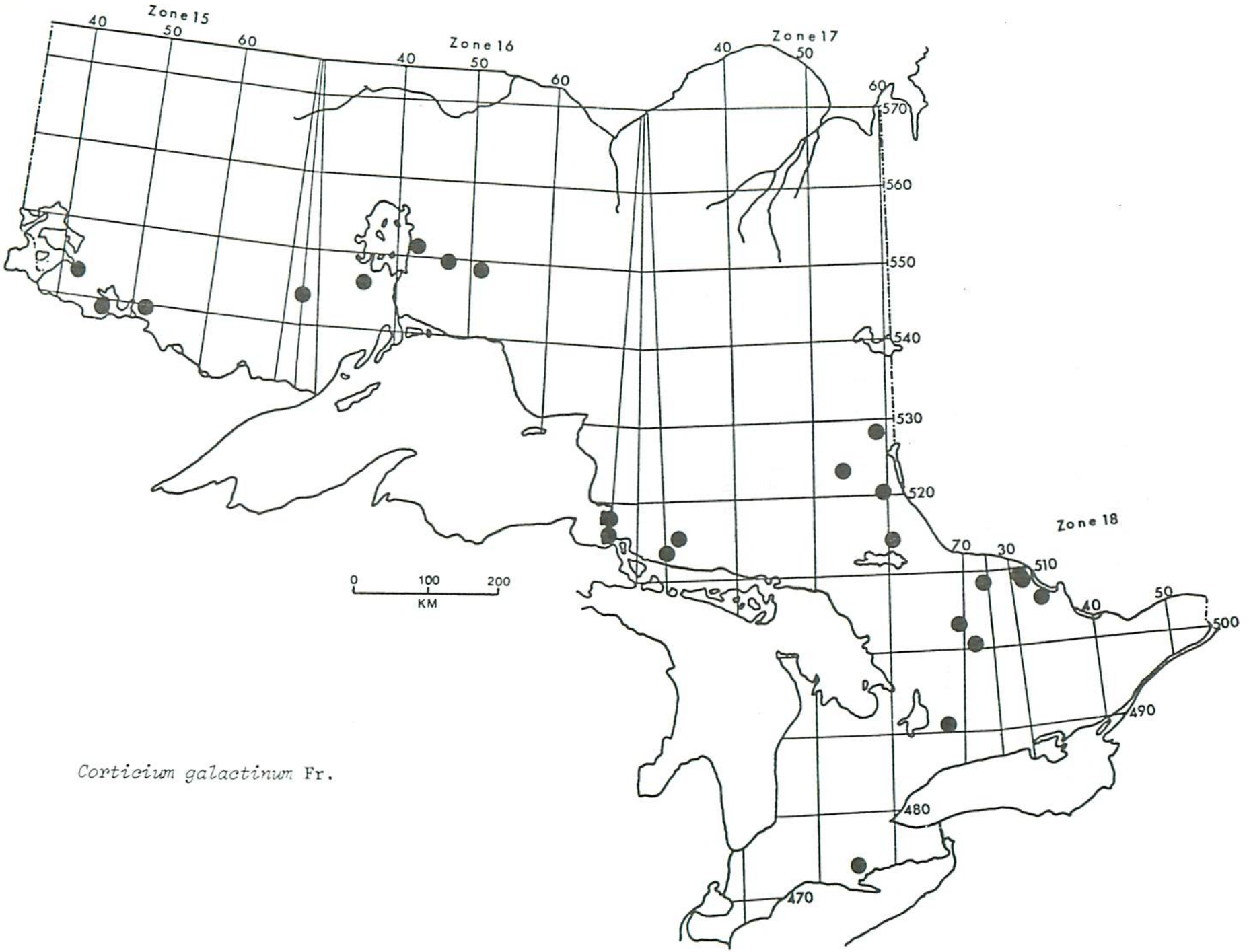
Herbarium specimens: *Pinus banksiana*, 38; *P. contorta* var. *latifolia*, 2; *P. resinosa*, 32; *Solidago canadensis*, 2; *S. flexicaulis*, 1; *S. graminifolia*, 1; *Solidago* sp., 5

Remarks: Nicholls et al. (1968) present evidence of the existence of three forms of this rust. Their work suggests that only species of *Solidago* will serve as alternate hosts for the needle rust on *Pinus banksiana* and *P. resinosa*, and speculates on the possibility of the western form of this rust being responsible for infection on *Aster* and *Pinus contorta* in Wisconsin.



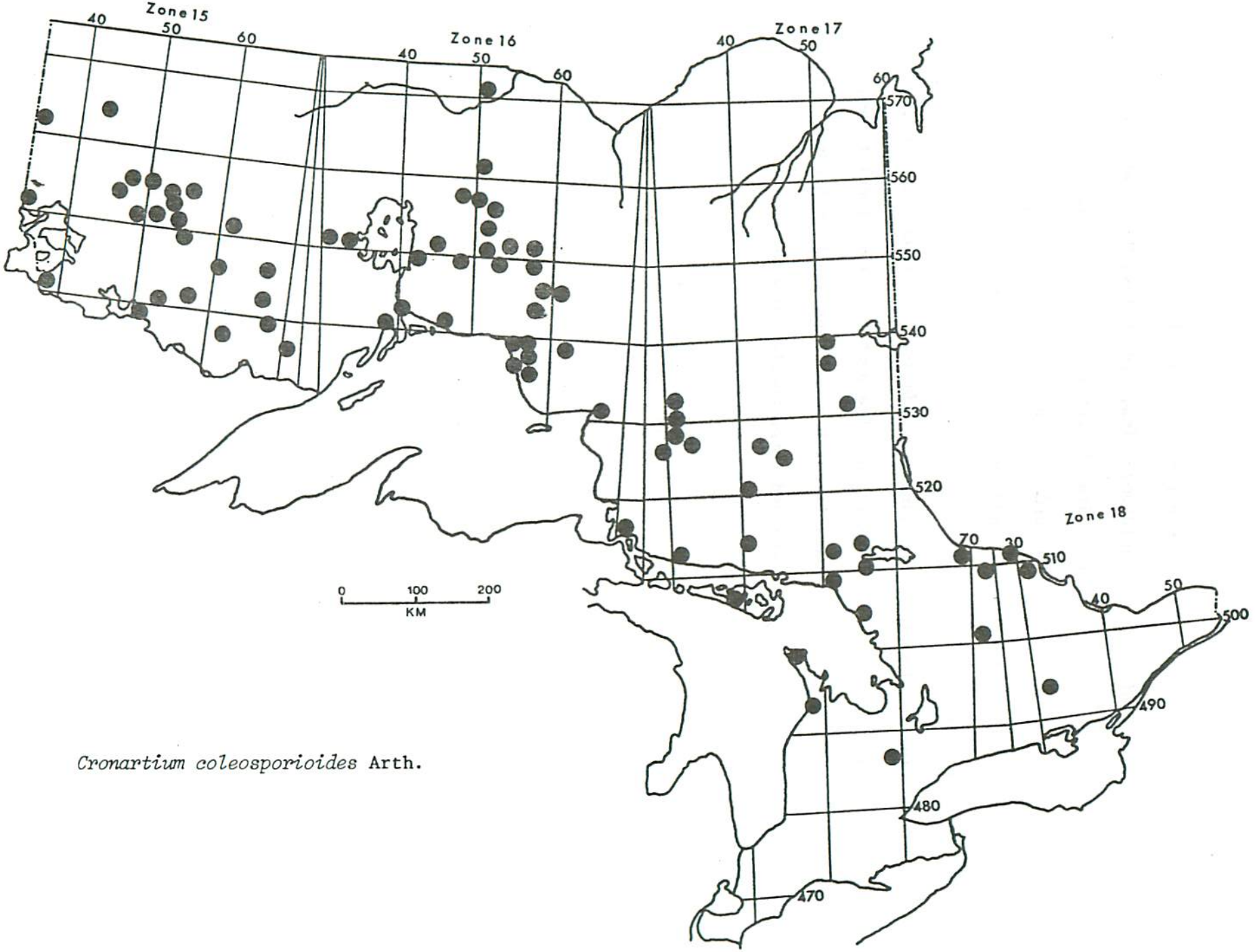
Coleosporium asterum (Diet.) Syd.

Organism:	*Corticium galactinum* Fr.
	Syn.: *Scytinostroma galactinum* (Fr.) Donk
Taxonomic position:	Basidiomycotina, Aphyllophorales, Corticiaceae
Disease caused:	Root and butt rot of conifers and hardwoods
Hosts on record:	*Abies balsamea, Acer saccharum, Picea glauca, P. mariana, P. rubens, Pinus banksiana, P. resinosa, P. strobus, Quercus alba, Thuja occidentalis*
Number of records:	24
Herbarium specimens:	*Abies balsamea*, 1; *Acer saccharum*, 1; *Picea glauca*, 2; *P. mariana*, 2; *Pinus resinosa*, 2; *P. strobus*, 3; *Thuja occidentalis*, 1
Remarks:	*Corticium galactinum* is a common cause of root and butt rot in conifers and hardwoods. In Ontario, *C. galactinum* is an important cause of decay in black spruce, white spruce, white pine, balsam fir, and yellow birch (Basham and Morawski 1964). It is generally present in mature and overmature stands of its host species throughout the province.



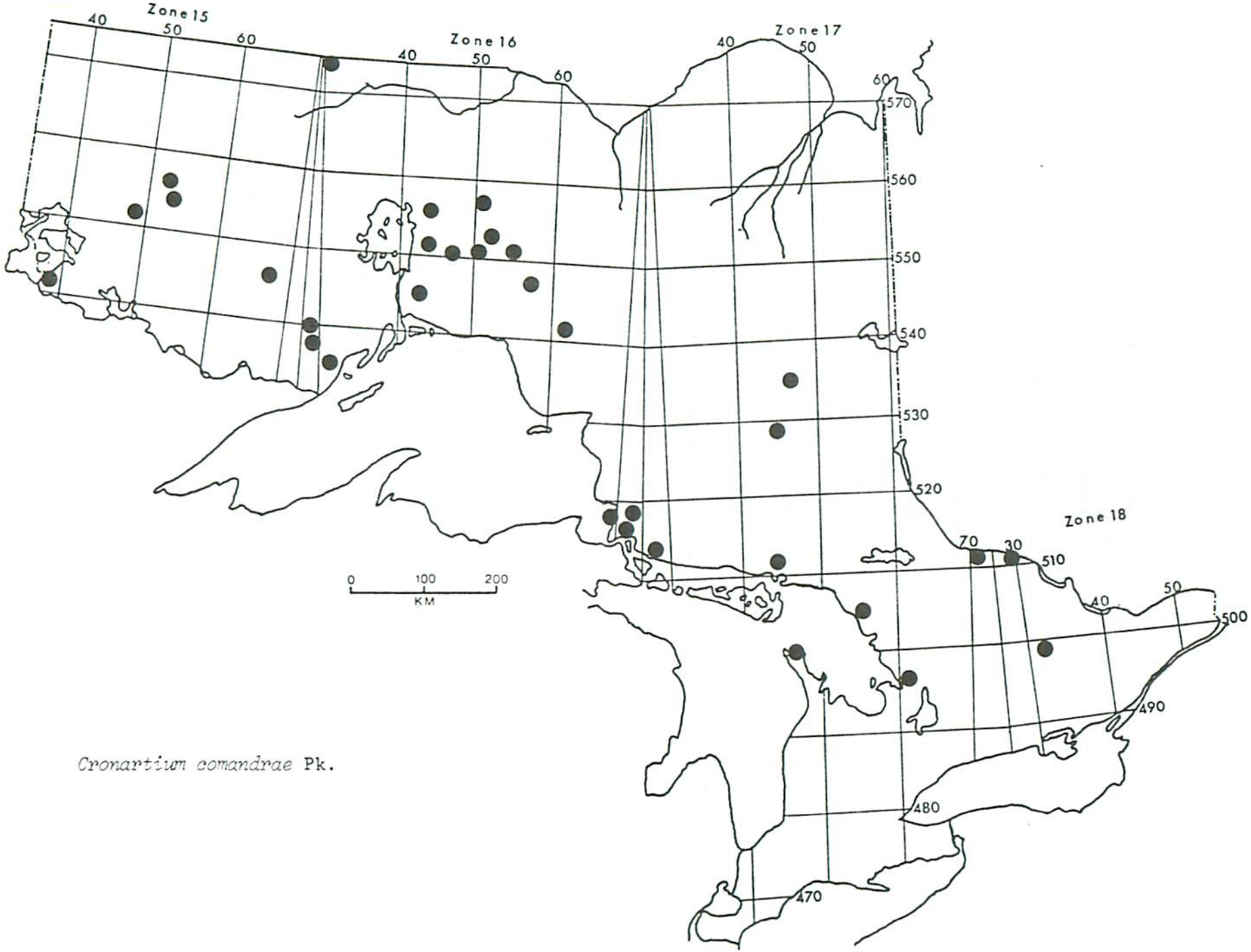
Corticium galactinum Fr.

Organism:	*Cronartium coleosporioides* Arth.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Stalactiform rust canker
Hosts on record:	*Castilleja coccinea*, *Melampyrum lineare*, *Pinus banksiana*
Number of records:	42
Herbarium specimens:	*Castilleja coccinea*, 1; *Melampyrum lineare*, 1; *Pinus banksiana*, 21
Remarks:	*Cronartium coleosporioides* causes large stalactiform cankers on the stems of two- and three-needled pines. The rust also infects branches, on which it produces fusiform galls. Because this rust was first detected in Ontario in 1970, data for the disease include records from 1970 to 1976.



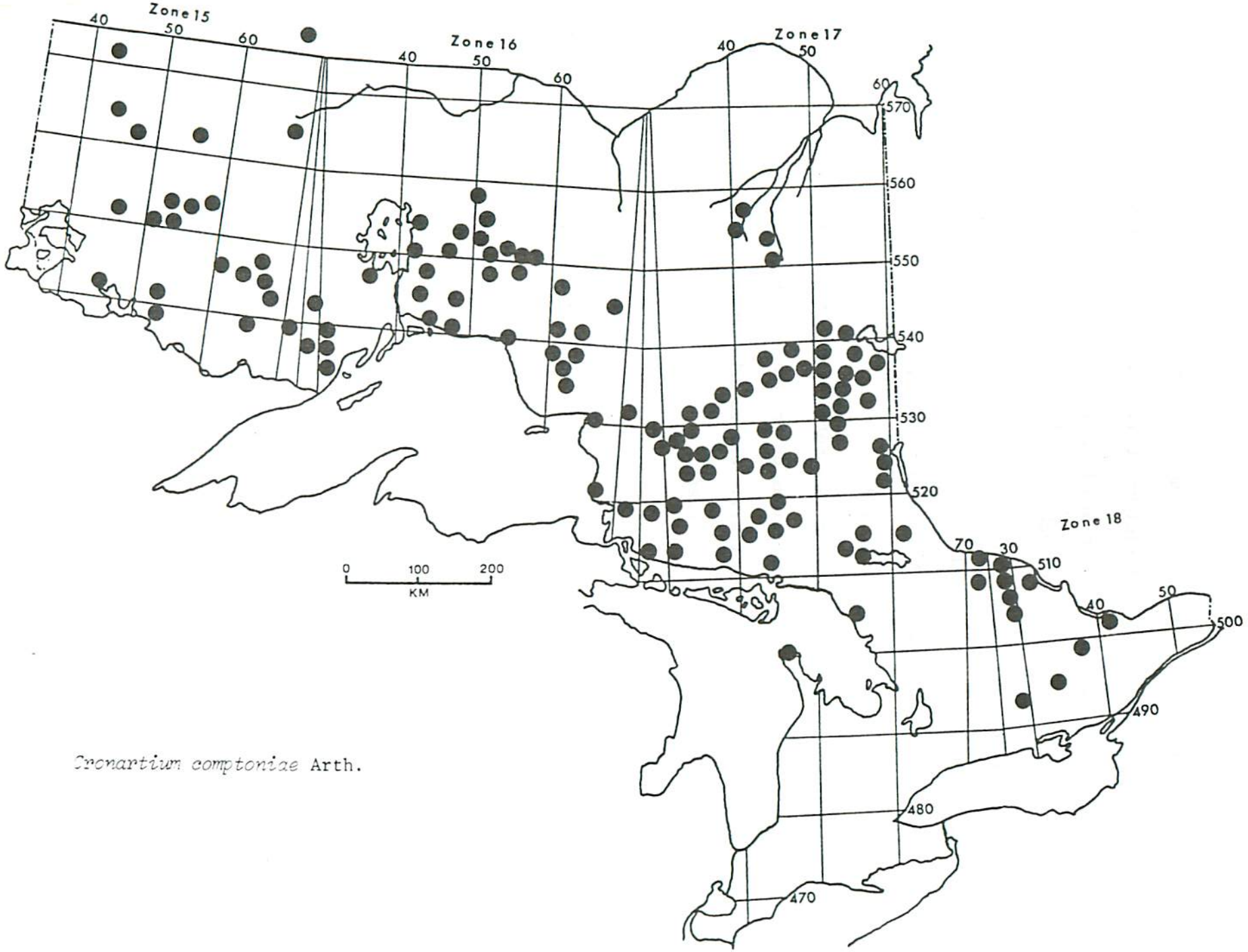
Cronartium coleosporioides Arth.

Organism:	*Cronartium comandrae* Pk.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Comandra blister rust and leaf rust of bastard-toadflax
Hosts on record:	*Comandra richardsiana*, *Pinus banksiana*
Number of records:	58
Herbarium specimens:	*Comandra richardsiana*, 9; *Pinus banksiana*, 20
Remarks:	This is one of a number of rust fungi found in Ontario which cause stem and branch cankers of two- and three-needled pines.



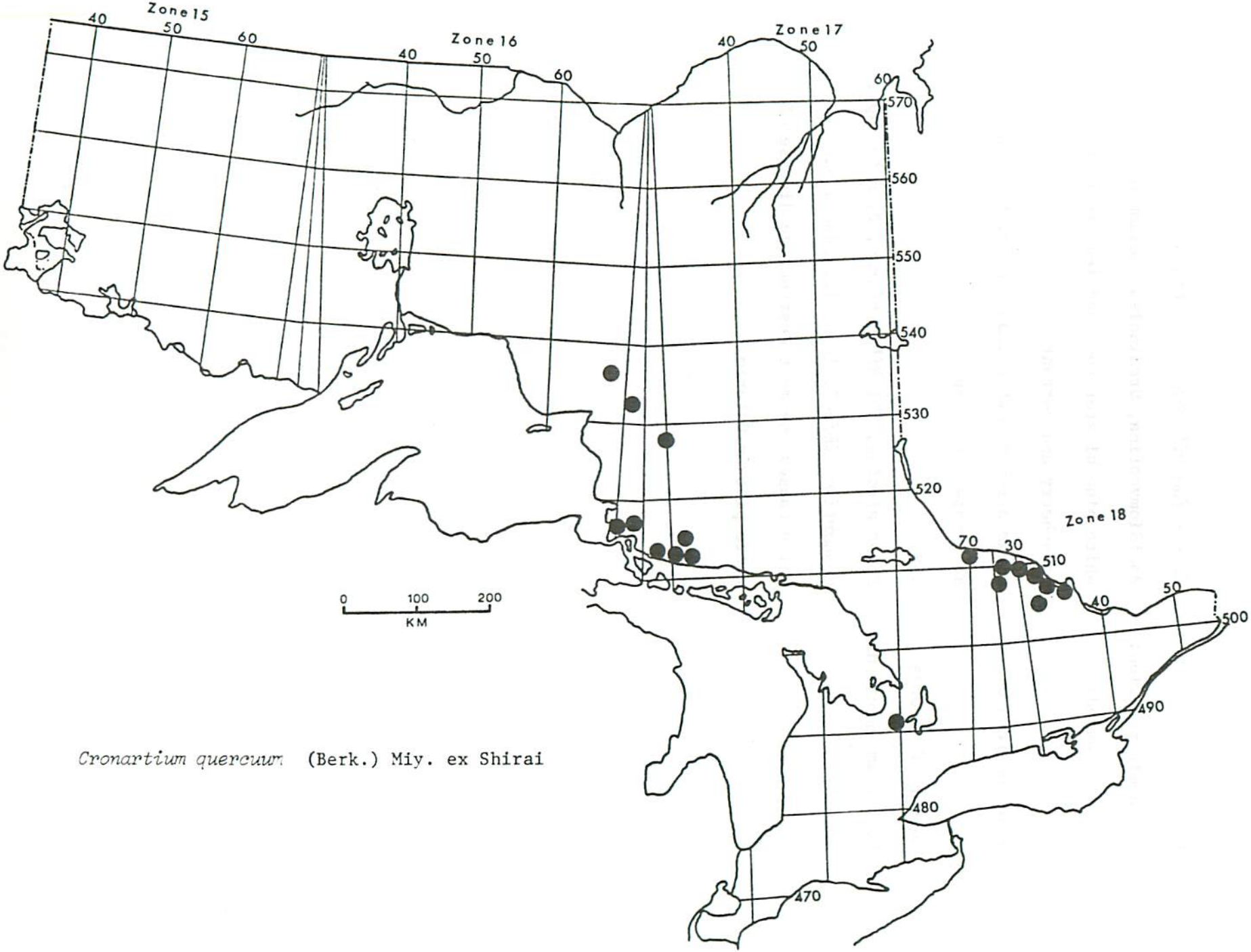
Cronartium comandrae Pk.

Organism:	*Cronartium comptoniae* Arth.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Sweet-fern blister rust and leaf rust of sweet-fern and sweet gale
Hosts on record:	*Comptonia peregrina*, *Myrica gale*, *Pinus banksiana*, *P. contorta* var. *latifolia*, *P. sylvestris*
Number of records:	268
Herbarium specimens:	*Comptonia peregrina*, 6; *Myrica gale*, 6; *Pinus banksiana*, 56; *P. sylvestris*, 3
Remarks:	This fungus causes basal stem cankers and serious seedling losses of two- and three-needled pines.



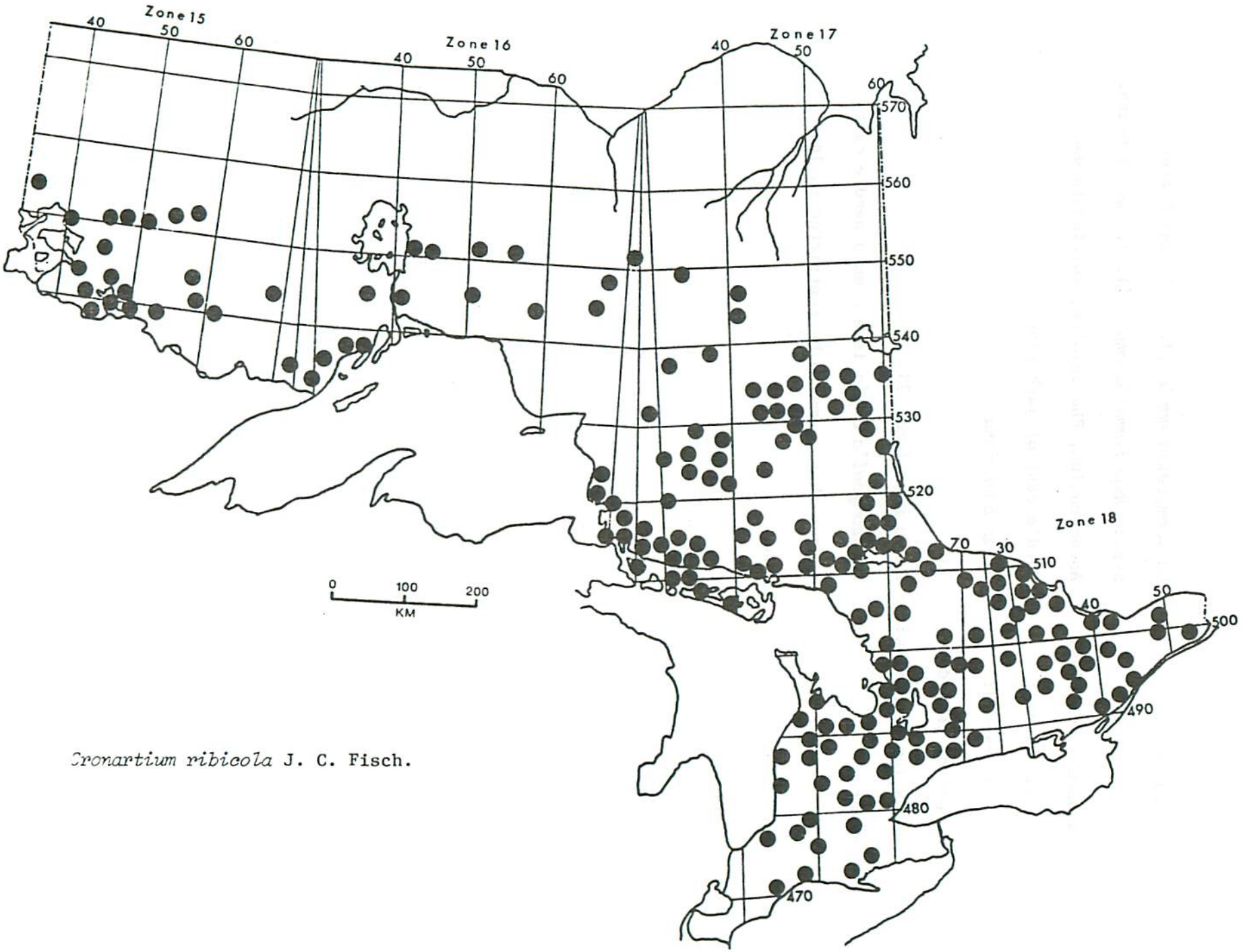
Cronartium comptoniae Arth.

Organism:	*Cronartium quercuum* (Berk.) Miy. ex Shirai
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Stem and branch galls on pine and a leaf rust of oak
Hosts on record:	*Pinus banksiana, P. sylvestris, Quercus rubra*
Number of records:	21
Herbarium specimens:	*Pinus banksiana*, 2; *P. sylvestris*, 2; *Quercus rubra*, 9
Remarks:	Infections noted at the three northernmost locations on the map likely occurred at a nursery. See remarks under *Endocronartium harknessii*.



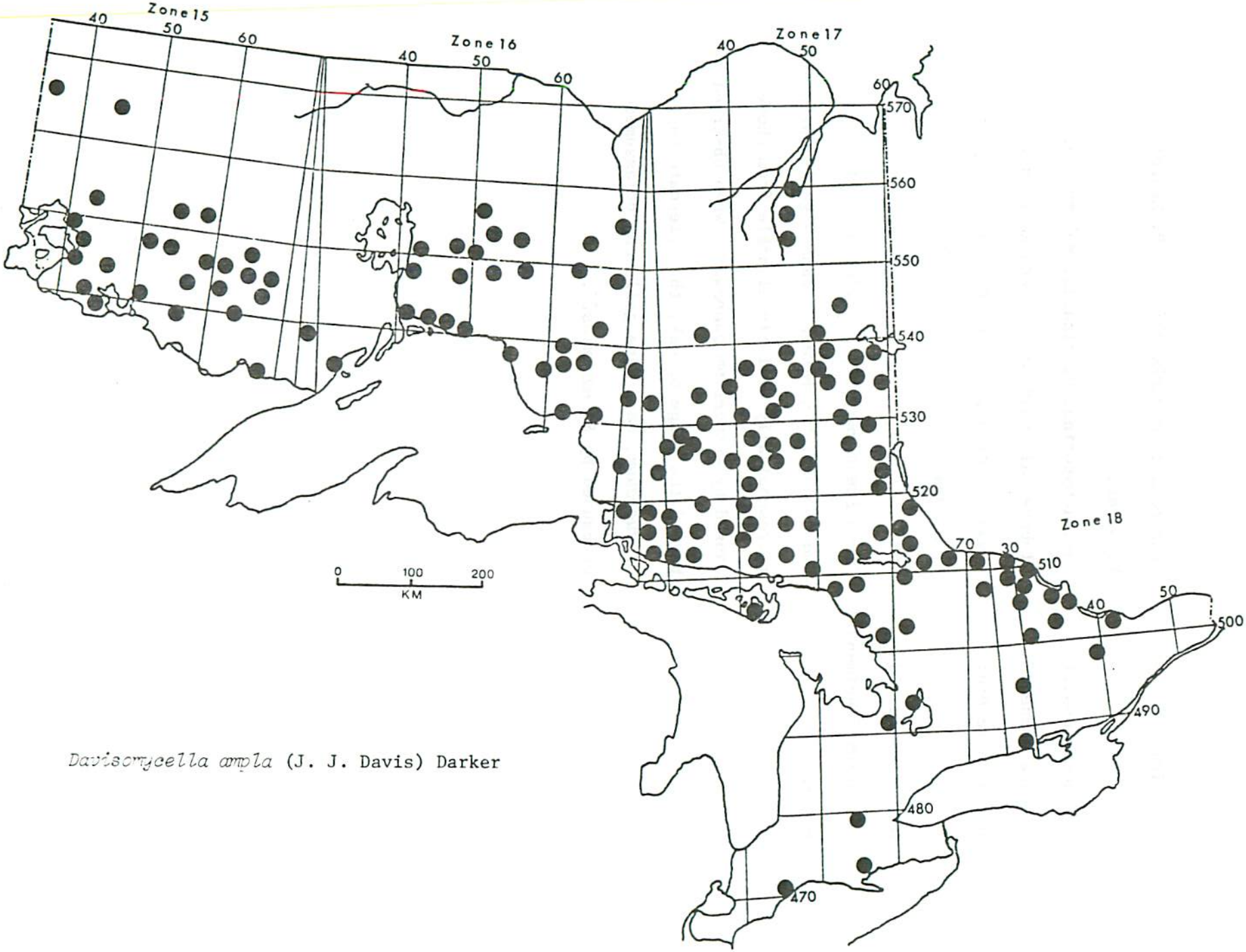
Cronartium quercuum (Berk.) Miy. ex Shirai

Organism:	*Cronartium ribicola* J. C. Fisch.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caus[redacted]	White pine blister rust and leaf rust of gooseberry and currant
Hosts on record:	*Pinus strobus*, *Ribes glandulosum*, *R. nigrum*, *R. triste*, *Ribes* sp.
Number of records:	459
Herbarium specimens:	*Pinus strobus*, 54; *Ribes nigrum*, 2; *Ribes* sp., 11
Remarks:	*Cronartium ribicola* is an introduced pathogen which causes the most destructive disease of white pine in Ontario.



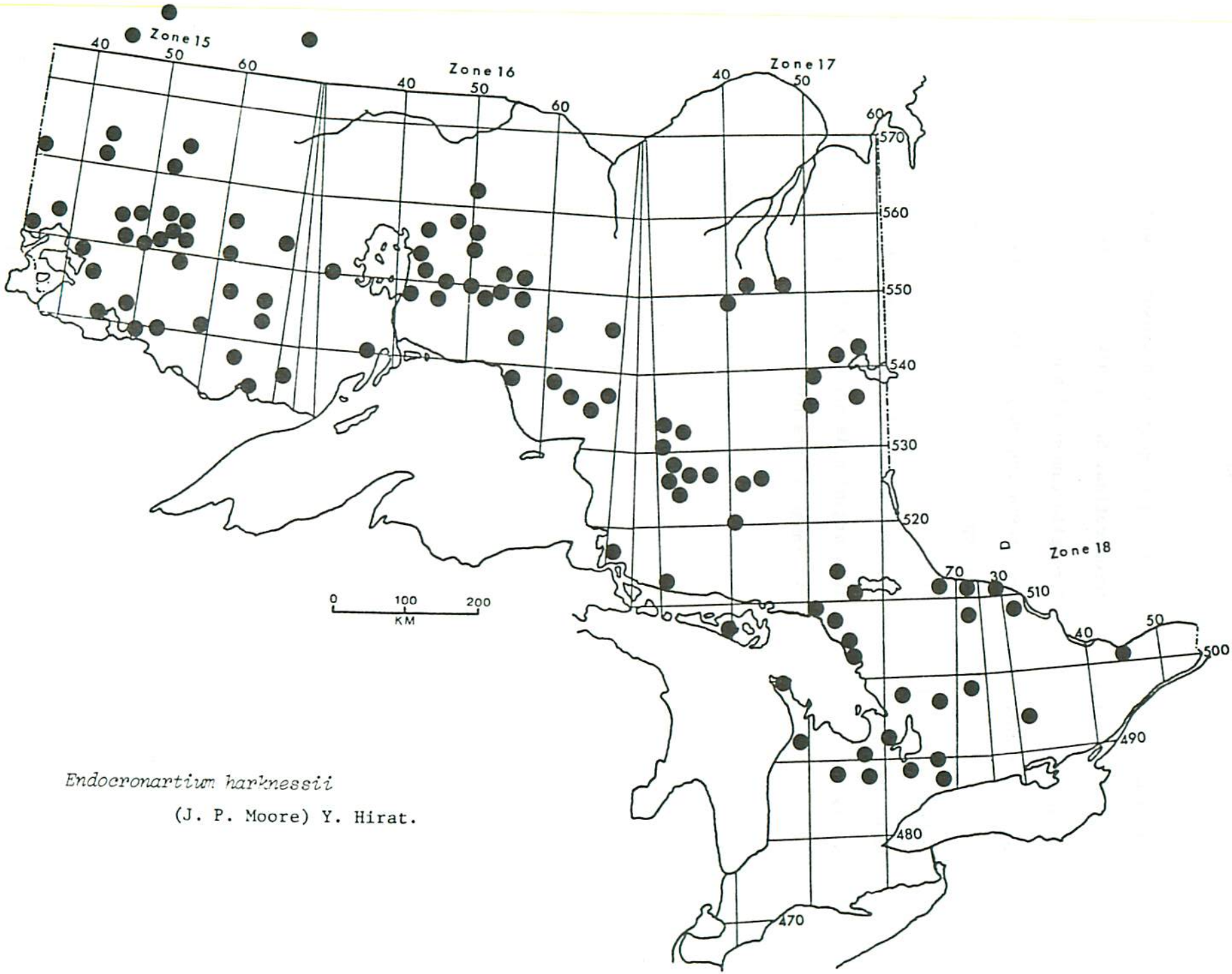
Cronartium ribicola J. C. Fisch.

Organism:	*Davisomycella ampla* (J. J. Davis) Darker
	Syn.: *Hypodermella ampla* (J. J. Davis) Dearn.
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Needle cast of jack pine
Host on record:	*Pinus banksiana*
Number of records:	332
Herbarium specimens:	*Pinus banksiana*, 33
Remarks:	*Davisomycella ampla* is a common needle cast fungus that seems to be restricted to jack pine.



Davisomycella ampla (J. J. Davis) Darker

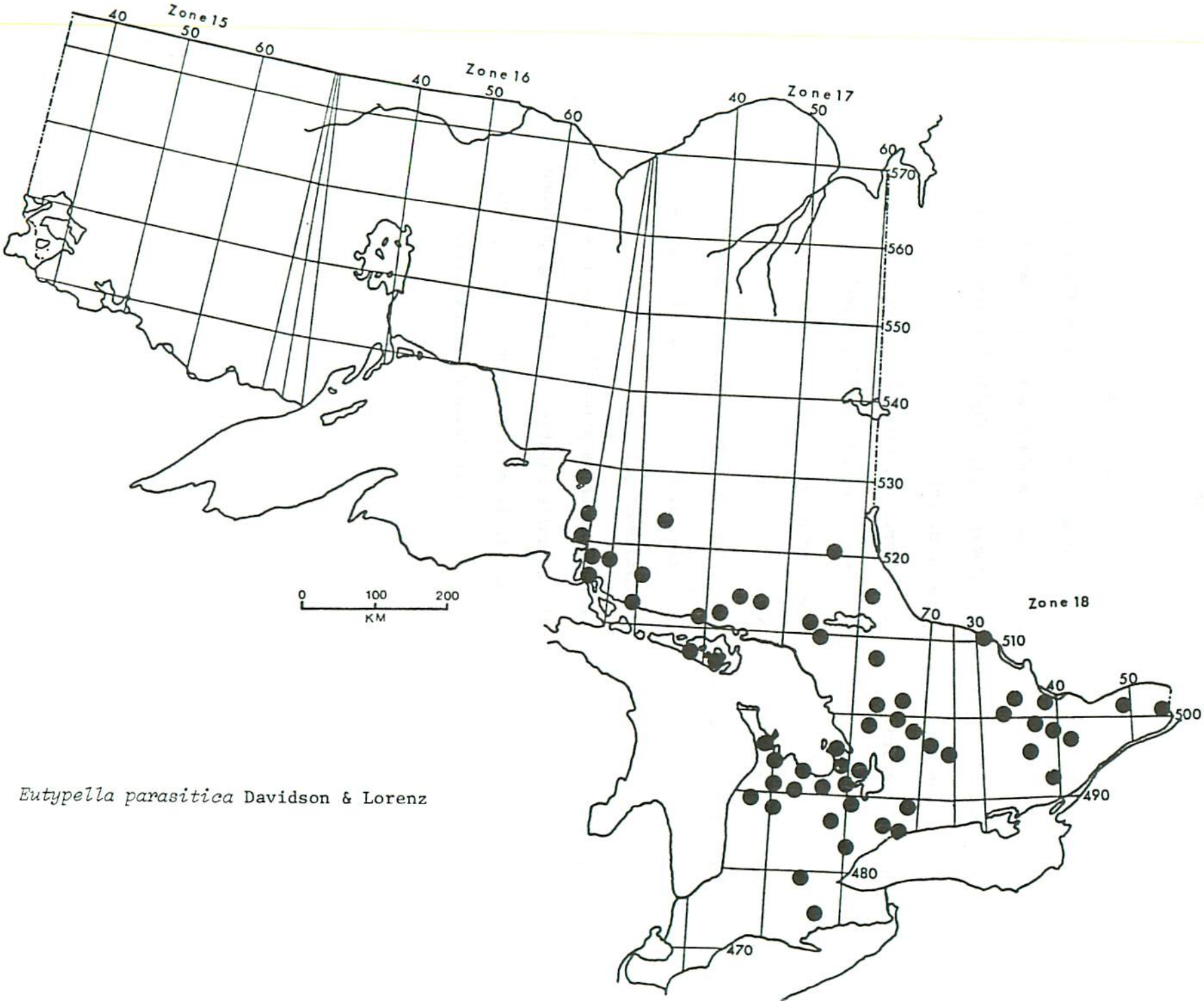
Organism:	*Endocronartium harknessii* (J. P. Moore) Y. Hirat.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Globose gall rust and western gall rust
Hosts on record:	*Pinus banksiana*, *P. contorta* var. *latifolia*, *P. sylvestris*
Number of records:	148
Herbarium specimens:	*Pinus banksiana*, 11; *P. sylvestris*, 1
Remarks:	*Endocronartium harknessii* causes galls which are macroscopically indistinguishable from those caused by *Cronartium quercuum*. When observed beyond the range of oak, the alternate host of *C. quercuum*, hard pine galls can be assumed to be caused by *E. harknessii*.



Endocronartium harknessii

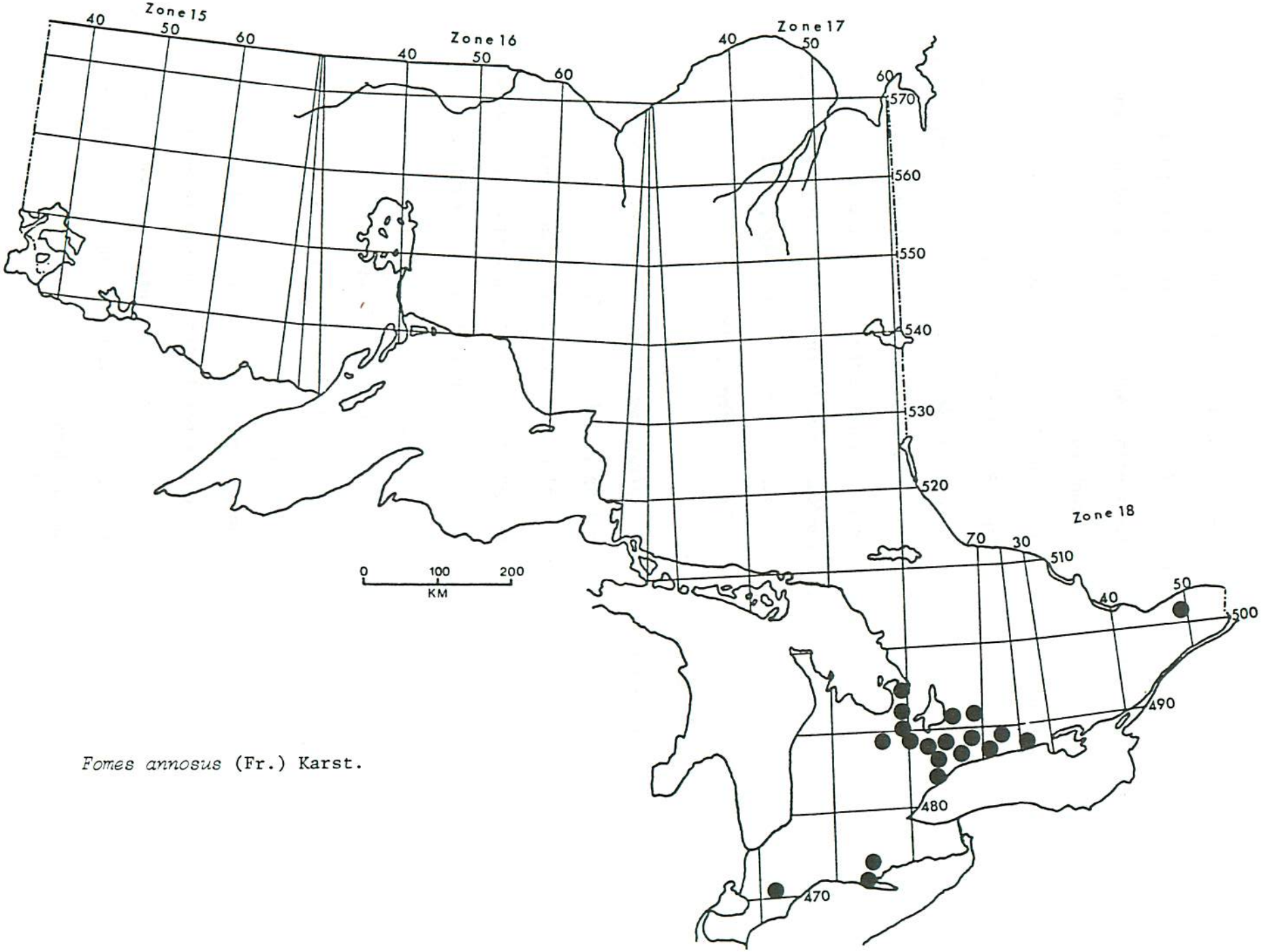
(J. P. Moore) Y. Hirat.

Organism:	*Eutypella parasitica* Davidson & Lorenz
Taxonomic position:	Ascomycotina, Sphaeriales, Diatrypaceae
Disease caused:	Eutypella canker of maple
Hosts on record:	*Acer pensylvanicum*, *A. rubrum*, *A. saccharum*, *Acer* sp.
Number of records:	62
Herbarium specimens:	*Acer rubrum*, 2; *A. saccharum*, 42
Remarks:	This organism is common in Ontario throughout the range of its hosts.



Eutypella parasitica Davidson & Lorenz

Organism:	*Fomes annosus* (Fr.) Karst.
	Syn.: *Heterobasidion annosum* (Fr.) Bref.
	Fomitopsis annosa (Fr.) Karst.
Taxonomic position:	Basidiomycotina, Aphyllophorales, Polyporaceae
Disease caused:	Fomes root rot
Hosts on record:	*Larix laricina, Pinus banksiana, P. resinosa, P. strobus, P. sylvestris, Populus grandidentata, Ulmus americana*
Number of records:	58
Herbarium specimens:	*Larix laricina*, 1; *Pinus banksiana*, 1; *P. resinosa*, 15; *P. strobus*, 1; *Populus grandidentata*, 1
Remarks:	*Fomes annosus* is primarily a pathogen of conifers, though quite capable of infecting hardwoods as well. It is most damaging in thinned pine plantations on well-drained, sandy soils.



Fomes annosus (Fr.) Karst.

Organism: *Fomes igniarius* (L. ex Fr.) Kickx

Syn.: *Phellinus igniarius* (L. ex Fr.) Quél.

Taxonomic position: Basidiomycotina, Aphyllophorales, Polyporaceae

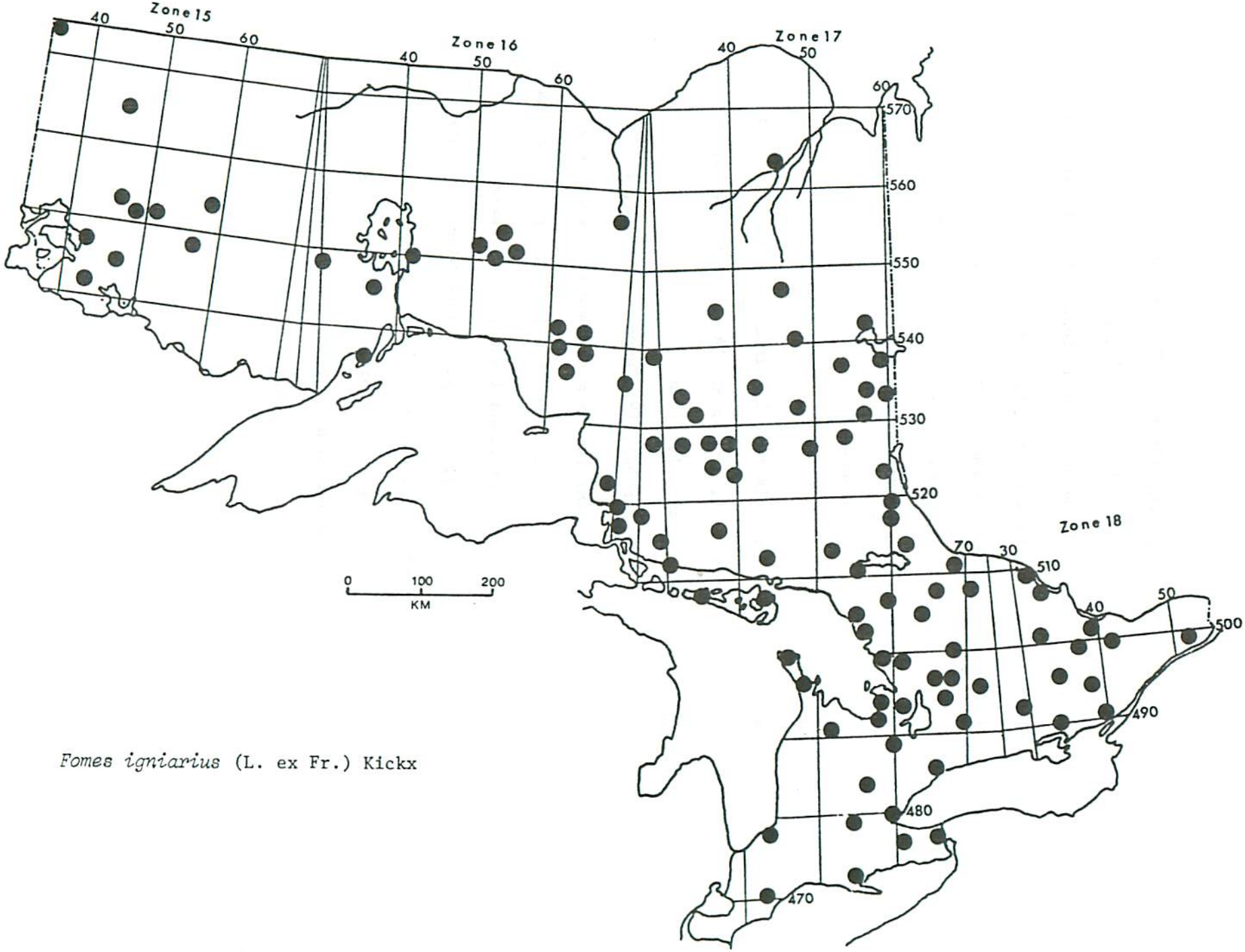
Disease caused: White trunk rot

Hosts on record: *Acer pensylvanicum, A. rubrum, A. saccharum, Acer* sp., *Betula alleghaniensis, B. papyrifera, Betula* sp., *Carpinus caroliniana, Fagus grandifolia, Fagus* sp., *Fraxinus nigra, Juglans cinerea, Juglans* sp., *Ostrya virginiana, Populus balsamifera, P. grandidentata, P. tremuloides, Populus* sp., *Quercus alba, Q. rubra, Sorbus* sp., *Tilia americana, Ulmus americana, Ulmus* sp.

Number of records: 149

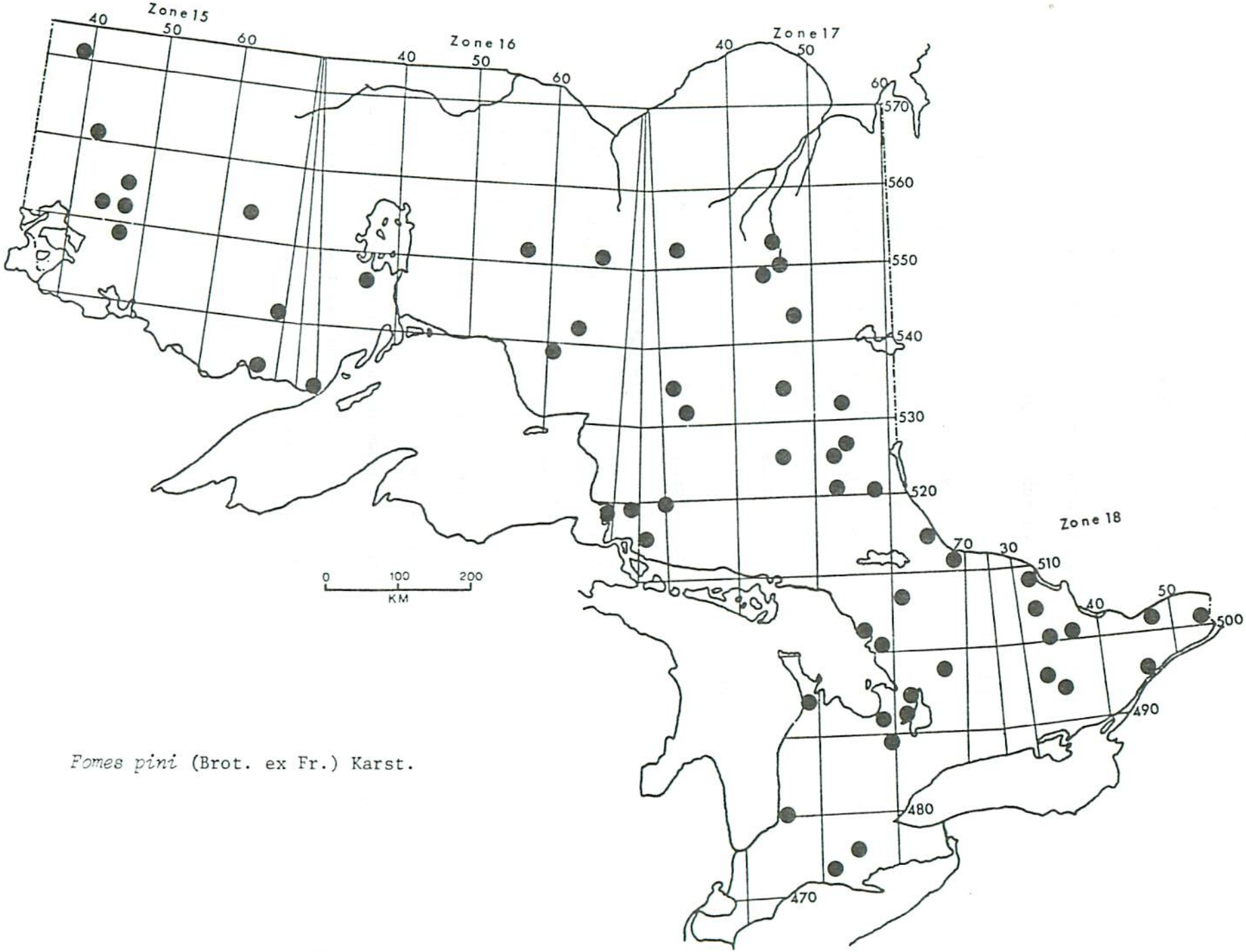
Herbarium specimens: *Acer pensylvanicum*, 3; *A. rubrum*, 6; *A. saccharum*, 10; *Acer* sp., 1; *Betula alleghaniensis*, 3; *B. papyrifera*, 28; *Betula* sp., 2; *Carpinus caroliniana*, 4; *Fagus grandifolia*, 9; *Fagus* sp., 3; *Fraxinus nigra*, 1; *Juglans* sp., 3; *Ostrya virginiana*, 16; *Populus balsamifera*, 1; *P. grandidentata*, 5; *P. tremuloides*, 21; *Populus* sp., 19; *Quercus alba*, 1; *Q. rubra*, 2; *Sorbus* sp., 2; *Tilia americana*, 2; *Ulmus americana*, 6; *Ulmus* sp., 1

Remarks: This fungus infects a wide variety of hardwood species and is particularly severe in aspen stands. It is also important as a cause of decay in white birch, yellow birch and sugar maple (Basham and Morawski 1964).



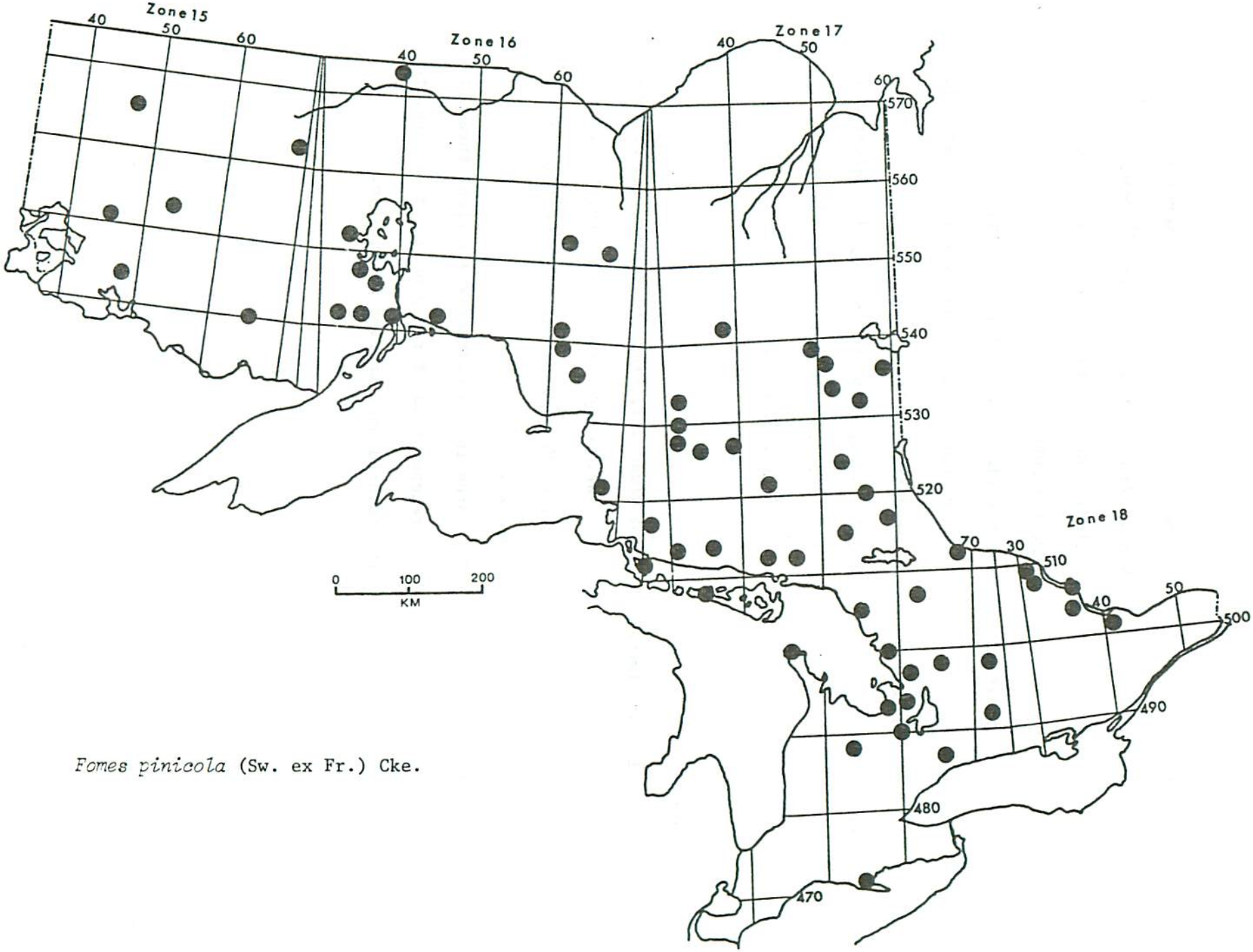
Fomes igniarius (L. ex Fr.) Kickx

Organism:	*Fomes pini* (Brot. ex Fr.) Karst.
	Syn.: *Phellinus pini* (Brot. ex Fr.) Ames
Taxonomic position:	Basidiomycotina, Aphyllophorales, Polyporaceae
Disease caused:	Red ring rot or white pocket rot
Hosts on record:	*Abies balsamea, Larix decidua, L. laricina, Picea abies, P. glauca, P. mariana, Picea* sp., *Pinus banksiana, P. resinosa, P. strobus, Tsuga canadensis*
Number of records:	63
Herbarium specimens:	*Abies balsamea*, 2; *Larix laricina*, 5; *Picea abies*, 1; *P. glauca*, 14; *P. mariana*, 13; *Picea* sp., 1; *Pinus banksiana*, 6; *P. resinosa*, 2; *P. strobus*, 18; *Tsuga canadensis*, 1
Remarks:	*Fomes pini* is the most important wood decay fungus on conifers in Ontario as far as volume lost is concerned (Basham and Morawski 1964). In Ontario, white pine, jack pine and black spruce are the major hosts (ibid.), but the fungus is usually present in all mature or overmature stands of any of its host species throughout the province.



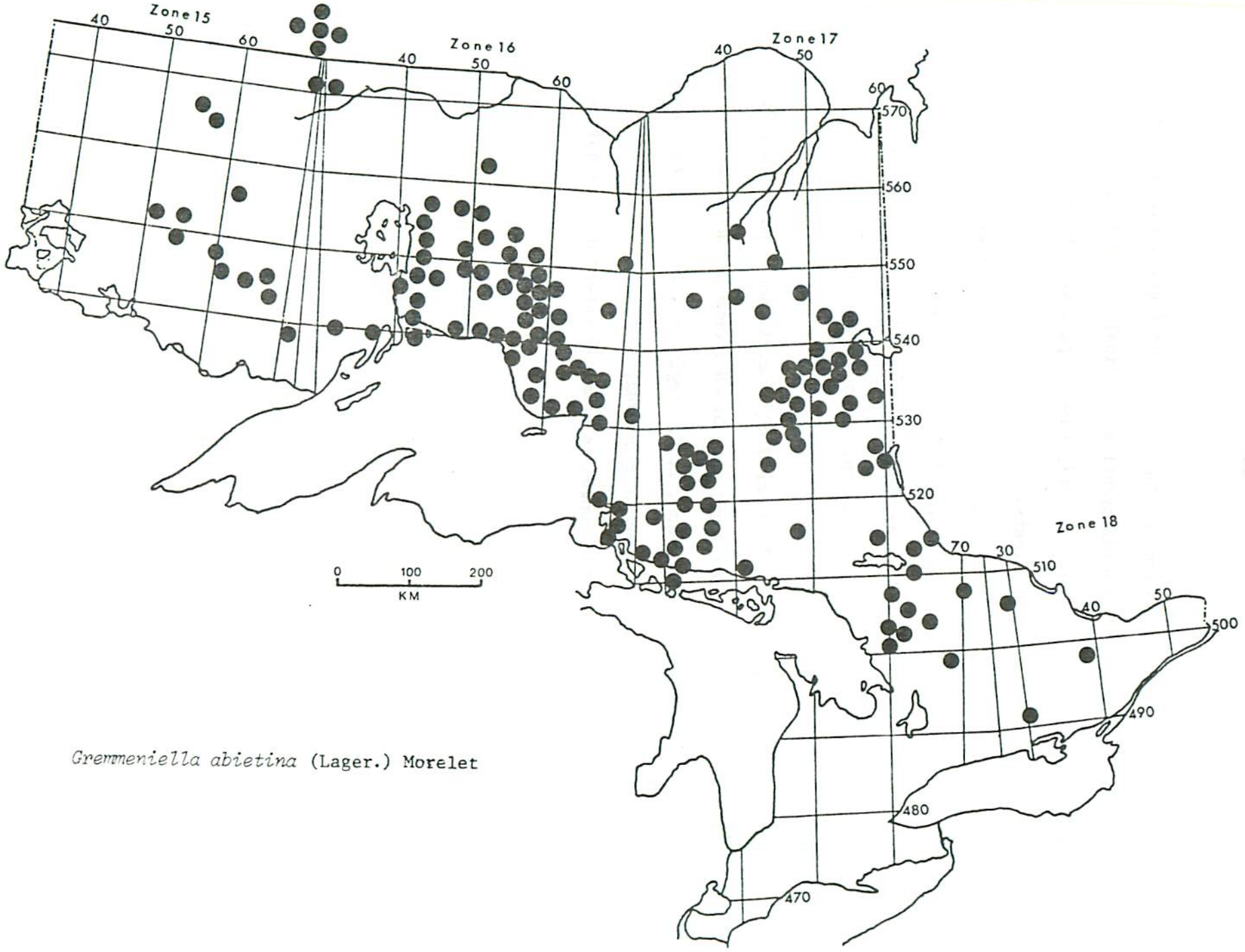
Fomes pini (Brot. ex Fr.) Karst.

Organism:	*Fomes pinicola* (Sw. ex Fr.) Cke.
	Syn.: *Fomitopsis pinicola* (Sw. ex Fr.) Karst.
Taxonomic position:	Basidiomycotina, Aphyllophorales, Polyporaceae
Disease caused:	Brown cubical rot
Hosts on record:	*Abies balsamea*, *Acer saccharum*, *Acer* sp., *Betula alleghaniensis*, *B. papyrifera*, *Betula* sp., *Picea glauca*, *P. mariana*, *Picea* sp., *Pinus banksiana*, *P. resinosa*, *P. strobus*, *Populus* x *euramericana*, *P. tremuloides*, *Populus* sp., *Tsuga canadensis*
Number of records:	88
Herbarium specimens:	*Abies balsamea*, 21; *Acer saccharum*, 1; *Acer* sp., 1; *Betula alleghaniensis*, 1; *B. papyrifera*, 7; *Betula* sp., 1; *Picea glauca*, 10; *P. mariana*, 13; *Picea* sp., 3; *Pinus banksiana*, 7; *P. resinosa*, 3; *P. strobus*, 4; *Populus* x *euramericana*, 1; *P. tremuloides*, 5; *Populus* sp., 4; *Tsuga canadensis*, 6
Remarks:	This organism is known as the red belt fungus. It causes decay in the heartwood and sapwood of down timber.



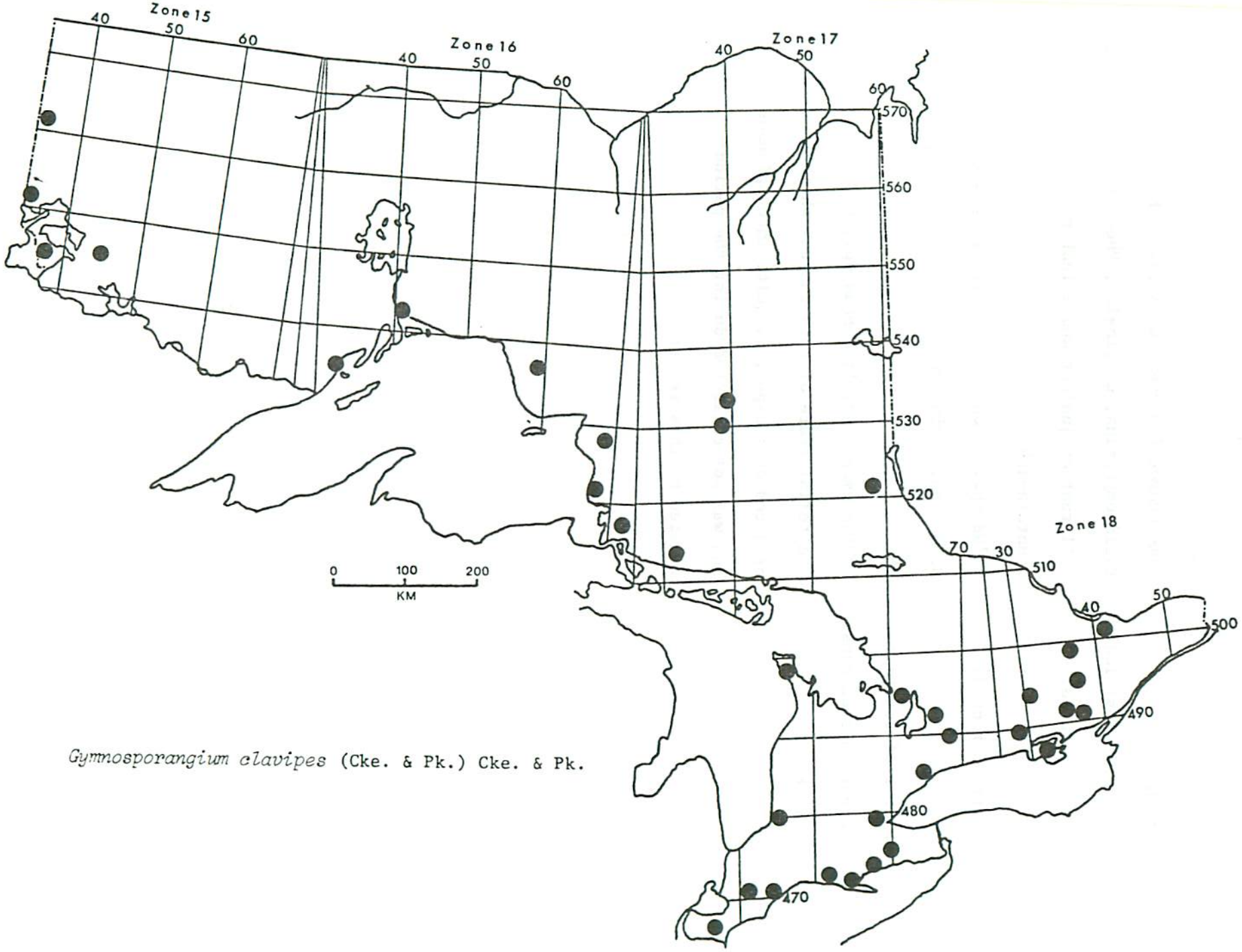
Fomes pinicola (Sw. ex Fr.) Cke.

Organism:	*Gremmeniella abietina* (Lager.) Morelet Syn.: *Scleroderris lagerbergii* Gremmen Including stat. conid. *Brunchorstia pinea* (Karst.) Höhn.
Taxonomic position:	Ascomycotina, Helotiales, Dermataceae, Deuteromycotina, Sphaeropsidales, Sphaerioidaceae
Disease caused:	Scleroderris canker
Hosts on record:	*Picea glauca, Pinus banksiana, P. contorta* var. *latifolia, P. mugho* var. *mughus, P. nigra, P. resinosa, P. strobus, P. sylvestris, Pinus* sp.
Number of records:	543
Herbarium specimens:	*Picea glauca*, 1; *Pinus banksiana*, 18; *P. contorta* var. *latifolia*, 2; *P. nigra*, 6; *P. resinosa*, 7; *P. strobus*, 4; *P. sylvestris*, 4; *Pinus* sp., 2
Remarks:	This organism is currently a serious threat to the regeneration of red pine and jack pine, the two favored host species in Ontario.



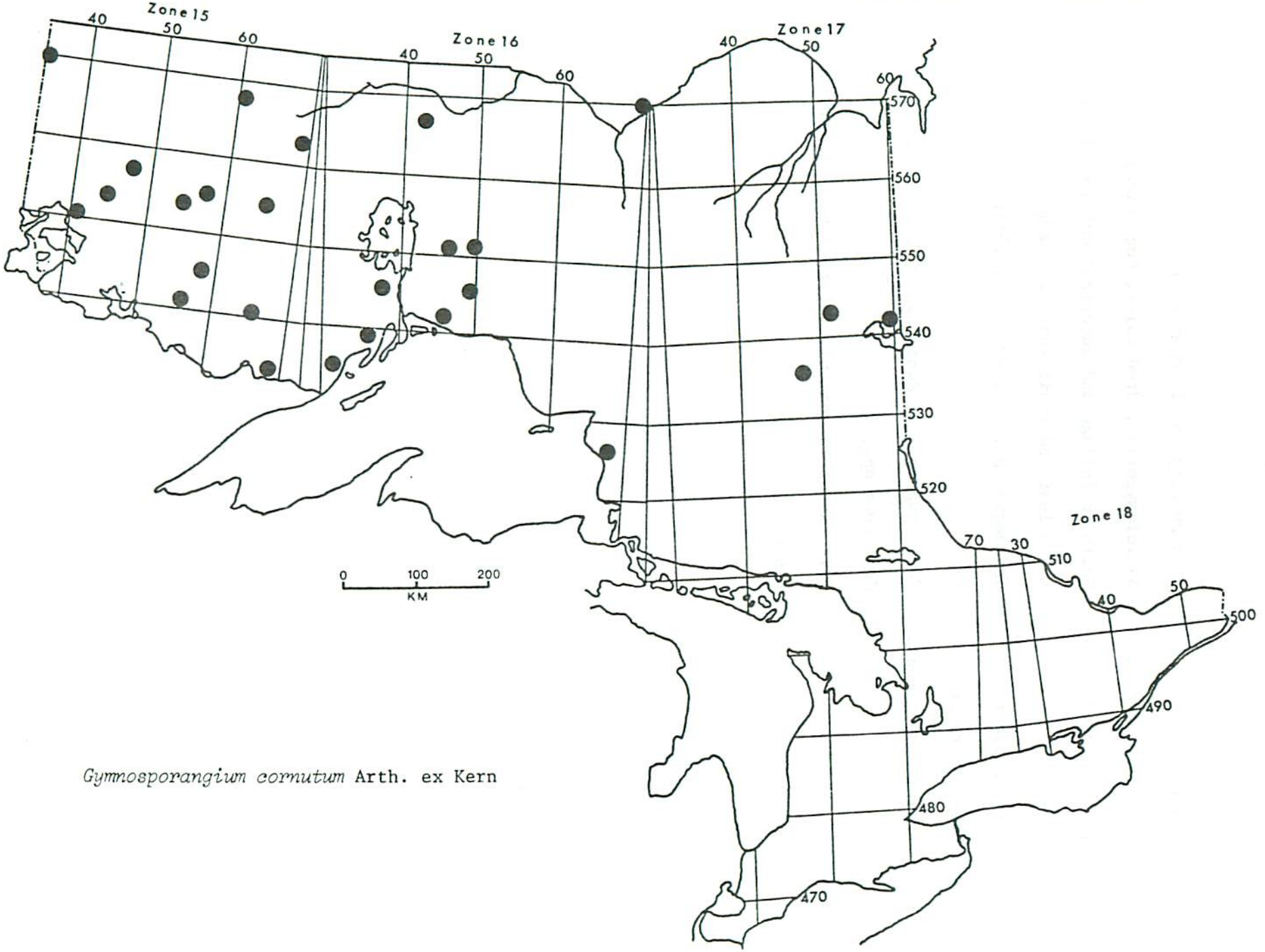
Gremmeniella abietina (Lager.) Morelet

Organism:	*Gymnosporangium clavipes* (Cke. & Pk.) Cke. & Pk.
Taxonomic position:	Basidiomycotina, Uredinales, Pucciniaceae
Disease caused:	Leaf and twig rust of pomaceous hosts and junipers.
Hosts on record:	*Amelanchier alnifolia*, *Amelanchier* sp., *Crataegus* sp., *Juniperus communis* var. *depressa*, *J. virginiana*, *J. virginiana* var. *crebra*, *Juniperus* sp., *Sorbus americana*
Number of records:	35
Herbarium specimens:	*Amelanchier alnifolia*, 1; *Amelanchier* sp., 9; *Crataegus* sp., 5; *Juniperus communis* var. *depressa*, 2; *J. virginiana*, 10; *Juniperus* sp., 3; *Sorbus americana*, 1
Remarks:	This fungus is commonly referred to as quince rust.



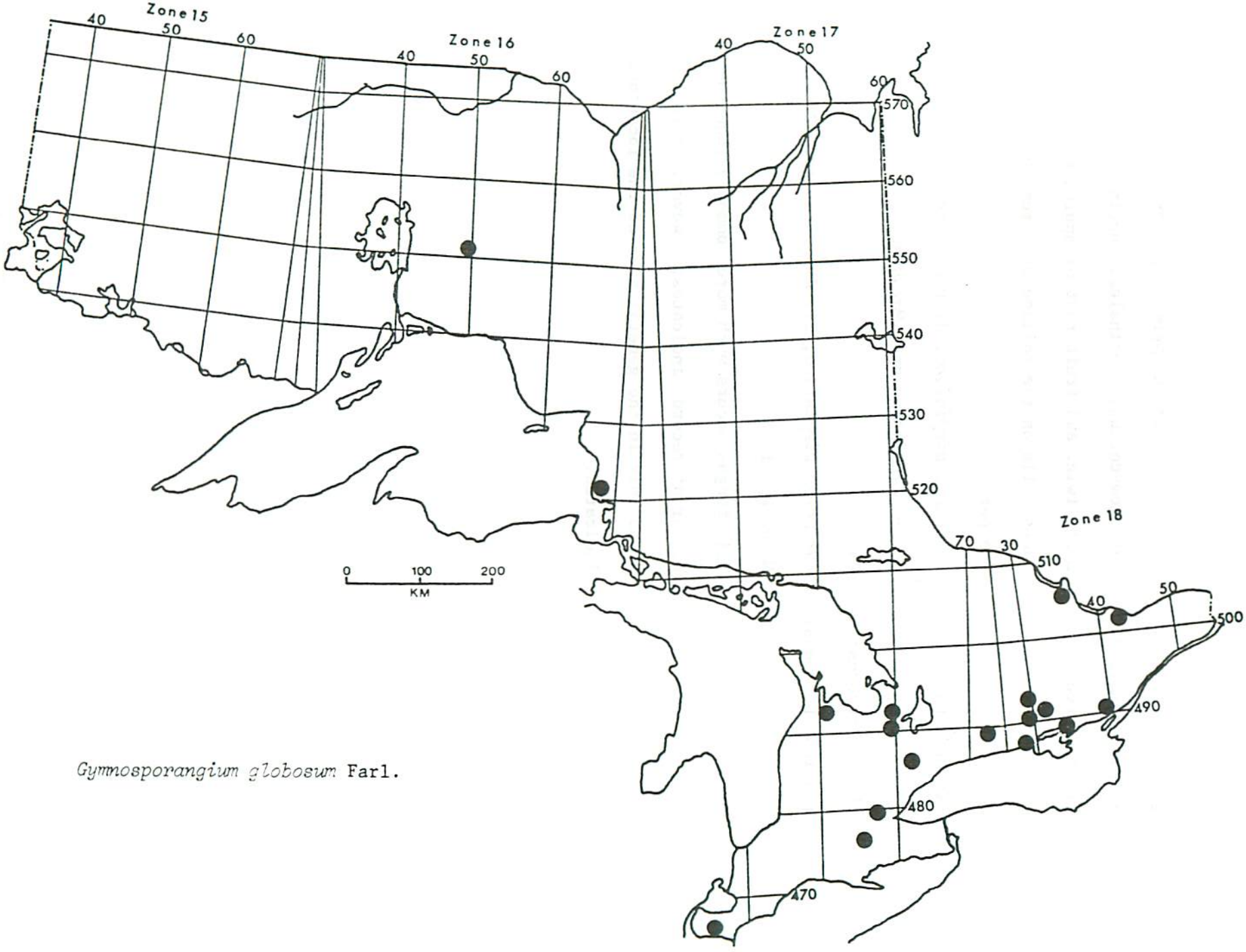
Gymnosporangium clavipes (Cke. & Pk.) Cke. & Pk.

Organism:	*Gymnosporangium cornutum* Arth. ex Kern
Taxonomic position:	Basidiomycotina, Uredinales, Pucciniaceae
Disease caused:	Gall rust of juniper and a leaf rust of mountain-ash
Hosts on record:	*Malus* sp., *Sorbus americana, S. aucuparia, S. decora, Sorbus* sp.
Number of records:	36
Herbarium specimens:	*Sorbus americana*, 1; *Sorbus* sp., 8
Remarks:	The telial state of this fungus, which is produced on juniper, is quite inconspicuous and was not collected during the period covered by this report.



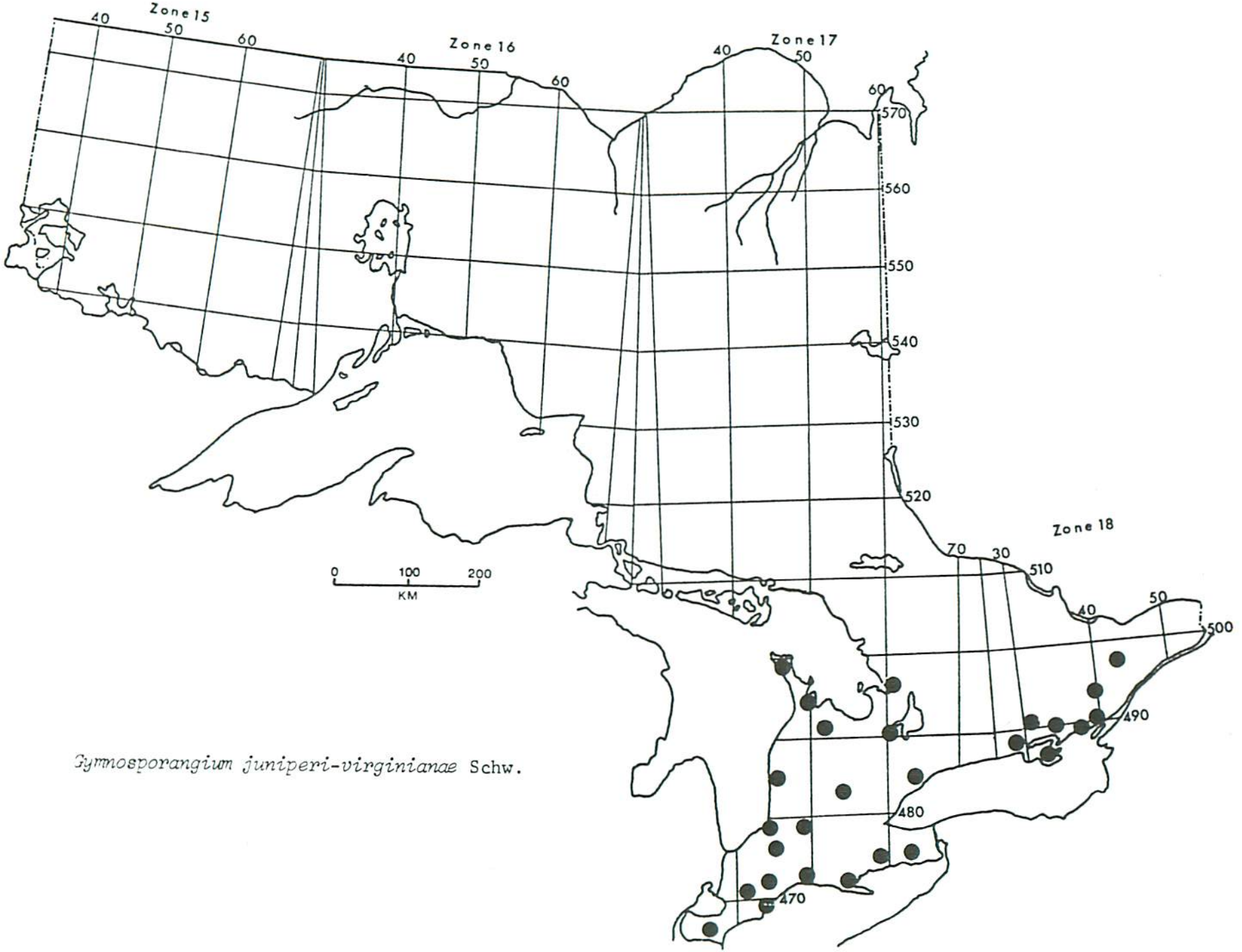
Gymnosporangium cornutum Arth. ex Kern

Organism:	*Gymnosporangium globosum* Farl.
Taxonomic position:	Basidiomycotina, Uredinales, Pucciniaceae
Disease caused:	Galls on foliage and succulent twigs of juniper and a leaf and fruit rust of hawthorn
Hosts on record:	*Crataegus* sp., *Juniperus virginiana*, *Juniperus* sp.
Number of records:	18
Herbarium specimens:	*Crataegus* sp., 8; *Juniperus virginiana*, 2; *Juniperus* sp., 1
Remarks:	This fungus is commonly referred to as hawthorn rust.



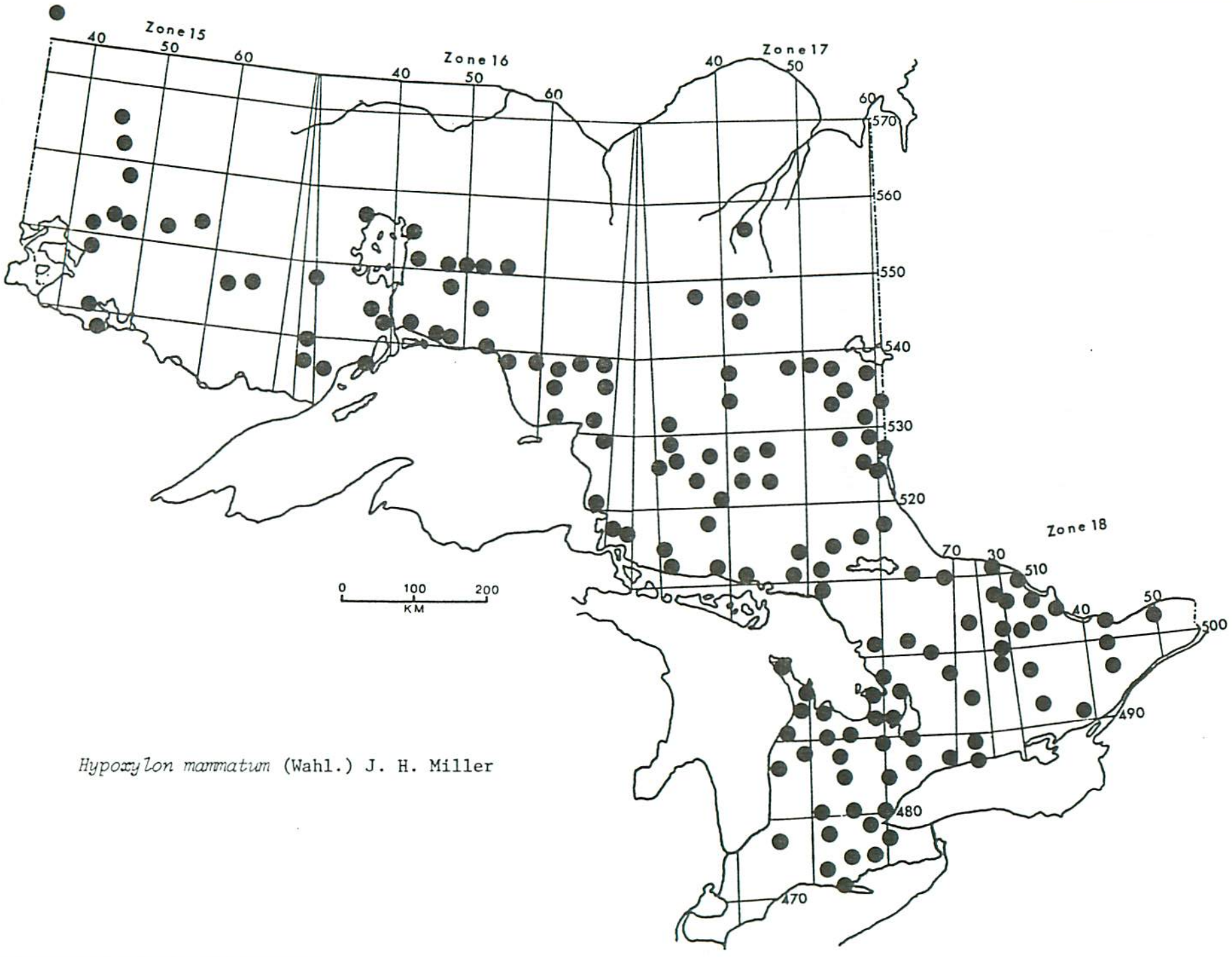
Gymnosporangium globosum Farl.

Organism:	*Gymnosporangium juniperi-virginianae* Schw.
Taxonomic position:	Basidiomycotina, Uredinales, Pucciniaceae
Disease caused:	Leaf, twig, and fruit rust of apple; produces galls on the foliage and stems of juniper
Hosts on record:	*Juniperus virginiana*, *J. virginiana* var. *crebra*, *Juniperus* sp., *Malus* sp.
Number of records:	35
Herbarium specimens:	*Juniperus virginiana*, 11; *Juniperus* sp., 2; *Malus* sp. 1
Remarks:	This fungus occurs much more commonly than the number of records indicates; however, it is found only in the general area of the locations indicated.



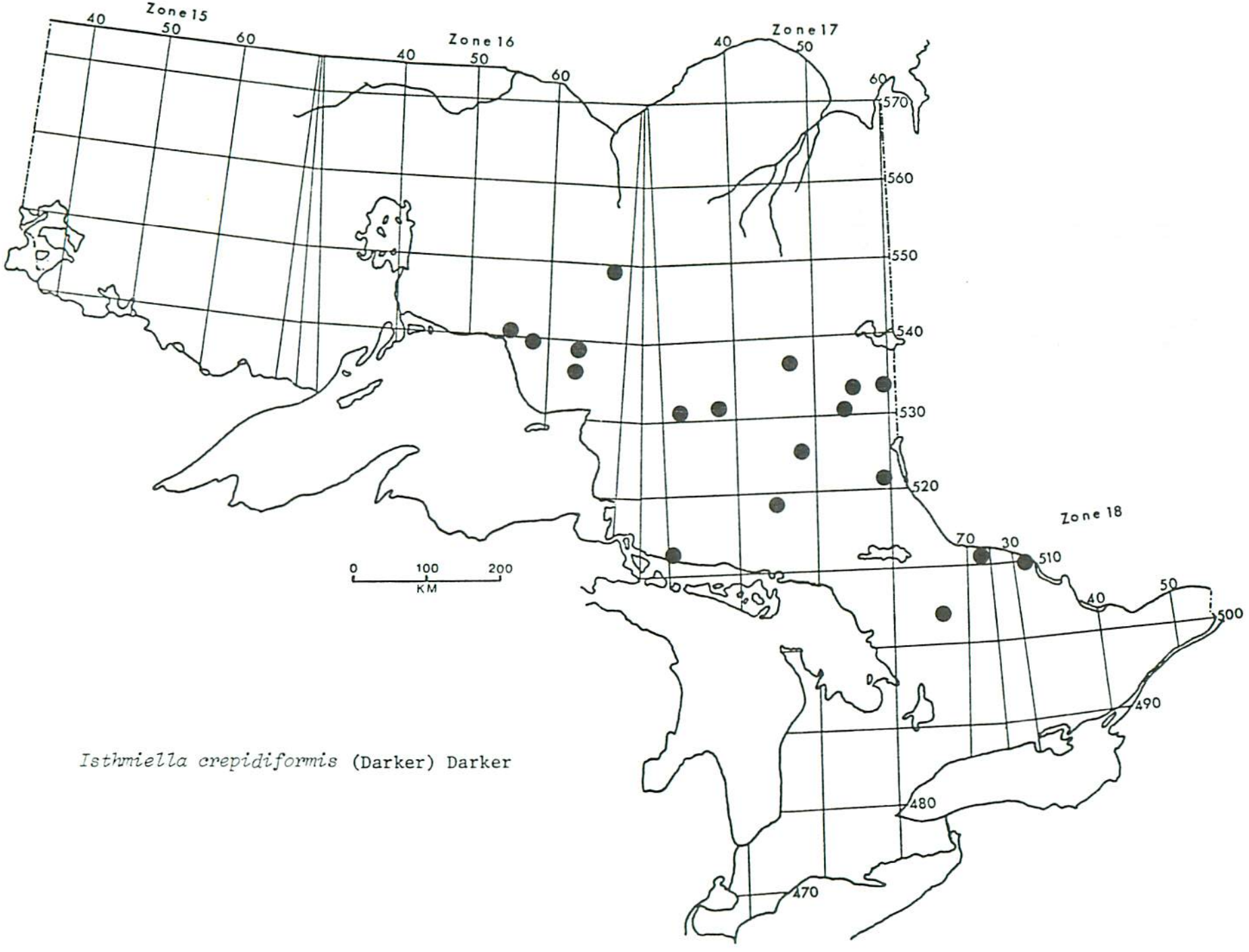
Gymnosporangium juniperi-virginianae Schw.

Organism:	*Hypoxylon mammatum* (Wahl.) J. H. Miller
	Syn.: *Hypoxylon pruinatum* (Klotzsch) Cke.
Taxonomic position:	Ascomycotina, Sphaeriales, Xylariaceae
Disease caused:	Stem canker of aspen and other hardwoods
Hosts on record:	*Acer rubrum*, *Alnus rugosa*, *Alnus* sp., *Betula alleghaniensis*, *B. papyrifera*, *Fagus* sp., *Populus grandidentata*, *P. tremuloides*, *Populus* sp., *Salix* sp.
Number of records:	212
Herbarium specimens:	*Acer rubrum*, 1; *Alnus rugosa*, 1; *Alnus* sp., 4; *Betula alleghaniensis*, 4; *B. papyrifera*, 2; *Fagus* sp., 3; *Populus grandidentata*, 2; *P. tremuloides*, 114; *Populus* sp., 7; *Salix* sp., 2
Remarks:	Hypoxylon canker is a very serious disease of mature aspen; however, very young trees can also be infected and killed by this fungus.



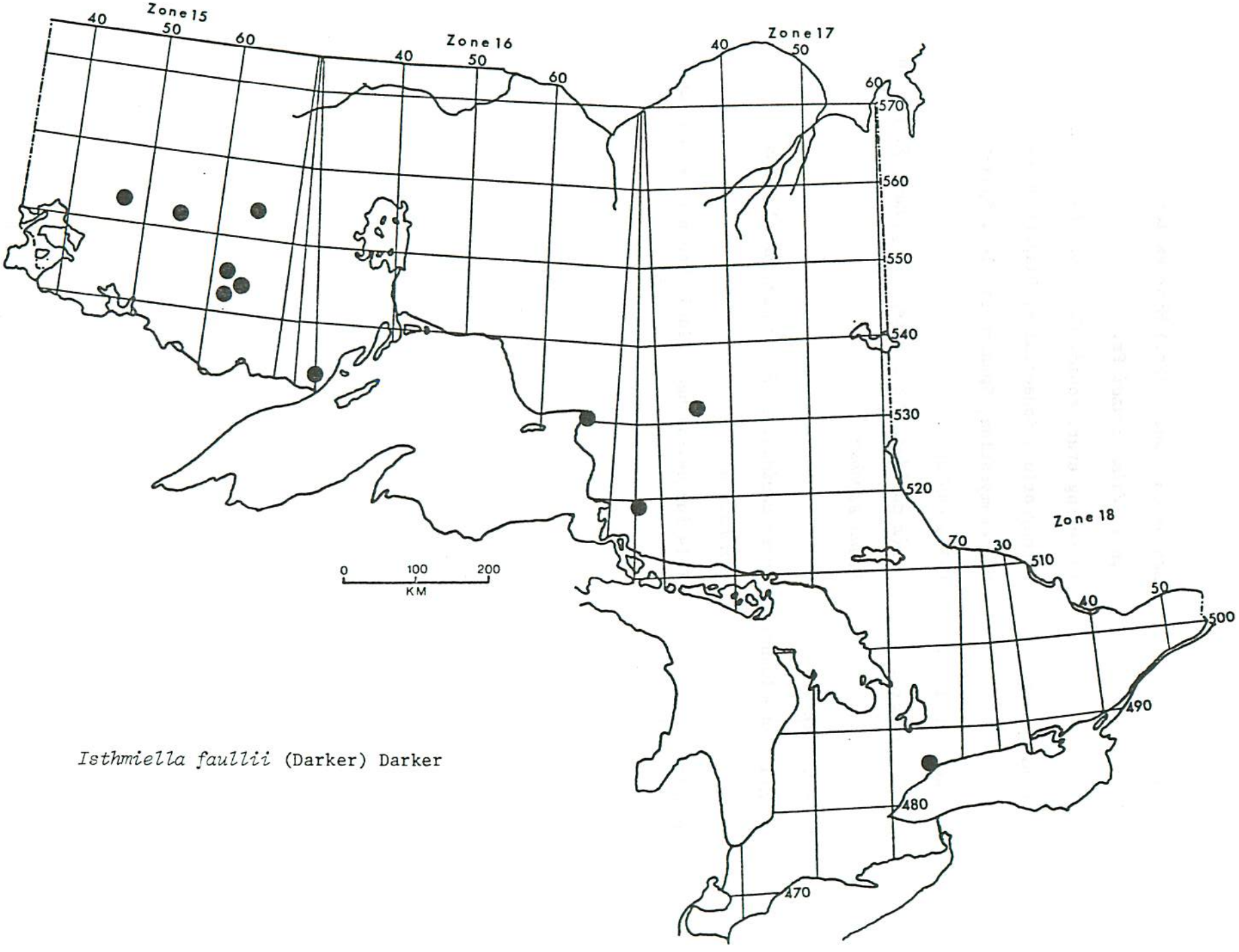
Hypoxylon mammatum (Wahl.) J. H. Miller

Organism:	*Isthmiella crepidiformis* (Darker) Darker
	Syn.: *Bifusella crepidiformis* Darker
Taxonomic position:	Ascomycotina, Phacidales, Rhytismataceae
Disease caused:	Needle cast of spruce
Host on record:	*Picea mariana*
Number of records:	49
Herbarium specimens:	*Picea mariana*, 13
Remarks:	This is the most common needle cast of spruce in Ontario.



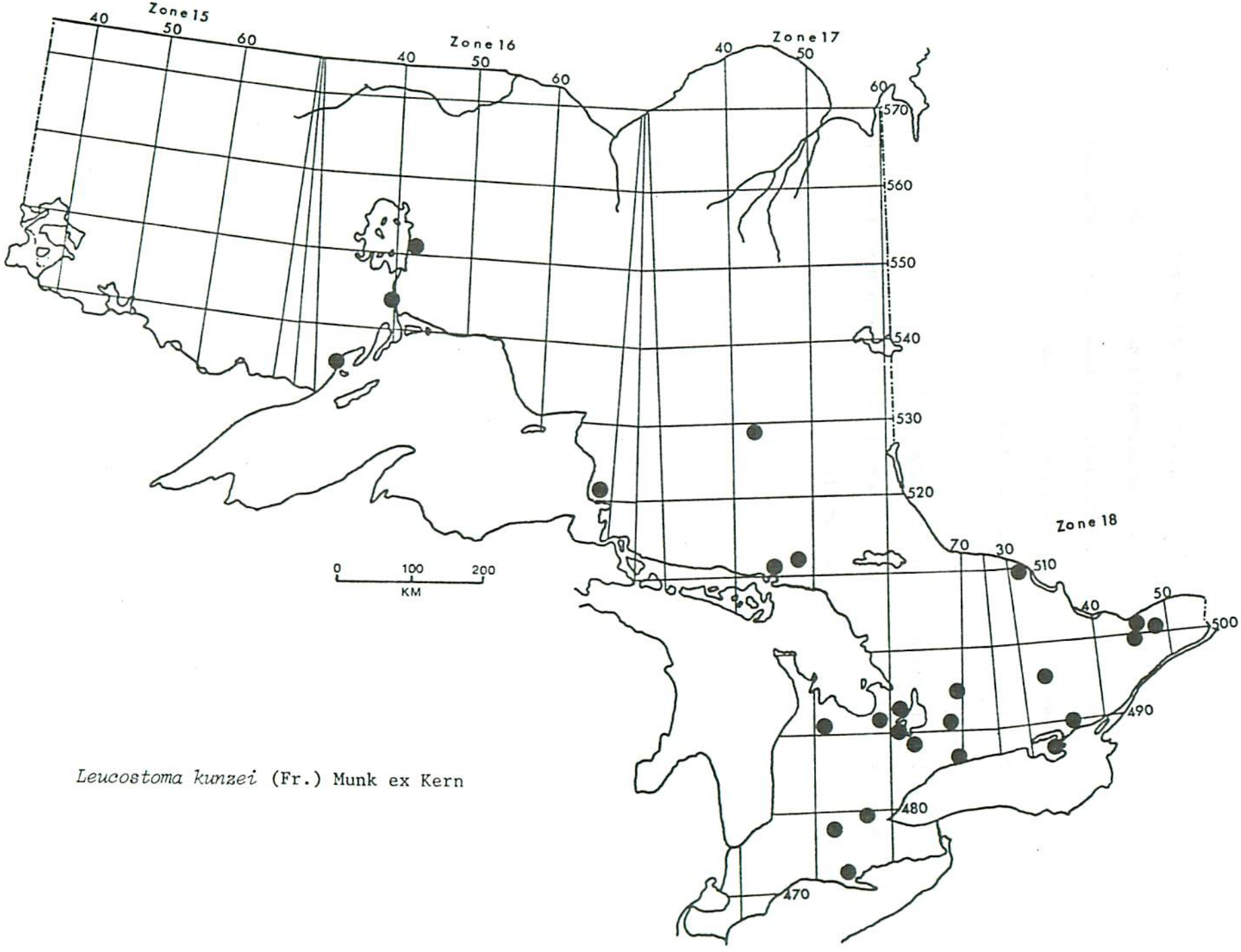
Isthmiella crepidiformis (Darker) Darker

Organism:	*Isthmiella faullii* (Darker) Darker
	Syn.: *Bifusella faullii* Darker
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Needle cast of balsam fir
Host on record:	*Abies balsamea*
Number of records:	17
Herbarium specimens:	*Abies balsamea*, 15
Remarks:	This is a common needle cast of balsam fir in Ontario.



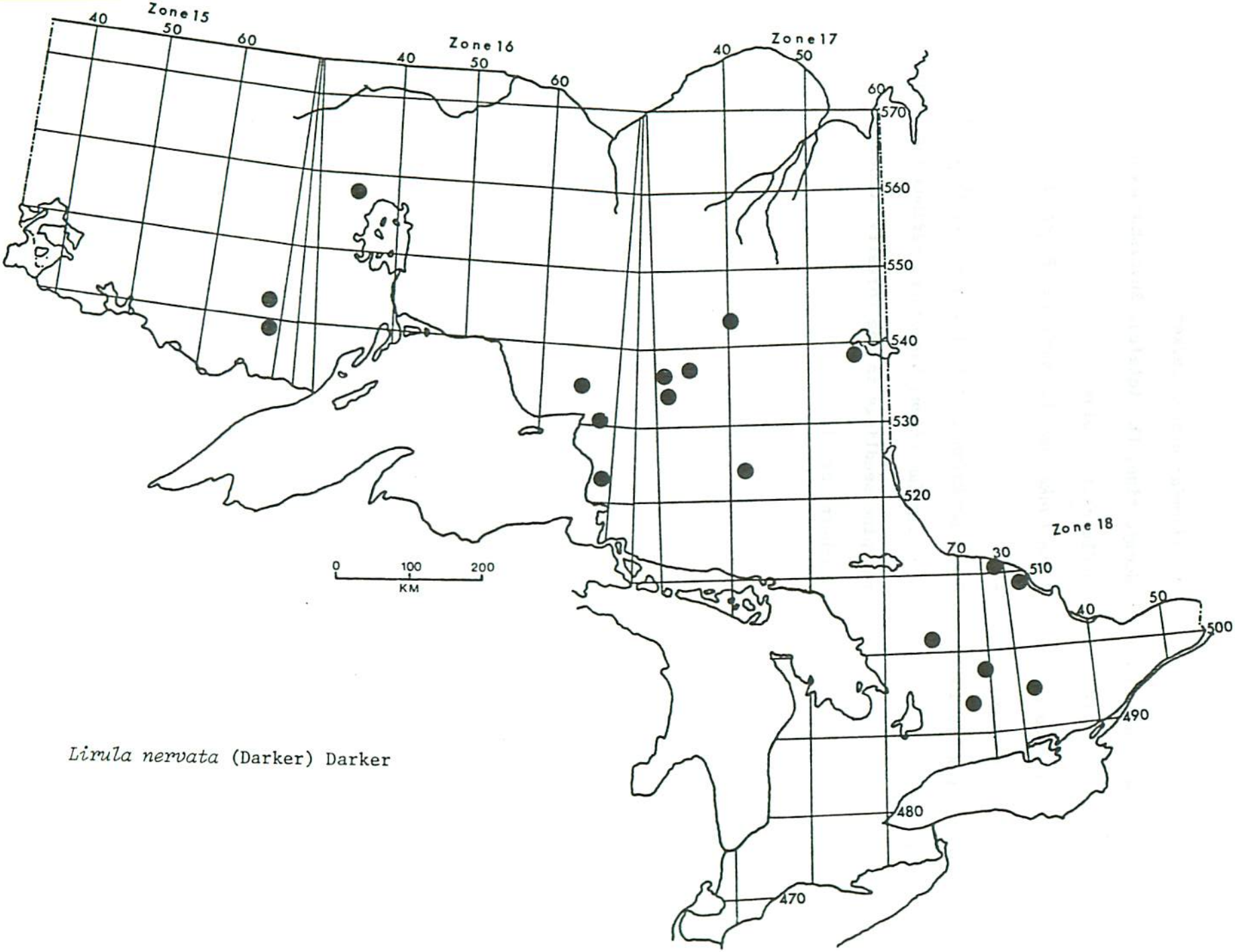
Isthmiella faullii (Darker) Darker

Organism:	*Leucostoma kunzei* (Fr.) Munk ex Kern
	Syn.: *Valsa kunzei* Fr.
	including stat. conid. *Cytospora kunzei* Sacc.
Taxonomic position:	Ascomycotina, Sphaeriales, Diaporthaceae,
	Deuteromycotina, Sphaeropsidales, Sphaerioidaceae
Disease caused:	Valsa canker
Hosts on record:	*Larix decidua, Picea abies, P. glauca, P. pungens, Pinus strobus*
Number of records:	11
Herbarium specimens:	*Larix decidua*, 1; *Picea pungens*, 1; *Pinus strobus*, 4
Remarks:	This fungus has been widely known as *Valsa kunzei*.



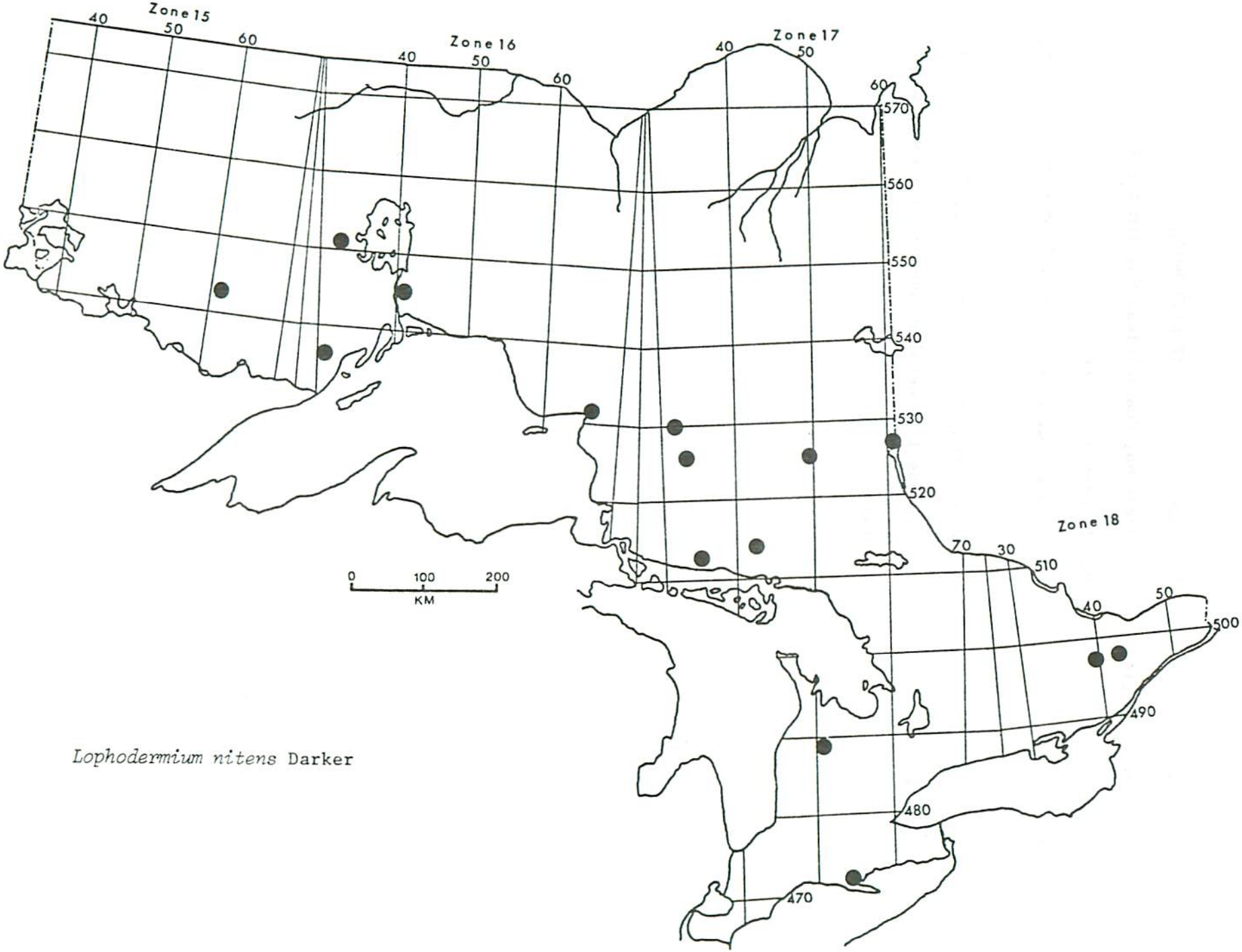
Leucostoma kunzei (Fr.) Munk ex Kern

Organism:	*Lirula nervata* (Darker) Darker
	Syn.: *Hypodermella nervata* Darker
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Needle cast of balsam fir
Host on record:	*Abies balsamea*
Number of records:	15
Herbarium specimens:	*Abies balsamea*, 7
Remarks:	*Lirula nervata* is a common needle cast on balsam fir.



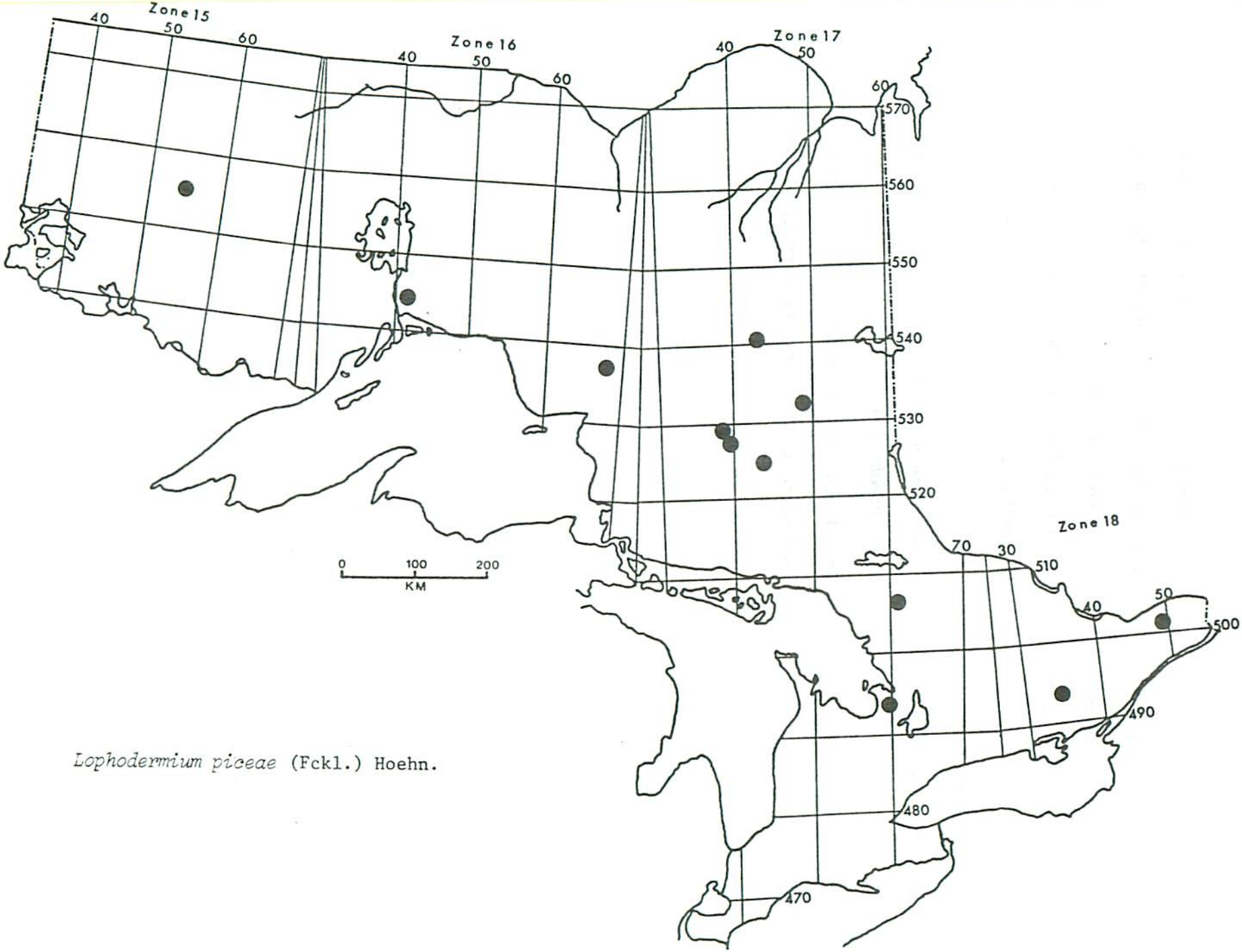
Lirula nervata (Darker) Darker

Organism:	*Lophodermium nitens* Darker
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Needle cast of pine
Hosts on record:	*Pinus banksiana*, *P. resinosa*, *P. strobus*
Number of records:	21
Herbarium specimens:	*Pinus banksiana*, 2; *P. resinosa*, 2; *P. strobus*, 3
Remarks:	*Lophodermium nitens* has caused serious losses in red pine seedlings in one forestry nursery in southern Ontario.



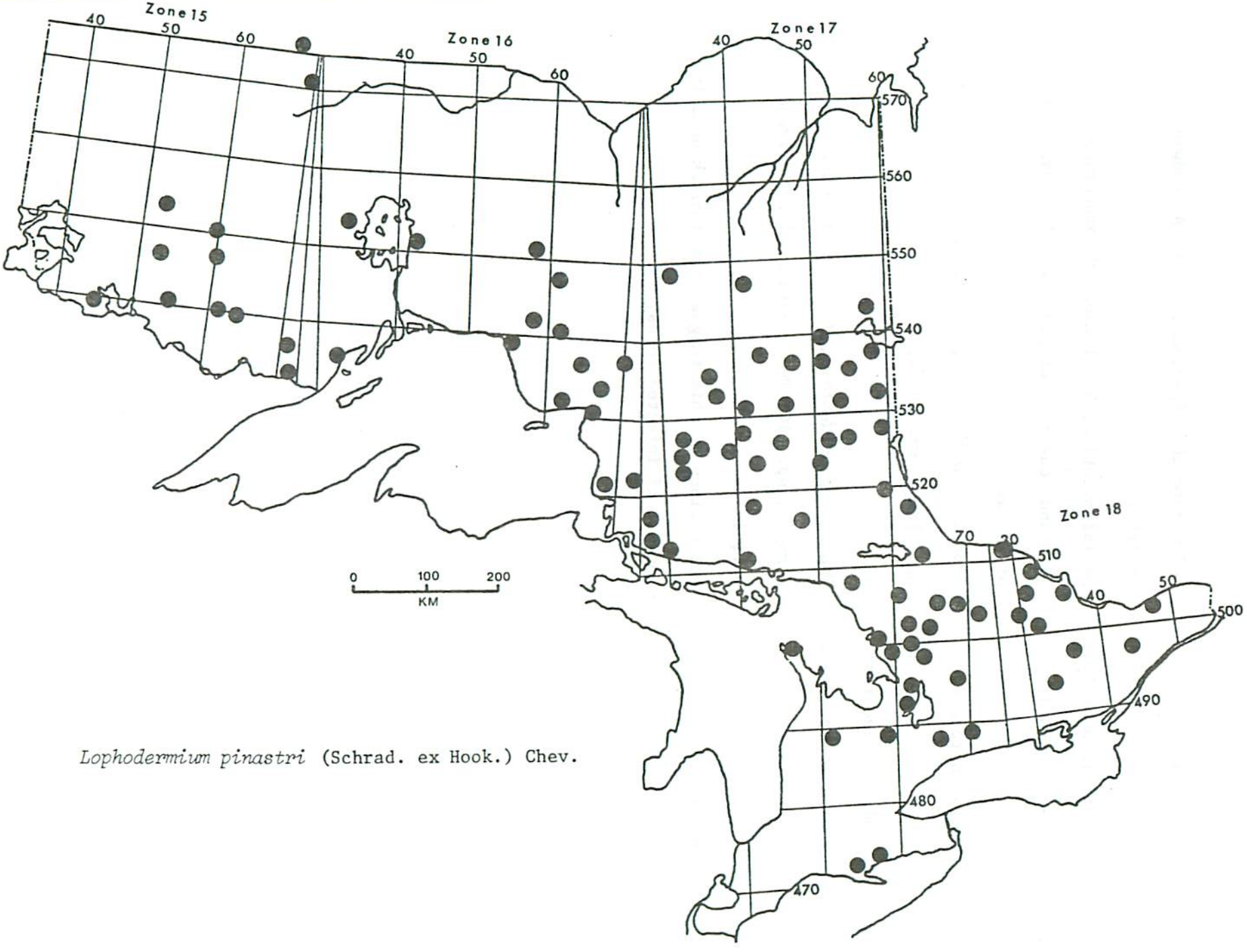
Lophodermium nitens Darker

Organism:	*Lophodermium piceae* (Fckl.) Hoehn.
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Needle cast of spruce
Hosts on record:	*Abies balsamea*, *Picea glauca*, *P. mariana*, *Picea* sp.
Number of records:	10
Herbarium specimens:	*Abies balsamea*, 2; *Picea glauca*, 2; *P. mariana*, 1
Remarks:	This fungus is generally considered a facultative parasite.



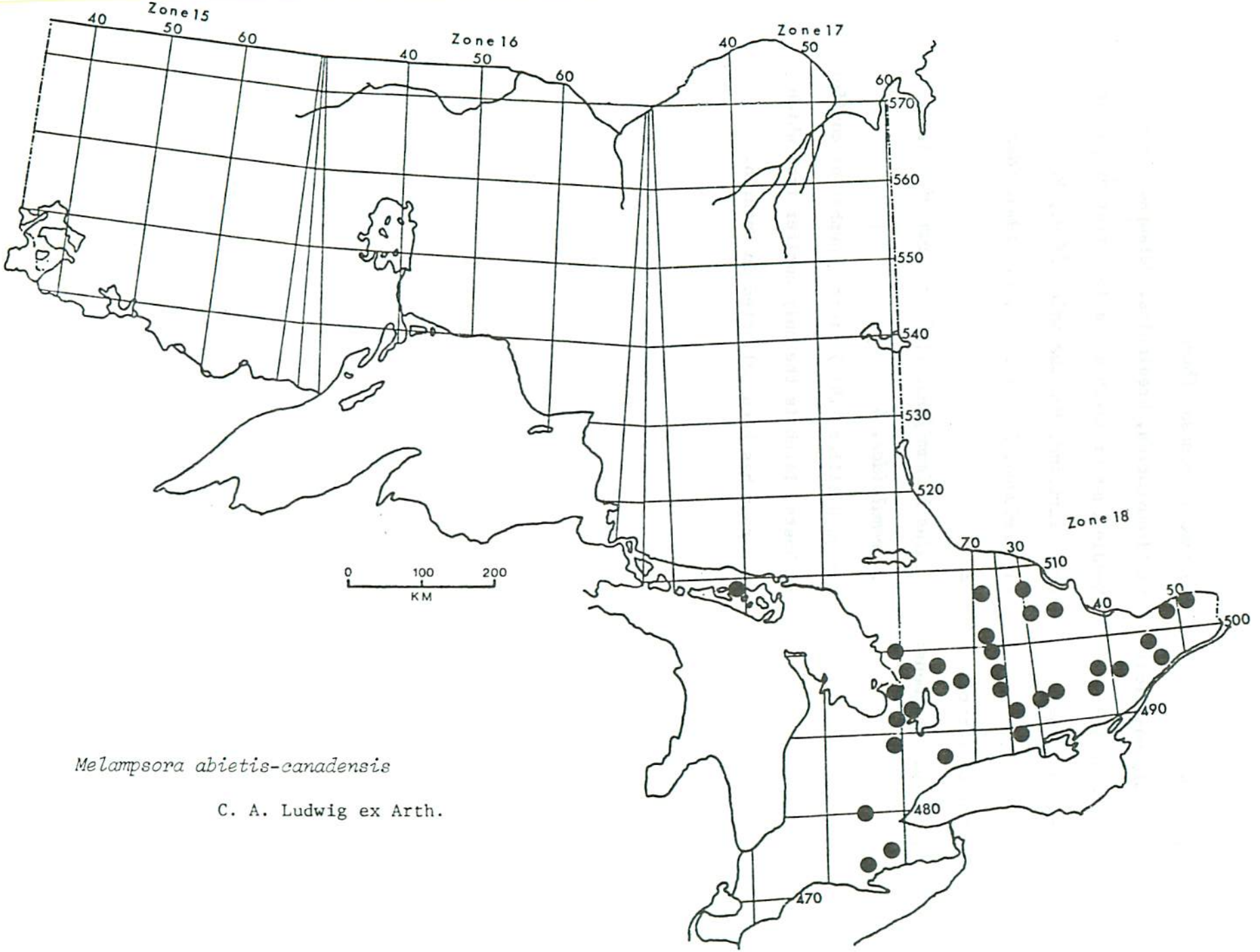
Lophodermium piceae (Fckl.) Hoehn.

Organism:	*Lophodermium pinastri* (Schrad. ex Hook.) Chev.
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Needle cast of pine
Hosts on record:	*Pinus banksiana*, *P. contorta*, *P. nigra*, *P. resinosa*, *P. strobus*, *P. sylvestris*
Number of records:	184
Herbarium specimens:	*Pinus banksiana*, 11; *P. nigra*, 1; *P. resinosa*, 8; *P. strobus*, 4
Remarks:	This fungus has occasionally caused heavy localized mortality in forestry nurseries in Ontario.



Lophodermium pinastri (Schrad. ex Hook.) Chev.

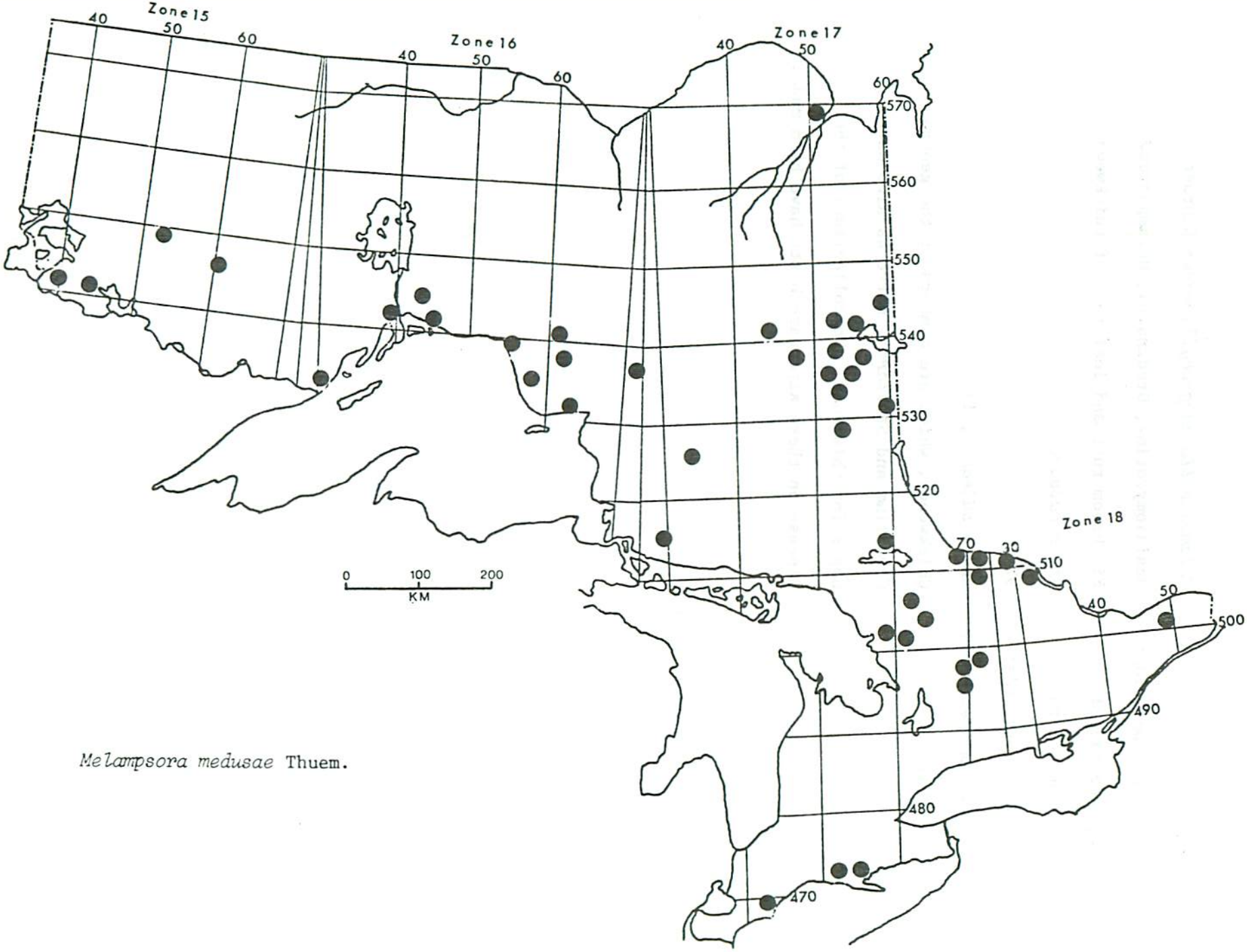
Organism:	*Melampsora abietis-canadensis* C. A. Ludwig ex Arth.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Twig and cone rust of hemlock and a leaf rust of poplar
Hosts on record:	*Populus grandidentata*, *P. tremuloides*, *Populus* sp., *Tsuga canadensis*, *Tsuga* sp.
Number of records:	57
Herbarium specimens:	*Populus grandidentata*, 2; *P. tremuloides*, 2; *Populus*, sp., 10; *Tsuga canadensis*, 14; *Tsuga* sp., 1
Remarks:	Collections of this fungus from hemlock usually consist of infected cones.



Melampsora abietis-canadensis

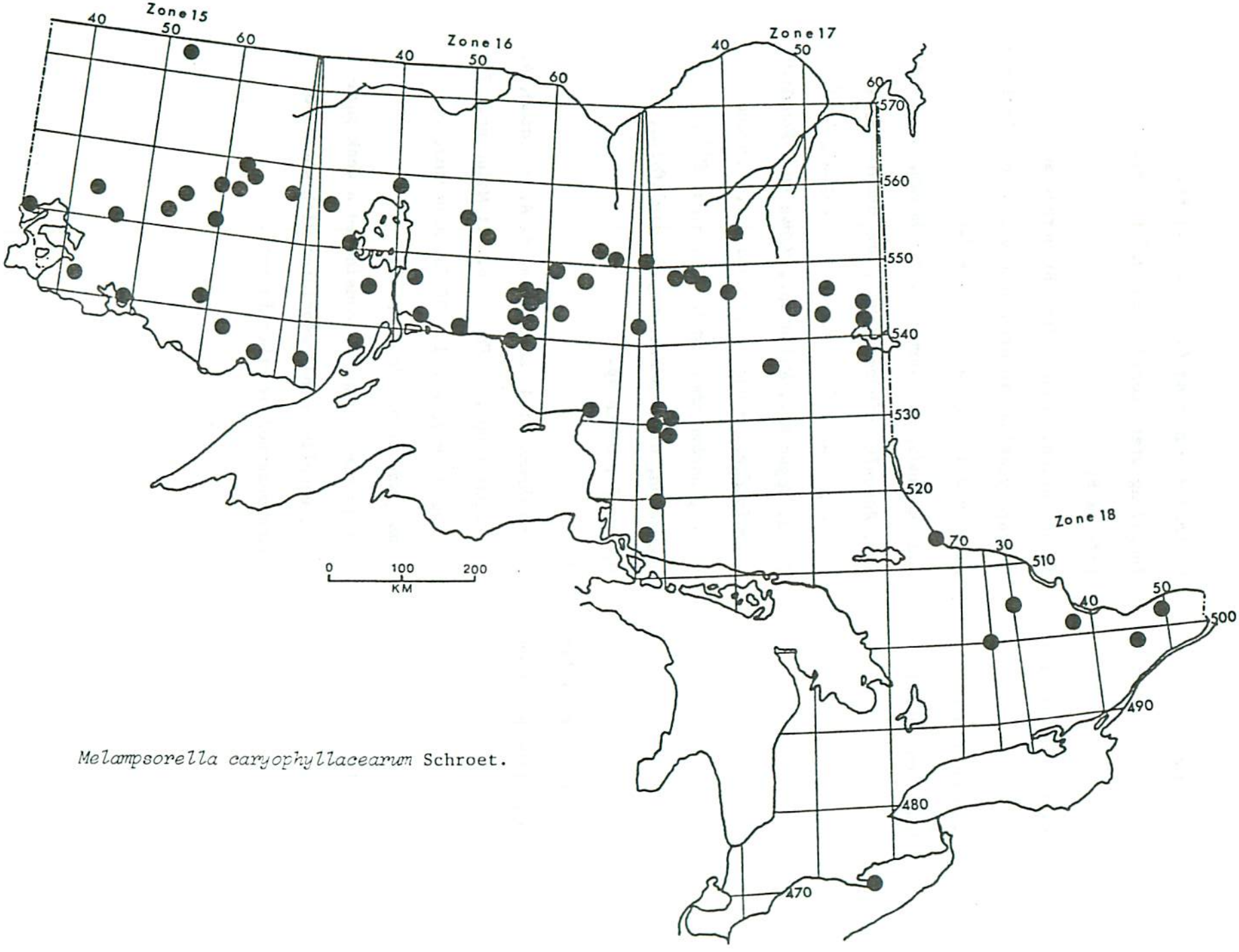
C. A. Ludwig ex Arth.

Organism:	*Melampsora medusae* Thuem.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Needle rust of larch and a leaf rust of poplar
Hosts on record:	*Larix laricina*, *Populus balsamifera*, *P.* x *euramericana*, *P. deltoides*, *P. tremuloides*
Number of records:	62
Herbarium specimens:	*Populus balsamifera*, 1; *P.* x *euramericana*, 2; *P. tremuloides*, 4
Remarks:	Although Ziller (1974) lists a number of conifers as hosts, larch is the only conifer from which this rust has been collected in Ontario.



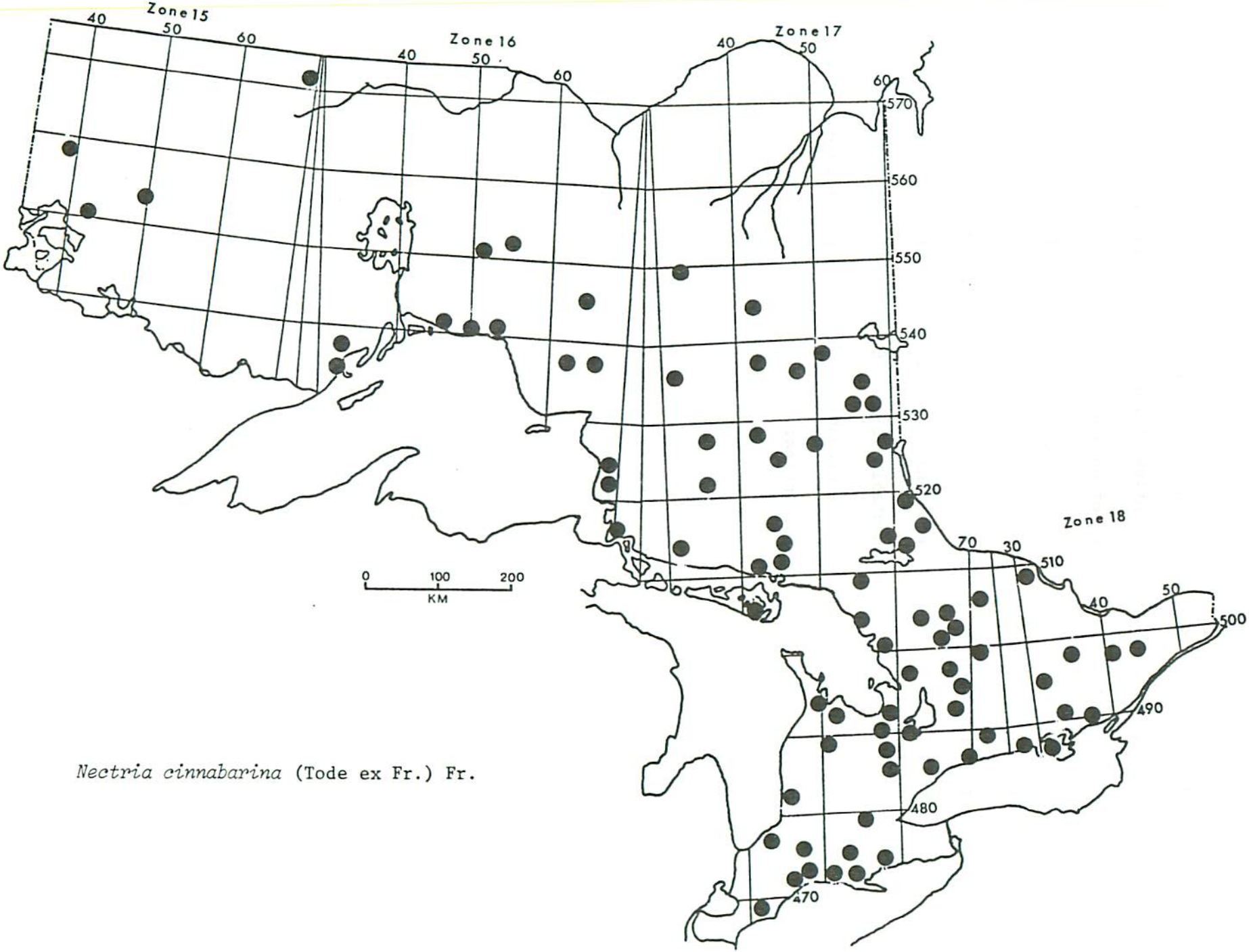
Melampsora medusae Thuem.

Organism:	*Melampsorella caryophyllacearum* Schroet.
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Fir broom rust and leaf rust of chickweed
Host on record:	*Abies balsamea*
Number of records:	92
Herbarium specimens:	*Abies balsamea*, 11
Remarks:	Chickweeds, which are members of the genera *Cerastium* and *Stellaria*, serve as alternate hosts for this rust. No collections of the disease on these alternate hosts have been made.



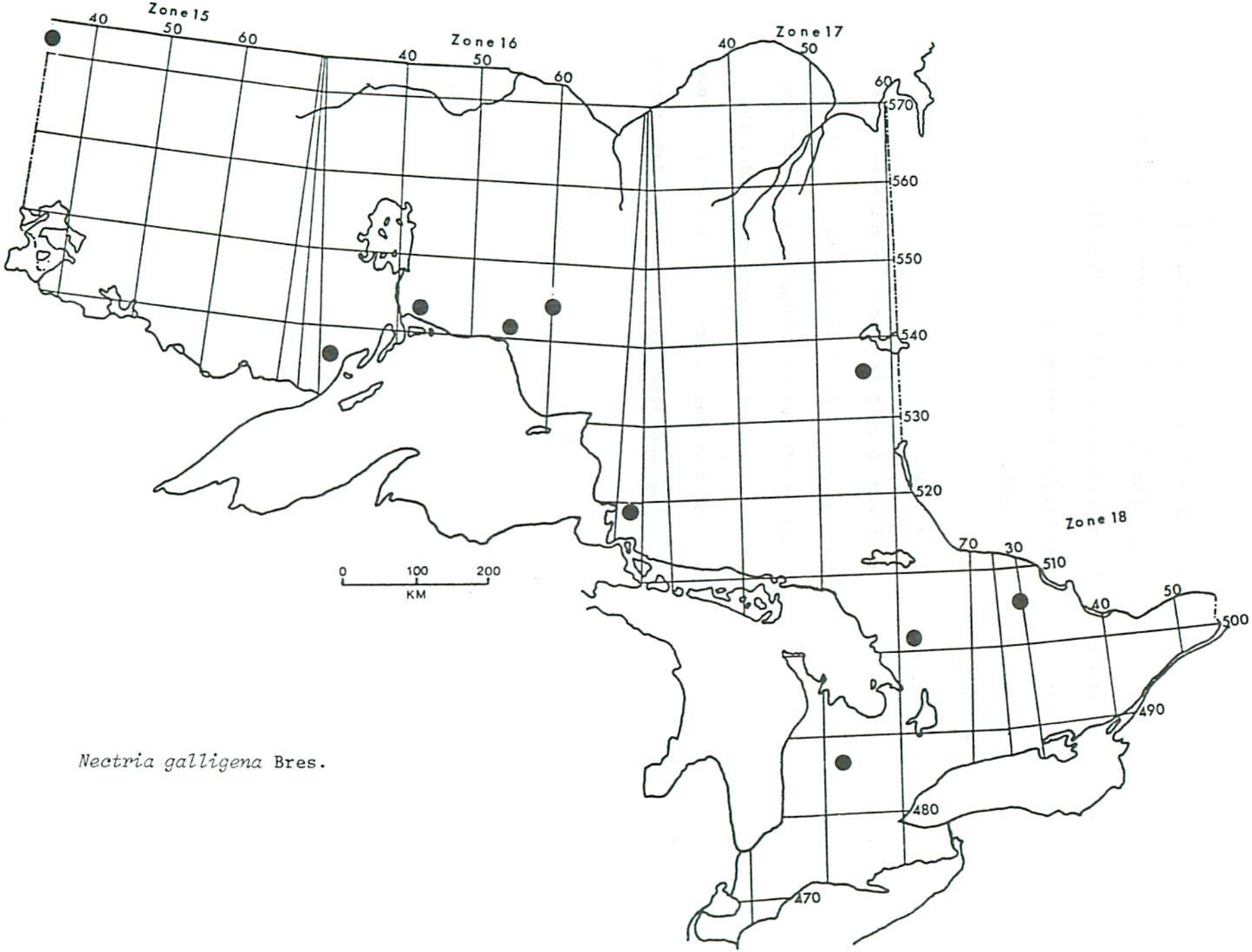
Melampsorella caryophyllacearum Schroet.

Organism:	*Nectria cinnabarina* (Tode ex Fr.) Fr. Including stat. conid. *Tubercularia vulgaris* Tode ex Fr.
Taxonomic position:	Ascomycotina, Sphaeriales, Hypocreaceae, Deuteromycotina, Tuberculariales, Tuberculariaceae
Disease caused:	Dieback and twig canker of hardwoods
Hosts on record:	*Acer negundo, A. rubrum, A. saccharum, A. spicatum, Aesculus hippocastanum, Amelanchier* sp., *Betula pendula, Cotoneaster* sp., *Fagus grandifolia, Fagus* sp., *Malus* sp., *Morus* sp., *Populus tremuloides, Prunus* sp., *Rosa* sp., *Sambucus pubens, Sorbus americana, S. decora, Tilia americana, Ulmus americana, U. parvifolia, U. pumila, Ulmus* sp.
Number of records:	33
Herbarium specimens:	*Acer rubrum*, 1; *A. saccharum*, 8; *A. spicatum*, 4; *Cotoneaster* sp., 1; *Fagus* sp., 1; *Malus* sp., 2; *Populus tremuloides* 1; *Tilia americana*, 2; *Ulmus pumila*, 5; *Ulmus* sp., 1
Remarks:	*Nectria cinnabarina* is considered a weak parasite, usually found associated with wounds or hosts weakened by other factors.



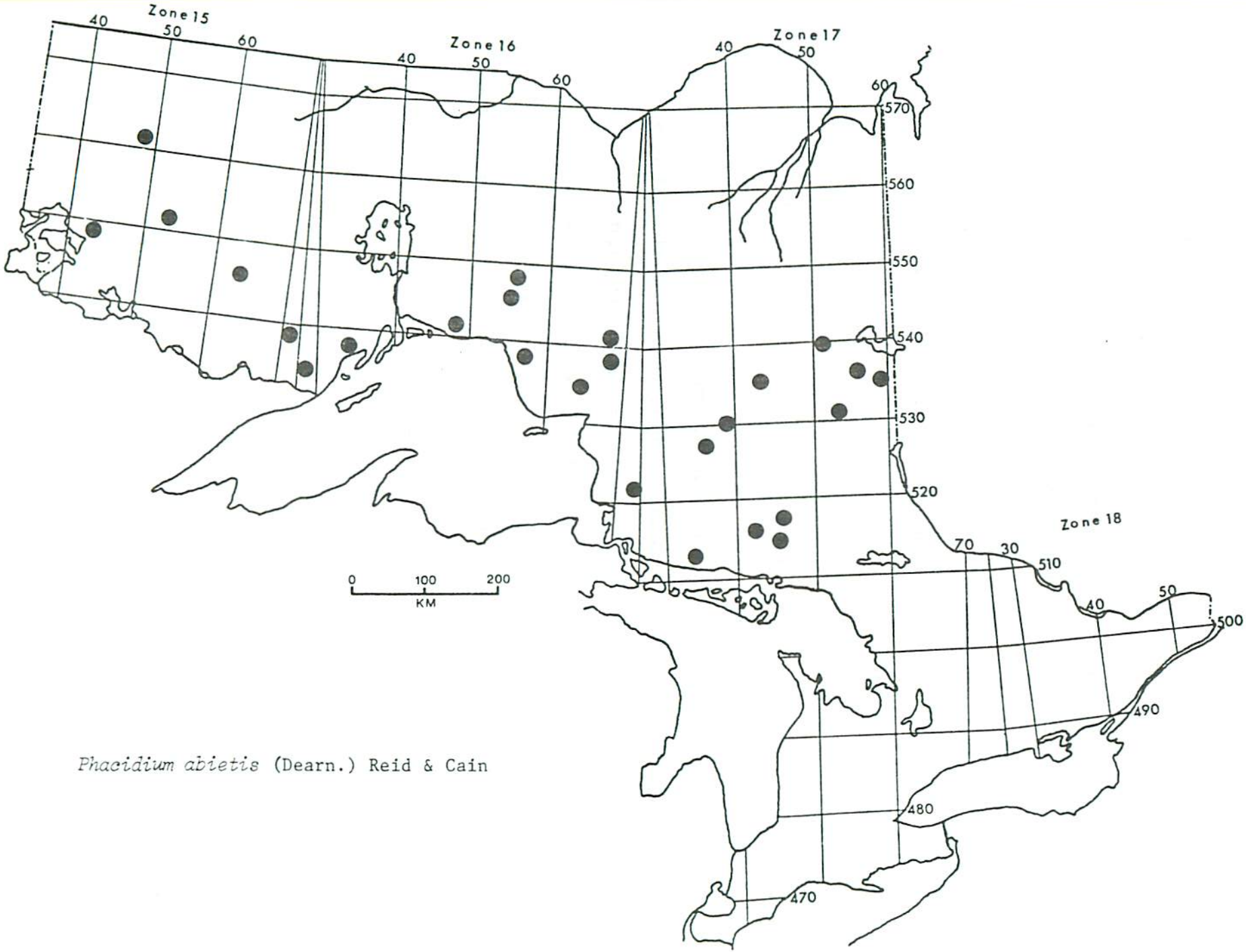
Nectria cinnabarina (Tode ex Fr.) Fr.

Organism:	*Nectria galligena* Bres.
Taxonomic position:	Ascomycotina, Sphaeriales, Hypocreaceae
Disease caused:	Canker of hardwoods
Hosts on record:	*Betula papyrifera*, *Acer* sp., *Alnus* sp.
Number of records:	11
Herbarium specimens:	*Betula papyrifera*, 4; *Acer* sp., 1; *Alnus* sp., 1
Remarks:	Nectria canker can significantly reduce the merchantable volume of infected hosts. The fungus is probably much more common than our records indicate.



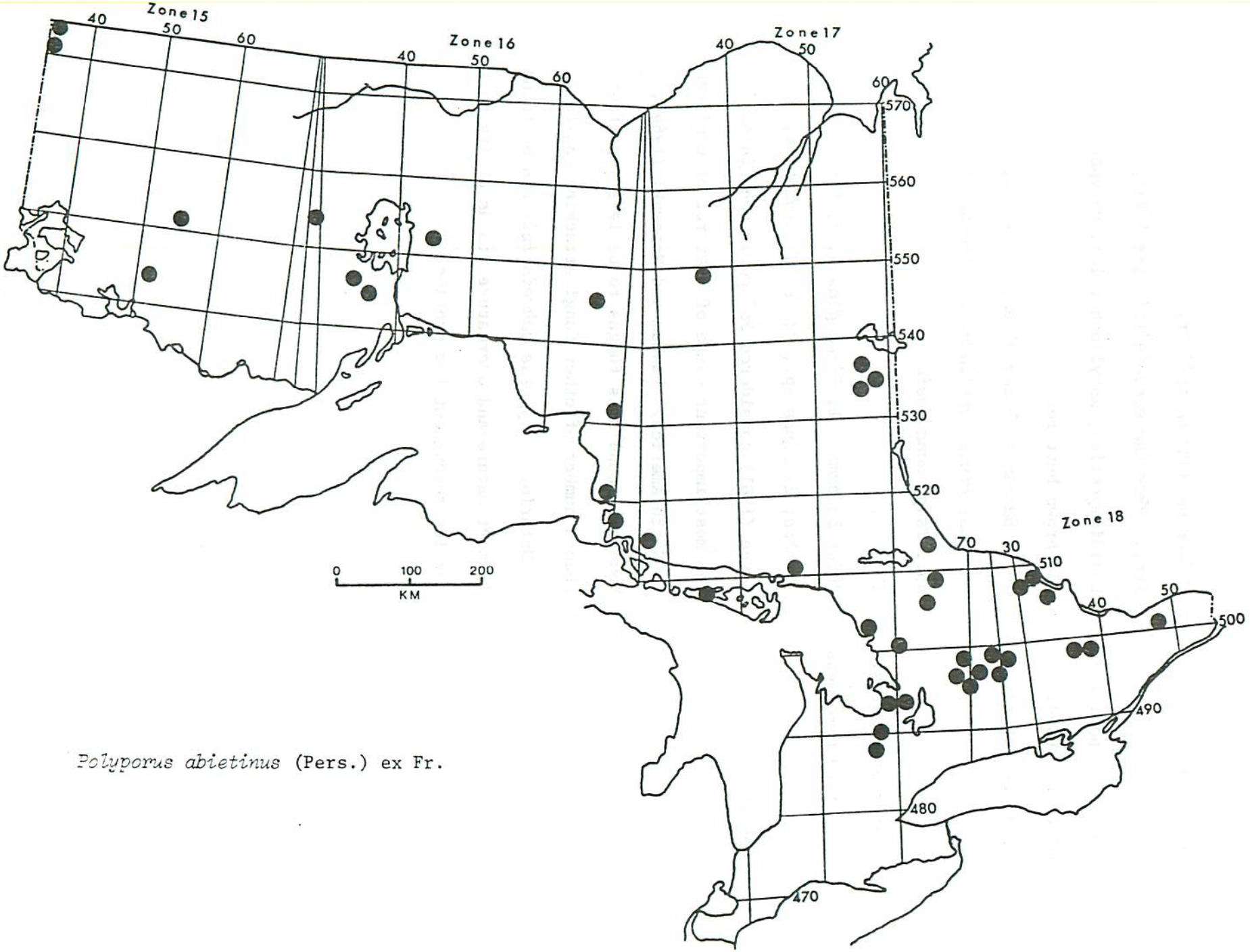
Nectria galligena Bres.

Organism:	*Phacidium abietis* (Dearn.) Reid & Cain
	Syn.: *Phacidium infestans* var. *abietis* Dearn.
Taxonomic position:	Ascomycotina, Phacidiales, Phadiciaceae
Disease caused:	Snow blight of balsam fir
Hosts on record:	*Abies balsamea*
Number of records:	33
Herbarium specimens:	*Abies balsamea*, 8
Remarks:	*Phacidium abietis* is common in northern Ontario and can cause significant damage to small trees. Damage is limited to foliage beneath the snow, so that trees which are completely under the snow line, or have only a small portion of the crown above the snow line, can be severely defoliated.



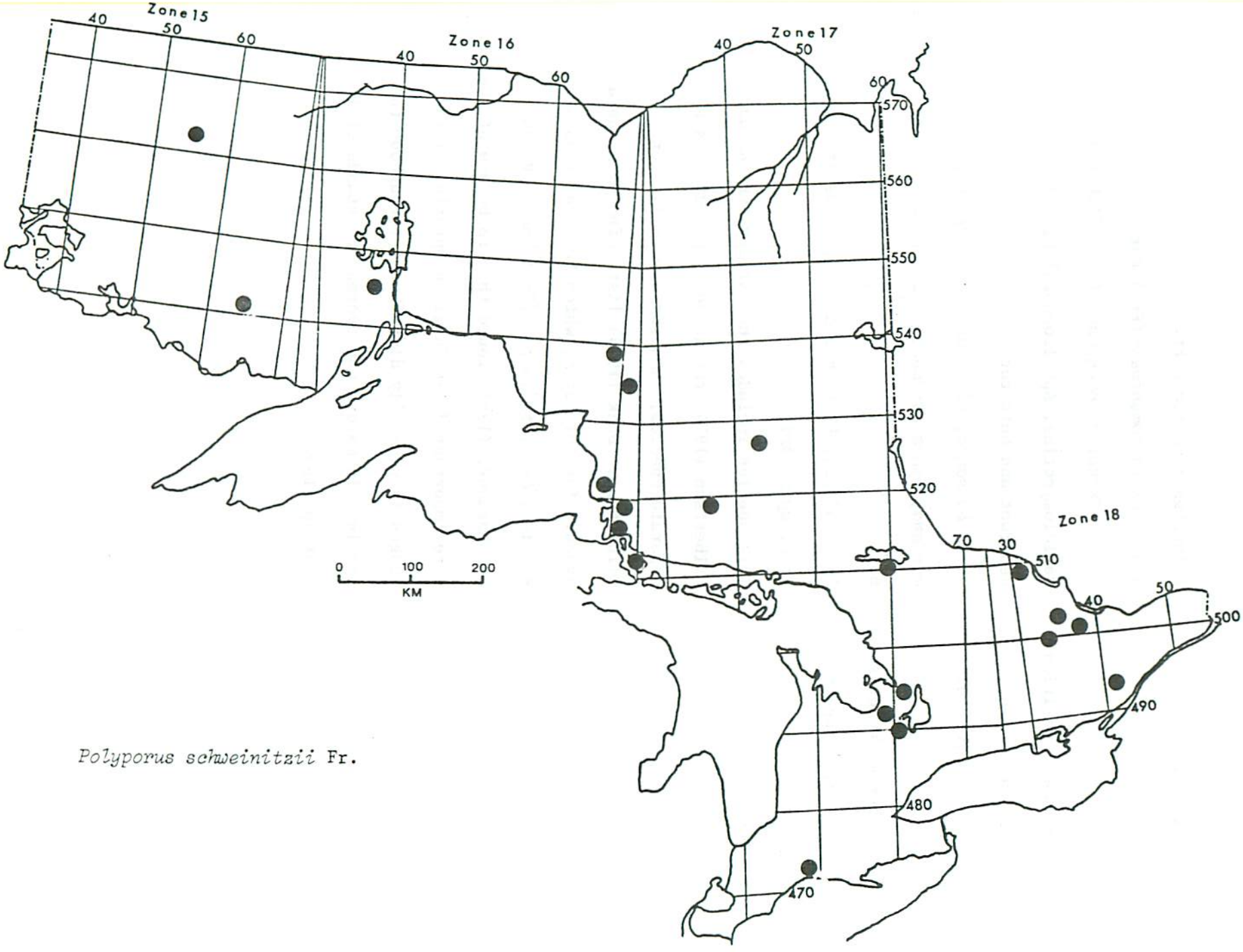
Phacidium abietis (Dearn.) Reid & Cain

Organism:	*Polyporus abietinus* (Pers.) ex Fr.
	Syn.: *Hirschioporus abietinus* (Pers. ex Fr.) Donk
Taxonomic position:	Basidiomycotina, Aphyllophorales, Polyporaceae
Disease caused:	Pitted sap rot
Hosts on record:	*Abies balsamea, Abies* sp., *Picea glauca, Picea* sp., *Pinus banksiana, P. resinosa, P. strobus, P. sylvestris, Tsuga canadensis, Tsuga* sp.
Number of records:	38
Herbarium specimens:	*Abies balsamea*, 14; *Abies* sp., 1; *Picea glauca*, 1; *P. mariana*, 3; *Picea* sp., 1; *Pinus banksiana*, 1; *P. resinosa*, 1; *P. strobus*, 3; *Tsuga canadensis*, 1; *Tsuga* sp., 1
Remarks:	A common cause of decay on dead coniferous timber and slash throughout Ontario, *P. abietinus* is the most important wood decay fungus involved in the deterioration of balsam fir killed by the spruce budworm (Basham 1951).



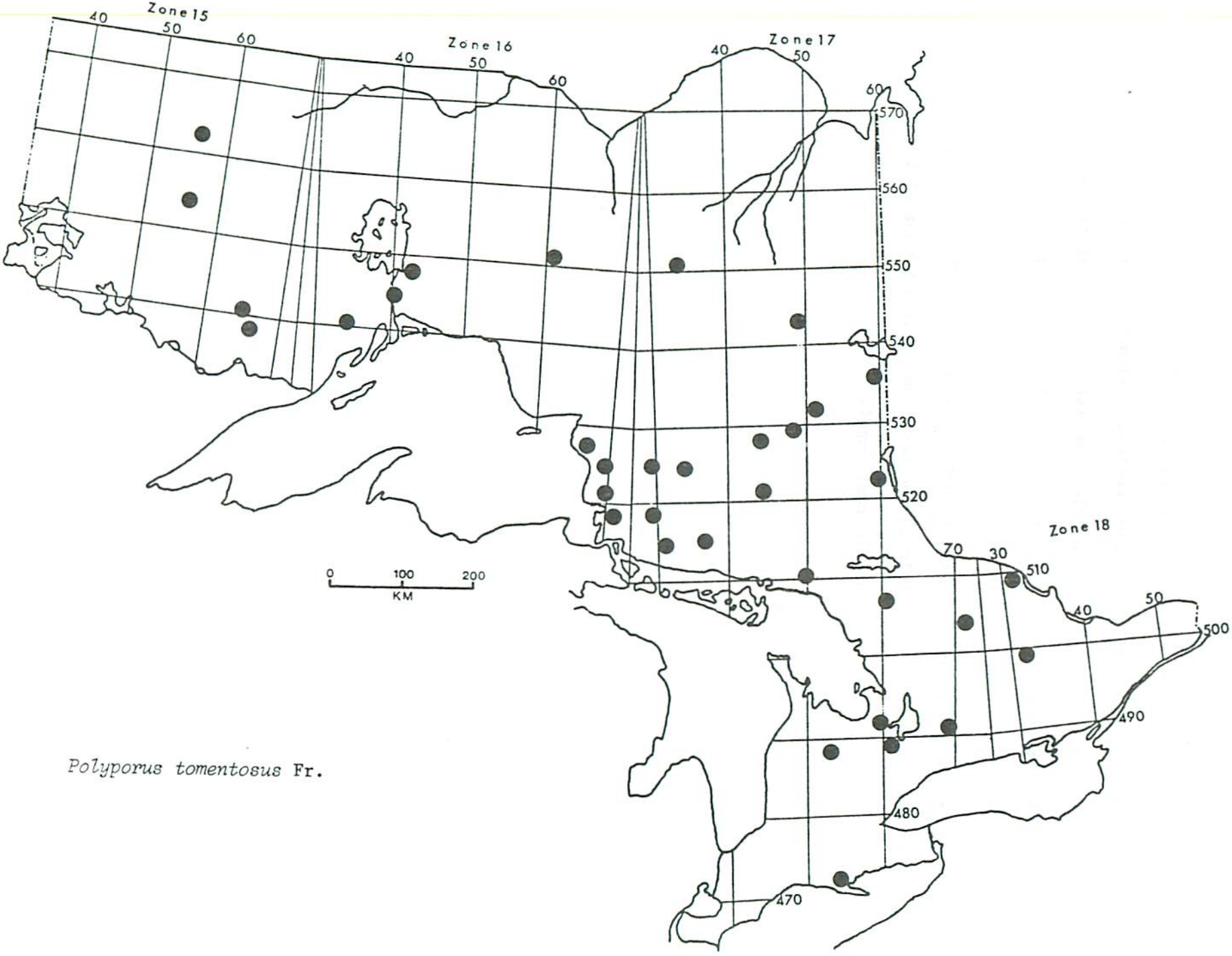
Polyporus abietinus (Pers.) ex Fr.

Organism:	*Polyporus schweinitzii* Fr.
	Syn.: *Phaeolus schweinitzii* (Fr.) Pat.
Taxonomic position:	Basidiomycotina, Aphyllophorales, Polyporaceae
Disease caused:	Red-brown butt rot
Hosts on record:	*Abies balsamea, Picea abies, P. glauca, P. mariana, Pinus banksiana, P. strobus, Pinus* sp., *Tsuga canadensis*
Number of records:	29
Herbarium specimens:	*Abies balsamea*, 1; *Picea glauca*, 5; *Pinus strobus*, 2; *Pinus* sp., 2; *Tsuga canadensis*, 1
Remarks:	Boyce (1961) considered *Polyporus schweinitzii* the most important cause of butt rot of conifers in North America. Basham and Morawski (1964), however, found this fungus to be less important than a number of other fungi attacking conifers in Ontario. *Polyporus schweinitzii* can be found in most mature and overmature stands of its host species throughout the province.



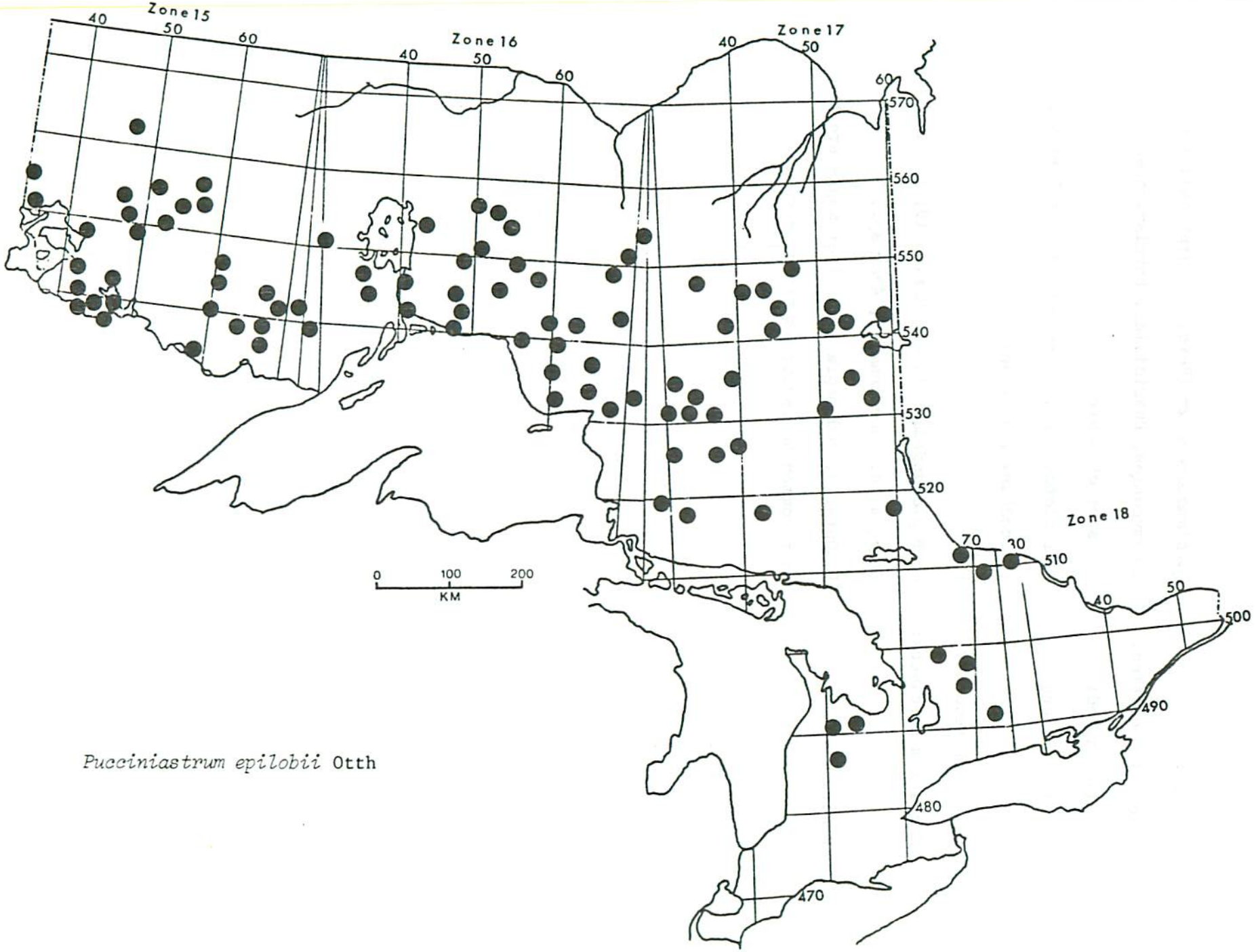
Polyporus schweinitzii Fr.

Organism:	*Polyporus tomentosus* Fr. Syn.: *Onnia tomentosa* (Fr.) Karst. *Inonotus tomentosus* (Fr.) Gilbertson
Taxonomic position:	Basidiomycotina, Aphyllophorales, Polyporaceae
Disease caused:	Red root and butt rot
Hosts on record:	*Abies balsamea, Picea abies, P. glauca, P. mariana, Pinus strobus, P. sylvestris*
Number of records:	65
Herbarium specimens:	*Picea glauca*, 6; *P. mariana*, 3; *Pinus strobus*, 1; *P. sylvestris*, 1
Remarks:	This species includes the variety *circinatus*. Gilbertson (1974) recognizes *circinatus* as a separate species, *Inonotus circinatus* (Fr.) Gilbertson. Donk (1974) lists *circinatus* as a synonym for *triqueter*, which he regards as a species, *Onnia triqueter* (Fr.) Imaz. Basham and Morawski (1964) found this to be one of the more important decay fungi in Ontario. This fungus is generally distributed throughout the province in mature and overmature stands of its host species.



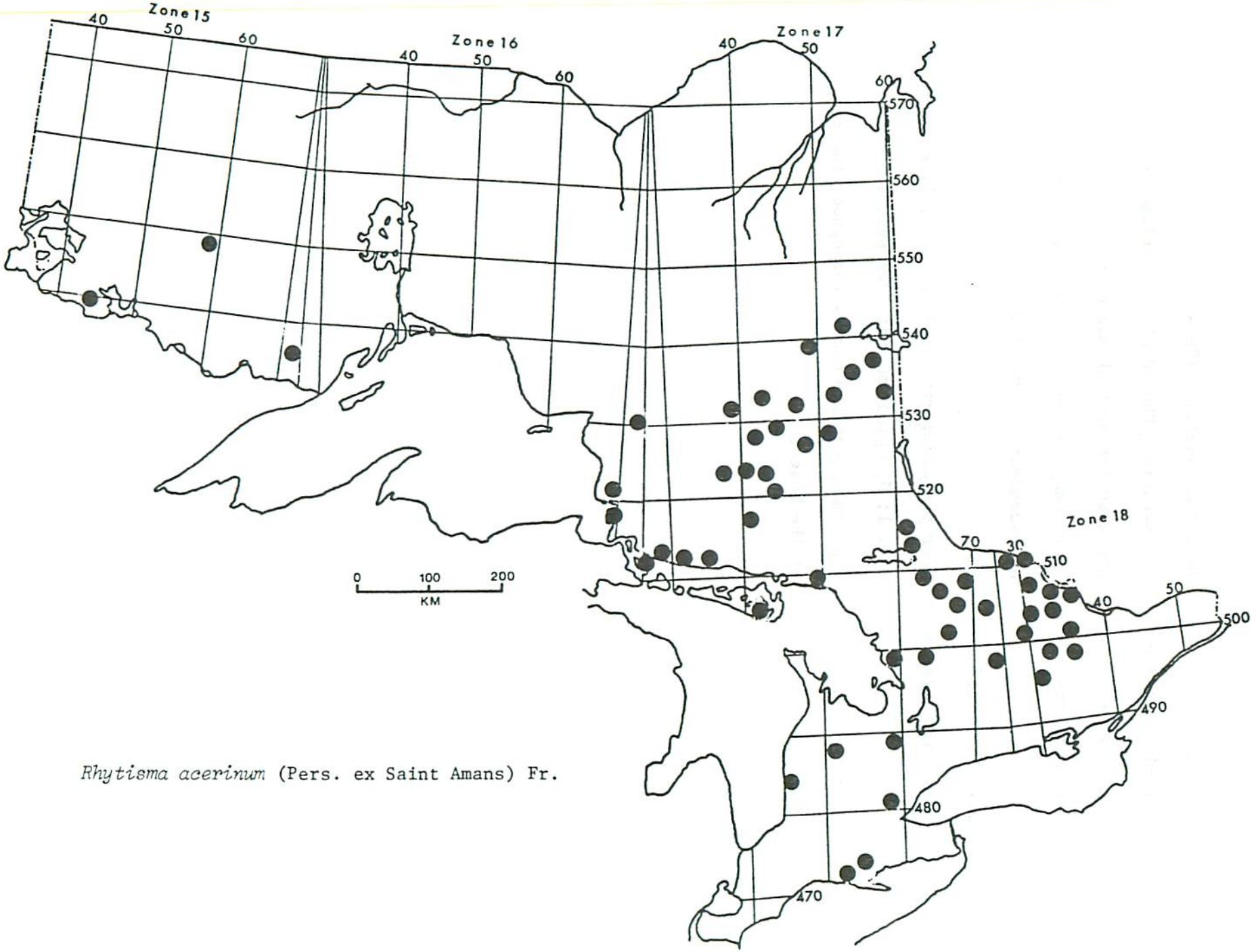
Polyporus tomentosus Fr.

Organism:	*Pucciniastrum epilobii* Otth
Taxonomic position:	Basidiomycotina, Uredinales, Melampsoraceae
Disease caused:	Fir needle rust and leaf rust of fireweed
Hosts on record:	*Abies balsamea*, *Epilobium angustifolium*
Number of records:	162
Herbarium specimens:	*Abies balsamea*, 7; *Epilobium angustifolium*, 1
Remarks:	This is the most common of a number of fir needle rust fungi.



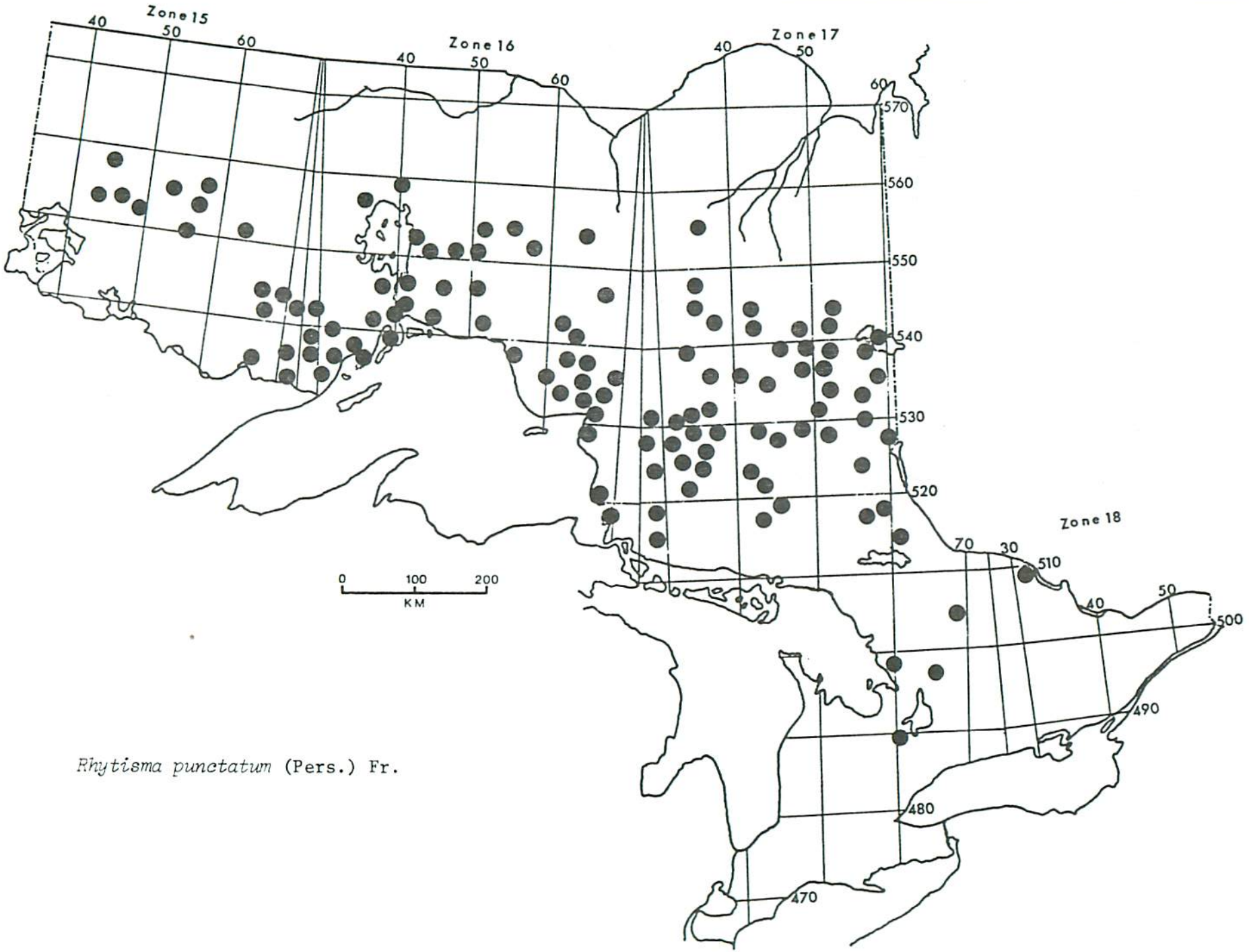
Pucciniastrum epilobii Otth

Organism:	*Rhytisma acerinum* (Pers. ex Saint Amans) Fr.
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Tar spot of maple
Hosts on record:	*Acer platanoides*, *A. rubrum*, *A. saccharinum*, *A. saccharum*, *Acer* sp.
Number of records:	114
Herbarium specimens:	*Acer platanoides*, 1; *A. rubrum*, 19; *A. saccharinum*, 4; *A. saccharum*, 1; *Acer* sp., 1
Remarks:	In Ontario, red maple and silver maple are the most common hosts for *Rhytisma acerinum*.



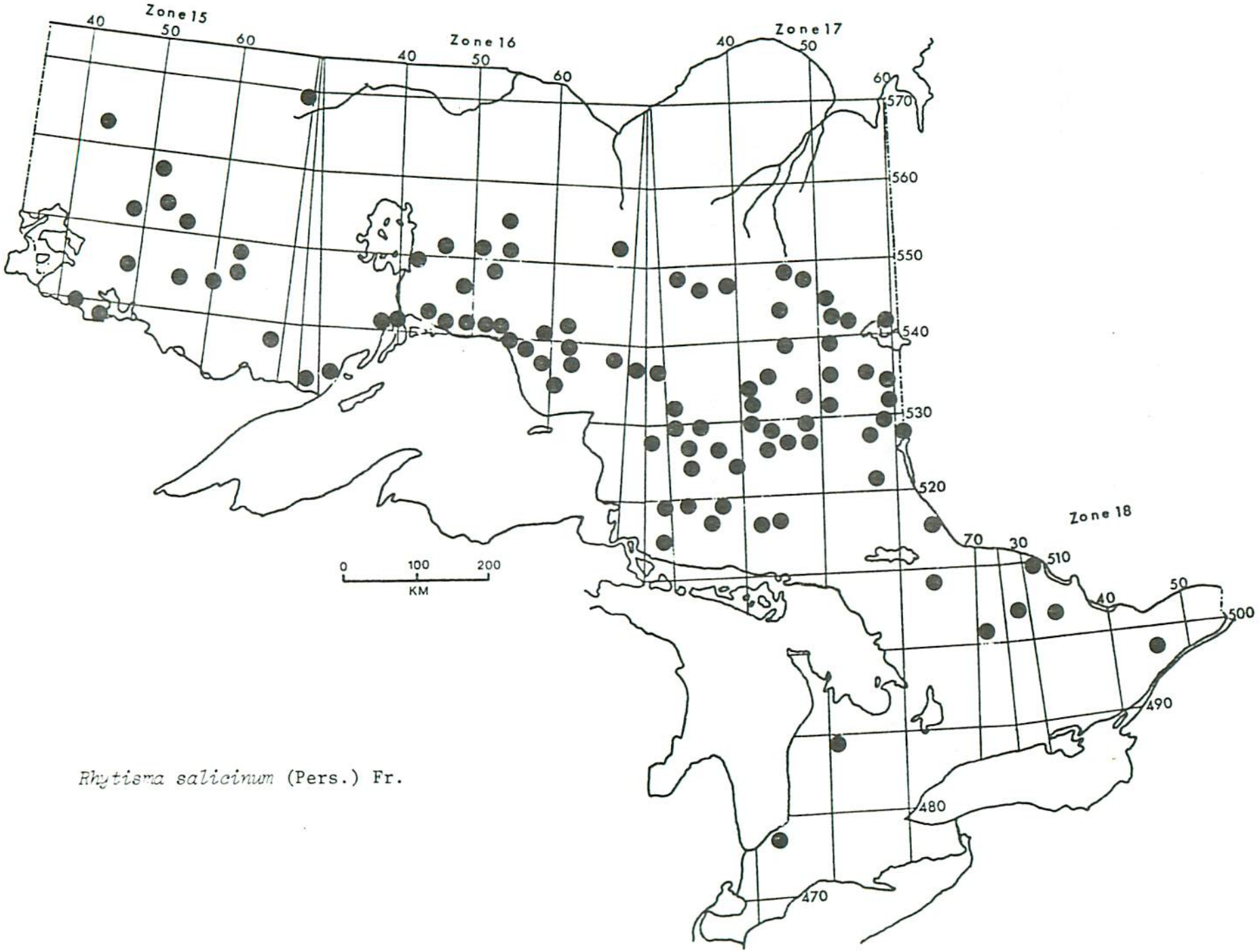
Rhytisma acerinum (Pers. ex Saint Amans) Fr.

Organism:	*Rhytisma punctatum* (Pers.) Fr.
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Speckled tar spot of maple
Hosts on record:	*Acer pensylvanicum*, *A. negundo*, *A. rubrum*, *A. saccharum*, *A. spicatum*
Number of records:	224
Herbarium specimens:	*Acer pensylvanicum*, 4; *A. negundo*, 5; *A. saccharum*, 1; *A. spicatum*, 43; *Acer* sp., 1
Remarks:	*Rhytisma punctatum* occurs throughout the range of the hosts.



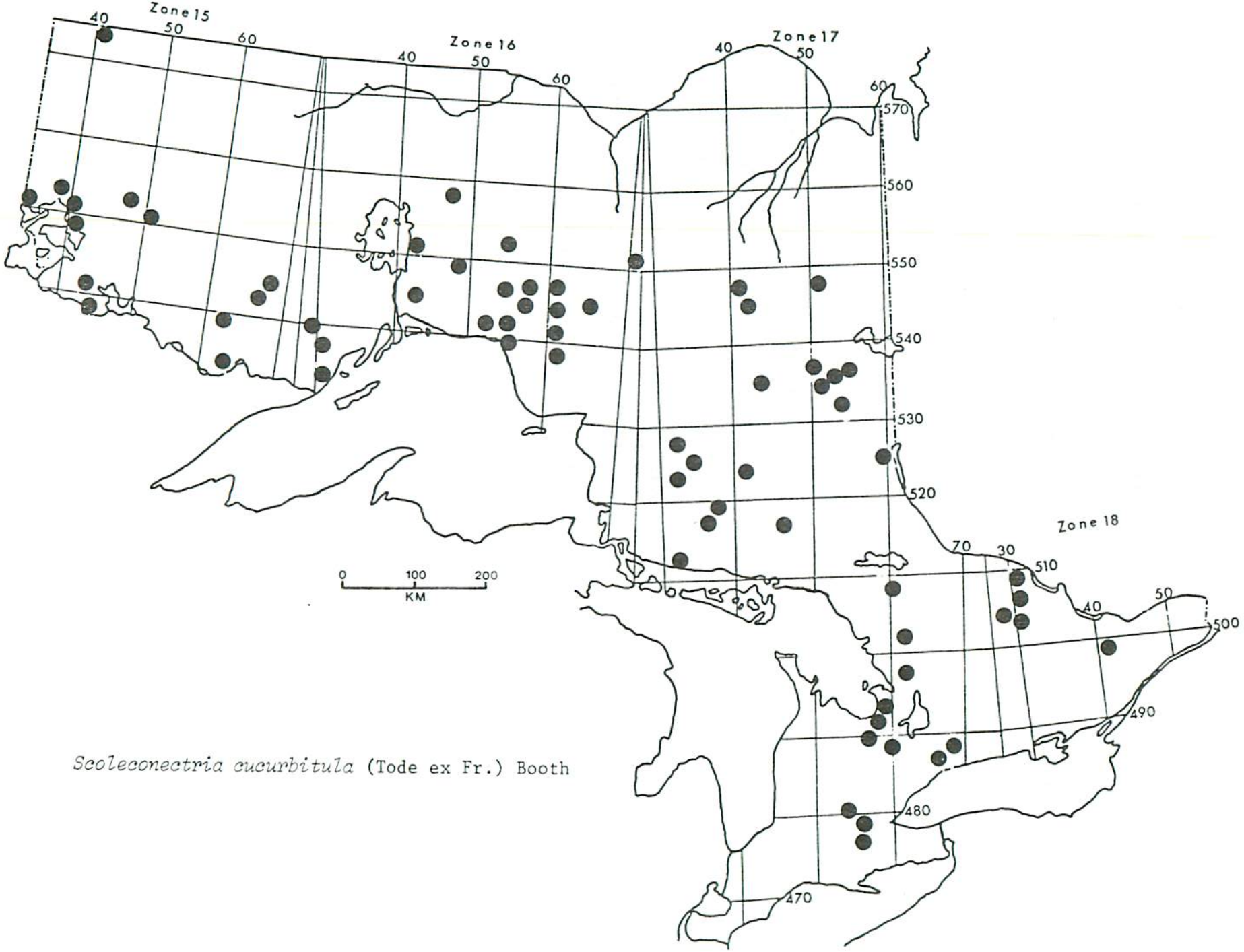
Rhytisma punctatum (Pers.) Fr.

Organism:	*Rhytisma salicinum* (Pers.) Fr.
Taxonomic position:	Ascomycotina, Phacidiales, Rhytismataceae
Disease caused:	Tar spot of willow
Hosts on record:	*Salix* sp.
Number of records:	193
Herbarium specimens	*Salix* sp., 20
Remarks:	This fungus occurs throughout the range of the hosts.



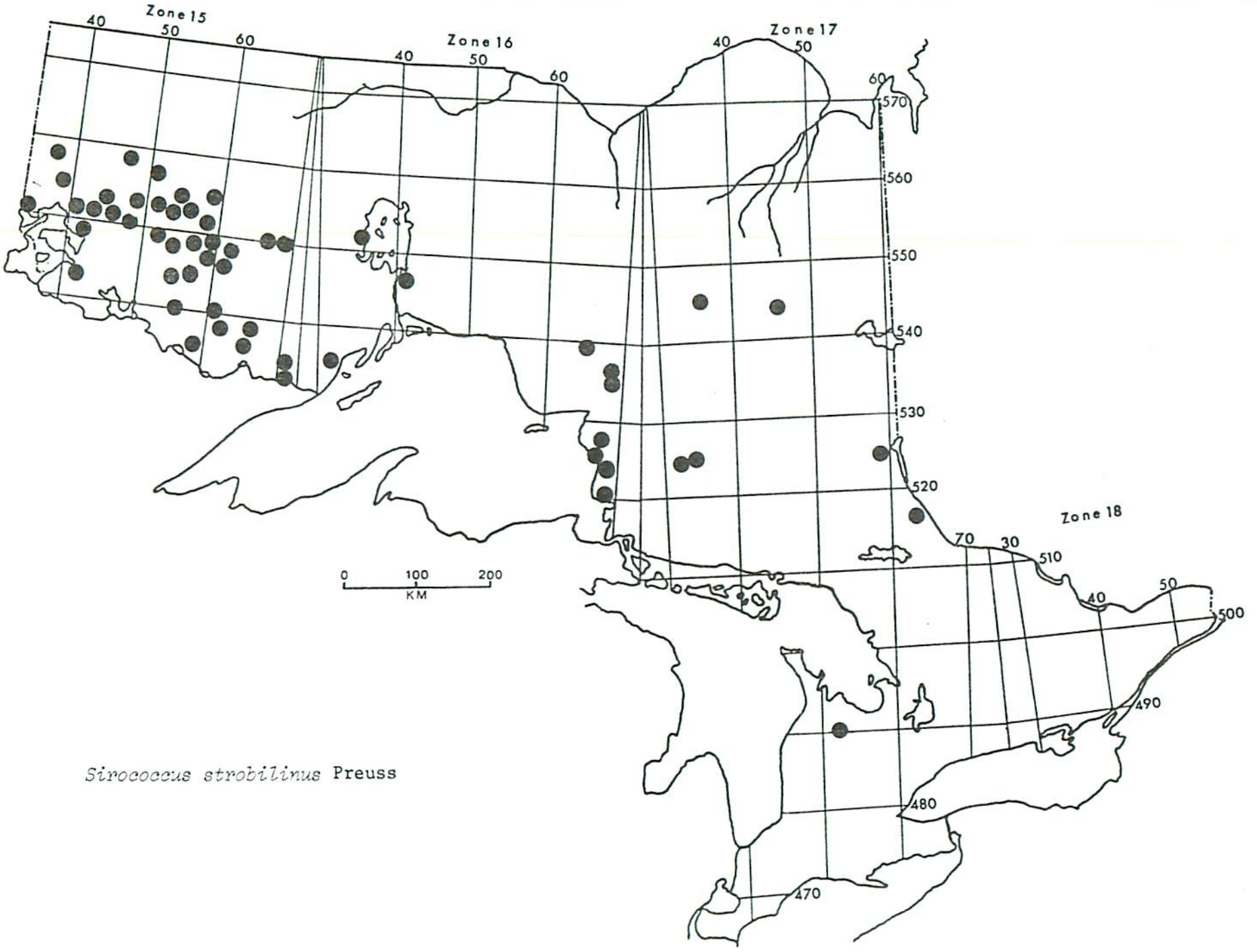
Rhytisma salicinum (Pers.) Fr.

Organism:	*Scoleconectria cucurbitula* (Tode ex Fr.) Booth
Taxonomic position:	Ascomycotina, Sphaeriales, Hypocreaceae
Disease caused:	Associated with dieback of conifers
Hosts on record:	*Abies balsamea*, *Larix decidua*, *Pinus banksiana*, *P. contorta* var. *latifolia*, *P. resinosa*, *P. strobus*, *P. sylvestris*
Number of records:	146
Herbarium specimens:	*Abies balsamea*, 1; *Larix decidua*, 1; *Pinus banksiana*, 7; *P. resinosa*, 3; *P. strobus*, 16; *P. sylvestris*, 1
Remarks:	This fungus occurs quite commonly on pine branches killed by *Gremmeniella abietina*.



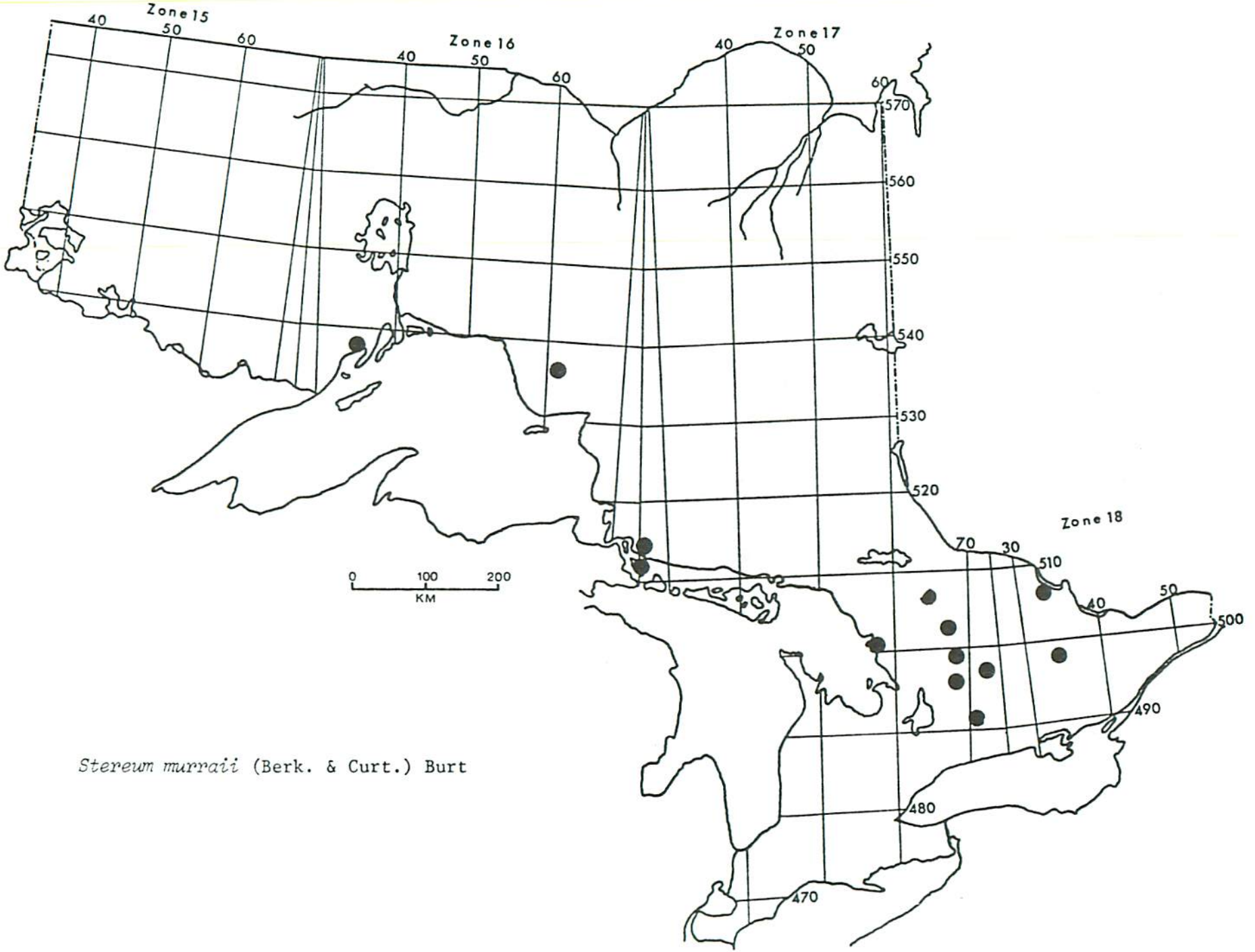
Scoleconectria cucurbitula (Tode ex Fr.) Booth

Organism:	*Sirococcus strobilinus* Preuss
	Syn.: *Ascochyta parasitica* (Hart.) Rostr.
	Ascochyta piniperda Lindau
Taxonomic position:	Deuteromycotina, Sphaeropsidales, Sphaerioidaceae
Disease caused:	Shoot blight
Hosts on record:	*Picea pungens, Pinus banksiana, P. resinosa, P. strobus*
Number of records:	62
Herbarium specimens:	*Picea pungens*, 3; *Pinus resinosa*, 6; *P. strobus*, 1
Remarks:	The first collection of this fungus in Ontario was made in 1973. *Sirococcus strobilinus* has caused defoliation and mortality in young red pine growing under a red pine overstory. The fungus has also caused shoot blight of jack pine seedlings in a forestry nursery in Ontario.



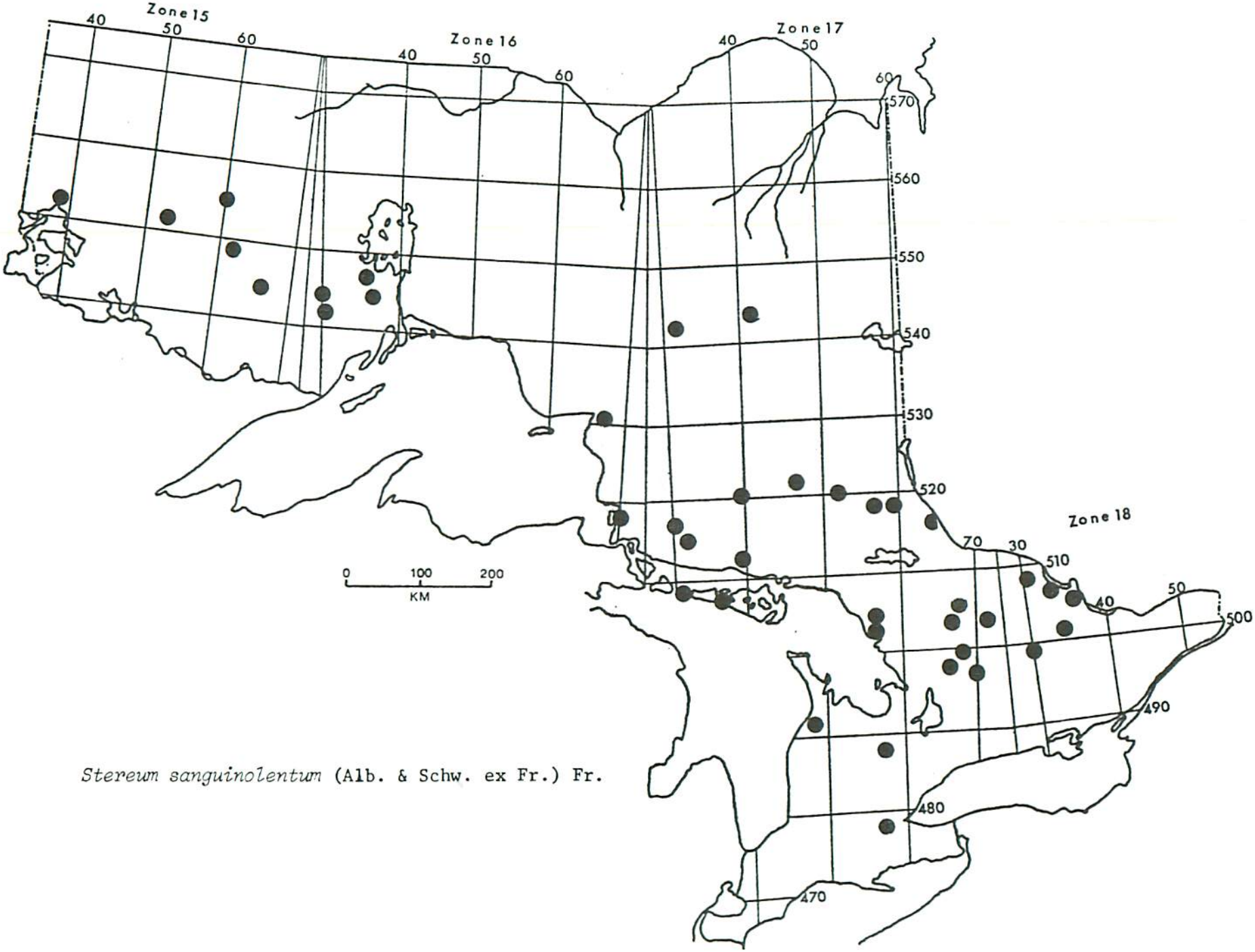
Sirococcus strobilinus Preuss

Organism:	*Stereum murraii* (Berk. & Curt.) Burt
	Syn.: *Cystostereum murraii* (Berk. & Curt.) Pouz.
Taxonomic position:	Basidiomycotina, Aphyllophorales, Stereaceae
Disease caused:	Heart rot of hardwoods
Hosts on record:	*Acer negundo*, *A. saccharum*, *Betula alleghaniensis*, *B. papyifera*, *Betula* sp., *Populus tremuloides*
Number of records:	21
Herbarium specimens:	*Acer negundo*, 1; *A. saccharum*, 3; *Betula alleghaniensis*, 4; *B. papyrifera*, 11; *Betula* sp., 1; *Populus tremuloides*, 1
Remarks:	In Ontario, *Stereum murraii* has been found responsible for one-third of the volume loss due to heartwood defect in yellow birch (Basham and Morawski 1964), and is widely distributed within the province. It is found infrequently as a cause of decay in conifers (ibid.).



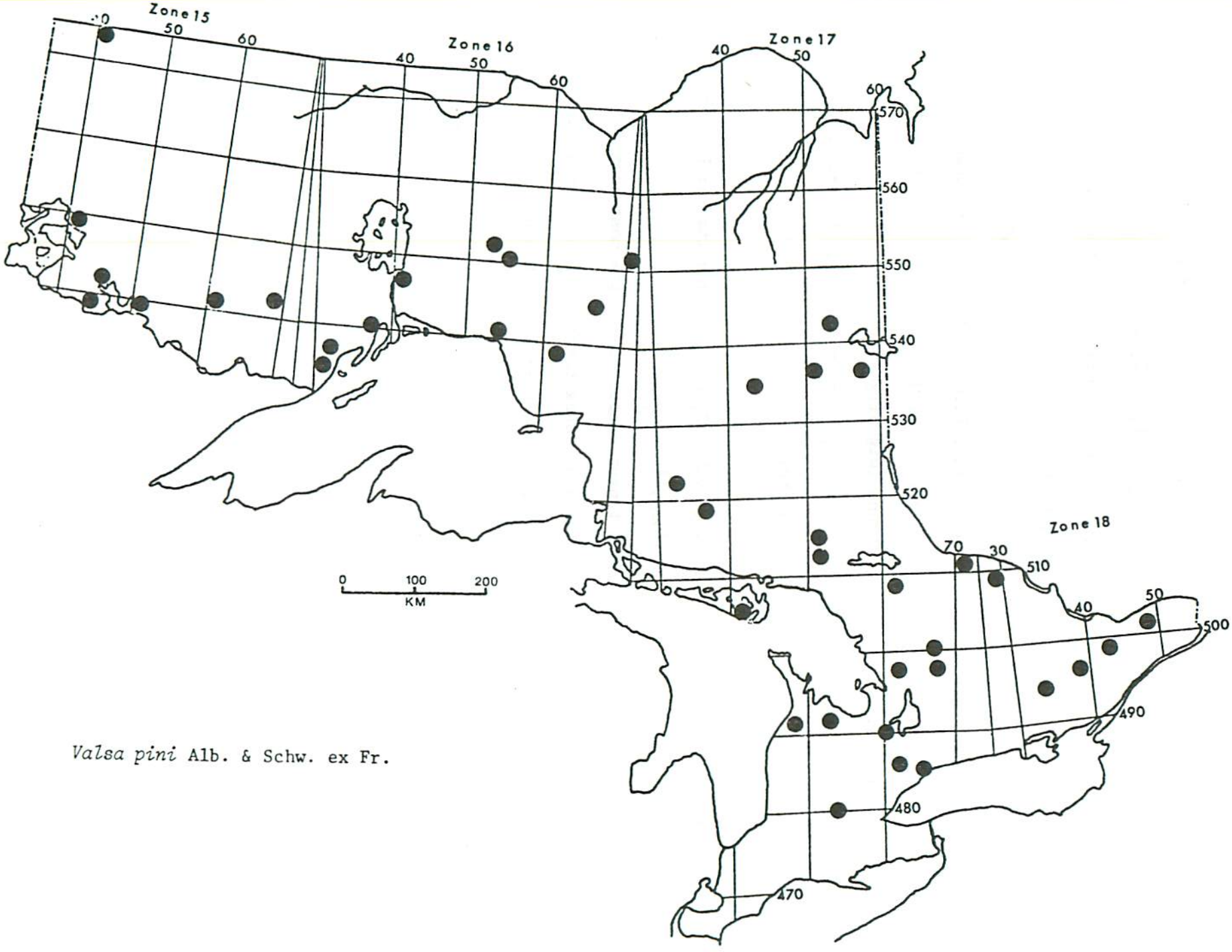
Stereum murraii (Berk. & Curt.) Burt

Organism:	*Stereum sanguinolentum* (Alb. & Schw. ex Fr.) Fr.
Taxonomic position:	Basidiomycotina, Aphyllophorales, Stereaceae
Disease caused:	Red heart rot
Hosts on record:	*Abies balsamea*, *Picea glauca*, *P. mariana*, *Picea* sp., *Pinus resinosa*, *P. strobus*, *Pinus* sp., *Tsuga canadensis*
Number of records:	45
Herbarium specimens:	*Abies balsamea*, 8; *Picea glauca*, 5; *P. mariana*, 4; *Picea* sp., 1; *Pinus resinosa*, 2; *P. strobus*, 3; *Pinus* sp., 1; *Tsuga canadensis*, 5
Remarks:	Basham and Morawski (1964) found *Stereum sanguinolentum* to be the most important cause of decay in balsam fir and hemlock in Ontario. It was also found to be a significant cause of decay in black spruce. It is generally present throughout the province in mature and overmature stands of its host species.



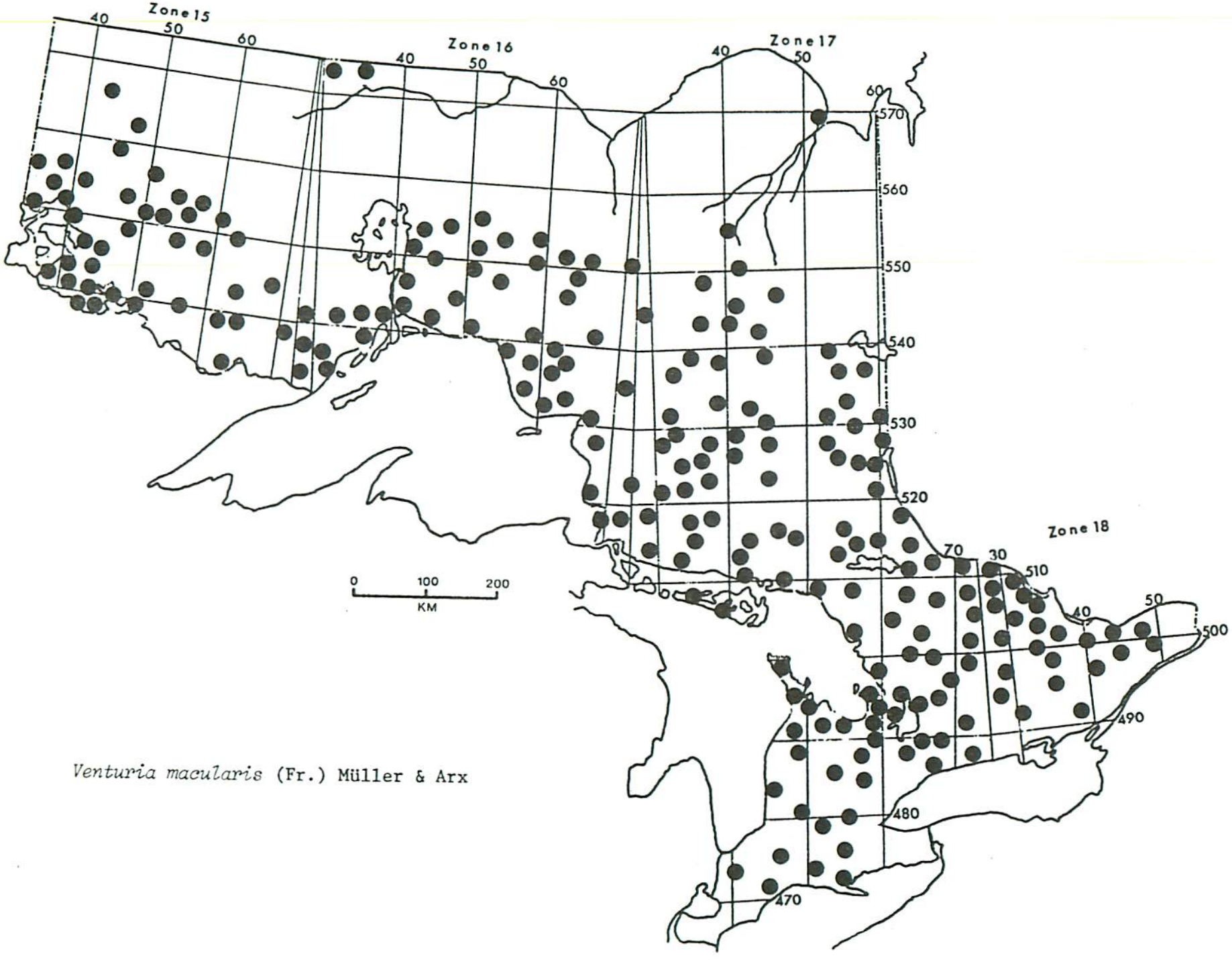
Stereum sanguinolentum (Alb. & Schw. ex Fr.) Fr.

Organism:	*Valsa pini* Alb. & Schw. ex Fr. Including stat. conid. *Cytospora pini* Desm.
Taxonomic position:	Ascomycotina, Sphaeriales, Diaporthaceae, Deuteromycotina, Sphaeropsidales, Sphaerioidaceae
Disease caused:	Dieback and cankers on conifers
Hosts on record:	*Abies balsamea, Pinus banksiana, P. resinosa, P. strobus, P. sylvestris, Pinus* sp.
Number of records:	52
Herbarium specimens:	*Pinus banksiana*, 1; *P. resinosa*, 2; *P. strobus*, 2; *P. sylvestris*, 1
Remarks:	This fungus is commonly associated with dead and dying material.



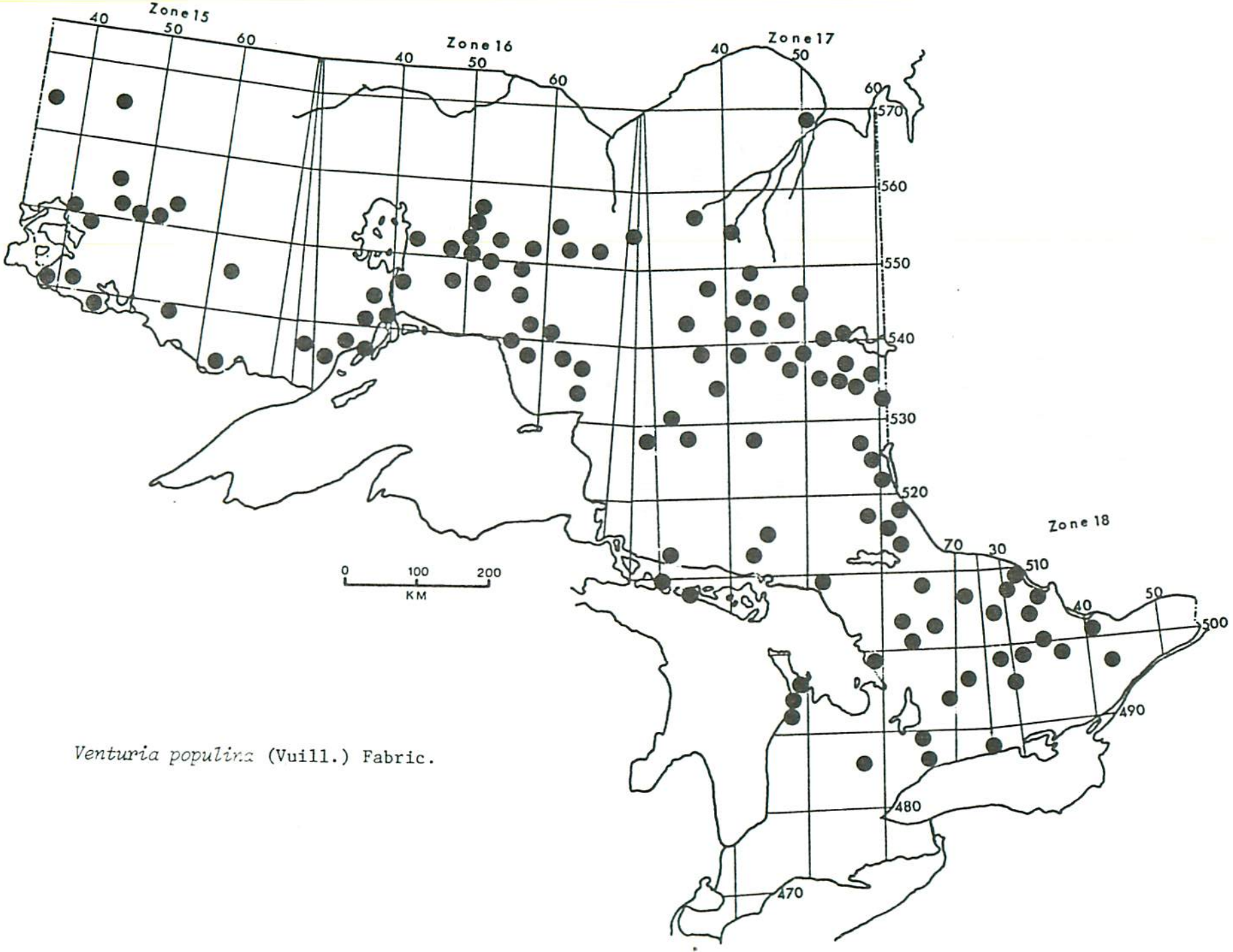
Valsa pini Alb. & Schw. ex Fr.

Organism:	*Venturia macularis* (Fr.) Müller & Arx Syn.: *Venturia tremulae* Aderh. Including stat. conid. *Pollaccia radiosa* (Lib.) Bald. & Cif. Syn.: *Fusicladium tremulae* Frank
Taxonomic position:	Ascomycotina, Pleosporales, Venturiaceae, Deuteromycotina, Hyphomycetales, Dematiaceae
Disease caused:	Leaf and twig blight of aspen
Hosts on record:	*Populus alba, P. grandidentata, P. tremuloides, Populus* sp.
Number of records:	763
Herbarium specimens:	*Populus alba*, 2; *P. grandidentata*, 6; *P. tremuloides*, 48; *Populus* sp., 4
Remarks:	This fungus causes one of the most common diseases of young trembling aspen and occurs throughout the range of its hosts.



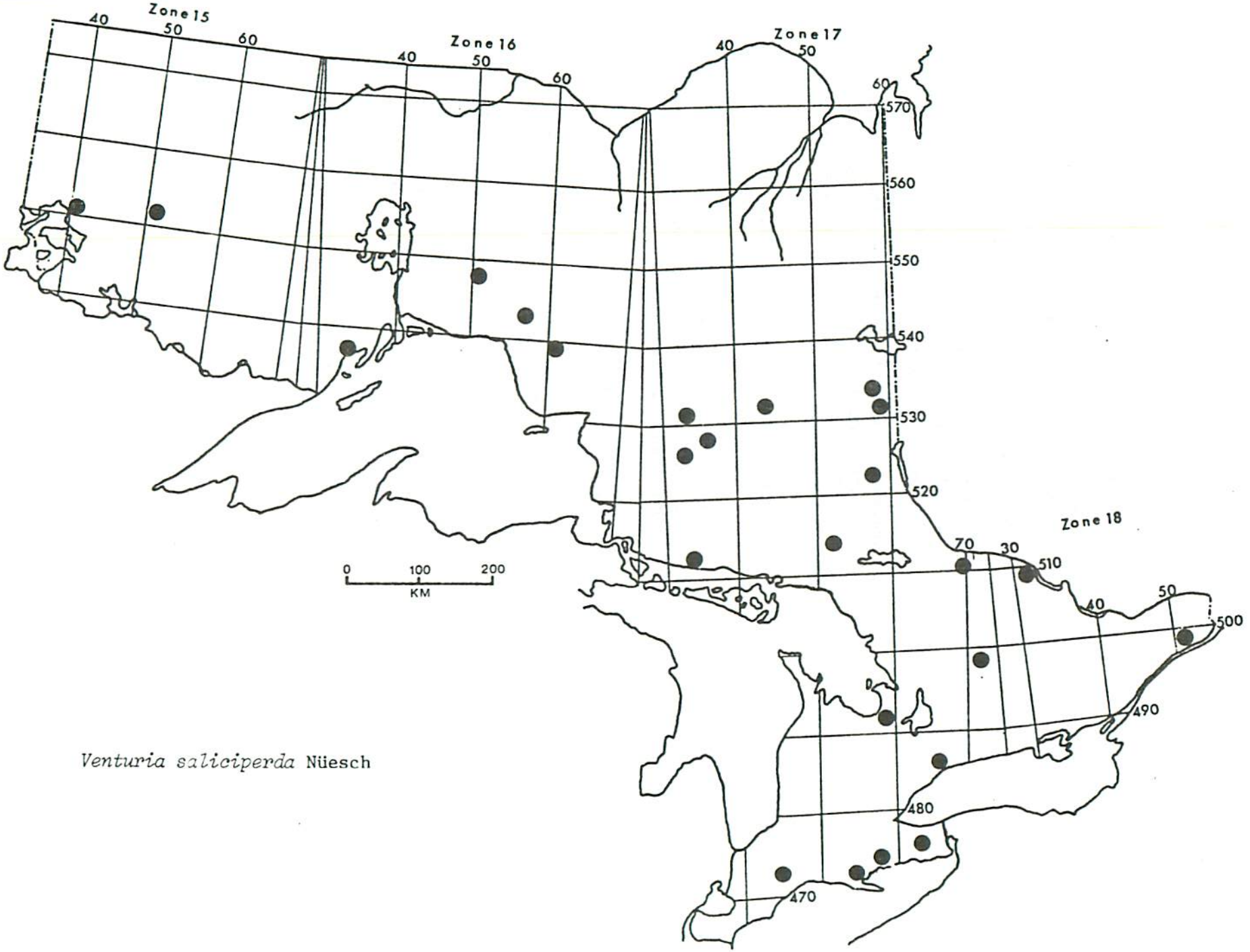
Venturia macularis (Fr.) Müller & Arx

Organism:	*Venturia populina* (Vuill.) Fabric. Including stat. conid. *Pollaccia elegans* Servazzi
Taxonomic position:	Ascomycotina, Pleosporales, Venturiaceae, Deuteromycotina, Hyphomycetales, Dematiaceae
Disease caused:	Leaf and twig blight of poplar
Hosts on record:	*Populus balsamifera*, *P.* x *euramericana*, *P. nigra* var. *italica*, *P. trichocarpa*
Number of records:	249
Herbarium specimens:	*Populus balsamifera*, 27; *P.* x *euramericana*, 1
Remarks:	This fungus injures mainly regeneration and small trees in plantations. It occurs throughout the range of the hosts.



Venturia populina (Vuill.) Fabric.

Organism:	*Venturia saliciperda* Nüesch Including stat. conid. *Pollaccia saliciperda* (Allesch. & Tub.) Arx
Taxonomic position:	Ascomycotina, Pleosporales, Venturiaceae, Deuteromycotina, Hyphomycetales, Dematiaceae
Disease caused:	Leaf and twig blight of willow
Hosts on record:	*Salix* sp.
Number of records:	48
Herbarium specimens:	*Salix* sp., 6
Remarks:	This fungus was introduced into North America from Europe and has become one of the most important diseases of willow. It occurs throughout the range of its hosts and is more common in Ontario than the number of records indicates.



Venturia saliciperda Nüesch

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