

The Status of
Feathery False Solomon's Seal
(*Maianthemum racemosum* subsp. *racemosum*)
in Newfoundland and Labrador



Photo: Michael Burzynski

**THE SPECIES STATUS ADVISORY COMMITTEE
REPORT NO. 18**

February 20, 2008

ASSESSMENT

Assessment: Endangered	Current designation: None
Criteria met: D1. Number of mature individuals <250	
Reasons for designation: Qualifies as " <i>endangered</i> " under the SSAC/COSEWIC criteria D1: <ul style="list-style-type: none">• Only 3 locations in the province, one of which is historical• Overall population, excluding historical location, estimated <125 mature individuals• Rescue effect unlikely	

The original version of this report was prepared by John E. Maunder on behalf of the Species Status Advisory Committee.

STATUS REPORT

Maianthemum racemosum (Linnaeus) Link subsp. *racemosum*

Feathery False Solomon's Seal, Large False Solomon's Seal, False Spikenard; Fr.
smilacine à grappes

Synonyms:

Convallaria racemosa Linnaeus

Smilacina ciliata Desfontaines

Smilacina racemosa (Linnaeus) Desfontaines

Unifolium racemosum (Linnaeus) Britton

Vagnera australis Rydberg;

Vagnera racemosa (Linnaeus) Morong

Vagnera retusa Rafinesque

Family: Convallariaceae (Lilies-of-the-Valley)

Life Form: Herbaceous, perennial forb.

Distribution

Global:

North America: Canada [see more detail below]. United States of America: approximately the eastern two thirds of the country, *including* Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, District of Columbia, Maryland, Delaware, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Florida, Ohio, Kentucky, Tennessee, Alabama, Michigan, Indiana, Mississippi, Wisconsin, Illinois, Minnesota, Iowa, Missouri, Arkansas, Louisiana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas (LaFrankie 2003). [Nature Serve Explorer adds: New Mexico.]

National:

Newfoundland and Labrador (Newfoundland only), Nova Scotia, Prince Edward Island, New Brunswick, Québec, Ontario, Manitoba, Alberta (LaFrankie 2003).

Provincial:

On the Island of Newfoundland, known from only three small localities (one of them historical) on the west coast (Fig. 1).

Annotated Range Map

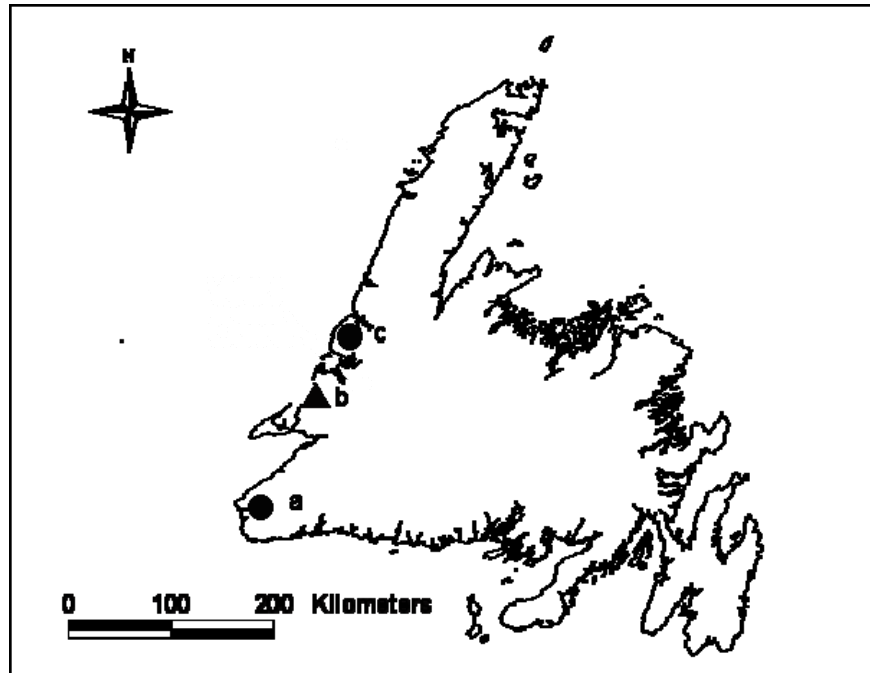


Figure 1. Known localities for *Maianthemum racemosum* in Newfoundland: [a] Mollychignick Brook, [b] southwest slope of the Lewis Hills (historical), [c] Trout River Ponds.

Description

An arching, lily-like plant, closely resembling (but not very closely-related to) the garden variety Solomon's Seal. Growing up to 125 cm tall. Bearing 70-250 small, white, star-like flowers in a concentrated terminal array. Berries green with copper spots when young, maturing through a "pinkish" stage to a deep translucent red.

Habitat

A plant of deciduous woodlands, persisting along shaded roadsides and urban and suburban wooded tracts; 0-800 m.

In Newfoundland, the gross habitat of *Maianthemum racemosum* is quite varied. At Mollychignick Brook, the habitat is spring-flooded alder thickets near a medium-sized river, at very low elevation. On the southwestern slope of the Lewis Hills, it is an alder thicket, but at an altitude of about 600 metres. At Trout River

Ponds, it is a well-vegetated north-facing ravine at the base of a high cliff above a large lake, also at a very low elevation.

Overview of Biology

A rhizomatous plant of rich, shaded, temperate woodland soils. Flowering in June and July throughout its northern range.

The perennating [ie. overwintering] organ of *Maianthemum racemosum* is a rather long rhizome, up to 17 cm long (Brundrett and Kendrick 1988), which may survive well in excess of 20 years (LaFrankie 1985b). Piper (1989) considered the reproduction of *Maianthemum racemosum* to be primarily clonal, via infrequent fragmentation of this rhizome. In this regard, in the event of the fragmentation of a rhizome, or an injury to a rhizome apex, a reserve bud (which may remain dormant for up to 20 years) will normally reactivate to allow the new or debilitated rhizome portion to continue to grow. (LaFrankie 1985b).

The species also reproduces through flowering. LaFrankie (2003) suggested that *Maianthemum racemosum* might be “apomictic” (ie. flowers reproducing asexually); but, Piper (1989) stated clearly that the species produces self-incompatible, entomophilous flowers, and is “an obligate [insect-pollinated] outcrosser”. Seeds are apparently dispersed by birds (Piper 1989).

In *Maianthemum racemosum*, the number of flowers increases with the size of the aerial stem; and the percentage of fruitset, as well as the number of fruits maturing, increases with the number of flowers. However, on average, fruitset appears to be <10%; and, even though each resultant fruit may start out with as many as four seeds, only one of these seeds generally matures (Piper, 1989).

Of considerable conservation interest, is the fact that the generation of a new, flowering, adult *Maianthemum racemosum* plant, from seed, is a very protracted and complex process. First, the seed requires a cold period before the radicle emerges. Subsequently, in the first year, the seedling does not develop foliage leaves, since the species is “double-dormant” and requires a second cold period before foliage leaves are produced. In the second year, the seedling develops only one foliage leaf. In the third year, the seedling develops two foliage leaves. At this point, a lateral bud develops on the vertical seedling axis, initiating the horizontal subterranean rhizome (LaFrankie 1985a). In the fourth year, the first “adult” leafy flowering stem is produced, from the horizontal rhizome (LaFrankie 1985b). Each subsequent year, an aerial stem arises, from a subsequent growth-section of the horizontally growing rhizome. Branching of the rhizome is very uncommon. On any given rhizome branch, only one aerial stem is produced at a time.

The initial production of new shoots always begins two-three years before the shoots actually grow upwards to become aerial flowering stems. The long period of development of these “pre-formed” shoots would seem to compromise the ability of individual plants to adjust to rapid environmental changes, or injury (LaFrankie 1985b).

Of additional conservation interest, in Newfoundland, is the fact that only about 25% of observed plants appear to flower in any given year (see below: “Population Size and Area of Occupancy”). While all mature aerial stems would seem to have the potential to flower, it is not actually known, from either Newfoundland or other observations, what proportion of “non-flowering plants” are actually “non-flowering mature individuals”. While Piper (1989) noted that smaller mature plants tend to have fewer flowers, it is not at all clear whether this number can commonly be zero. M. Burzynski (personal communication, 2007) stated that the non-flowering plants he recorded at Trout River Ponds seemed to be smaller than the flowering ones, but could not recall the number of leaves produced by each, and some could have been “one- or two-leaf seedlings”. Significantly however, N. Djan-Chékar (personal communication, 2008) has observed “non-flowering plants” with more than two leaves at Mollychignick Brook.

Plants collected at Mollychignick Brook on May 30, 2002, had very young inflorescences, about 1 cm long; plants collected at the same locality on June 11, 2001, had similarly young inflorescences about 1.5 cm long; while plants collected at the same locality on July 21, 1997, had small (2-3 mm in diameter), speckled, immature green fruits (the above specimens are deposited in The Rooms Provincial Museum [NFM]). M. Burzynski photographed slightly older stems, with more mature “pinkish” berries, at Trout River Ponds on August 9, 2004 (see cover photo of this report; and Burzynski 2005). Senescence is complete by early to mid-September.

Population Size and Area of Occupancy

Mollychignick Brook:

According to the Provincial Wildlife Division database, a total of 156 individuals were counted, at a total of four very closely associated sites in the vicinity of Mollychignick Brook, by N. Djan-Chékar and J. Brazil, on May 30, 2002. A smaller sub-sample, counted by N. Djan-Chékar and C. Hanel, in 2001, found 19 flowering and 52 non-flowering individuals [total = 71; 26.8% flowering]

The area of occupancy at Mollychignick Brook is very difficult to estimate. However, considering that the total linear extent of the known population,

along both sides of the river, is approximately 1200 m, and assuming, based upon various field experience, a total habitat width of approximately 20 m on each side of the river throughout the population, an AO of 48000 m² (= 0.048 km²) might be reasonable to assume.

Southwestern slopes of the Lewis Hills:

Thought to be a single locality. Both population size, and area of occupancy, are unknown.

However, given the relatively small size of the populations occurring at the other two extant sites, as well as the fact that the Lewis Hills observer (Damman, 1965) wrote on the herbarium label of his collection the phrase “an open spot in *Alnus crispa* thicket ... [underlining added by JEM]”, it might be reasonable to assume that this population, too, was relatively small.

Trout River Ponds:

On August 9, 2004, C. Bennett, T. Gallant, and M. Burzynski found 12 flowering and 41 non-flowering individuals [total = 53; 22.6% flowering]. Area of occupancy very small; possibly < 10 m².

In summation, it seems reasonable to suggest that the combined population of *Maianthemum racemosum* for the three known sites is likely to be somewhat less than 500 individuals (flowering plus non-flowering). It should be reiterated here, that some of the “non-flowering individuals” enumerated above may well be “one- and two-leafed “seedlings” (see above: “Overview of Biology”). The combined total number of flowering individuals enumerated for the Mollychignick Brook population, plus the Trout River Ponds population, may well be as few as 54 individuals (ie. 156 X 26.8% [for basis, see above] = 42 [extrapolation for Mollychignick Brook] + 12 [actual count for Trout River]).

Traditional and Local Ecological Knowledge

No published or other evidence has been found regarding the aboriginal use of this species within the Province. In particular, a specific inquiry to the Federation of Newfoundland Indians in 2007 yielded no definitive information.

However, Arnason *et al.* (1981: tables 3, 7 and 8) included the species in their study of the ethnobotany of eastern Canada [the active medicinal ingredients involved in all examples appear to be tannins, and azetidene-2-COOH (AZE)]:

1. Food Uses:

Ojibwa: "roots soaked in lye before cooking" (ref. Smith, 1932)

2. Medicinal Uses:

Ojibwa (Flambeau): "Kidneys in pregnancy, sore throat, headache: roots used and *Apocynum*" (ref. Smith, 1932)

Ojibwa (Chippewa): "Headache: root dried, sprinkled on hot coals, inhale fumes" (ref. Gilmore, 1933)

Ojibwa (Chippewa): "Pain in back: root decoction; female weakness" (ref. Densmore, 1974)

Ojibwa: Childbirth: leaf decoction; cuts (stop bleeding): crushed leaves; headache: inhale fumes, root used" (ref. Hoffman, 1891)

Algonquin: Sore back: tea (ref. Black, 1980)

Abenaki: Overexertion, bleeding from mouth: root used (ref. Rouseau, 1947)

Malecite: Rash, itch: leaves, twigs for bath (ref. Mechling, 1959)

Trends

Apparently stable, since no recent disturbance or habitat change is known to have occurred at any one of the three known localities.

Threats and Limiting Factors

No known significant threats, at present. However, the possibility of some sort of future land development at the Mollychignick Brook site should be anticipated. Since that site is a well-known sport fishing destination, and since it was once the site of both a hotel, and a major rental cabin development, it is not inconceivable that the area could be re-developed in the future. Any clearing of the alder thickets between the former development site and the river could have a devastating effect upon the *Maianthemum racemosum* population there, at least on the highway side of the Grand Codroy River.

The species is sometimes cultivated for ornamental use (Galway 1945, LaFrankie 2003); conceivably, at least the Mollychignick Brook population could become the target of horticultural collectors. The berries are not palatable to humans, but appear to be eaten by some birds (Galway 1945).

Rank or Status

Global	
G-rank	G5T5
IUCN	not assessed
National	
N-rank	NNR (not ranked)
National General Status	4
COSEWIC	not assessed
Provincial	
Provincial General Status	2
Newfoundland S-rank	S1
Newfoundland General Status	2
Labrador S-rank	not present
Labrador General Status	not present
Adjacent Jurisdictions	
Nova Scotia S-Rank	S4S5
Nova Scotia General Status	4
Prince Edward Island S-Rank	S5
Prince Edward Island General Status	4
New Brunswick S-Rank	S5
New Brunswick General Status	4
Québec S-Rank	S5
Québec General Status	4

[Note: Where available, ranking data from the biodiversity databases of the individual Provinces has been used. Otherwise, General Status ranks are based upon the “General Status of Species in Canada (2005)”, and S-Ranks are based upon “NatureServe Explorer”. Where there is apparent discrepancy, NatureServe Explorer ranks are considered to be the least current.]

Existing Protection

The Trout River Ponds population is located within Gros Morne National Park.

Special Significance

None known.

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Collections Examined

Provincial Museum of Newfoundland and Labrador:
Five herbarium collections.

TECHNICAL SUMMARY

Distribution and Population Information	Criteria Assessment
<i>Extent of occurrence (EO)(km²)</i>	approximately 965 km ²
<i>Area of occupancy (AO) (km²)</i>	perhaps 0.048 km ² for Mollychignick Brook plus Trout River Ponds populations; AO of Lewis Hills population unknown (but probably not very large)
<i>Number of extant locations</i>	probably 3; but, <i>one</i> of these has not been relocated within the last 25 yrs
<i>Specify trend in # locations, EO, AO (decline, stable, increasing, unknown)</i>	apparently stable
<i>Habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat</i>	apparently stable
<i>Generation time (average age of parents in the population) (indicate years, months, days, etc.)</i>	unknown; perennial; the seed-to-adult time is 4 years
<i>Number of mature individuals (capable of reproduction) in the Provincial population (or, specify a range of plausible values)</i>	at least 54 flowering individuals (plus an unknown population from Lewis Hills); however reproduction may also be clonal, via infrequent rhizome fragmentation
<i>Total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals or number of populations</i>	apparently stable
<i>Are there extreme fluctuations (>1 order of magnitude) in number of mature individuals, number of locations, AO and/or EO?</i>	unknown; but unlikely
<i>Is the total population severely fragmented (most individuals found within small and isolated populations)</i>	Yes
Rescue Effect (immigration from an outside source)	
<i>Does species exist elsewhere?</i>	Yes
<i>Status of the outside population(s)? [adjacent Provinces only]</i>	Nova Scotia, Prince Edward Island, New Brunswick, and Québec, secure.
<i>Is immigration known or possible?</i>	very unlikely
<i>Would immigrants be adapted to survive here?</i>	Unknown
<i>Is there sufficient habitat for immigrants here?</i>	Unknown

Appendix A. Population Information

Recently Verified Occurrences/Range Use (recorded within the last 25 years)

Verified occurrences consist of observations supported by the collection of a voucher specimen (i.e. a sample to be identified/confirmed by experts and deposited in a herbarium).

Mollychignick Brook :

July 21, 1986. Mollychignick Brook. Alluvial woods. [Observers: A. Bouchard, S. Hay. Collection: MT 86026 (Université de Montréal)]

July 21, 1997. Mollychignick Brook. Trail to Grand Codroy River, behind Chignic Lodge cabins [cabins now derelict]. Open woods with yellow birch. [Observer: J. E. Maunder. Collection: NFM 5696 (Provincial Museum of Newfoundland and Labrador).]

July 21, 1997. Mollychignick Brook. Plants with small, speckled, immature green fruits. [Observer: H. Mann. Collection: Mann 97-30 (Sir Wilfred Grenfell College Herbarium).]

June 11, 2001. Grand Codroy River valley, at Mollichignick Brook, between the Trans Canada Highway and the Grand Codroy River, behind the Chignic Lodge [a hotel, now burned down], <100 m from the river. *Alnus rugosa/Sambucus pubens* thicket on alluvial terrace with lush herb layer dominated by *Carex intumescens* and *Dryopteris spinulosa* (*sensu lato*); fresh, deep organic soil with some silt, covered by a thick layer of litter. On grassy hump slightly higher than the surrounding area or under *Prunus virginianus* thicket along edge of terrace. [Observers: N. Djan-Chékar, and C. Hanel. Collection: NDC 01-66 = NFM 8432 (Provincial Museum of Newfoundland and Labrador).]

May 30, 2002. Codroy Valley, Grand Codroy River, E-shore of river, S of the mouth of Mollichignick Brook. *Alnus rugosa* thicket on elongate mound parallel to the river in alluvial flat; with some *Populus balsamifera*, *Sambucus pubescens* and *Prunus virginiana*, and rich herb layer with *Dryopteris intermedia*, *Trillium cernuum*, and *Rubus pubescens*; substrate moist loam to loamy sand, with 25% litter cover; filtered light. [Observers: N. Djan-Chékar, and J. Brazil. Collection: NDC 02-22 = NFM 8054 (Provincial Museum of Newfoundland and Labrador).]

May 30, 2002. Codroy Valley, Grand Codroy River, W-shore of river, downstream of the mouth of Mollichignick Brook. *Prunus virginiana/Alnus rugosa* thicket on alluvial flat along river, 3 m above the water; with forested slope behind and bordered by a wet area; rich herb layer

dominated by *Thalictrum pubescens*; fresh sandy loam; mostly bare, with only 25% covered with litter; filtered light. [Observers: N. Djan-Chékar, and J. Brazil. Collection: NDC 02-23 = NFM 8053 (Provincial Museum of Newfoundland and Labrador)]

May 30, 2002. Grand Codroy River, W-shore of river, downstream of the mouth of Mollichignick Brook. *Alnus rugosa* thicket with *Sambucus pubescens* and *Prunus virginiana* on raised area in alluvial flat; rich herb layer with *Dryopteris intermedia*, *Thalictrum pubescens*, *Clintonia borealis* and *Trillium cernuum*; substrate moist loamy sand with 25% litter cover; filtered light. [Observers: N. Djan-Chékar, and J. Brazil. Collection: (specimens were collected, but a minor specimen numbering issue needs resolution)]

May 30, 2002. Grand Codroy River, W-shore of river, downstream from the mouth of Mollichignick Brook. *Alnus rugosa* thicket on alluvial flat with a meander of muddy depressions; with *Sambucus pubescens*, *Prunus virginiana* and a rich herb layer dominated by *Carex* (NDC 02-14), *Aster* (NDC 02-12), *Dryopteris intermedia*, *Trillium cernuum*, *Maianthemum stellatum*, *Thalictrum pubescens* and *Rubus pubescens*; moist sandy loam, 25% litter cover; filtered light. On drier, raised areas. [Observers: N. Djan-Chékar, and J. Brazil. Collection: NDC 02-19 = NFM 8064 (Provincial Museum of Newfoundland and Labrador).]

Trout River Ponds :

August 6, 1996. Trout River [Big] Pond [the easternmost of the two Trout River Ponds], south shore. North-facing ravine, below sparsely-vegetated 350 metre-high gabbro cliff; in shadow much of the day; heavily vegetated with beaked hazel (*Corylus cornuta*) and mountain maple (*Acer spicatum*). Several plants in fruit. [Observers: A. Marceau and M. Burzynski. Collection: one specimen in Gros Morne National Park herbarium: (Park herbarium does not yet assign accession numbers to its collections)]. (Ref: Burzynski 2005)

August 9, 2004. Trout River Ponds, same locality as visited on August 6, 1996. A total of 12 flowering *Maianthemum racemosum* and 41 non-flowering plants were located. The plants were growing on the floor of a small ravine, down to the lake shore. They were growing in association with *Corylus cornuta*, *Alnus viridis*, *Acer spicatum*, *Taxus canadensis*, *Thalictrum pubescens*, *Polystichum braunii*, *Gymnocarpium dryopteris*, and *Phegopteris connectilis* (Burzynski 2005). [Observers: C. Bennett, T. Gallant, and M. Burzynski. Collection: diagnostic photos taken, see Burzynski (2005), and the cover of the present report].

Recent Search Effort (areas searched within the last 25 years with estimate of effort)

General rare plant surveys of the west and northeast coasts of the Island were conducted by members of the Newfoundland Rare Plant Project (*q.v.*), specifically during 1999 to 2001, when 1645 individual sites were surveyed and 7622 plant collections were made. Additional general rare plant surveys have been conducted within the Province by various National Parks personnel, and by J. E. Maunder of the Provincial Museum and H. Mann of Sir Wilfred Grenfell College (early 1970's to present), as well as by N. Djan-Chékar of the Provincial Museum (2002 to present). Significant additional general collecting has been conducted, on the south coast of the Island, by R. Etcheberry, of St.-Pierre et Miquelon (1986, 1987, 1989, 1990, 1992, and 1993).

Targeted rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of the publication "The Rare Vascular Plants of the Island of Newfoundland" (Bouchard *et al.* 1991), in: 1984 and 1985 (Gros Morne National Park), 1986 (southwest coast, and the general Port au Port area), 1987 (Great Northern Peninsula), 1988 (Baie Verte Peninsula, Notre Dame Bay, and central and eastern Newfoundland), 1989 (Gros Morne National Park, and the south coast), and 1990 (west coast, and Great Northern Peninsula).

Geographically focused rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of contracted rare plant reports for Port au Choix National Historic Park (Bouchard *et al.* 1993), L'Anse aux Meadows National Historic Park (Bouchard *et al.* 1993), Gros Morne National Park (Anions, 1994; Bouchard *et al.*, 1985, 1986, 1991, 1994, 1996; and Brouillet *et al.*, 1998), and Terra Nova National Park (Brouillet *et al.* 1997). Additional geographically focused rare plant surveys were conducted in the Squid Cove and Doctors Brook areas, and the Labrador Straits region by C. Hanel (2004, 2005a, 2005b).

A 2-days targeted search for *Maianthemum racemosum* on the lower course of the South Branch and Grand Codroy rivers was carried out by N. Djan-Chékar and J. Brazil in 2002.

Historical Verified Occurrences/Range Use (recorded prior to the last 25 years)

Mollychignick Brook:

June 19, 1962. Mollychignick Brook. Under alders, near the shores. [Observer: E. Rouleau. Collection: Rouleau 7455. MT (Université de Montréal).]

June 18, 1967. Mollychignick Brook. Under alders along the shores. [Observer: E. Rouleau, G. Lamoureux, R. Lachaine, M. Dubuc, L. Bérard, A. Bouchard, and N. Paradis. Collection: Rouleau 10531. MT (Université de Montréal).]

Lewis Hills:

October 19, 1961. Southwest slope of Lewis Hills. Altitude 1800 feet [note: contrary to the collection label data, Damman (1965: 375) gave the altitude for this locality as “about 1000 ft.” (possibly a typo?)!]. Open spot in *Alnus crispa* thicket, with *Rubus pubescens*, *Carex leptonevia*, and *Solidago rugosa*. [Observer: A. W. H. Damman. Collection: 759 (Newfoundland Forestry Centre Herbarium - CDFN) (determined by A. W. H. Damman, 1961; verified by Patricia Baines, herbarium curator, 2006).]

Other Observations (unverified occurrences)

It is unclear whether the Reverend A. C. Waghorne knew of the occurrence of *Maianthemum racemosum* in Newfoundland, or not, and, if he did, from precisely where. In his “A Summary Account of the Wild Berries and other Edible Fruits of Newfoundland and Labrador” (1888), he wrote, somewhat cryptically: “*The False Solomon’s Seal or Smilacina genus* which gives us the two-leaved Solomon’s seal” [*S. bifolia*], and the three-leaved Solomon’s seal [*S. trifolia*]. Both these have bright red berries, and are perhaps known here as “scurvy berries,” the star-flowered Solomon’s seal, or false spikenard [*S. stellata*], with blackish berries, and the clustered Solomon’s seal [*S. racemosa*], having pale-red speckled berries.” [All of the square brackets in the foregoing quote are those of Waghorne, himself. His “*S. bifolia*” is, apparently, *Maianthemum canadense*.]

It is interesting to note that, while botanizing the Grand Codroy River, up to 14 miles inland from the river mouth, and then striking considerably inland, to the southwest, away from the river, towards the Anguille Mountains, Dr. John Bell (1870) completely missed *Maianthemum racemosum*, but nonetheless found the sometimes co-occurring *Claytonia caroliniana*, even though he probably passed directly in front of the Mollychignic Brook site.

Potential Sites Unexplored

The alder thickets of western Newfoundland have, on balance, been poorly searched. The relatively diverse habitat characteristics of the three known localities suggest that undiscovered sites almost certainly still exist, especially at higher altitude.

Appendix B. Supplementary Details

Taxonomic Clarifications

Until recently, *Maianthemum racemosum* has been known, most commonly, as *Smilacina racemosa* (ie. Fernald 1950). However, in recent years, there has been considerable discussion regarding the true relationships between the two closely-related taxa *Maianthemum* and *Smilacina*. Formerly, the two were separated on the simple basis that (LaFrankie 1986) *Maianthemum* was “dimerous” (4 tepals, 4 stamens, 2 carpels), while *Smilacina* was “trimerous” (6 tepals, 6 stamens, 3 carpels). LaFrankie (1986) discussed the basis for including *Smilacina* within *Maianthemum*.

The subspecies *racemosum*, from eastern North America, is well distinguished from the subspecies *amplexicaule*, from western North America, by its arching versus erect habit, its petiolate versus sessile clasping leaves, its tapered versus rounded leaf base, and its caudate [ie. tailed] versus short-acute leaf apex [judged at the third leaf below the inflorescence] (LaFrankie 2003).

Description

Plants terrestrial. To 125 cm tall. **Rhizomes** sympodial [ie. without a single, persistent growing point, changing direction by frequent replacement of the growing apex by a lateral growing point below it], cylindrical, units 30-40 cm × 8-14 mm, sometimes multiplied, roots scattered but primarily from the previous year's section of the rhizome. **Stems** arching, 75-125 cm × 7-9 mm. **Leaves** 7-12, petiolate; blade elliptic to ovate, 9-17 × 5-8 cm; base tapered; apex of third leaf below inflorescence caudate, with apex 12-25 mm long. **Inflorescences** paniculate, 70-250 -flowered, branches well developed, pyramidal. **Flowers** 3-merous; tepals inconspicuous, 0.5-1 × 0.5 mm; filaments 1 × 0.5 mm; anthers 0.5-1 mm; ovary globose, 1 mm wide; style 0.1-0.3 mm; stigma obscure; pedicel 0.5-1 × 0.5 mm. **Berries** green with copper spots when young, maturing through a “pinkish” stage to a deep translucent red, globose or 3-lobed, 4-6 mm wide. **Seeds** 1-4, globose, 2.5-4 mm. **2n** = 36, 72, 144. (Modified after LaFrankie 2003, and other sources). “Flora of North America” illustration at: http://www.efloras.org/object_page.aspx?object_id=41726&flora_id=1. Additional useful image in Mann (1999). See also Figure B-1.



Photos: Nathalie Djan-Chékar

Figure B-1. Description: [a] young leafy stem (May 30, 2002), [b] young inflorescence (June 11, 2001). Both photos from Mollychignick Brook.

Habitat

Mollychignick Brook (Fig. B-2a):

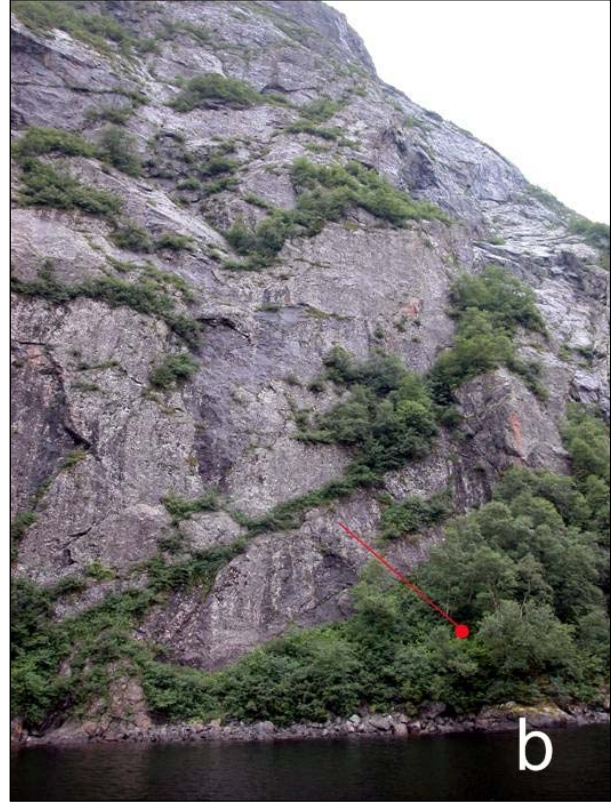
Alluvial river terraces. Speckled alder (*Alnus incana* subsp. *rugosa*) thickets with red elderberry (*Sambucus racemosa* subsp. *pubens*) and choke cherry (*Prunus virginiana*). Lush herb layer dominated by *Carex intumescens* and *Dryopteris intermedia*, with *Thalictrum pubescens*, *Maianthemum stellatum*, *Clintonia borealis*, *Rubus pubescens* and *Trillium cernuum*. Some *Populus balsamifera*, and *Betula alleghaniensis*. Fresh, deep organic soil with some silt, or moist sandy loam. About 25% litter cover. Typically on drier grassy humps, slightly higher than the surrounding area, or under *Prunus virginiana* along the edge of terraces. Filtered light.

Lewis Hills:

Damman (1965: 375) wrote that: "It occurs in an *Alnus crispa* thicket on the southwest slope of the Lewis Hills at about 1000 [possibly a typo?] feet elevation [the label on the collected specimen adds that it was found in "an open spot ... with *Rubus pubescens*, *Carex leptonevia*, and *Solidago rugosa*", but that it occurred at an altitude of about "1800 feet"!]. It is not a particularly warm site, but it is usually covered with snow until the middle of June. Moreover, the conditions of the forest floor show an interesting resemblance to those of a hardwood forest."

Trout River Ponds (Fig. B-2b):

North-facing ravine, below sparsely-vegetated 350 metre-high gabbro cliff; in shadow much of the day; heavily vegetated with beaked hazel (*Corylus cornuta*) and mountain maple (*Acer spicatum*). The plants were growing on the floor of a small ravine near the lake shore, in association with *Corylus cornuta*, *Alnus viridis* subsp. *crispa*, *Acer spicatum*, *Taxus canadensis*, *Thalictrum pubescens*, *Polystichum braunii*, *Gymnocarpium dryopteris*, and *Phegopteris connectilis* (Burzynski 2005). According to Burzynski (2005): "The north-facing ravine apparently mimics the cool shaded conditions of rich mixed forest or hardwood forest floor, typical habitat for *Maianthemum racemosum* on the Canadian mainland. A relatively deep moist soil has accumulated in this small sheltered site."



Photos: Nathalie Djan-Chékar [a], Michael Burzynski [b]

Figure B-2. Habitat: [a] alder thicket habitat at Mollychignick Brook, [b] cliff base habitat at Trout River Ponds (site is at red spot).

Collections Examined

Provincial Museum of Newfoundland and Labrador:

NFM 5696, NFM 8053, NFM 8054, NFM 8064, NFM 8432 [see Appendix A for details].