NEW RECORDS AND RANGE EXTENSIONS FOR *ROSA* (ROSACEAE) IN NORTH AMERICA

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ABSTRACT

The genus *Rosa* L. (Rosaceae) was recently treated floristically for North America, but range extensions and an additional taxon have been confirmed since then and are detailed here. These new reports document range extensions in the US and Canada of some native and introduced *Rosa* species, and new distributions and population data for several established *Rosa* hybrids (nothospecies). Some introduced European species and some nothospecies are more widespread than previously realized, and some are actively spreading.

RESUMEN

El género *Rosa* L. (Rosaceae) recientemente se trató en su aspecto florístico para América del Norte, sin embargo distribuciones adicionales y un taxón adicional se han confirmado y se documentan aquí. Estes registros nuevos muestran distribuciones adicionales en los EE.UU. y Canada para unas especies nativas y introducidas, y distribuciones adicionales más datos de poblaciones para unos híbridos establecidos de *Rosa* (nothospecies). Unas especies europeas introducidas y unas nothospecies tienen distribuciones más amplias que se conocieron antés, y unas de ellas se encuentran en el proceso de dispersión.

INTRODUCTION

The genus *Rosa* L. (Rosaceae) was recently studied in detail for North America (Lewis et al. 2015: 75–119), but several significant range extensions and an additional taxon have been confirmed since then. These are detailed below. These new reports document range extensions the US and Canada of some native and introduced *Rosa* species, and new distributions and population size data for several established reproducing *Rosa* hybrids (nothospecies). These new reports show in particular that some introduced European species and some nothospecies are more widespread than previously realized. The additional reports here supplement the *Flora of North America* treatment. *Rosa* is well known for its numerous showy species and its extensive ability to hybridize (Lewis 2008; Lewis et al. 2015), and both native and cultivated *Rosa* species are important in horticulture.

These new reports provide more accurate knowledge of species distributions in *Rosa* to support conservation, for compilation of state and local floras, and for management of native and introduced taxa. The better documentation presented here of nothospecies of *Rosa* traces the ongoing process of hybridization and integration in this group, which is dynamic and affects species limits. The rapid naturalization of some non-native *Rosa* species shows their plasticity and highlights generic differences within this genus. Some native *Rosa* species and nothospecies are rare and thus of concern for conservation, so this documentation increases our knowledge of their ranges and population densities.

The risk of extirpation of many local *Rosa* species and nothospecies is evident and increasing. Current practices of herbicide use are expanding to the detriment of *Rosa* plants, and invasive species threaten many native *Rosa* populations. For example, herbicide use is becoming commonplace to clear roadsides and fencerows, and has already degraded many potential localities for native *Rosa* species. Also, invasive species such as barberry have reduced populations of the rare nothospecies *Rosa* × *churchillii* W.H. Lewis on Monhegan Island (Lewis 2016). In a world of on-going climate change, understanding alterations in population size, the migration of species, distributions and on-going evolutionary processes is critical.

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All specimen identifications reported here were made by W.H. Lewis unless otherwise indicated. All specimens cited have been seen by the first author unless otherwise indicated. The new reports are presented in alphabetical order within each section.

A NEW REPORT IN *ROSA* FOR NORTH AMERICA

Rosa × warleyensis Baker ex E. Wilm., Warley Rose (*Rosa blanda* Aiton × *Rosa rugosa* Thunb.)

This nothospecies was discovered sometime before 1893, albeit its origin is unknown. It was grown from seed in the gardens at the Warley Estate in England by Ellen Ann Wilmott, and was introduced into many European botanic gardens. It is now known to be a hybrid between the North American *Rosa blanda* and the Asian *Rosa rugosa*, both of *Rosa* sect. *Rosa*. This nothospecies is a showy plant that grows up to 6'7" (200 cm) tall, and has four to eight violet-pink petals and leaves with five to seven leaflets. Its characteristics reflect aspects of both its Asian and North American parentage. A description of this nothospecies can be found in Willmott (1991: 202) as well as the online source http://www.helpmefind.com/rose/l.php?l=2.46806.0. *Rosa* × *warleyensis* is documented formally from North America here for the first time; spontaneous hybrids between these two *Rosa* species in Quebec were known previously (Lewis et al. 2015: 104) but were not treated as the formally named nothospecies. Since both parent species are recognized in this and other New England states, the discovery of this nothospecies only in Vermont is surprising. This restricted distribution suggests several possibilities, including this specimen being a new, rarely formed hybrid or perhaps a naturalized escapee from a horticultural collection. Unless shown otherwise by future genetic analysis this collection merits being tentatively referred to as the "Vermont Rose."

Voucher specimen: **U.S.A.VERMONT. Washington Co.:** Moretown and S of Moretown, Jun 2005, *A.V. Gilman 15015* (MO, VT).

RANGE EXTENSIONS AND SIGNIFICANT ADDITIONAL POPULATION RECORDS FOR SPECIES AND VARIETIES OF *ROSA* IN NORTH AMERICA

A. NATIVE SPECIES: Rosa sect. Rosa

Rosa acicularis subsp. **sayi** (Schwein.) W.H. Lewis, Say's Acicular Rose

Rosa acicularis Lindl. has a circumpolar distribution, ranging widely across northern North America and northern Eurasia (Lewis 1958). Two subspecies are recognized (Lewis et al. 2015: 114–115): *Rosa acicularis* subsp. *acicularis* is found in Eurasia and Alaska, and *Rosa acicularis* subsp. *sayi* is found across North America and perhaps in Siberia. *Rosa acicularis* subsp. *sayi* is characteristic of arctic and boreal habitats, and ranges southward in ecologically similar areas in the Rocky Mountains and northern plains (Lewis & Lewis, in press). It was not previously reported from Idaho, and its occurrence in that state is documented here.

Voucher specimen: **U.S.A. IDAHO. Idaho Co.:** Idaho, N.I.J. Forest, s.d., *D. Robbins* (WS).

Rosa arkansana Porter, Prairie Rose

This species is found widely in North America, and was noted by Lewis et al. (2015: 104) to be unusually invasive and actively increasing its range. This species is widely used in horticulture, and some of its range extension has resulted from repeated introductions through cultivation. Here we document the presence of this species outside its native range in Quebec and New England. Because this species is not native in these areas, its populations may be ephemeral. However, for identification of *Rosa* in these in these areas its presence is noteworthy.

Voucher specimens: **CANADA. QUEBEC.** Matapedia City, Mont-Joli, 26 Jul 1977, *N. Charest 856* (DAO) (det. Mike Oldham). **U.S.A. MAINE. Androscoggin Co.:** 2 mi S of North Turner, 29 Jun 1954, *W.H. Lewis 2169* (MO, UBC). **Franklin Co.:** Eustis, near Flagstaff Lake, 29 Jul 2009, *A.V. Gilman 9081* (MO, VT). **NEW YORK. Essex Co.:** Olmstedville, 27 Aug 1941, *H.D. House 28122* (MO, NYS). **Warren Co.:** 2 mi W of Bakers Mills, 1 Jul 1954, *W.H. Lewis 2178* (MO). **VERMONT. Essex Co.:** Wenlock, W Ferdinand, Rte. 105, 17 Aug 2013, *A.V. Gilman 13109* (MO, VT); Brighton, Rte. 105 near Boylan State Airport, 5 Jul 2014, *A.V. Gilman 14025* (VT).

Rosa blanda Aiton, Meadow Rose

This species is found widely in North America, and was noted by Lewis et al. (2015: 104) to be morphologically

variable and actively hybridizing with introduced species in some places. It is considered adventive in Europe. The frequency and distribution of this species in some parts of its range have not been well documented. Here the identifications of several problematic specimens are clarified to provide additional documentation of the population density of this species in Maine and Vermont.

Voucher specimens: **U.S.A. MAINE. Piscataquis Co.:** Foxcraft, 23 Jul 1895, *M.L. Fernald 319* (VT). **NEW YORK. Washington Co.:** Goose Egg Mtn., 5 Jul 1981, *P.F. Zika 3925* (VT). **VERMONT. Addison Co.:** Ferrisburg, 8 Jul 1981, *P.F. Zika 4054* (VT), Middlebury, 18 Jul 1901, *N.F. Flynn s.n.* (VT). **Burlington Co.:** Apple Tree Bay, 4 Aug 1900, *N.F. Flynn s.n.* (VT); S Burlington, 30 Jul 1901, *N.F. Flynn s.n.* (VT). **Chittenden Co.:** Burlington, 5 Jul 1942, *L.A. Charette 547* (VT), NW Burlington, 4 Jul 1967, *L.A. Charette 3008* (VT). **Rutland Co.:** Fairlee, 1890, *H.E. Sargent & H.G. Jesup s.n.* (VT).

Rosa virginiana Mill., Virginia Rose

It is found in northeastern North America (Lewis et al. 2015: 100–101), where it grows primarily along coasts and lakes and in open disturbed habitats. It has also been introduced in Europe. *Rosa virginiana* is similar to *Rosa carolina*, and these species are known to hybridize; their hybrid forms the nothospecies *Rosa* × *novae-angliae* W.H. Lewis, discussed below, which is morphologically similar to its parents and often confused with them. Thus the native range of *Rosa virginiana* has not always been clear. Lewis et al. (2015: 101) considered this species introduced in Ontario, eastern Michigan, and Virginia, although they considered the plants found along lakes in northern New York State to be native there. Here we document one range extension for this species. This Mississippi population is notably disjunctive from other occurrences of the species as well as growing in an ecologically different site, and no doubt represents an introduction.

Voucher specimen: **U.S.A. MISSISSIPPI. Kempler Co.:** 2 mi S Sucarnoochee, 26 May 1967, *S.B. Jones 12512* (MISS).

Rosa woodsii Lindl. subsp. **woodsii,** Wood's Rose

This species is widespread and morphologically quite variable. Lewis et al. (2015: 106–109) noted that it is the most commonly encountered species of *Rosa* in central and western North America, and they recognized six subspecies. Five of these subspecies are found in western North America, while *Rosa woodsii* subsp. *woodsii* is widely distributed. Lewis et al. (2015: 107) reported this subspecies from central through western North America, and detailed it ranging from the northern Great Lakes region, in Ontario and Minnesota, to Mexico, Pacific Canada, and Alaska. The new distribution record presented here for *Rosa woodsii* subsp. *woodsii* extends the range of its entire species significantly to the east, and suggests that this species and subspecies may be expected also in Quebec.

Voucher specimen: **CANADA. NEWFOUNDLAND AND LABRADOR. Great Northern Peninsula:** St. Anthony, near jct. Spruce Lane & Little Brehat Road, 16 Sep 2010, *W.H. Lewis 21388* (MO).

B. INTRODUCED SPECIES: cited alphabetically according to Section

a. Rosa sect. Caninae

Rosa canina L., Dog Rose

This species is a native of Eurasia. It is widely adventive in much of the rest of the world, and adventive plants have been inadvertently described as new species several times due to not being recognized as a European introduction. *Rosa canina* is found sporadically in disturbed sites in North America (Lewis et al. 2015: 90), and its occurrence in an additional state is documented here.

Voucher specimen: **U.S.A. MINNESOTA. St. Louis Co.:** Duluth, 26 Jul 2014, *D.J. Schimpf 775* (DUL, MO).

Rosa mollis Sm., Soft Downy-Rose

This species is a native of Scotland and closely allied to *Rosa villosa* L. It was reported from North America by Lewis et al. (2015: 93) as known only from Vermont, without further comment. It is not widely documented from this state, and its known localities are detailed here to show its population distribution

Voucher specimens: **U.S.A. VERMONT. Addison Co.:** SE quadrant of jct. Vermont Rte 17 and US 7, New Haven Jct., town of New Haven, agricultural (hay) setting, not residential, one large plant, 12 Oct 2015, *A.V. Gilman 15149* (Herb. Arthur V. Gilman). **Caledonia Co.:** near Haynesville Brook, Vermont Rte 15 ca 2.5 mi E of village of Hardwick, large patch, 21 Jul 2007, *A.V. Gilman 07093* (Herb. Arthur V. Gilman);

Hardwick, 2.5 mi E of village along Vermont Rte 15, above Lamoille River, 44°30'08"N, 72°19'58"W, 1014 ft, shrubs to 2 m tall, 16 Jul 2008, *W.H. Lewis and A.V. Gilman 21141* (MO, 2 sheets and living collection).

Rosa obtusifolia Desv., Round-leaved Dog Rose

This species is native to the mountainous regions of middle to central Europe, from Scandinavia to France, Rumania and Greece. A description of this species was provided by I. Klásterskỳ in the *Flora Europaea* (1968: 30). This species was mentioned by Lewis et al. (2015: 89) as "marginally naturalized in California, New Mexico, and Virginia," but not treated further. Additional documentation of its naturalized presence is presented here, and a range extension of it into Idaho.

This European species was first found naturalized in North America in collections by Jeannie Gregory and John Gregory from two localities in San Diego County, California, in 2004 and 2005. An additional specimen collected by them in 2005 in the same county affirms the density of these populations in this area. Its subsequent discovery growing naturalized in widely disjunctive sites in New Mexico and Idaho represents another example of how this species of mountainous regions of Europe has adapted to southwestern U.S. econiches. Such ecological plasticity is significant because other *Rosa* species, or at least some of their karyotypes as in *Rosa acicularis* Lindl., lack this adaptive capacity (Lewis & Elvin-Lewis 2017).

Voucher specimens: **U.S.A. CALIFORNIA. San Diego Co.:** Julian, 0.5 mi S, 26 Apr. 2005, *J. Gregory 1465* (MO, SD). **IDAHO. Ada Co.:** Boise, Bogus Rd., 11 Jul 2014, *B. Ertter 22064 & P. Shaffer* (MO, SRP, UC). **NEW MEXICO. San Miguel Co.:** 500 ft S of Montezuma, Line Canyon, 9 Jun 2010, *J. McGrath 948* (MO, UNM).

b. Rosa sect. Pimpinellifoliae

Rosa spinosissima L., Burnet Rose

This species is from Eurasia, and is the only representative of the Old World *Rosa* sect. established in North America. *Rosa spinosissima* has been widely cultivated and not surprisingly is naturalized in various temperate regions around the world. This species also hybridizes actively; see for example *Rosa* × *harisonii* Rivers, below. *Rosa spinosissima* is naturalized rather widely in eastern North America (Lewis et al. 2015: 94), and here we document further extensions of its range to the west and south.

Voucher specimens: **U.S.A. MINNESOTA. St. Louis Co.:** Duluth, 28 Jun 2014, *D.J. Schimpf 766* (DUL, MO). **MISSISSIPPI. Franklin Co.:** Roxie, 9 Jun 1966, *S.B. Jones 6349* (US, MISS).

c. Rosa sect. Rosa

Rosa glauca Pourret, Redleaf Rose

This species is a native of Europe. It is considered native to the mountains of central and southern Europe, and is also present but considered adventive in northern Europe. *Rosa glauca* is cultivated in North America, and is sporadically adventive and expected to become more widely distributed and established in the future (Lewis et al. 2015: 98). Lewis et al. noted a report of this species in Maine, where it was known from a limited range; two additional populations of *Rosa glauca* in that state are documented here and show that it is spreading.

Voucher specimens: **U.S.A. MAINE. York Co.:** Kittery, 22 Aug 2002, *A.V. Gilman 2130* (VT). **Aroostook Co.:** Caribou, 3 Jul 2003, *A.V. Gilman 3021* (VT).

d. Rosa sect. Systelae

Rosa multiflora Thunb., Multiflora Rose

This species is native to Asia but widely distributed today. *Rosa multiflora* is an aggressive invasive in many parts of the world, and causes eye and skin irritation in cattle and thus a problem for animal husbandry. Although it was once planted by government agencies for soil stabilization, it is now considered a noxious weed in much of the US (Lewis et al. 2015: 84–85). *Rosa multiflora* has been cultivated as an ornamental and an important rootstock for horticultural rose breeding, *Rosa mutliflora* was generally reported by Lewis et al. (2015: 85) from Labrador; because that report represents the extreme northern edge of this species' range, the detailed documentation is presented here.

Voucher specimens: **CANADA. NEWFOUNDLAND AND LABRADOR. W. Peninsula:** Norris Point's Bonne Bay, above Marine Station, 13 Sep 2010, *W.H. Lewis 21386* (DAO, MO).

RANGE EXTENSIONS AND SOME POPULATION DOCUMENTATIONS OF NOTHOSPECIES OF *ROSA* IN NORTH AMERICA

Rosa × dulcissima Lunell (*Rosa blanda* Ait. × *Rosa woodsii* ssp. *woodsii* Lindl.)

This native nothospecies is a hybrid between two members of *Rosa* sect. *Rosa*. Lewis (1962) presented descriptive information. This nothospecies was mentioned briefly by Lewis et al. (2015: 95), who reported it from Manitoba, Saskatchewan, Minnesota, North Dakota, South Dakota and Wisconsin. They noted that not all authors have considered these plants a distinct nothospecies, and that it has some observed oddities such as outnumbering its parent species in some regions. Here we document the occurrence of this nothospecies in North Dakota and Wisconsin, which is notable because one of its parent taxa, *Rosa woodsii* subsp. *woodsii*, is not known from those states. This suggests that additional studies are warranted to understand the status of these plants.

Voucher specimens: **U.S.A. NORTH DAKOTA. McHenry Co.:** Towner, 27 Jul 1913, *J. Lunell s.n.* (MO). **Rolette Co.:** Turtle Mts., near Duznseith, 3 Sep 1911, *J. Lunell s.n.* (NY). **WISCONSIN. Green Co.:** N jct. Hwy. 81 & Skinner Hollow Rd, 8 Aug 2002, *S. Joly & J.R. Starr 624* (MT).

Rosa × harisonii Rivers, Harison's Yellow Rose (*Rosa spinosissima* L. × *Rosa* × *foetida* Herrm.)

This nothospecies was produced in about 1830 through an artificial cross of two Eurasian species of *Rosa*. It was a popular ornamental plant in particular in the 19th century, and was reported by Lewis et al. (2015: 94) to have been widely planted by settlers moving into the western US. *Rosa* × *harisonii* is found sporadically today in those regions, and may have survived from plantings or may have established locally after cultivation. This artificial hybrid may now be more established and spreading, as documented by the collections below.

Voucher specimens: **U.S.A. IDAHO. Blaine Co.:** Fish Creek Rd., Iron Creek, 1 mi WSW, 23 Jun 2014, *B. Ertter 21930 & J.L. Reveal* (MO, SRP). **Gem Co.:** Emmett, ca. 8 air mi E, along Willow Creek, 21 May 1014, *B. Ertter 21777, J.F. Smith & A. Dinicola* (MO).

Rosa × hollandica Pers. ex Steud., Dutch Rose (*Rosa rugosa* Thunb. × unknown taxon)

This non-native nothospecies is of unclear origin, and is widely distributed and naturalized in particular in northern Europe. It was reported as naturalized in Vermont and New York by Lewis et al. (2015: 99), and here we present formal documentation of those occurrences and an additional site for this nothospecies in New Hampshire.

Because of its hardiness and showy vibrant red flowers, the Eurasian *Rosa rugosa* was introduced in Europe and North America in the 18th century. It became naturalized here, and readily crosses with many other *Rosa* species. The identity of the other parent of *Rosa* × *hollandica* is as yet unclear, but has been suggested credibly to be the hybrid Noisette Rose that Manettii developed in 1835, or possibly the species *Rosa majalis* Herm. or alternatively the species *Rosa davurica* Pall. (Bruun 2005). A description of this nothospecies can be found in Haines (2011). First grown in Holland by J. Spek in 1888, *Rosa* × *hollandica* was then called "Scherpe Boskoop" or "Boskoop Rugosa". Its naturalized presence in New England states is possibly the result of its popularity in commerce as an understock or for budding, because it is extremely hardy and crosses so readily (Krüssmann 1981: 270). It is noteworthy that other, different hybrids of *Rosa rugosa* that have escaped from cultivation have sometimes also been referred to by this name (Bruun 2005).

Voucher specimens: **U.S.A. NEW HAMPSHIRE. Sullivan Co.:** Grantham, 9 Sep 1955, *A.R. Hodgon, F. Steele & A. Lincoln Jr. 9292* (NHA) (determined by A.V. Gilman). **NEW YORK. Schuyler Co.:** Hector, Finger Lakes Natl. Forest, 25 Jun 2010, *D. Werier & A. Haines 3795* (MO) (determined by D. Werier & A. Haines). **VERMONT. Caledonia Co.:** Newark, E branch Passumpsic River, 26 Jun 2010, *A.V. Gilman O10036* (MO, VT) (determined by A.V. Gilman & D. Werier).

Rosa × novae-angliae W.H. Lewis, New England Rose (*Rosa carolina* L. × *Rosa virginiana* Mill.)

This native nothospecies is part of a large polymorphic allotetraploid complex that includes *Rosa carolina*. Both its parents belong to *Rosa* sect. *Rosa*. This nothospecies was first collected in the late 19th century in Fairfax

County, Virginia, near Washington, D.C., and in Massachusetts. It was not recognized as a hybrid, however, until later study found putative introgressants and additional specimens from within the range of the parental species in New Jersey and Pennsylvania (Lewis 2008) and its pollen was studied. The mean pollen sterility of *Rosa* × *novae-angliae* is 8% less than that of its two parents, which were both found to be highly fertile (Erlanson 1934; Erlanson 1931). It is important to emphasize that the introgressive plants are considered very rare and "difficult to detect due to the morphological variability of both parents" (Haines 2011), so study of the hybridization process in these plants is complicated.

Lewis et al. (2015: 101) reported this nothospecies from New England southward through New Jersey to Virginia. They reported each of its parent species from a much broader range, and reported that both species are known from a larger area than where the nothospecies is found: New Brunswick, Ontario, Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Virginia. New collections of *Rosa* × *novae-angliae* now extend its range and provide better understanding of its population dynamics. The origin of the 1900 collection of *Rosa* × *novae-angliae* from "Wady Petra" in central Illinois is perplexing since the locality is so widely disjunctive from other known collections, the two parent species are not both known from this region, and the exact location of the site has not been located on modern maps. However *Rosa carolina* is found further north of there in Wisconsin, and both the parental species are found to the northeast of there in Michigan (Lewis et al. 2015). We suggest that there are many ways in which a population of *Rosa* × *novae-angliae* might have been established in Stark County, Illinois, including by seeds or plants of the parents or hybrid being transported by waterways such as the nearby Illinois River, or transported by railroad trains or settlers from New England passing by the area.

Voucher specimens: **U.S.A. CONNECTICUT. New Haven Co.:** Southbury, *A.E. Blewett 2056* (PH). **Maine: York Co.:** Berwick, 9 Sep 1932, *A.E. Perkins s.n.* (VT). **ILLINOIS. Stark Co:** Wady Petra, 11 Jun 1900, *V.H. Chase 610* (MISS). **MASSACHUSETTS. Barnstable Co.:** Provincetown, *M.L. Fernald & B. Long 18605* (PH). **Essex Co.:** Crane Beach, Ipswich, 20 Jun 2002, *S. Joly & J.R. Star 494* (MT). **Worcester Co.:** New Braintree, 27 Jun 2006, *R.I. Bertin 3699* (CHC). **NEW HAMPSHIRE. Sullivan Co.:** Claremont, Ferry, 28 Jun 1956, *A.R. Hodgdon & F. Steele s.n.* (NHA). **NEW JERSEY. Cape May Co.:** 5 mi from Beach Cape Bay, 17 Sep 1893, *A. MacElwee Jr. s.n.* (PA). **Warren Co.:** Phillipsburg, 15 Aug1890, *T.C. Porter s.n.* (PA). **NEW YORK. Onondaga Co.:** Green Lakes State, 2 Jul 1954, *W.H. Lewis 2181* (MO).

Rosa × palustriformis (Rydb.) Voss, Northern Swamp Rose (*Rosa blanda* Ait. × *Rosa palustris* Marshall)
This native nothospecies was mentioned briefly by Lewis et al. (2015: 100), and reported to be found sporadically in Maine, Michigan, Ohio, and Wisconsin. Its two parent species belong to *Rosa* sect. *Rosa*, and are both widespread and morphologically variable. Lewis et al. noted that these hybrid plants were long considered species, and distinctive forms of it were named variously as *Rosa carolina* var. *aculeata* Schuette, *Rosa michiganensis* Erlanson, and *Rosa schuettiana* Erlanson. More recently these plants were recognized as a putative hybrid and thus are now regarded as a nothospecies closely resembling one of its parents, *Rosa palustris* (Lewis 2012).

Here we document two new occurrences of *Rosa* × *palustriformis*, both in Vermont, and additional occurrences in Wisconsin. Both its parental species are found together throughout a much broader area (Lewis et al. 2015), in New Brunswick, Nova Scotia, Ontario, Quebec, Arkansas, Connecticut, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Vermont, West Virginia, and Wisconsin. Because its parental species are known to occur in regions where this nothospecies has not been discovered, it is likely that, depending on specific econiches where it prefers to grow, it can be expected to be found elsewhere. *Rosa* × *palustriformis* has a clear preference for growing in swampy locations within the northern states of the Midwest. It is also likely that some herbarium specimens now labeled as *Rosa palustris* may prove to be this nothospecies.

Voucher specimens: **U.S.A. VERMONT. Windsor Co.:** Norwich, banks of Connecticut River, 7 Jul 1890 (hips in Sep), *H.G. Jesup s.n.* (VT). **Orange Co.:** Orange, shore of Thurman, W Dix Reservoir, 16 Jun 2010, *A.V. Gilman 09162* (MO, VT). **WISCONSIN. Brown Co.:** Ashwaubenon, Jul 1890, *J.H. Schuette s.n.* (US); Green Bay City, 28 Aug 1899, *J.H. Schuette* (F). **Door Co.:** Little Sturgeon Bay, 17 Aug 1891, *J.H. Schuette s.n.* (US); Lily Bay, 16 Jul 1890, *J.H. Schuette s.n.* (MO).

DISCUSSION

These examples provide evidence of how *Rosa* species, both native and introduced, and nothospecies are spreading throughout North America. This may be the result of intentional or inadvertent introductions, or in other instances their spread may be attributed to their ability to take advantage of natural dispersal modes. Other mechanisms may also play a part, such as transport by vehicles and roadwork as suggested for *Rosa setigera* Michx. in Maine (Lewis 2016). Additional work is needed to clarify the presence of nothospecies where only one or neither parental species has been found, and to understand instances in which both parents are present but the hybrids have yet to be detected. Because of current natural environmental and man-made changes in addition to the introduction of invasive species, the existence of certain *Rosa* populations are threatened. Alternatively new ecological niches may evolve as new weather patterns affect seasonal variations in temperature and the content of moisture in local soils thus permitting some *Rosa* to spread and thrive in these new conditions.

It is also important to recognize that collections found in herbaria are often misidentified, and also may not represent the current status of *Rosa* populations. For these reasons studies on the density and diversity of *Rosa* populations, both natural and introduced from elsewhere, should be ongoing.

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